

# J.P.Morgan

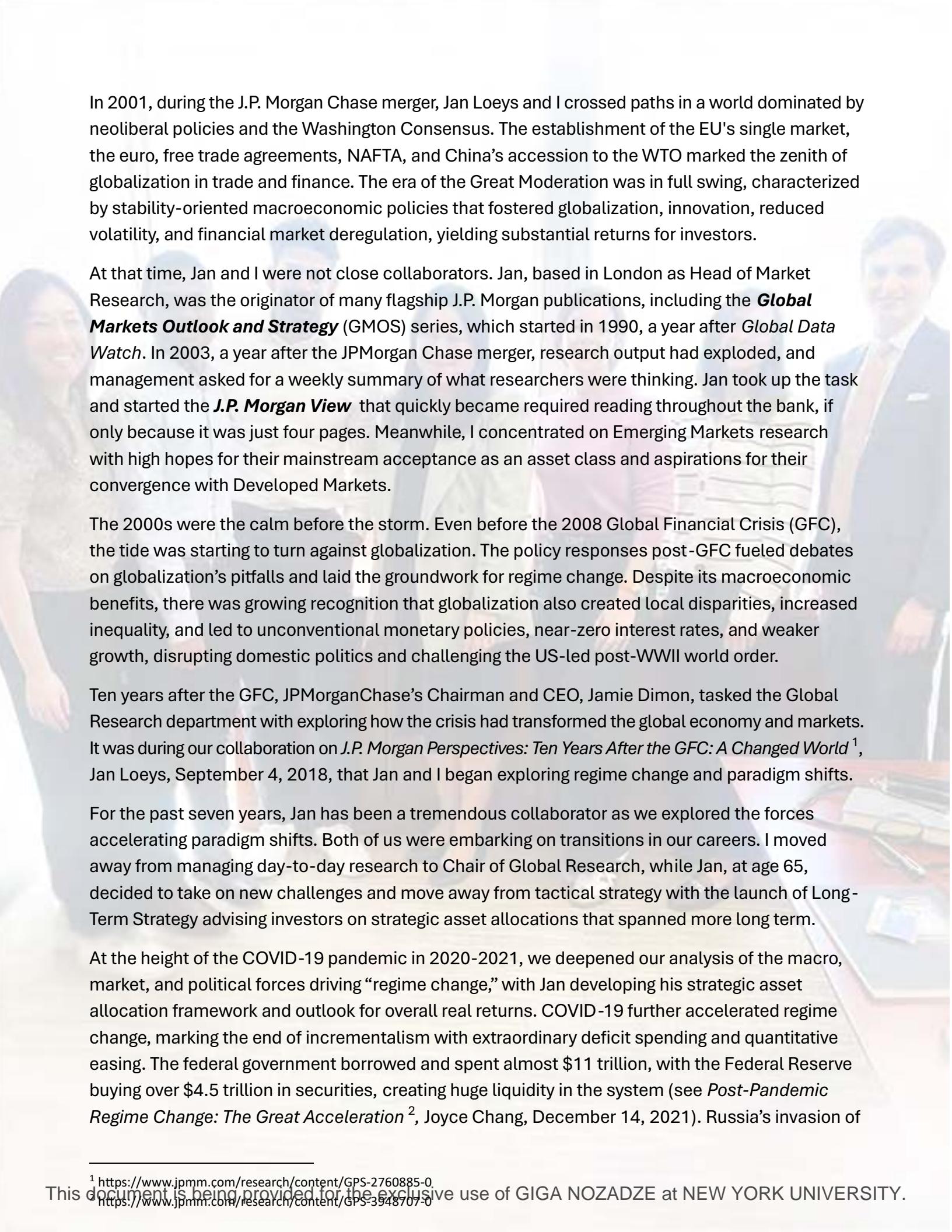
A photograph of a wooden deck overlooking a calm lake at sunset. The sky is filled with warm orange and yellow hues. A wooden Adirondack chair is positioned on the deck, facing the water. A small, round wooden table with a single candle is placed next to the chair. The overall atmosphere is peaceful and contemplative.

## The Best of *The Long-term Strategist*



# Prologue

*By Joyce Chang,  
Chair of Global Research*



In 2001, during the J.P. Morgan Chase merger, Jan Loeys and I crossed paths in a world dominated by neoliberal policies and the Washington Consensus. The establishment of the EU's single market, the euro, free trade agreements, NAFTA, and China's accession to the WTO marked the zenith of globalization in trade and finance. The era of the Great Moderation was in full swing, characterized by stability-oriented macroeconomic policies that fostered globalization, innovation, reduced volatility, and financial market deregulation, yielding substantial returns for investors.

At that time, Jan and I were not close collaborators. Jan, based in London as Head of Market Research, was the originator of many flagship J.P. Morgan publications, including the ***Global Markets Outlook and Strategy*** (GMOS) series, which started in 1990, a year after *Global Data Watch*. In 2003, a year after the JPMorgan Chase merger, research output had exploded, and management asked for a weekly summary of what researchers were thinking. Jan took up the task and started the ***J.P. Morgan View*** that quickly became required reading throughout the bank, if only because it was just four pages. Meanwhile, I concentrated on Emerging Markets research with high hopes for their mainstream acceptance as an asset class and aspirations for their convergence with Developed Markets.

The 2000s were the calm before the storm. Even before the 2008 Global Financial Crisis (GFC), the tide was starting to turn against globalization. The policy responses post-GFC fueled debates on globalization's pitfalls and laid the groundwork for regime change. Despite its macroeconomic benefits, there was growing recognition that globalization also created local disparities, increased inequality, and led to unconventional monetary policies, near-zero interest rates, and weaker growth, disrupting domestic politics and challenging the US-led post-WWII world order.

Ten years after the GFC, JPMorganChase's Chairman and CEO, Jamie Dimon, tasked the Global Research department with exploring how the crisis had transformed the global economy and markets. It was during our collaboration on *J.P. Morgan Perspectives: Ten Years After the GFC: A Changed World*<sup>1</sup>, Jan Loeys, September 4, 2018, that Jan and I began exploring regime change and paradigm shifts.

For the past seven years, Jan has been a tremendous collaborator as we explored the forces accelerating paradigm shifts. Both of us were embarking on transitions in our careers. I moved away from managing day-to-day research to Chair of Global Research, while Jan, at age 65, decided to take on new challenges and move away from tactical strategy with the launch of Long-Term Strategy advising investors on strategic asset allocations that spanned more long term.

At the height of the COVID-19 pandemic in 2020-2021, we deepened our analysis of the macro, market, and political forces driving "regime change," with Jan developing his strategic asset allocation framework and outlook for overall real returns. COVID-19 further accelerated regime change, marking the end of incrementalism with extraordinary deficit spending and quantitative easing. The federal government borrowed and spent almost \$11 trillion, with the Federal Reserve buying over \$4.5 trillion in securities, creating huge liquidity in the system (see *Post-Pandemic Regime Change: The Great Acceleration*<sup>2</sup>, Joyce Chang, December 14, 2021). Russia's invasion of

---

<sup>1</sup> <https://www.jpmm.com/research/content/GPS-2760885-0>  
<sup>2</sup> <https://www.jpmm.com/research/content/GPS-3948707-0>

Ukraine further accelerated regime change as supply chains were disrupted, bringing a return to large-scale industrial policies and the institutionalization of big government and deficits, while new alliances were created across geopolitical lines (see *J.P. Morgan Perspectives: The great supply chain disruption: ASEAN's rise, India's potential, USMCA and Chino-Latino flows*<sup>3</sup>, Joyce Chang et al., June 23, 2023). The debate over US-China strategic competition evolved from a discussion on de-risking to the merits and feasibility of decoupling ( see *J.P. Morgan Perspectives: Made in China 2025 meets America First: Will de-risking turn into decoupling?*<sup>4</sup>, Joyce Chang et al., November 27, 2024 and *J.P. Morgan Perspectives: Made in China 2025 — The World Reacts*<sup>5</sup>, Joyce Chang et al., October 18, 2024).

In the **J.P. Morgan Perspectives series**, launched in 2017, my team continues to cover many of the paradigm regime changes that Jan and Alex Wise considered in their **Long-Term Strategy series**. This compilation includes key research articles from the series, exploring the ongoing regime change driving de-globalization, de-dollarization, and structurally higher interest rates.

I have learned countless lessons from Jan on how to analyze risk and learn from my errors. Jan is one of the most avid and critical readers of empirical research in Economics and Finance I have ever met. Before he starts writing, he makes it a practice to review “the” literature on a topic. I have taken to heart his advice to read analysts who turn negative on their asset class and to read opposing views to assess their merits. He has also always advised being your own devil’s advocate and spending the most time with people who do not agree with you or who have a different perspective. One of his key philosophies is to learn and unlearn, as learning is not cumulative. For every insight gained, there are old ones that no longer hold true or may never have been fully right.

Jan has always emphasized that risk is not the same as past volatility, but the surprise that will hurt your portfolio. Instead of focusing on a long list of all the things that can go wrong over the next year, he starts with the premise that the big risks impacting the macro level almost always begin as small ones.

This compilation of Long-Term Strategy notes includes Jan’s insights on lessons learned, one from 2017 at the end of his tactical strategy years and another from 2023, about long-term investing as well as his final take published on May 5, 2025. I value Jan’s perspective that investors should be open to big, global transitions but wary of the market’s “crowd” mentality. When the crowd’s wisdom dominates, it is at these extremes that madness can take over, in bubbles and panic. I take to heart his advice to keep an eye out for extremes in long-term value to tell you when wisdom is turning to madness.

Congratulations on an amazing 40-year career at J.P. Morgan. Your invaluable contributions and enduring legacy have left a profound impact on colleagues and clients worldwide. Thank you for your dedication and commitment to research.

**Joyce Chang, Chair of Global Research, J.P. Morgan**

May 2025

<sup>3</sup> <https://www.jpmm.com/research/content/GPS-4398944-0>

<sup>4</sup> <https://www.jpmm.com/research/content/GPS-4855692-0>

<sup>5</sup> <https://www.jpmm.com/research/content/GPS-4820874-0>

# J.P.Morgan

## Table of Contents

---

What have I learned? Final take.....	1
<b>Asset Allocation</b>	
New SAA Q4 2024.....	8
Building Strategic Asset Allocation 2023 .....	11
<b>Climate</b>	
The climate threat to EM assets.....	23
Climate and extreme weather risk is not priced into US residential real estate.....	28
<b>Demographics</b>	
The looming competition for skilled immigration .....	34
Longevity: What do investors need to know? .....	38
Depopulation and PAYG pensions.....	45
Working-age depopulation has arrived .....	48
Demography and markets .....	53
Long-term impact of aging on equity markets .....	59
<b>Emerging Markets</b>	
Strategic questions on EM allocations.....	65
<b>Equities</b>	
Strategic country scorecard.....	87
How can valuations help long-term sector selection? .....	91
Long-term equity returns across DM ex-US.....	98
CAPE and country long-term equity returns .....	103
What drives low future US equity returns? .....	107
Does higher growth boost long-term equity return? .....	113
Will Americans continue to love equities? .....	119
Democracy metrics and equity markets .....	126
Will US market exceptionalism last? .....	132
Health Care: A Strategic Sector OW .....	144
<b>Forecasting returns</b>	
Very long-term return forecasts for US bonds and equities .....	159
Forecasting long-term US equity returns with a neural network .....	162
Long-Term FX forecasts .....	168
<b>Interest rates</b>	
Real yields along the US curve: Long-term forecasts .....	182
Real bond yields in DM: Long-term projections .....	188
Long-term forces point to higher US bond yields .....	198
A demographic reversal to start pushing real interest rates up .....	215
<b>Long-term macro</b>	
Deregulation, long-term growth and markets .....	225
Strategic concerns on US government debt .....	231
Government debt: Japan vs the US .....	237
Long-run economic growth forecasts .....	242
Commodity-linked assets as a long-run inflation hedge .....	258
Business Concentration .....	267
<b>Long-term risk</b>	
Does cash lower or raise long-term risk? .....	276
Top long-term risks and what to do about them .....	282
Long- versus short-term risk .....	303
How good are long-term forecasts? .....	308
Bonds time diversify much better than you think .....	319

## **Regime change**

What went wrong with capitalism? .....	328
The de-dollarization risk scenario .....	333
Industrial policy, deglobalization and strategic asset allocation .....	343
Inflation, markets and the end of the Great Moderation .....	349
De-globalization Update 2020 .....	362

## **Retirement**

Should saving for old age be mandatory? .....	372
Rules of thumb for managing retirement savings .....	375
Inflation and retirement finances .....	380
Are annuities a good retirement investment? .....	385
Life expectancy and retirement spending, .....	392
How much can you spend out of retirement savings? .....	397
The defined-contribution problem .....	401

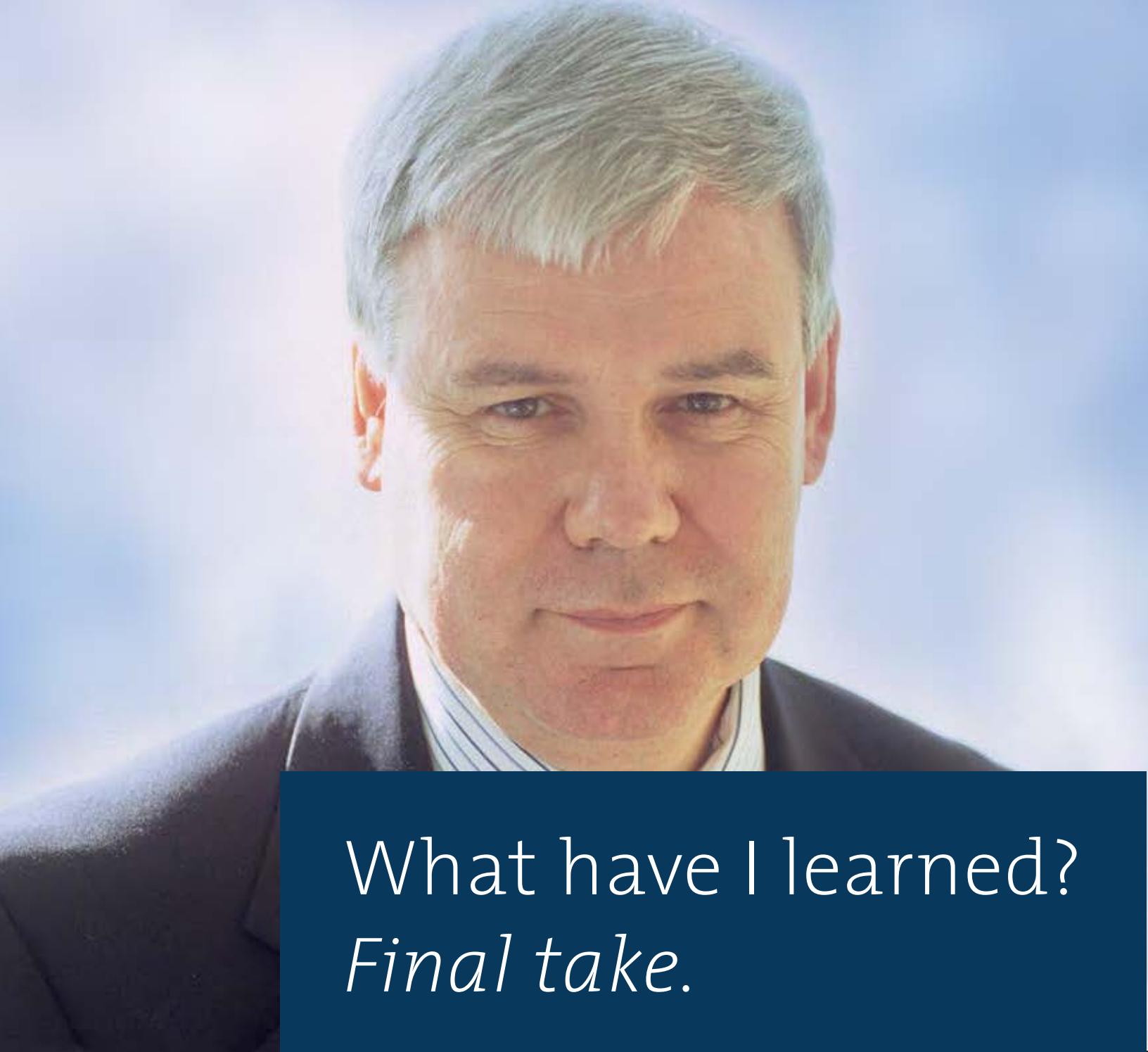
## **Strategic investing**

Total portfolio approach vs SAA .....	409
The attraction of illiquidity .....	413
KISS investing .....	417
Ten topics in strategic investing .....	425
What have I learned so far on strategic investing? .....	433
Ten more strategic questions .....	440
Strategic investing questions by the dozen, .....	446
Is thematic investing worth it? .....	453
Why long term? .....	460
<b>Library of past issues .....</b>	<b>465</b>

---

This material is neither intended to be distributed to Mainland China investors nor to provide securities investment consultancy services within the territory of Mainland China. This material or any portion hereof may not be reprinted, sold or redistributed without the written consent of J.P. Morgan.

---



# What have I learned? *Final take.*

*By Jan Loey*

This document is being provided for the exclusive use of GIGA NOZADZE at NEW YORK UNIVERSITY.<sup>1</sup>

# The Long-term Strategist

Global Long-term Strategy

2 May 2025

What have I learned? Final take.

- This is my final note at JPMorgan, having decided now is a good time to retire after nearly 40 years in research at the firm. Alex Wise, who has written many issues of *The Long-term Strategist* with me over the past 4 years, takes over. You are in good hands with him.
- I have written twice before about lessons learned, one in [2017](#) at the end of my tactical strategy years, and one in [2023](#) about long-term investing. Here are some closing thoughts.
- As analysts and investors, we are constantly pouring over data for patterns and lessons on what to expect next, as if markets and economies are stationary systems. I find, though, that the only real constant is change as people, policy makers and investors constantly learn and adapt. It is dangerous to expect past patterns will persist or that macro variables and assets prices/IRRs will always return to past means.
- Each of us wants to believe we know better than the market, which is driven by the sum of all of us. Clearly this does not add up. I find it better to start the presumption that markets are quite good at pricing the future and then look for exceptions where a decent case can be made for a mispricing.
- The market reflects the “crowd”. Is there wisdom in the crowd, as is frequently argued, or instead madness? I think most of the time, the crowd’s wisdom dominates, but it is at extremes that madness takes over, in bubbles and panic. Keep an eye out for extremes in long-term value to tell you when wisdom is turning to madness.
- Being long term does give you advantages. Saving for old age is the main reason why we save and invest, and the long-term perspective should thus dominate asset pricing. But I find market attention, models, news, and data focus on the near term, making truly longer-term investors the minority and thus better able to pick up assets that are priced for the short-term investor, making them attractive for the long-term one.
- One principle I have been living by is to always keep things simple, in analysis, writing, speaking, and investing. Simple words, short, clear and blunt language, and simple and cheap products are best.
- Words, words, words: Long or short term; fundamental or technical; cycle or structure; regimes and paradigms are all words that aim to describe and explain reality, but they exist only in our mind. Do use them, but do not think of them as facts and reality.
- Thank you so much for your support, friendship, and insights you gave me over the years. You taught me much more than I could ever teach you. It will stay with me forever.

You can access all of the research notes from this book on J.P. Morgan Markets. They are available on the Long-term Investment Strategy page here: [https://www.jpmm.com/#research.longterm\\_strategy](https://www.jpmm.com/#research.longterm_strategy)

As in the earlier such notes, these are my own thoughts and do not necessarily represent those of my fellow researchers nor an official view of J.P. MorganChase. To make this clear, I will use the term “I” here instead of our usual communal “We”.

## 1. All knowledge is provisional.

- As well understood in science, what we call knowledge in any field is really the latest set of **hypotheses** for which we have so far received the best empirical support and that allow us best to understand what is happening around us and to make some educated guesses – aka forecasts – of what to expect in the future. I am tempted to say that **there is no absolute truth** and never will be, but need to make clear I am only talking about economics and finance, and not about what is morally right or wrong.
- **Learn, and unlearn.** I always thought that learning is *accumulative* in that each lesson would add to my understanding of the world. I hoped to become more knowledgeable as I studied, analyzed, and acquired more insights. But instead, I found that for each new insight I gained, I learned that one or more old ones are no longer the case or may never have been fully right. In the end, I am not sure I now know more than when I began, unless I count also all the things I now know are not so. If the beginning of all wisdom is to know what you don’t know, then I have surely gained a lot of wisdom.
- One implication of this has been that I have generally preferred working with economists and finance specialists with **more advanced academic degrees, and/or with more experience**, not because they know more, but exactly because they have learned how little we can actually say with confidence.
- **What do we learn from**, and what is more important, theory or empirical observations? Do we learn deductively from principles, or inductively from observations? To me, data without a theoretical framework mean nothing and easily give you nonsense correlations. But theory by itself is not enough, and if anything, worse, as for every theory on how an event drives markets up, one can frequently build another one with the opposite result. **The supply of plausible theories in economics and finance is quite elastic and a lot more inexhaustible than the supply of empirical regularities.** Hence, we need both theory to guide us where to look for empirical relationships, and data to test what theories can get empirical support.

I tend to read pretty much only empirical research in Economics and Finance.

- **The Wisdom or Madness of the Crowd?** Which one is it? The [wisdom of the crowds](#) refers to groups of independent thinkers generally yielding better judgments or forecasts than a single person. Philip Tetlock and Dan Gardner’s 2016 book on [Superforecasting: The art and science of prediction](#) was a big eye-opener for me on this. That is why I have paid a lot of attention to the consensus view on markets and economies that so many a strategist tends to pooh-pooh as just so “average” and not very good. As I argued in my first [Lessons note in 2017](#), I pay particular attention to the momentum in consensus opinion *changes* as their serial correlation give them great signaling value for markets.
- But what is the Madness of Crowds then? It is what happens when the crowd’s wisdom goes in hyperdrive and leads to manias and bubbles on the upside and panics and crashes on the downside. The main protection against wisdom turning to madness is to keep your eye on very large deviations from long-term value to signal that the momentum of the crowd has gone too far, and it is time to go against it.

## 2. Change is the only constant.

- With this, I don’t just mean that there is always volatility in markets and economies, but more deeply that their underlying structures are subject to constant change, most of the time slowly, but at times suddenly. We analysts typically assume, at least implicitly, that what we try to forecast is the result of a **stationary processes**, which means that its statistical properties – mean, variance, and correlations – do not change over time. The more history we thus have, the better we should get at forecasting.
- In tactical investing, we use this assumption most to judge whether particular asset classes are cheap or expensive, based on where their internal rates of return (IRRs) are trading versus past means. But if **we cannot be confident that IRRs will indeed mean revert**, then we are always wondering whether any deviation from a past mean could just be a move to a new mean. The steady decline in real US bonds yields from the 1980s to the eve of Covid, as well as the secular decline since the

Middle Ages<sup>1</sup>, show us the dangers of assuming stationarity and mean reversion.

- I have thus learned it is better to look at our world as a system that forever changes and is thus not stationary because **people constantly learn and adapt**. Tomorrow, our behavior can be different from today, because tomorrow, we have one data point more, namely what happened today. That was the idea behind the so-called [Lucas Critique](#) on which I wrote my dissertation nearly 50 years ago.
- Forecasting how people, markets and systems are adapting and learning is **extremely difficult**, and I have made mistakes in believing I had detected such regime changes and why there were occurring, for it to dawn on me later there was no real change, or that it was quite different from what I had expected. I thought, e.g., [a few years ago](#) that the world would gradually turn away from strict inflation control as DM growth had been steadily falling over the last three decades of inflation targeting, despite the reasonable expectation that macro stability would boost growth. The Great Moderation had not only reduced macro volatility but coincided also with weaker growth. Wide US voter anger because of Covid inflation, partly induced by massive fiscal easing, then showed me that voters care more about low inflation than low unemployment. I had to eat [humble pie](#) on my earlier view.
- For one to have a decent chance of seeing the right change, it must have started, but not yet be fully established because at that point it will be obvious to all and fully priced in.

### 3. Market efficiency should be your starting hypothesis.

- **Eugene Fama's 1976 Foundations of Finance** was the first Finance book I read just as I arrived at UCLA. It had a big impact on me. Fama has long been the best-known champion of the **Efficient Markets Hypothesis**, according to which all known information should be in the price. And he received the Nobel Prize in Economics for it in 2013.
- It was thus obviously a challenge becoming one of the first strategists at the bank as I could not simply say "markets are efficient and there is nothing for

<sup>1</sup> See Rogoff, Rossi and Schmelzing, [Long-run trends in long-maturity real rates:1311-2022](#), American Economic review, Aug 2024.

you to do". But it always required me to think about what conditions could lead to mispricings of assets. These conditions include anything that prevents full arbitrage such as market segmentation, coming from differential taxation, regulations, accounting rules, capital requirements, capital controls, investment horizons, or from price insensitive investors such as central banks.

- Still, one should **never underestimate the market** and should give it due respect as it is quite fast at incorporating new information. The speed and ubiquity of new information, new data sources and academic research on markets imply that new insights on how to beat the market, with tactical or systematic alpha, get priced in quite rapidly.
- A rather uncomfortable implication of the constant search for superior returns to risk is that **any opportunity that is quantifiable and thus easily discoverable with today's quant tools, is bound not to last very long**. This goes against the direction of our industry towards ever more sophisticated quantitative techniques applied to an ever-expanding collection of data, culminating now in rapid application of AI techniques to find hitherto hidden profit opportunities. All this **steadily shortens the life span of systematic alpha, and requires us to constantly invest in better and faster techniques and finding new data sources**. Most alpha thus has a sell-by date.
- On the upside, this leaves one with tactical and strategic opportunities that cannot be detected through quantitative analysis of past data. That is why in recent years I have been directing my focus more towards **longer-term regime changes** as their slow-moving nature make them more likely not yet to be fully incorporated in asset prices, and their long-term nature means they are more likely not observed seen in the past and their impact on asset prices thus not easily detected and arbitraged away with quantitative techniques. These more structural changes included our work on changing longevity, birth rates, and immigration on the demographic side, climate change and extreme weather, deglobalization, populism, and the new US-China competition<sup>2</sup>.
- **Thematic investing** is one way that many investors aim to position on a view on how the world is changing. When we [looked](#) at such funds,

<sup>2</sup> The [JPMorgan Perspectives](#) series led by Joyce Chang, Chair of Global Research, has since 2017 covered and analyzed more extensively many of the paradigm shifts and regime changes that we as long-term strategists have been considering.

though, we found they badly underperformed the overall market. Half of this was due to the high fees on such funds. The other half was that investors only really tend to buy such funds on evidence that they are indeed outperforming, which means that by the time they bought them, the assets the funds held were rather expensive and set to produce lower returns from that point on. The lesson here is investing on a widely held view that already has had a measurable impact on asset prices probably means you will be a bit late to the game. Better to start on a theme that is not yet consensus and can only be judged a serious risk rather than a done deal.

#### 4. We are all long-term, until...

- **...we lose money**, paraphrasing Mike Tyson's "Everybody has a plan until they get punched in the mouth". Pretty much every asset manager and non-financial company will say they are long term as that sounds very fundamental and intelligent and signals they not just riding the latest fad. Short-termism is considered a negative. But are they really? Virtually all research from sell-side firms like ours is tactical. Many an investor with far-out liabilities or spending needs -- like pensions, endowments, and sovereign wealth funds -- swear they are long term, but quietly admit that even one year of weak performance will elicit calls of concern by their boards that will demand changes in management if the bad performance lasts for 2 or 3 years.
- **It is easy to be critical** of panicky reactions to market downfalls, and of cutting risk when the near-term outlook looks dicey. Leveraged investors do not always have a choice as they may be broke before their more optimistic long-term views become reality. But even for long-only investors with no immediate liquidity needs, it is not irrational to cut risk when markets fall as past histories that falls in assets prices have been good buying opportunities for the patient investor are no guarantee that history will repeat itself. As argued earlier, change is the only constant.
- **Long-term investors do have some advantages, though.** In principle, being a different kind of investor than most should allow you to pick up assets that are attractive from your point of view as the overall market will be determined and priced for the risk and return perceptions of the majority. With the main reason for saving and investing for most people and the people who manage their assets having enough money for old age, the long-term investor should be the dominant force driving

asset prices. Still, I find that news flow, market attention, flows, investment research and models are so dominantly short-term oriented that having a long-term perspective and investment horizon puts one more in the minority and thus better positioned to pick up attractive assets that are really priced for the shorter-term investor.

- **One way the long-term advantage manifests itself is its perception of risk.** Since [Harry Markowitz](#) invented Modern Portfolio Theory, our industry has defined investment decision making in terms of just three parameters: **expected return**, **risk**, and **correlation**, or  $\mu$ ,  $\sigma$ , and  $\rho$ . Risk is generally estimated as the standard deviation of historic returns. To judge long-term risk, our industry assumes returns are identically and independently distributed ("iid") over time. This allows us to gauge risk over longer periods through the square root of time rule as the volatility ( $\sigma$ ) of the average return over  $n$  periods is then  $\sqrt{n} * \sigma$ . If asset returns mean revert over time, and some do, then risk over longer periods will be lower than this  $\sqrt{\text{time}}$  rule.

More importantly, we should think about risk more as the probability and magnitude of being wrong in our return expectation. We have found we can use asset class IRRs to make pretty accurate projections of future long-term returns. These IRR-based return forecast errors is to us the right measure of risk for the buy-and-hold investor. We have found this measure of return uncertainty to be less than half of what is implied by the  $\sqrt{\text{time}}$  rule on short-term market volatility. That is why we have [argued](#) that long-term risk is much less than implied by the extrapolation of short-term volatility. It is this finding that allows us to understand why it makes sense for the long-term investor to hold more risky assets than investors more pre-occupied with the near term.

#### 5. The beauty and efficiency of keeping it simple.

- **I live by KISS (keeping it simple) in communication, analysis and investing.**
- In **speaking and writing**, I started expressing myself with few and simple words, as English was not my first language. Over time, I found it helped making myself better understood. Starting in the US helped as Americans use shorter sentences and abbreviate everything. I found that a simple trick to be clear and well understood is to stick with the Anglo-Saxon core of the language, rather than

French and Latin words which tends to be more abstract and cerebral. Put even more simply: stick with “peasant-English”. Instead of saying, e.g., that “the process of monetary contraction is set to accelerate”, just say “The Fed will hike rates”.

- KISS analysis is equivalent to **Occam’s Razor**. If you can explain the world with one variable, don’t use two. This does not deny that reality is complex, but it forces one to focus on the most important drivers of markets and to cut the clutter.
- KISS **investing** means using a simple approach to choose an investing portfolio, starting with basic and clear objectives, holding just a few basic, globally diversified funds – such as an equity and a bond fund – that are easy to value and to judge risk and long-term return on, that are cheap to hold and easy to liquidate, while staying fully invested in them without a lot of trading around them. MIT’s Andrew Lo, in his recent [In pursuit of the Perfect Portfolio](#), with Stephen Foerster, interviews 10 of the greatest thinkers in finance (6 with a Nobel Prize) and pretty much each of them points to holding a few simple, passive, long-term global investments as their perfect portfolio.

## 6. Everybody has an axe.

- Before I start writing on an asset class or strategy, I try to review the literature, as there is no sense in trying to reinvent the wheel. And I always thought such research is objective because “it should be”. But over time, I have become a bit more jaundiced on this. I now always ask myself why the authors have written this piece, and where their loyalties are. Financial researchers are not academic professors who are supposed to discover the absolute truth but belong to private organizations that have been tasked them to help them make money. This applies to me also. And academic researchers also frequently consult with industry or try to stay true to earlier positions they have taken on. That is, we all try to sell you something. Caveat emptor.

- **How can one then find more objective analysis?**

One approach is to focus on analysts who have been studying the same field for a long time, as research is a “repeat purpose” business, and not just a single transaction. Analysts who are too much into “sell-mode” will not gather a loyal following and may thus not last very long. A second is to read analysts who do turn negative on their asset class from time to time. And a third is to read opposing views on a topic or asset class and make up your own mind on their relative merit.

## 7. Words, words, words.

- Short or long term; fundamental or technical; supply or demand side; cheap or expensive; cyclical, structural, or secular; paradigms and regimes. These are all words that we bander around in an effort to create some clarity in a messy world. But these words are just that: words and not reality. The here and now are the only reality. The past is gone and forever subject to re-interpretation.
- Is the long term just a sequence of short terms and we should analyze each of them as they come? Or is the short run just the first in a path to the long run and we should really focus on the latter to understand where the future sequence of short runs is headed? Our Chief Economist Bruce Kasman’s approach is more the first. Mine more the second. My recent work has focused on the long term not because I know for sure that this is the only way to understand the near term, but more to look for signals, and forces that can impact on the here and now to complement that many shorter-term forces that keep our attention each day.
- How, e.g., do we really know that we are today at the beginning of a new paradigm in international relations rather than being in a skirmish in a forever changing world? Regimes and paradigms tend to be defined, timed, and understood mostly after the fact. How do we know that a given market move is fundamental or technical? The latter seems to be just a word for not knowing what caused the move.
- I do not deny the value of these big words and have been using them quite a lot myself, but each time I need to remind myself that these exist only in our mind and are just names we give to describe how we see this messy world.



# Asset Allocation

# The Long-term Strategist

New SAA Q4 2024

- In this note, we update our Strategic Asset Allocation (SAA) recommendations, last changed in June.
- Our Strategic Allocations consider only long-term return and risk signals and are thus different from J.P. Morgan Research's tactical recommendations which advise on shorter-term deviations from an investor's own SAA.
- We made two changes.
- We have been warning over the last few years about the risk of a coming end of the Great Moderation because of more active fiscal policies and a reduced fixation with inflation control. This would raise risk premia and thus depress equity multiples. We have been wrong on this view so far as the high political cost of the Covid inflation spike appears to have solidified a consensus on the importance of keeping inflation low, and rising concerns about the steady rise in government debt can constrain fiscal activism.
- We thus exit our allocation to Inflation-Linked Bonds.
- We maintain our allocation to hedge funds that continue to outperform, as it is based more broadly on higher macro and market volatility, with geopolitical tensions, the rise of populism, and the risk of greater disruptions from extreme weather remaining realities that are probably not going away.
- We initiate a strategic overweight of the equity markets of Canada, Australia, UK and NZ – the Anglosphere, ex US. Immigration and less population aging should be strong long-term boosts for relative economic growth and equity returns in the New World countries plus the UK, but expensive CAPE valuation offsets this benefit for the US. EU and Japan have relatively cheap valuations that should, on their own, allow them to outperform the US over the coming decade, but this boost is offset by a weak demographics outlook that should keep their economic growth depressed.

## Long-term Strategy

**Jan Loeys AC**

(1-917) 602-9440

jan.loeys@jpmorgan.com

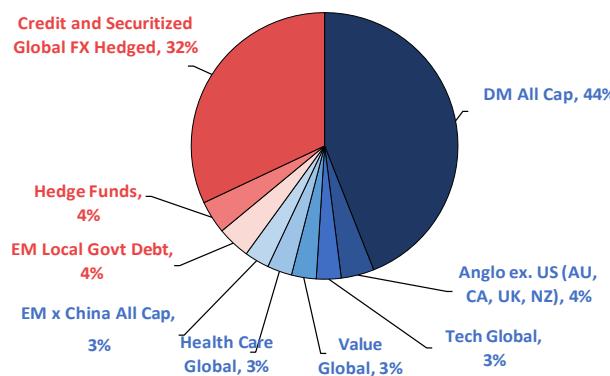
**Alexander Wise**

(1-212) 622-6205

alexander.c.wise@jpmchase.com

J.P. Morgan Securities LLC

Figure 1: Our Strategic Asset Allocation



Source: J.P. Morgan.

### Exit inflation-linked bonds

We argued three years ago in [Inflation, markets and the end of the Great Moderation](#), Sept 27, 2021, that over the then-coming decade, inflation was at serious risk of being higher and more volatile than it had been in the preceding three decades. The period since the mid-1980s has been named the **Great Moderation** during which anti-cyclical macro policies and inflation targeting succeeded in reducing macro volatility and with it the number of recessions. Risk premia generally came down across the bond, credit and equity markets and made US investors more confident in holding equities, doubling the equity multiple to an average ~20x.

Our main fear of a coming death of the Great Moderation was that while the period of inflation targeting by central banks did indeed lower both the average level of inflation and its volatility around much of the world, it did not bring the main economic benefits that we economists expected from it, inducing policymakers to rethink their strategy. The ultimate objective and benefit of low and stable inflation was to reduce long-term uncertainty by ending the previous decades of stop-go economic policies and boom-bust cycles. Fewer recessions and stable and low inflation were expected to bring down risk premia and perceptions, and get economic agents to make more long-term investments.

We did get indeed fewer recessions, with the length of the average US cycle doubling from 5 to 10 years, while inflation came down and stabilized, and real interest rates and risk premia all came down steadily. But nevertheless, we did not see a surge in capital investment spending and instead greater investing in risky financial assets and boom-bust cycles in financial markets. **The expected gains from the Great Moderation came in finance and not in the real economy.** Real economic growth came down during the Great Moderation. Economic stability came with lower growth, greater financial

instability, and greater income and wealth inequality.

Granted, coincidence is not proof of causality and it is quite possible that without inflation targeting across much of the world, growth would have been even worse. But none of this matters in politics, as weak growth and inequality are putting pressure on politicians and policymakers to “do something”. Weaker growth in US expansions came in the first 1-2 years of the recovery that were usually quite underwhelming, with employment taking 3-5 years to recover back to previous full employment levels. Seeing how the US under the Biden Administration took this possibly as a sign that more fiscal support was needed during a recession, we thought this could easily imply a rebalancing of the Fed Dual Mandate of “maximum employment and price stability” towards greater emphasis on jobs and less on inflation.

This has probably turned out to be a **wrong assumption**, as shown by the **high political costs paid by governments from the dramatic rise in inflation** during Covid and the seeming consensus on all sides to do what it takes to bring inflation under control. Any political support and votes gained from getting some people back to work quickly have likely been offset by the economic losses to the broad population hurt by the dramatic rise in inflation.

It may be early to call time on what is really a long-term view, and maybe we should allow it to run, as we should not lose sight of the other forces we suspected could be raising inflation – a greater prevalence of adverse supply-side shocks, including extreme weather induced by Climate Change; de-globalization; and greater uncertainty about macro-economic parameters such as  $r^*$  and NAIRU, increasing the risk of policy errors.

Still, the high political cost of inflation suggests we are probably better off not to base our strategic allocation on higher and more volatile inflation over the coming decade than seen pre-Covid during the Great Moderation.

Hence, we **exit our allocation to inflation-linked bonds in our SAA**. We have argued before that long-term investors should not hold DM government bonds as they are systematically expensive against the broad spread market, which did not chime well with our allocations to inflation-linked debt, which is almost exclusively issued by governments.

### Stay overweight hedge funds

We have expressed the [view](#) repeatedly over the past three years that higher macro volatility, partly due to increased US fiscal policy activism, supported also by intensifying geopolitical tensions and rivalry, will allow specialized alpha producers – hedge funds – to outperform a global equity and

bond portfolio with the same volatility as the overall hedge fund asset class. The view has worked, but with us exiting the view that the Great Moderation has died and having exited the strategic allocation to inflation-linked bonds, the question is thus whether we should hold on to hedge funds. We hold on to the hedge fund asset class at present as there are other reasons to fear high macro volatility. Geopolitical tensions, the rise of populism, and the risk of greater disruptions from extreme weather remain realities that are probably not going away. We thus stay with hedge funds in our strategic holdings.

### Add “Anglosphere” equities, ex-US

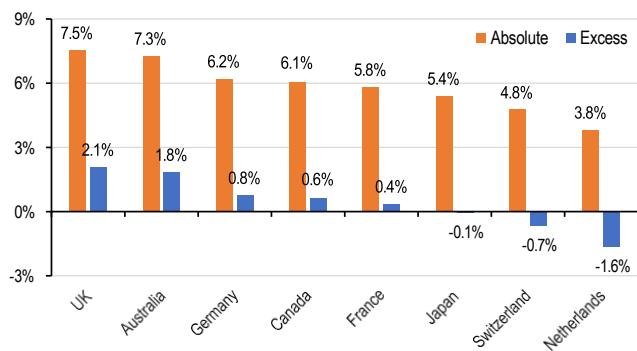
In the early years of our empirical investigations on effective long-term signals, we had been frustrated by not finding much to guide us in strategically over- or underweighting different countries’ equity markets. In recent months, we have made more progress, correlating relative equity market performance over 10-year holding periods with economic growth, demographics, and valuation. The latter is represented by Shiller cyclically adjusted PE ratios (CAPEs). The relationships with growth and demographics are contemporaneous and thus require us also to forecast what countries will have better economic growth, which means productivity and its labor force, both of which are affected by birth rates, longevity, aging and immigration. We have shown before that forecasting economic growth 10 years out has been quite hazardous. However, with the aid of insights into demographic developments, which tend to be trending and slow moving, we feel better equipped to make some judgements on what countries likely will fare better.

We have found that current valuation, on its own, signals lower returns in the US and the Netherlands against the rest of DM. The demographics of falling global birth rates to below levels needed to keep populations stable hurts all countries, but then puts the onus on immigration where the New World, UK and Ireland stand out for being much better in attracting and assimilating large number of immigrants into their economies and societies. For the EU and Japan, we found that weak demographics largely offset the benefit of cheap valuations. For the US, its expensive CAPE offsets the benefits of stronger demographics. For the UK, Canada, Australia and New Zealand, stronger demographics and valuation combine to convince us their equity markets are likely to outperform the rest of the world over the next decade, from today’s entry points, with an expected return of 7.0% pa over the coming decade, compared to our expectation of a 5.4% pa return on US equities. Their currencies are also relatively cheap versus the US dollar. Figure 1 below shows our current long-term

return expectations on the largest non-US equity markets in local currency terms, and Figure 2 shows a decomposition of the effects of valuation, growth and aging on relative expected returns.

Figure 2: Forecast 10yr returns on MSCI country indices in local currency, absolute and relative to S&P 500

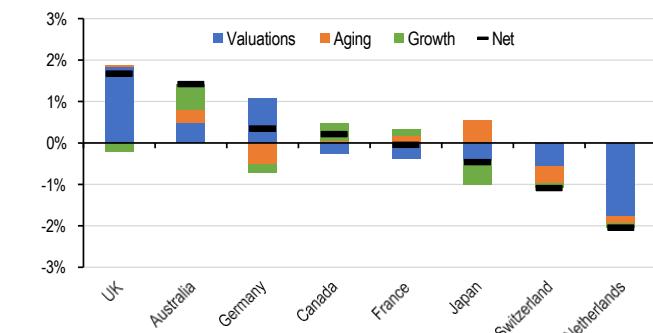
% pa. Based on MSCI country indices in local currency. Returns forecast from September 30, 2024. Aging based on UN Medium Variant population forecasts. Growth based on our long-term growth forecasts.



Source: J.P. Morgan, MSCI, IMF, UN, World Bank, Board of Governors of the Federal Reserve System, Bureau of Labor Statistics, Bureau of Economic Analysis, Robert Shiller, Feenstra et al. (2015), Ha et al. (2022), Refinitiv, S&P, Bloomberg Finance L.P.

Figure 3: Decomposition of expected excess return relative to DM ex-US average

% pa. Based on MSCI country indices in local currency. Returns forecast from September 30, 2024. DM ex-US is unweighted average of these countries.



Source: J.P. Morgan, MSCI, IMF, UN, World Bank, Board of Governors of the Federal Reserve System, Bureau of Labor Statistics, Bureau of Economic Analysis, Robert Shiller, Feenstra et al. (2015), Ha et al. (2022), Refinitiv, S&P, Bloomberg Finance L.P.

## The Long-term Strategist

### Building Strategic Asset Allocation 2023

- We present a simple method to build a SAA across asset classes and apply it using insights gained in recent issues of *The Long-term Strategist*.
- We start from global market outstandings and then over- or underweight certain assets based on views we have developed on which offer better long-term returns to risk, and on the impact of structural and regime changes in the world.
- **We keep a fixed 60/40 allocation** to equities and bonds as market timing on bonds and equities is generally part of Tactical Asset Allocation, covered by other strategists in Global Research. We use US dollar as our base currency, ignore taxation and regulations, are long only, and focus on the long-term investor.
- Within **fixed income**, we have no cash, no government bonds, and no foreign currency bonds, except for EM local bonds to position for the eventual weakening of the dollar we expect in a manner that is positive carry. Cash is a very risky and low return asset over the longer run. US Treasuries do not offer enough return to long-term risk for the long-only, longer-term investor we focus on. FX risk is generally not well compensated for the risk it creates. This leaves us with the broad US spread market, to which we add TIPS and hedge funds.
- Within **global equities**, with hold extra allocations in Climate Change funds (as a hedge on worsening change), Value and Financials (correlate well long term with higher bond yields), Technology (upside risk from AI) and Health Care (aging and a new innovation wave, despite risk from IRA-mandated price negotiations).
- We move **US equities and Small Caps back to market weight** (the return of antitrust and any deglobalization are not having much impact) as well as **Neutral on Hybrids** (we have found better ways to reduce long-term risk).
- We have a **strategic underweight on EM equities** as EM is in our mind more vulnerable to climate change, pandemics, AI innovation, and deglobalization. We hold this underweight by including a below-market allocation to EM ex China as Chinese policy is not much focused on creating shareholder wealth and its market is becoming challenging to international investors.

#### Long-term Strategy

##### Jan Loeys AC

(1-917) 602-9440

jan.loeys@jpmorgan.com

##### Alexander Wise AC

(1-212) 622-6205

alexander.c.wise@jpmchase.com

J.P. Morgan Securities LLC

10 October 2023

**A Strategic Asset Allocation (SAA)** means a target allocation across different broad asset classes that functions as an average position to be held over the medium to longer term – usually a number of years – based on objective estimates of risks and returns, and with consideration of the investor’s return objectives, investment horizon, periodic cash flow needs, tax status, and risk tolerance.

It is meant to keep the investor progressing toward their ultimate goals, as asset allocation is broadly understood to be the most important factor that will decide whether ultimate objectives are met. The asset owner, or their asset manager, can at times decide to deviate tactically from this target allocation to exploit perceived shorter-term opportunities, but having an SAA ensures one does not deviate too much from the portfolio seen as most suitable to achieve one’s long-term financial objectives.

Our **approach** to building our Strategic Allocation recommendations has developed over time as we acquired insights through a set of empirical studies published in our *The Long-term Strategist* and *J.P. Morgan Perspectives* publications. A library of previous LTS issues and links is at the back of this note. In this paper, we explain more clearly our approach to building a strategic portfolio and what it implies today, using the insights we have gained over the past six years. It supersedes the [model portfolio](#) we first published in March of 2021 and have since more informally updated in our publications.

We will use the **US dollar as base currency** as over half of world capitalization of global bonds and equities is in USD and as the dollar is the most prominent base currency used by investors, not only those based in the US but also others with home currencies pegged or managed closely to the dollar.<sup>1</sup> We also assess portfolio returns and risk on a **pretax basis**, and we **ignore regulations** as both tax rates and regulations can vary greatly across different investors.

To build our SAA, we begin with **global market outstandings of bonds and equities**, consistent with Global CAPM. We measure these through well-known indices from MSCI, Bloomberg, and our own family of bond and currency indices that can be found on [jpmorganmarkets.com](#).

**We keep the relative shares of equities and bonds at 60/40** and not at the relative world outstandings. This allocation decision is very particular to the individual investor’s ability

1. The [IMF 2022 report on currency arrangements](#) lists 37 countries using the US dollar as an anchor and 26 using the Euro, with very few using other currencies. Investors who judge returns in other currencies can use our thinking to adjust our recommendations to their base currency.

and willingness to absorb market volatility and ultimate downside risk. It can depend on how much money they have relative to what they anticipate needing in the future and how certain they are about the timing of cash/income needs. This could be very soon, or generations out in the case of sovereign wealth funds and endowments. We do not provide advice here on changing this allocation in response to any changes in relative expected returns – short or long term – as this is the mandate of our strategy colleagues that publish our weekly [The J.P.Morgan View](#).

Starting from a 60/40 of global equities and bonds, defined widely, we add or deduct certain assets that we think will provide **higher or lower returns to risk over the long term**, which means 10 years to us. To judge this, we look mostly at likely returns and less at risk, whether from volatility or correlation, as we move assets only within their own broad asset class – fixed income or equities – and as we focus primarily on long-term risk, which dampens overall volatility and raises correlations.<sup>2</sup>

Our research suggests to us three types of forces that can make certain sector, countries, regions, or sub asset classes perform better or worse over the long term than the broad global equity or bond markets. They consist of:

1. **Structural segmentation**, due to differences in base currency, tax status, regulations, and investment horizon that create differences in expected return across investors despite no differences in the asset’s price, *inter alia*.
2. **Structural Change, such as climate change and demographics**, that may not be in the price as markets have trouble pricing in far away and slow-moving events, or that may help hedge risks.
3. **Regime change** resulting from policy makers and economic agents learning and adapting and thus gradually changing the parameters that describe their behavior.

## Within fixed income

2. The traditional measure of risk to judge return to risk is annual return volatility. Over periods of a number of years, a “convenient” assumption is usually made that annual returns are “iid” or identically independently distributed so that the volatility of the average return over 10 years is simply estimated as 1-year vol divided by  $\sqrt{10}$ . As discussed in our Feb 1 note on [Long- versus short-term risk](#), we find that using current yields – bond or equity yields – allows us to forecast 10-year out pa returns with more accuracy and thus less uncertainty than implied by annual vol/ $\sqrt{10}$ . For both the US equity and aggregate bond market, our forecast error (RMSE) and thus our risk on being wrong in our return expectations was less than half of annual return vol/ $\sqrt{10}$ .

10 October 2023

In our SAA, we first exclude cash, DM foreign-currency bonds, and US government bonds.

## No cash

We exclude Cash from our strategic portfolio, not because we think you should not hold any cash but because that allocation is very particular to individual investors: instant liquidity needs and there is no “right” level that is appropriate for all. And anyway, from a return point of view, cash will **generally underperform all other assets over the long term** and is **only risk free over the short term**, but surely not over the longer term as future levels of short rates can be quite volatile, difficult to forecast over a number of years, and not easily assessed based on the IRR of the asset class, unlike in forecasting bonds and equities.

## No foreign currency bonds, at least not in DM

Most investors want some fixed income to limit short-term drawdowns and to gain diversification against equities. **Foreign currency bonds do not help** in this regard because of the **extra volatility that comes from currency changes that is generally not compensated**. On average, the volatility emanating from currency changes is higher than that from changing bonds prices. One might make a diversification argument when a sell-off in domestic assets also depresses the currency and thus creates gains on foreign currency holdings, but we are not convinced such offsets are stable and can be relied upon. We do see a strategic case to include foreign-currency bonds **when one's own bond market is very small and illiquid** and one's currency is pegged, or stable against one with a much larger and more liquid bond market. We do make the case today (see below) for US dollar-based investors to hold **EM local debt** to position on our view of eventual dollar weakening by holding EM local debt, which provides positive carry.

## No DM government bonds

The US dollar fixed income world consists of **government bonds, credit, and securitized debt**.<sup>3</sup> Government bonds consist of those issued by the federal government (US Treasuries, or USTs), those guaranteed by them, and those issued by state and local governments (Municipals, or “Munis”). Most Munis are exempt from US federal and state taxes (when held by that state's resident), which depresses their yield to a level where the marginal investor is indifferent to holding them vs USTs. Currently, that implies a breakeven tax rate close to the top federal marginal tax rate of 37%. We

exclude tax-free Munis as they are too low in yield for institutional and international investors who earn coupon income free of tax. We do **include US taxable Muni bonds**.

US Treasury debt, and the debt it guarantees, are also generally low in yield versus the rest of the bond market (credit and securitized) **without a significant advantage in lower return volatility or diversification, at least not for the long-term investor**. For example, comparing USTs with USD HG debt, we find that since 1986, USTs earned an excess return to annual risk ratio (Sharpe) of 0.27 compared with 0.41 for HG Corporates. Assessing these two types of bonds on a *long-term* risk basis, which to us means the average error (RMSE) in forecasting 10-year out returns, we find that at current yields, UST should earn a return of 4.7% the coming decade and US HG corporates 5.7%, with long-term one-sigma risk of 0.7% and 0.8% around these return projections.<sup>4</sup> Thus, we estimate roughly 93% odds that US HG will beat USTs over the coming decade based on the current forecasts and the historical correlation of forecast errors.

Corporate bonds typically outperform over the long run because their yield spread over USTs, which averaged ~150bp over the past 30 years, exceeds more than amply the ~30bp losses from net downgrades into High Yield. US Treasuries earn such a comparatively low yield because they are less correlated with equities, thus offering better diversification than credit, and because of a set of regulations on banks, insurance companies and central banks, usually through lower capital requirements, induce/force these institutions to hold US Treasuries, and impose much higher capital requirements when these institutions want to hold credit.

The **diversification advantage** of USTs is not to be ignored, especially as it typically comes when equities are going down, but it should be mostly attractive to investors who are sensitive to temporary drawdowns. Investors who have no leverage and no immediate cash needs, or whose liabilities are far out and well known, should not care that much about short-term volatility and only about how much their portfolio will be worth years out when they need the money. They should have little systematic need for safe government bonds.

**Given our focus on long-term investors and on long-term risk, we thus do not include US Treasuries and federally guaranteed bonds, mostly Agencies.** That leaves us with the broad credit, or spread, market consisting of bonds issued by

4. We do not judge these long-term returns to risk on an excess return to cash as in a normal Sharpe ratio as the latter is based on the fact that over the short term, cash is risk free, while cash is quite risky over the longer run, given our inability to provide an accurate forecast of the average cash return over the coming decade.

3. See the USD part of our [Global Aggregate Bond Index](#) (GABI) for more detailed composition of the broad USD bond market.

companies, whether US or foreign, both DM and EM, by foreign sovereigns, as well as mortgage-backed securities and taxable Munis.

## EM local government bonds

We have an active view that the risk of de-globalization or de-dollarization, on top of a US dollar that is at record high value against both EM and other DM currencies, makes it likely that **the dollar will lose value against the rest of the world over the coming five to 10 years**, at a faster pace than is currently priced into forwards.<sup>5</sup> Positioning this against EM instead of DM countries allows us to be positive carry rather than negative carry when we do this against DM currencies. EM currencies have withstood the Fed's 5% hiking cycle since March 2022 quite well, falling only as much as their rate differences against the US, thus producing zero return on a total return basis. We thus include **an allocation to EM fixed income, currency unhedged**. This can be done through our **GBI EM local bond index, or against our ELMI index, or an EM FX fund, either passively or actively managed**.

## Hedge funds

Our previous strategic portfolio included an allocation to hedge funds, on the **expectation that they would tend to outperform in a period of heightened macro volatility**. With the volatility in markets since the Covid pandemic, that has turned out to be the case. In 2022, hedge funds delivered a record high alpha over a rolling volatility weighted portfolio of equities and bonds in the post-GFC era ([Alternative Investments Outlook and Strategy](#), Nikolaos Panigirtzoglou et al., May 24, 2023). Though alpha has declined year to date in 2023, we expect continued performance as there are strong reasons to think that the **world has entered a sustained period of heightened macro volatility**, as we have argued over the past two years.<sup>6</sup> Thus, we believe that it remains appropriate to maintain a hedge fund allocation in our strategic portfolio.

## TIPs as inflation hedge

We have [previously](#) written about the likelihood that **inflation will be more volatile in the coming decade**, and that volatil-

5. Most recently, see [Top long-term risks and what to do about them](#), Jan Loey et al., July 18, 2023; [Where are we in Regime Change?](#) Jan Loey and Alexander Wise, November 8, 2022; [Back to School: Where are we in the Great Repricing](#), Joyce Chang et al., September 21, 2023. See also Long-Term FX forecasts, Dec 14, 2021.

6. Most recently, see [Top long-term risks and what to do about them](#), Jan Loey et al., July 18, 2023; [Where are we in Regime Change?](#) Jan Loey and Alexander Wise, November 8, 2022; [Back to School: Where are we in the Great Repricing](#), Joyce Chang et al., September 21, 2023.

ity can easily lead to higher inflation on average given the greater likelihood of overshoots than undershoots.

This hypothesis was based on several arguments. Firstly, there is a risk that the primacy of central bank's inflation targets will diminish somewhat into the future, due in part to a **judgment that the period of rigid inflation control during the Great Moderation delivered some unwanted economic consequences**, including slow growth due to hysteresis effects, and rising inequality. Secondly, the inflation overshoot in the aftermath of the Covid pandemic has shown that the models underlying **monetary policy decisions rely on parameters and relationships which have evidently been destabilized**, such as the Philips Curve, the Beveridge Curve,  $r^*$ , and NAIRU. This introduces more uncertainty into economic forecasts and assessments of the effects of policy actions, which should bias monetary authorities to be more reactive than in the past. Thirdly, **rising prevalence of adverse supply shocks** – for example due to demographic change, climate change, geopolitics, or deglobalization – may also exacerbate the short-term trade-off between inflation and employment objectives, raising the cost of a strict and overriding commitment to an inflation target.

For these reasons, we believe that more volatile inflation, and consequently slightly higher average inflation, is more likely than not over the coming decade. Hence, we **include an allocation to US TIPS in our SAA**.

## Within equities

In equities, we start with an allocation to **global equities, both DM and EM ex China, across large, mid, and small caps**. This can be represented by a portfolio of MSCI World All caps, MSCI EM ex China and MSCI EM Small caps (China is only 7% of the latter). This is a capitalization of \$67tr. Below, we discuss why we do not hold Chinese equities.

To this global all-cap ex China holding, we **add allocations to sectors that we think will outperform** the overall equity market over the coming decade, in effect overweighting them against the overall market that already includes these sectors at market weight. They consist of the **Climate Change Theme, Value, Financials, Health Care, and Tech**. We **move Small Caps and Hybrids, which we overweighted in the past, and the US, which we underweighted, back to Neutral**.

## Climate Change equities: Overweight

As we [noted recently](#), while scientific model forecasts of the path of climate change have proven quite accurate about the

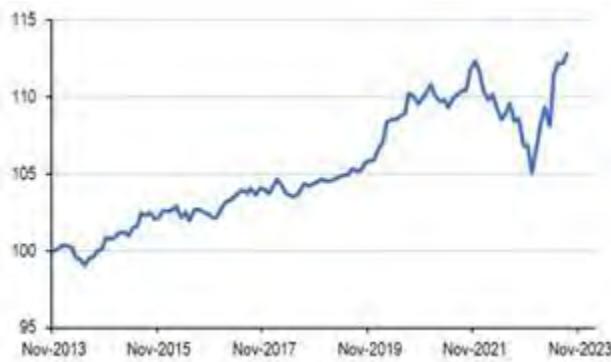
eventual trend in sea and temperature levels, over the course of decades,<sup>7</sup> there is **mixed evidence on whether the effects of climate change are priced into asset valuations**. In our view, markets particularly struggle to price in very long-term risks, particularly given uncertainty about how climate technology and policy will evolve in the decades ahead, and the risk of so-called catastrophic “tipping points.” That said, we believe that markets have better priced in upside risks for assets that stand to gain from climate change and our efforts to mitigate it compared to downside risks for assets that stand to lose, such as real estate in climate-exposed localities.

Given this imperfect market pricing, there is arguably a case for a **strategic overweight on an index that weights equities according to their exposure to risks and opportunities from climate change**. The MSCI Climate Change index “aims to represent the performance of an investment strategy that re-weights securities based upon the opportunities and risks associated with the transition to a lower carbon economy.”

Since the inception of the MSCI Climate Change USA index in 2013, it has outperformed the MSCI USA index by 1.29% pa. The ratio of total return indices is plotted in Figure 1. Over the same period of time, the MSCI Climate Change World index has outperformed the MSCI World index by 0.91% pa.

Figure 1: MSCI Climate Change USA total return index relative to MSCI USA

Monthly, 11/2013-8/2023. 11/2013 = 100.



Source: J.P. Morgan, MSCI, Datastream/Refinitiv.

At this stage, one caveat is in order. As we noted in [our analysis](#) of the performance of thematic funds, **the price of an asset or fund is critical**. Thematic funds have generally

7. [NASA, Study Confirms Climate Models Are Getting Future Warming Projections Right](#)

underperformed in recent years, both because of high fees and because such funds are typically launched only after their target assets have outperformed and become expensive. However, we note that differences in valuations of climate indices versus the overall market are currently not particularly wide. As of Sep 28, MSCI USA index traded at 19.8x trailing EPS, while the MSCI Climate Change USA index stood at 22.5x, a small gap for what should be a growth sector.

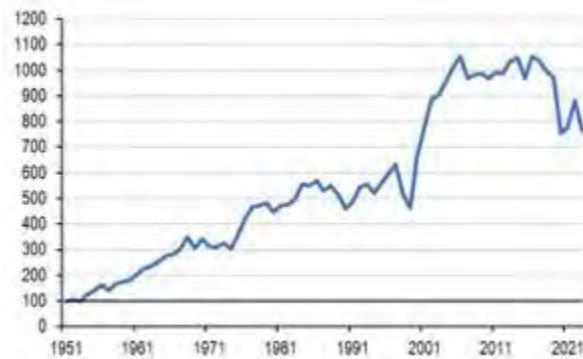
If we are correct in our view that downside risks of climate change are not well priced into valuations for reasons discussed above, there is a strong argument for **overweighting an index that underweights climate-exposed assets relative to outstandings**. Strategic investors would also stand to gain from such an overweight to the extent that upside risks are also less than fully priced in. Thus, we hold an **overweight on climate change equity funds in our strategic portfolio**.

## Value: Overweight

We have been **overweight the Value factor in equities since we published [Will Value Come Back?](#)**, Nov 16, 2018. This overweight was initially based on the persistent outperformance of value over long periods of time, even after the initial documentation of the tendency of Value to outperform in the long run and as the cost of information and transacting has declined. The performance of Value (through high E/P) relative to the market in data constructed by Kenneth French is shown in Figure 2. Since 2000, Value has outperformed the overall market by ~2.3% pa, though Value has underperformed the market by ~5.9% pa since 2018.

Figure 2: US Value total return index relative to US Market

Annual, 1951-2023. 2023 YTD as of July. Value are large stocks with high earnings yield. Market is large stocks.



Source: J.P. Morgan, Kenneth French.

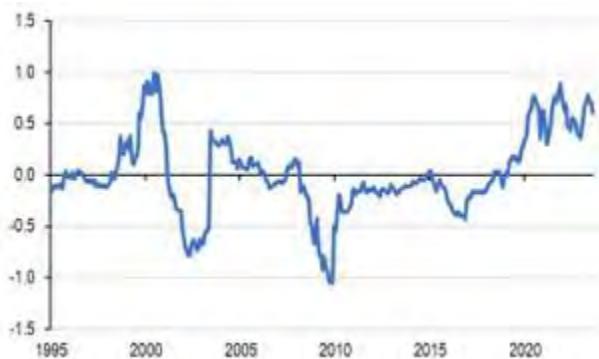
While Value has underperformed in the past five years, **the case for a strategic Value overweight has arguably strengthened in that time**, in our view. First, real interest rates have risen considerably since 2018, with the real yield on 10yr USTs increasing from a low of -1.5% in 2020 to

~2.4% today. We have argued that this is part of a larger normalization in real yields that is likely to persist, and we have previously documented that **Value tends to outperform Growth over the long term in a rising real yield environment.**

Further, we have found in our research **that valuations are typically the most effective signal** of long-term performance of an asset class. Figure 3 plots the deviation of the ratio of the Growth P/E multiple to the Value P/E multiple from the long-term historical average ratio in the US. Positive deviations indicate that the ratio of the Growth P/E multiple to the Value P/E multiple is above the long-term historical average, indicating that Growth is expensive relative to Value compared to the historical average. For much of the 2000s through to 2018, the deviation was negative, implying Growth stocks were cheap relative to the historical average. In these circumstances, recent outperformance of Growth is unsurprising. From today's entry point, the deviation is positive, albeit not as high as at the height of the Dotcom bubble, implying **Growth stocks are expensive relative to the historical average.**

Figure 3: Deviation of the ratio of Growth P/E to Value P/E from historical mean

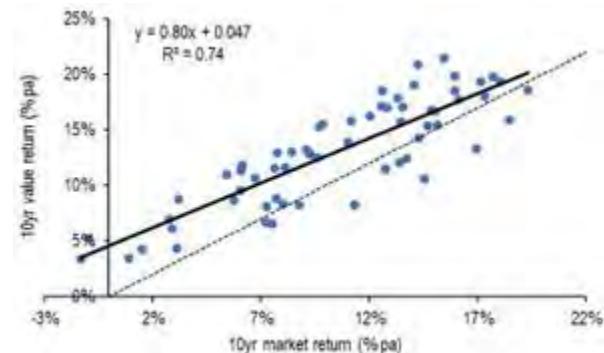
Monthly, 1/1995-8/2023. Deviation from average since 12/1974. Positive implies Growth is expensive relative to Value compared to history. Negative implies Value is expensive relative to Growth compared to history. Data from MSCI Value USA and MSCI Growth USA indices.



Source: J.P. Morgan, MSCI, Datastream/Refinitiv.

Finally, **Value is low beta**, as shown in Figure 4. In the US, Value has tended to outperform the market in 10yr periods with relatively low market returns. While it is arguable that the persistent outperformance of Value has been arbitraged away in recent decades, this remains the case when looking only at returns since 1980. Recently, we forecast a 7.0% pa return on the S&P 500 over the coming decade, which is toward the low end of returns in the past 40 years. In such circumstances, Value tends to perform well relative to the overall market.

Figure 4: 10yr return on US Value against 10yr return on US Market Annual, 1952-2023. 2023 YTD as of June. Value consists of average of high cash flow to price, high dividend yield, and high earnings yield. Value and Market consist of largest 30% of firms by market equity.



Source: J.P. Morgan, Kenneth French.

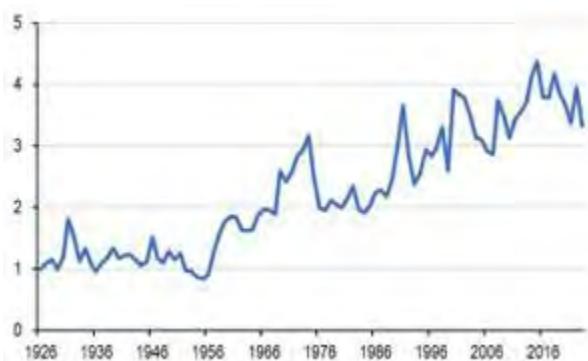
While there is an argument that persistent excess returns of various asset classes – Value equities included – have been arbitraged away in recent decades, this should lead us to a world in which these asset classes outperform intermittently, rather than persistently. Under some circumstances, Value outperformance should still be expected. In our view, the present environment with **comparatively favorable relative valuations, structurally higher interest rates, and low expected market returns is conducive to Value outperformance.**

## Health Care: Overweight

The **overweight on Health Care** is motivated by the observation that the sector has **outperformed the market over a very long period of time**, in the US, Europe, Japan, and EM, as we showed five years ago in detail in Health Care: A Strategic Sector OW, May 11, 2018. Figure 5 shows this for the US, where we have the longest time series. The sector produces goods and services that have a **high income elasticity of demand**: as people become more wealthy, they spend an increasing part of their income on healthcare. This should underpin strong demand and earnings growth in the future.

Figure 5: Cumulative relative return on US Health Care

Annual, 1926-2023. 2023 YTD as of July 2023. Ratio of cumulative total-return sector indices over overall market total return. 1926 = 1.



Source: J.P. Morgan, Kenneth French.

Since 2000, the S&P500 Health Care sector has outperformed the overall S&P500 by 1.87% pa. While the Health Care sector has underperformed the market by 0.47% pa since 2018, this is the product of the **large outperformance of the Technology sector**. In that time, Health Care has outperformed the S&P500 ex-Technology by 2.47% pa. Outside the US, where Tech is less dominant, Health Care has continued to outperform the overall market over the past five years.

One new factor that warrants consideration is the passage of the *Inflation Reduction Act* in August 2022, which provides for Medicare **negotiation of prices of a selection of prescription medications**. Exercising monopsony power will likely lead to reductions in the prices of targeted medications. Since the passage of the IRA in August 2022, the S&P500 Health Care sector has underperformed the overall S&P500 by 4.63% pa, and the S&P500 ex-Technology by 0.32% pa. One could argue that the negative effects of this legislation are **now priced into the markets**, though there is the possibility that these effects may turn out to be larger than expected.

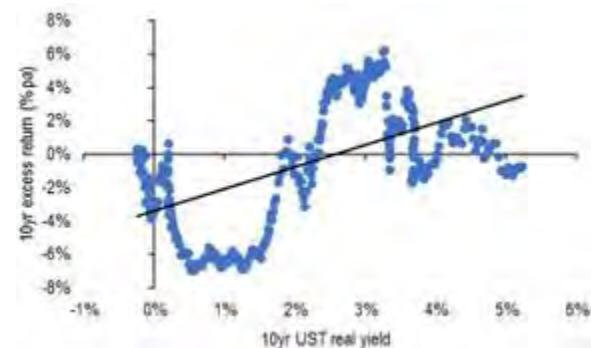
At the same time, there is an argument that the **Health Care sector is on the cusp of a new wave of innovation**, spurred by advances in AI and mRNA technology. At this stage, it is difficult to quantify how important this may be, but it is clear that this is a upside risk factor. An **aging population** and strong voting participation by the elderly should continue to support demand for health care services.

Balancing recent and long-term performance, the role of the IRA, aging, and the prospect for a new wave of innovation, **maintaining a Health Care overweight is still warranted in our view**.

## Financials: Overweight

Figure 6: Excess return on US Financials against 10yr UST real yield

Monthly, 7/1981-8/2023. 10yr rolling windows. Average 10yr UST real yield during 10yr window.



Source: J.P. Morgan, Federal Reserve Bank of Philadelphia, Datastream/Refinitiv, Bloomberg Finance L.P.

The **overweight on Financials is motivated by documented outperformance at higher interest rates**, likely at least in part due to the positive impact of higher interest rates on **net interest income**. Figure 6 shows 10yr excess returns on US Financials against average 10yr UST real yields in the corresponding period. Financials have performed either in line with the market or outperformed at 10yr UST real yields above 2%. There is also a positive relationship between 10yr excess returns and nominal yields (not depicted). The relationship between excess returns and the change in interest rates is weaker, possibly as interest-bearing liabilities such as deposits reprice quickly, while interest-earning assets such as loans roll over more gradually.

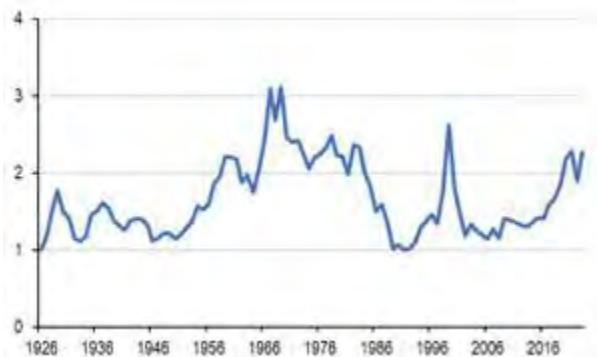
As interest rates have risen in the US since the start of 2021, the S&P500 Financial sector has underperformed the overall S&P500 by 0.11% pa but has outperformed the S&P500 ex-Technology by 1.13% pa. As we believe that **interest rates are in a process of normalization from post-GFC and pre-Covid lows**, the evidence suggests to us that outperformance over the next decade is more likely than not.

## Technology: Overweight

In previous strategic portfolios, we were neutral on the Technology sector, despite its positive momentum in the past few years, as we were concerned with the Biden administration's determination to bring antitrust back and to target the Tech sector first, just as the EU was gearing up to do the same. We thought we detected a shift in political discourse on both sides of the political aisle in the US against the power of super-large companies, such as those dominating the tech sector.

10 October 2023

Figure 7: Cumulative return on US Technology over market  
Annual, 1926-2023. 2023 YTD as of July 2023. Ratio of total-return sector indices over overall market total return. 1926 = 1.



Source: J.P. Morgan, Kenneth French.

Further, we noted that while Technology stocks have outperformed the US market **over the past near 100 years**, this has come in waves with each relative up-move offset by a later relative down-move. By the early 1990s, Tech had not yet beaten the overall US equity market over the previous 65 years (Figure 7). Then came the 90s Nasdaq boom then crash, which eliminated most of the Tech sector's outperformance in the late 90s. To the extent that Tech has outperformed the market over the past 100 years, it largely reflects the latest wave – call it wave #3.

Adding to this volatility, we expected that a return of antitrust with the Biden administration and renewed efforts by the EU Commission in Brussels would curtail further Tech's excess return (see our [Business Concentration](#), Sep 29, 2020). We preferred to hold no more than Tech's already large share of 20% in global equity outstandings.

But now, we have had a change of heart and have **moved Tech to a Strategic Overweight in global equities**. The efforts by Brussels and Washington to dent the dominant position of US mega tech companies have not prevented them from further gaining market share in corporate revenues and earnings. Governments are concerned about the economic power of mega tech, **but consumers like their products and low prices, gained via large economies of scale and network effects**.

In addition, we [recently wrote](#) of the **substantial upside to Technology due to the possibility of an AI boom**. In addition to being the suppliers of AI technologies, the Technology sector also stands to benefit substantially from the use of AI as an input in production. The AI revolution appears to be at an early stage, giving us reason to think that an extended period of outperformance could be sustained as the technology matures and diffuses through the economy.

Our timing was not great. While valuations are presently not as extreme as at the height of the Dotcom bubble, it is clear that **elevated valuations are a risk to long-term performance**. As of June 2023, the ratio of the Technology CAPE to the market CAPE in the US was ~0.25 points higher than the historical average since 1983: the current ratio is 1.66 compared to a historical average of 1.41.

## Small Caps: Neutral

Our previous SAAs were **strategically overweight on Small-cap equities**, holding more than its 11% in MSCI ACWI All Cap outstandings. We were motivated by Small caps' historical outperformance across global markets (discussed in our [Small Caps: A Strategic Overweight](#), Feb 15, 2019), while expecting that new antitrust action and deglobalization would hurt large companies, and new industrial policies would benefit small caps more.

On the first, the long-term excess performance of small caps has become so widely known and the cost of holding small caps through passive funds has come down so much that their structural outperformance, documented by Fama and French, has by now probably been arbitraged away.

We discussed in the previous section on the Tech sector that we feared that renewed **antitrust** action in the US and Europe would derail large companies, such as mega Tech. The Biden administration has tried for three years with no great successes and no end to large-cap outperformance.

Next, the trade intensity of the global economy has declined modestly since the GFC, and there are credible arguments that some form of **deglobalization or global fragmentation** may occur over the coming decade and beyond. Naturally, the biggest losers from deglobalization ought to be those who benefitted most in the period of rapid globalization – large multinationals. There have only been nascent signs of trade de-globalization, mostly as US/China strategic competition leads both sides to try to reduce their dependence on the other. Outright trade flows have barely changed, though. This remains a development to monitor.

Finally, we have more [recently observed](#) that there has been a resurgence in industrial policy, likely motivated by the escalation in geopolitical competition. There is a considerable body of evidence that smaller companies benefit most from industrial support, as it relaxes barriers to growth that more frequently constrain small companies.

Since we published on Small Caps in [2018](#), this asset class has underperformed the broad equity market. While our SAA is based on anticipated performance of asset classes over 10 years, we consider it quite unlikely that the performance of

Small- and Mid-caps over the next five years will more than reverse the underperformance thus far. While deglobalization, antitrust, and industrial policy should have benefitted Small- and Mid-caps in principle, other forces have evidently dominated. Chiefly, in our mind, there is an argument that there are growing economies of scale due to technological change, while growing R&D intensity poses a natural barrier to entry, with business R&D in the US increasing from 0.58% of GDP in 1953 to 2.52% of GDP in 2021 and particularly rapid growth in the past decade.<sup>8</sup> For example, there is new evidence that the diffusion of information technology causally contributed to a rise in business concentration and the growth of “superstar firms.”<sup>9</sup> It is conceivable that the diffusion of AI could have comparable effects.

**The fact that this underperformance occurred while the forces that we expected to underpin Small-cap outperformance were active warrants revision of this portfolio overweight, and we thus go strategically neutral Small Caps.**

## Hybrids: Neutral

Our previous strategic overweight on hybrids – including REITs, Preferreds, Utilities, Convertibles, HY – was motivated by the observation that they have historically generated long-term returns comparable with equities but a tighter range on 10-year compound returns long term due to the **benefit of time diversification from mean reversion in returns**.

This argument relies on assessing risk using unconditional volatility of observed long-term returns. However, there is an argument that **risk should be assessed conditional on information known at the start of the investment period**. In bonds, the starting yield on an index provides a good forecast of 10yr returns. In equities, decent forecasts of 10yr returns on an index can be produced using a selection of signals. Based on historical performance of these forecasts, long-term risk on bonds and equities is lower than implied by the unconditional volatility of long-term returns. However, we do not have good enough forecasts for the long-term performance of various hybrid assets. Thus, we remove the overweight on hybrids on the basis that the relative benefit of time

8. [National Center for Science and Engineering Statistics](#), 2023. A just released NBER paper by Braguinsky et al., Mega Firms and Recent Trends in the US Innovation: Empirical Evidence from the US Patent Data, NBER July 2023, finds that “the share of novel patents held by very large publicly traded US firms has risen sharply since the 1990s. Since 2007, novel patents held by these firms are disproportionately likely to spark further development.”

9. Erik Brynjolfsson, Wang Jin and Xiupeng Wang, [Information Technology, Firm Size, and Industrial Concentration](#) (2023) NBER Working Paper #31065.

diversification is weaker given our ability to reasonably forecast long-term returns on bonds and equities.

## US equities: Neutral

We have been strategically underweight on US equities, motivated by the argument that US exceptionalism was unlikely to persist, due to political dysfunction, the return of antitrust, and the very expensive entry point on the US dollar ([Will US market exceptionalism last?](#) June 24, 2021).

Since 2018, the US (MSCI US) has outperformed the rest of the world (MSCI ACWI ex-US) by 8.3% pa since 2018 in USD terms. **It is clear that the forces that we expected would underpin an end to US exceptionalism have not had the predicted effect.** As we have recently noted, US exceptionalism is not simply the story of the past five years but rather the story of the past 35 years. Since 1988, US equities have outperformed the rest of the world by 5.1% pa, and the only period longer than two years that the US underperformed was 2002 to 2008, when the US multiple went from the highest of the post-war period (30x at Nasdaq peak) to a very low 12x (lowest since 1988). Given the persistence of US outperformance over the course of decades, we are no longer willing to bet against US resilience in our long-term strategic allocation.

At this point, a strategic overweight on the US is not warranted, since **risks to US exceptionalism may intensify**, and we remain strongly of the view that the dollar is very expensive and is likely to depreciate against the majority of currencies over the coming decade. To this, we would add the tail risk of de-dollarization, which we recently assessed. Finally, we note that the US share of global equity markets (MSCI ACWI) has risen from a low of ~41.3% in 2009 to ~61.3% in 2023, so maintaining a neutral stance on US equities implies a somewhat larger US allocation than it would have in recent years.

## EM equities: Strategic Underweight through China

**EM equities have outperformed the DM world since the start of data in 1987.** But this performance has been a story of feast and famine, with the last famine cycle of EM underperformance now already in its 13th year. We have highlighted in our first piece on the EM asset class ([Strategic questions on EM allocations](#), Sep 28, 2018) a high correlation between relative equity performance for EM vs DM and how

their economies are performing against expectations.<sup>10</sup> EM growth has been steadily surprising on the downside vs DM since 2010, with the one-time exception of the first months of the pandemic when the Chinese economy did much better than feared.

We fear that **accelerating changes in climate, technology, and industrial policies and geo-political tensions will further disadvantage EM stocks vs DM, and thus we prefer to be strategically underweight EM equities, by not holding China equities.**

Firstly, **EM countries are particularly exposed to climate risk**, which we think is the most profound long-term risk facing strategic investors. To a degree, this elevated exposure reflects geography as many EM countries are situated near the equator. Compared to DM countries, many EM countries also lack the fiscal and administrative resources to effectively mitigate and adapt to the consequences of climate change. It is also likely that climate change will particularly adversely affect the agriculture sector, and most EM economies are agriculture intensive relative to DM.

Secondly, in our view, **rapid technological progress due to AI is more likely than not to be relatively advantageous for DM economies**. It is likely that making effective use of AI will require a well-developed stock of human capital. This is consistent with evidence that suggests that waves of technological innovation have historically contributed to developed-developing income divergence because of differences in the intensity of technology adoption.<sup>11</sup>

Thirdly, there has been a **resurgence in industrial policy**, likely motivated by the escalation in geopolitical competition. In the US, for example, the *Inflation Reduction Act* and the *CHIPS and Science Act* provided substantial pecuniary benefits to domestic industry and invigorated debate about comparable initiatives in Europe and Japan. As shown by Juhász et al. (2022), on average, developed economies are the most prolific users of pecuniary industrial policy, such as R&D subsidies, investment grants, low interest loans, likely as they

10. Note that a country or region with faster economic growth will not necessarily produce higher equity returns, even when assessed over 10 years or longer. One important driver of this gap, beside foreign earnings or sector concentrations, is whether market earnings growth comes from existing companies or from new companies not listed yet on a country's exchange. This is one major reason why EM stocks, with dramatically higher economic growth than DM, have delivered barely higher long-term equity returns – much of their growth comes from new companies.

11. Diego Comin and Martí Mestieri, If Technology Has Arrived Everywhere, Why Has Income Diverged? (2018) 10(3) *American Economic Journal: Macroeconomics* 137-178.

possess the greatest fiscal and administrative capacity.<sup>12</sup> Since industrial support is very likely to benefit recipient firms and sectors, a resurgence in industrial policy should advantage equity markets in countries with the capacity to effectively pursue industrial policy. In addition to positively benefiting recipient firms, industrial policy should create a competitive disadvantage for firms not in receipt of support. Thus, a resurgence in industrial policy is one factor that favors markets in DM countries, which are able to support industries most effectively, at the expense of EM countries.

While Climate, pandemic risk, technology, and industrial policies suggests a simple underweight of the broad EM equity asset class, we **prefer to hold this underweight by investing in EM ex China**, as the Chinese equity market offers its own challenges to international investors.

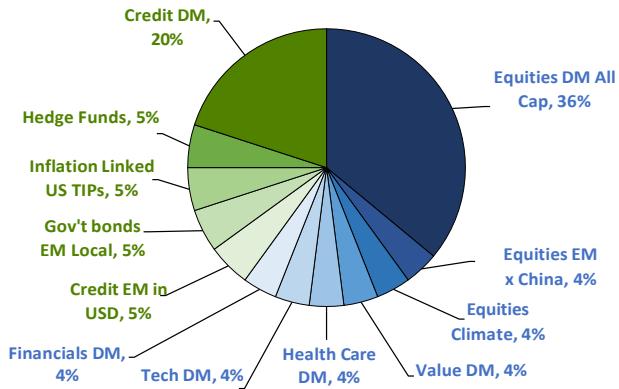
There is an argument that China is well positioned to contribute to and benefit from AI innovation. However, while China actively pursues industrial policy, this is enacted to a large degree through State-Owned Enterprises, potentially to the detriment of private firms. Further, **China's financial markets are undergoing a structural re-rating and have underperformed due to a confluence of domestic and global factors** that accelerated after the onset of Russia's war on Ukraine in March 2022 (*J.P. Morgan Perspectives: Navigating China's financial markets*, Joyce Chang et al., September 6, 2023). Geopolitics also remain a key risk factor. Jointly, these considerations lead us to omit China equities from our strategic equity allocation.

## Our new Strategic Asset Allocation

Figure 8 details our new Strategic Asset Allocation with percentage allocations to different asset classes. As a reminder, it is long only, starts from global outstandings and makes additions or exclusions (to over- or underweight), assumes a USD base currency, and ignores taxation. Each can be held through mutual funds or ETFs. We do not distinguish between passive or actively managed funds, or public or private assets, leaving such decision to the individual investor.

12. Réka Juhász, Nathan Lane, Emily Oehlsen and Verónica Pérez, The Who, What, When, and How of Industrial Policy: A Text-Based Approach (2022) Working Paper.

Figure 8: Our Strategic Asset Allocation



Source: J.P. Morgan.



# Climate

## The Long-term Strategist

### The climate threat to EM assets

- We have previously argued for an underweight on EM equities as they are likely to be more adversely affected by climate change.
- We see three supports for this view. First, EM countries are generally more exposed to climate change due to their geography. Second, the structure of EM societies and economies, including their larger agriculture sectors, makes them sensitive to the effects of climate change. Third, they generally have less economic and administrative capacity to reduce the harms caused by climate change.
- In this note, we examine the data in support of each and find broadly supportive evidence.
- In terms of geography, countries close to the equator are generally more exposed to the physical effects of climate change, though the relationship between latitude and exposure is not perfect. Much of EM is quite highly exposed, including South and Southeast Asia, Latin America, and Sub-Saharan Africa. On average, Europe is best situated.
- Countries with large agriculture sectors and populations dependent on subsistence farming are generally most sensitive to the damage from climate change. This is generally an issue for the least developed EM countries.
- The ability to reduce the damage from climate change is quite closely related to the level of development. EMs are, by definition, still in the process of development and thus generally have less capacity to reduce damage from climate change. The most developed countries in the world, in North America, Europe, East Asia, and Oceania have the most capacity.
- Combining these factors into a single measure, among the largest DM and EM, almost every EM country is at greater climate risk than all other DM countries.
- Within EM, EM Asia (ex-China), the Middle East, and Africa are the riskiest regions when it comes to climate. EM Europe, China, and Latin America are less risky, though still at more risk than DM.
- We see no clear evidence that these risks are priced into equity markets. In fact, EM countries with greater climate risk have more expensive equity markets on average. This is further evidence in support of our view that downside risk to assets from climate is not well priced yet but is now starting to show up.
- Investors in other asset classes should also consider climate risk in EM. At the very least, it seems likely to affect sovereign debt, currencies, real estate, and infrastructure.

#### Long-term Strategy

##### Alexander Wise <sup>AC</sup>

(1-212) 622-6205  
alexander.c.wise@jpmchase.com

##### Jan Loeys

(1-917) 602-9440  
jan.loeys@jpmorgan.com  
J.P. Morgan Securities LLC

Our [Strategic Asset Allocation](#) is underweight EM equities, to a degree based on the view that they are likely to be more adversely affected by climate change than DM economies. We see three reasons for this view. First, EM countries generally have greater exposure to expected climate change due to their geography. Second, the structural composition of EM economies, including their greater primary and secondary industry orientation, creates particular sensitivity to the effects of climate change. Third, due to their lesser economic development and generally weaker governance, EM countries do not have the same capacity to manage the costs of climate change, and climate costs are more likely to crowd out other productive investments made by governments. In this note, we examine each component of this claim.

The [ND-GAIN](#) index provides global data to assess these arguments. Its measures of climate exposure, sensitivity, and capacity address each of our arguments in turn.<sup>1</sup> In essence, these measures can be defined as follows:

- **Exposure** measures the physical exposure of a country to climate change;
- **Sensitivity** measures the economic and social dependence on sectors that are likely to be affected by climate change, and the proportion of the population exposed to its effects;
- **Capacity** measures the ability of countries to reduce the damage they suffer due to climate change.

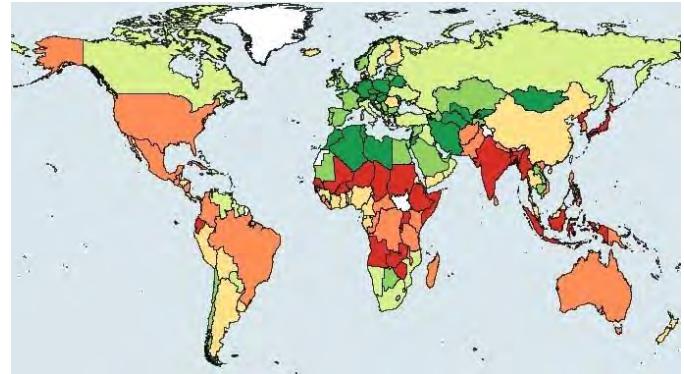
These three are then combined into an aggregate measure of climate **vulnerability**. We will address each in turn before moving to the aggregate vulnerability measure. Note that these variables are measured at the country level, but there will naturally be regional variation within countries, particularly in exposure and sensitivity in large countries.<sup>2</sup>

Starting with the **geography of climate change**, Figure 1 shows the exposure of countries around the world, ranging from lowest in green to highest in red. Among other factors, exposure is determined based on expected changes in agricultural yields, rainfall, climate-induced disease, ecosystem destruction, heat, and flooding. Countries closer to the equator are generally more exposed, though the relationship between latitude and exposure is not perfect. Beyond 25 degrees north and south of the equator, there is no clear relationship between latitude and exposure. Sub-Saharan Africa, Southeast Asia and, to a slightly lesser extent, Latin America are most geographically exposed to climate change, while the

regions around the Mediterranean are least exposed.

[Figure 1: Climate exposure around the world](#)

Ranges from lowest exposure (green) to highest exposure (red). White indicates no data or disputed territory. Exposure defined at the country level.

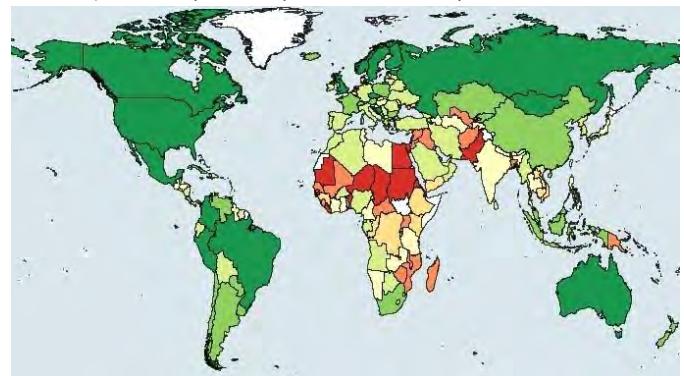


Source: J.P. Morgan, ND-GAIN, UN.

Turning to the **structure of economies and societies**, Figure 2 shows the sensitivity of countries around the world, again ranging from lowest in green to highest in red. By this measure, Sub-Saharan Africa is most sensitive to climate change, followed by South Asia. Most Sub-Saharan countries have large rural populations that are dependent on agriculture, which accounts for a large share of economic activity and is predictably very sensitive to climate change. The prevalence of subsistence farming also raises the risk of climate-induced food insecurity. This is also the case, albeit to a lesser degree, in South Asia. Relatively service-intensive economies that are less dependent on natural capital in the Americas, Europe, North Asia, and Oceania are all less sensitive in these respects.

[Figure 2: Climate sensitivity around the world](#)

Ranges from lowest sensitivity (green) to highest sensitivity (red). White indicates no data or disputed territory. Sensitivity defined at the country level.



Source: J.P. Morgan, ND-GAIN, UN.

Moving to the **ability to mitigate the adverse effects of climate change on economies and societies**, Figure 3 shows the capacity of countries around the world, ranging from

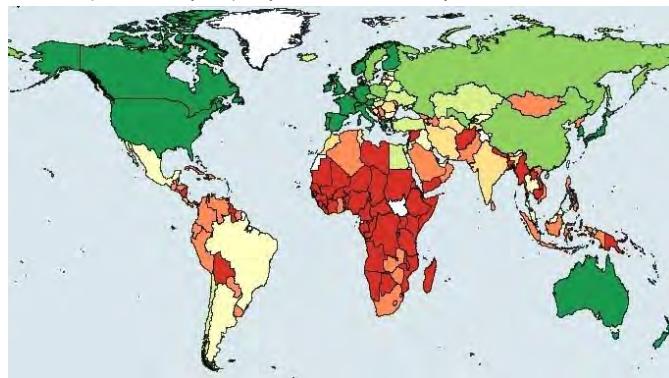
1. Precise definitions and measurement details are available in the ND-GAIN [technical report](#).

2. For instance, our [recent studies](#) on real estate exposure to climate change shows the considerable variation within the US.

highest in green to lowest in red. Measured capacity is supported primarily by strong infrastructure, well-developed human capital, and disaster preparedness. This measure is quite closely related to level of development, with the highest capacity in North America, Western and Northern Europe, East Asia, and Oceania. In line with their level of development, Latin America and Emerging Asia are toward the middle of the spectrum in capacity, while Sub-Saharan Africa is at the low end.

**Figure 3: Climate capacity around the world**

Ranges from highest capacity (green) to lowest capacity (red). White indicates no data or disputed territory. Capacity defined at the country level.

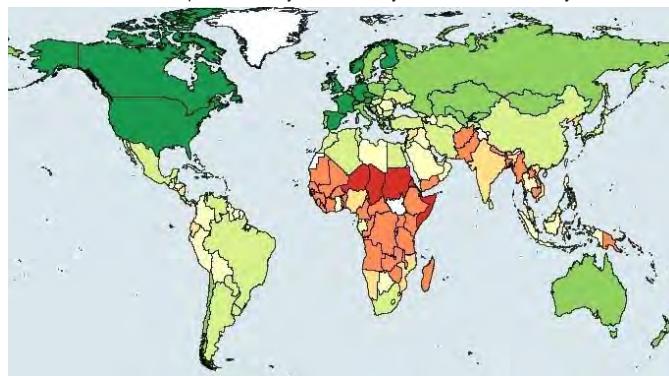


Source: J.P. Morgan, ND-GAIN, UN.

Combining these three dimensions of climate risk – exposure, sensitivity, and capacity – yields an **aggregate measure of vulnerability to climate change**, which is shown in Figure 4. Overall, North America, Europe, North Asia, and Oceania are exposed to the least climate risk, followed by Latin America, the Middle East, and South and Southeast Asia. Sub-Saharan Africa is most exposed to climate risk, reflecting its comparative weakness along each of the three dimensions.

**Figure 4: Climate vulnerability around the world**

Ranges from lowest vulnerability (green) to highest vulnerability (red). White indicates no data or disputed territory. Vulnerability defined at the country level.



Source: J.P. Morgan, ND-GAIN, UN.

Given the size of **India** and **China** within EM, it is worth briefly commenting on their particular risk profiles compared to the US as a benchmark. India is at greater risk than the US by each of the three measures, with higher exposure and sensitivity and lower capacity. Among other factors, it is relatively close to the equator, is broadly exposed to extreme heat and drought, has a large rural population still dependent on subsistence farming, has less developed infrastructure, and is broadly less developed. Most of these factors appear to be more moderate in China. For instance, [agriculture](#) accounted for 23% of employment in China in 2022, compared to 43% in India, heavy investment in infrastructure has been at the core of the Chinese growth model for decades now, and China is more developed than India overall. While at less risk than India, China is still assessed as being at greater risk than the US due to its greater sensitivity and lower capacity, though this is partially offset by slightly less physical exposure to climate change.

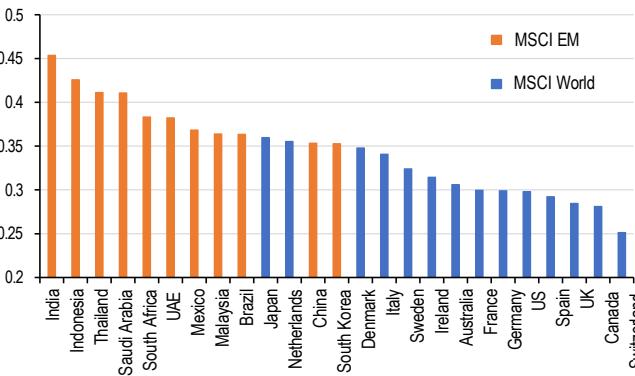
## Implications for asset allocation

There are, in our view, reasonable arguments that **climate risk is relevant for most investable assets**, including equities, fixed income, and alternative assets such as real estate and infrastructure. While Sub-Saharan Africa is exposed to the most acute climate risk, the universe of investable assets there is comparatively small, so this is unlikely to be of first-order significance for a global investor.

Starting with equities, we evaluate our initial hypothesis that **EM equity markets are particularly exposed to climate risk**. Figure 5 ranks a selection of the largest DM and EM equity markets by climate vulnerability – the aggregate climate risk measure. As claimed, EM countries are generally exposed to greater climate risk than DM countries. Within MSCI EM, India, Indonesia, Thailand, and Saudi Arabia are the most exposed, while China and South Korea are the lowest risk. Within DM, Japan, the Netherlands, and Denmark are assessed to be the highest risk, though they are less risky than almost all large EM countries. Switzerland, Canada, and the UK rank as the least exposed countries. As an aside, these results are thus supportive of our strategic overweight on [Anglosphere ex-US equities](#), though this allocation is primarily based on valuations and macroeconomic and demographic fundamentals.

Figure 5: Climate vulnerability of large equity markets

Measure is climate vulnerability from ND-GAIN.

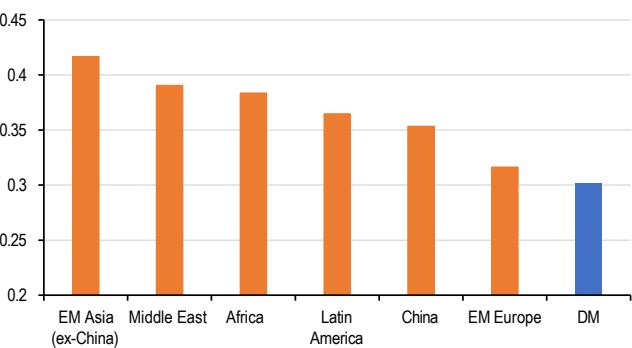


Source: J.P. Morgan, ND-GAIN, MSCI, Bloomberg Finance L.P.

Figure 6 presents a different perspective of the variation in climate risk within EM, showing the **equity capitalization-weighted climate risk of EM regions** versus the capitalization-weighted average of DM. This suggests that EM Asia (ex-China) and the Middle East are exposed to the greatest climate risk, while EM Europe and China are exposed to the least risk.<sup>3</sup> While the argument that climate change poses a risk to EM assets is among the least compelling in the case of China, our benchmark SAA portfolio has no allocation to Chinese equities for other reasons, as discussed in the appendix to this note.

Figure 6: Capitalization-weighted vulnerability of EM regions relative to DM

Measure is climate vulnerability from ND-GAIN. DM is MSCI World. Regions consist only of countries with MSCI index. Market capitalization as of November 7, 2024.



Source: J.P. Morgan, ND-GAIN, MSCI, Bloomberg Finance L.P.

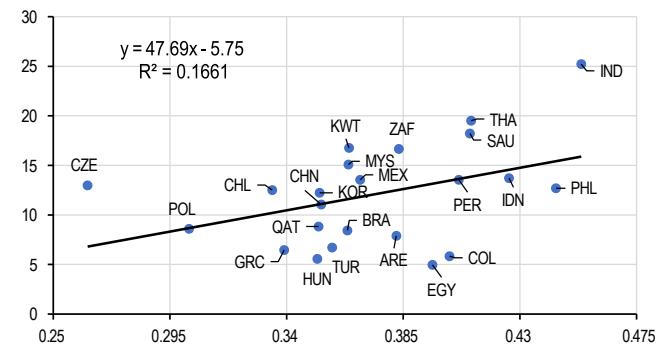
We see **no clear evidence that these risks are priced into equity markets**. In fact, among 23 countries in the MSCI EM index, we observe that the more vulnerable a country is to cli-

3. As the African equity market primarily consists of South African stocks, the capitalization-weighted climate risk of Africa is not nearly as high as observed in most other Sub-Saharan countries.

mate change, the more expensive its equity market is on average (Figure 7) – measured by its trailing price-to-earnings multiple – even when there is reason, in our view, to think more vulnerable countries should have lower multiples for other reasons, given vulnerability is correlated with level of development for instance. That being the case, the fact that more vulnerable countries generally have higher multiples is particularly striking.

Figure 7: Climate vulnerability of EM equity markets against trailing P/E ratios

PE ratios as of November 26, 2024.



Source: J.P. Morgan, ND-GAIN, MSCI, Bloomberg Finance L.P.

**India is an outlier** among these countries both in terms of climate vulnerability and valuations. India is now favored by many investors, who are attracted by its faster growth than China and favorable demographics, and the perception that it is more business friendly and well positioned to be a beneficiary of supply chain restructuring. However, its vulnerability to climate change sounds a cautionary note for long-term investors. Parallels can perhaps be seen to the enthusiasm about some booming states in the US that are low tax and seen as business friendly but where our recent [research](#) suggests climate risk is now beginning to weigh on asset prices.

Beyond equities, investors in **EM sovereign debt** should also consider climate risk, and there is evidence that this is already factored into credit rating assessments.<sup>4</sup> Destructive extreme weather is likely to impose a high fiscal cost on vulnerable countries but could also persistently reduce economic growth, which can harm the long-term ability to repay debt. Adverse effects on currencies would also impair a country's ability to repay hard currency debt.

Climate risk is also an important consideration for investors in **immobile assets such as real estate and infrastructure**. Based on our research in the US, downside risk on immobile

4. Serhan Cevik and Joao Tovar Jalles, [Feeling the Heat: Climate Shocks and Credit Ratings](#) (2020) IMF Working Paper #2020/286.

assets such as real estate is barely priced into markets. Therefore, our results suggest screening these assets for climate risk not only within country but also across countries.

One might argue that the effects of climate change will be felt in the distant future, beyond the investment horizon of many investors. However, our recent research suggests that **negative climate risk is now starting to be priced into markets** and that this process has only just begun (see Climate change is starting to bite for US real estate, November 8, 2024). The effects of climate change are also now clearly being felt, with, for instance, 2024 expected to be the first year the world will pass the 1.5°C warming threshold at the heart of the Paris Agreement – though it has not yet been sustained for the extended period of time needed to constitute “failure” by their definition.<sup>5</sup> This suggests to us that the time to factor the adverse effects of climate change into an SAA is now, not decades from now.

---

5. [Earth Will Exceed 1.5 Degrees Celsius of Warming This Year](#),  
*Scientific American*, November 7, 2024.

## The Long-term Strategist

Climate and extreme weather risk is not priced into US residential real estate

- Despite record-high damages from extreme weather events, we see little impact on US home prices at the county level.
- We find that US home prices have risen more in counties with higher climate and extreme weather risk from heat, drought, wildfire, pollution, coastal flooding, riverine flooding, sea level rise and hurricanes.
- Since 2000, homes in counties in the top quintile of climate and extreme weather risk have risen ~40% more in price than they did on average across all other counties.
- This is consistent with other evidence that Americans have moved on net towards areas with higher risk of extreme weather, instead of away from them. We show that population growth was higher on average in more exposed counties.
- Homeowners may not be paying enough attention to climate and extreme weather risks as they do not expect to bear the full costs. Government commitments to assist in rebuilding damaged or destroyed properties may also skew incentives.
- While rising property insurance costs could force homeowners to focus on climate and extreme weather risk, it is unclear that property insurance prices have risen yet in line with risk.
- These findings suggest that banks, insurance companies, mortgage originators and investors with exposure to US residential real estate should carefully screen their risk exposure.
- Less exposed areas may stand to benefit most from house price appreciation if climate change eventually drives migration to those areas.

### Long-term Strategy

#### Alexander Wise <sup>AC</sup>

(1-212) 622-6205  
alexander.c.wise@jpmchase.com

#### Jan Loeys

(1-917) 602-9440  
jan.loeys@jpmorgan.com  
J.P. Morgan Securities LLC

In our analysis last year about the [top long-term risks](#), we discussed evidence about whether climate change is appropriately priced into markets. In this note, we assess whether there is evidence of market pricing of climate and extreme weather risks (hereafter “climate risk•”) in the US residential real estate market.

Many investors and financial institutions, such as banks, insurance companies and mortgage originators have sizable exposure to US residential real estate. If evidence for market pricing of climate risk is weak, they may be exposed to considerably more risk than they expect, and so should carefully screen their exposure. There may be investor demand for residential real estate funds which disclose and limit climate exposure, which may also stand to benefit most from price appreciation if climate change eventually drives migration towards less exposed areas.

To test whether climate change is priced into US residential real estate, we examine the rate of house price growth in US counties with different exposure to climate risk. If markets price climate risk, one would expect that the prices of properties exposed to growing and approaching climate risk should decline relative to those that are less exposed, all else being

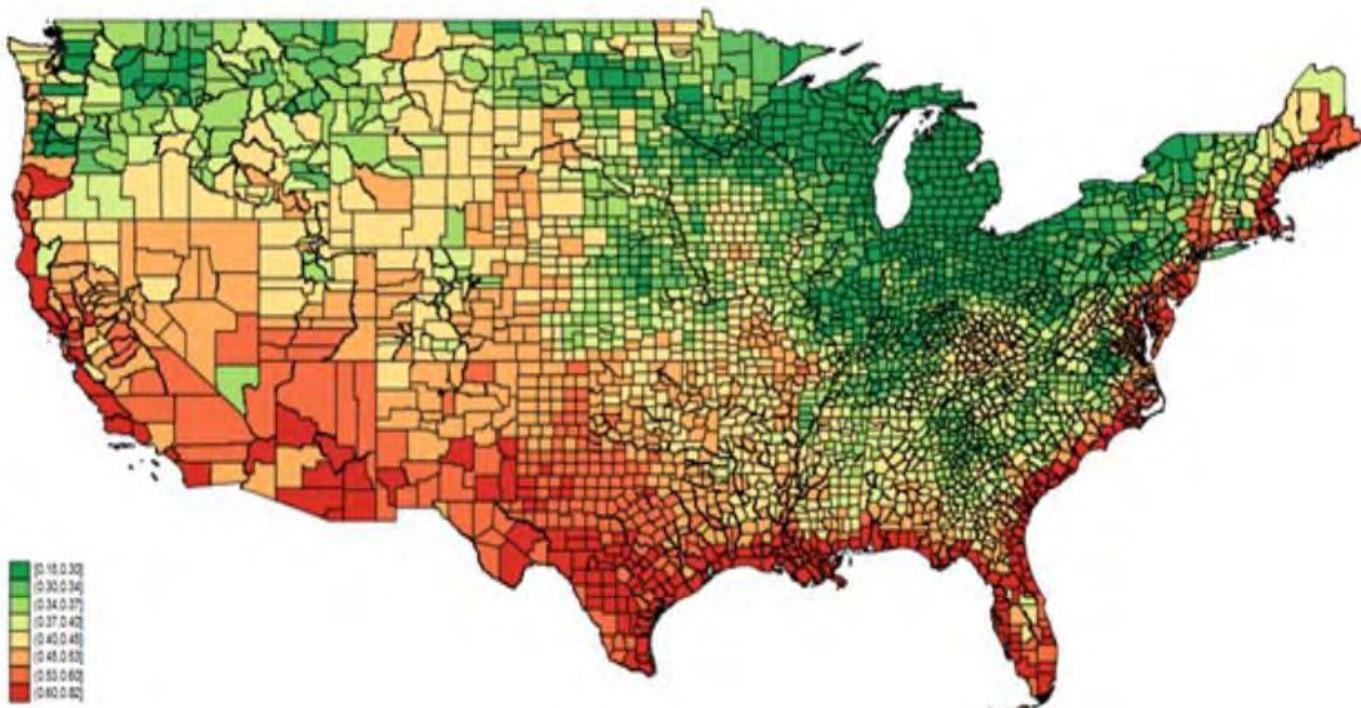
equal.<sup>1</sup> As a concrete example, take two houses which are identical in every respect, except one house will be irreparably destroyed by an extreme weather event in 2050. If climate exposure is priced, the price of the house which will be destroyed will converge towards zero as 2050 approaches, while the price of the other house will not.

Thus, our empirical test for whether climate risk is currently priced into residential real estate markets is to examine whether there is a negative relationship between climate risk exposure and residential real estate price growth in recent years. In our view, this is a more robust statistical test than simply assessing the relationship between price *levels* and climate risk.<sup>2</sup> In any case, the house price index (HPI) data used

1. More formally, the expected costs of climate change, which will be felt most acutely in the future, are less heavily discounted as time passes.
2. The relationship between climate risk and real estate prices *in levels* is likely to be confounded by a large set of variables, many unobserved, which obscure any relationship. For example, real estate on the coast may provide higher amenity value, though it will also be exposed to greater climate risk. The set of plausible confounding variables is likely to be smaller when one assesses the relationship between climate risk and *changes* in real estate prices as climate costs mount.

Figure 1: Composite climate risk

See text for a description of how the measure is constructed. For further details about Suffolk County, NY, and Clark County, NV, see footnote 7. Red indicates higher risk.



Source: J.P. Morgan, US Census Bureau, Climate Vulnerability Index, Lewis et al. (2023).

26 February 2024

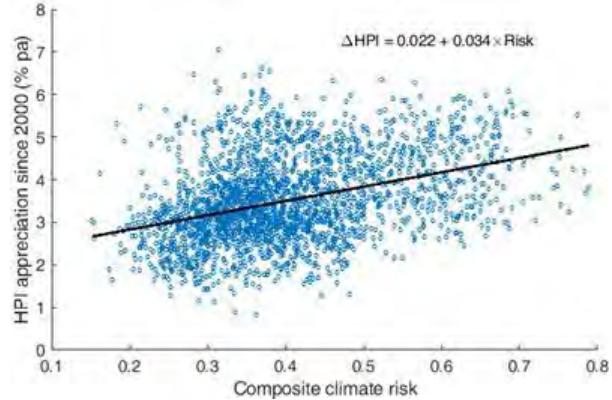
in this note are set to 100 in the first year of data coverage in each county, which allows cross-county comparison of changes in prices, but not of levels.

Turning to the data, we use US county-level house price indices from the Federal Housing Finance Agency (FHFA).<sup>3</sup> We source climate risk data from the *Climate Vulnerability Index* project, which assesses a number of dimensions of climate risk, including heat, flooding, drought, wildfires and storms.<sup>4</sup> For each risk, the *Climate Vulnerability Index* project assigns counties a risk exposure score between 0 (lowest risk) and 1 (highest risk).<sup>5</sup> Here, we construct a measure of composite climate risk by taking the simple average of scores across a set of climate risks: extreme heat, drought, wildfire, riverine flooding, coastal flooding, sea level rise, surface PM2.5, and hurricanes.<sup>6</sup> Each of these forces should affect the expected amenity value of housing. Figure 1 shows this measure of composite climate risk on a map of the US, with red areas indicating higher climate risk.<sup>7</sup>

Figure 2 plots a scatter of the rate of county HPI growth between 2000 and 2022 against composite climate risk, showing a positive relationship which is statistically significant at the 1% level of significance. On average, residential real estate prices have grown faster in the past two decades in areas which are more exposed to climate risk, which is precisely the opposite of what one should have expected if climate risk were appropriately priced into markets. On average, a one standard deviation increase in composite climate risk is associated with a 0.37 percentage point pa increase in the rate of HPI growth between 2000 and 2022. The relationship between composite climate risk and HPI growth remains positive and statistically significant at the 1% level of significance if house price growth is measured since 1990 or 2010, instead of 2000. In terms of specific risks, there is a positive correlation between HPI growth and drought, wildfire, surface PM2.5, sea level rise and coastal flooding, but not riverine flooding and hurricanes. The relationships between HPI growth and various measures of extreme heat vary.

Figure 2: Rate of county housing price appreciation versus exposure to climate risk

% pa. Observations are county-level HPI appreciations from 2000 to 2022. Black line is linear regression. 2413 counties with HPI data since 2000.



Source: J.P. Morgan, FHFA, Bogin et al. (2019), Climate Vulnerability Index, Lewis et al. (2023).

These price changes are consistent with the pattern of population growth since 2000. Using the same measure of climate risk, we find a positive and statistically significant relationship between climate risk and population growth in US counties since 2000, as depicted in Figure 3. This is consistent with other research which has documented higher rates of net inward migration in counties with higher exposure to various climate risks.<sup>8</sup>

The results we have presented so far are based on a simple regression of house price growth on climate risk. One could argue that it is possible that climate-exposed counties experienced systematically faster economic growth, creating greater economic opportunity and making those locations more attractive. It is possible that this could lead to faster house price growth in climate-exposed areas even if homeowners were taking climate risk into account. As a check of the robustness of our results, we run another regression of house price growth on climate risk, this time including a control for the rate of real GDP growth in a county between 2001 and

3. Federal Housing Finance Agency, [House Price Index](#) (2024). FHFA data is based on Alexander Bogin, William Doerner and William Larson, [Local House Price Dynamics: New Indices and Stylized Facts](#) (2019) 47(2) *Real Estate Economics* 365-398.

4. [Climate Vulnerability Index](#) (2024). For further discussion and methodological documentation, see PGT Lewis, Weihsueh Chiu, Ellu Nasser, Jeremy Proville, Aurora Barone, Cloelle Danforth, Bumsik Kim, Jolanda Prozzi and Elena Craft, [Characterizing vulnerabilities to climate change across the United States](#) (2023) 172 *Environment International* 107772. To visualize various risk measures, see [here](#) and then navigate to the drop-down menu next to “Extreme Events” in the right panel.

5. Note that most of the climate risk measures used here are static measures, which are based primarily on the current risk profile of

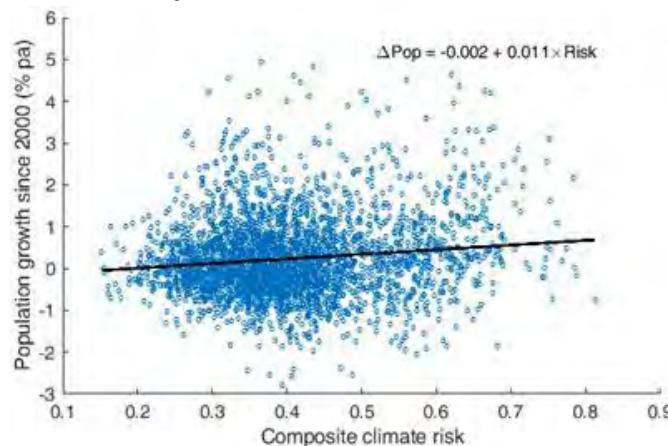
US counties. It is implicitly assumed that the future growth in risk due to climate change will be positively correlated with the current risk profile. For example, hotter regions of the US should be most adversely affected by global warming, regions on the coast should be most adversely affected by the rising frequency of climate events which cause coastal flooding, and so on.

6. Specifically, we use “Urban Heat Island Extreme Heat Days”, “40 Degree Celsius Days”, “Drought (annualized frequency)”, “Wildfire”, “Riverine Flooding”, “Coastal Flooding”, “Sea Level Rise”, “Surface PM2.5”, and “Hurricanes”. “Tornado” is excluded due to [ambiguous evidence](#) about the relation with climate change.

7. Suffolk County, NY, is lower risk than neighboring counties primarily due to lower measured coastal and riverine flooding risk in the source data. Another source, the FEMA National Risk Index,

2021.<sup>9</sup> We find positive and highly significant coefficients on both climate risk and economic growth. The estimated coefficient on climate risk was very similar in this regression to the previous one; a one standard deviation increase in climate risk is associated with a 0.34 percentage point pa increase in the rate of house price growth between 2000 and 2022, compared to a 0.37 percentage point pa increase in the original analysis. This gives us greater confidence that climate risk is not priced into residential real estate.

**Figure 3: Rate of population growth versus exposure to climate risk**  
 % pa. Observations are county-level population growth rates from 2000 to 2022. Black line is linear regression.



Source: J.P. Morgan, US Census Bureau, Climate Vulnerability Index, Lewis et al. (2023).

## Why isn't climate risk priced in?

Most single-family houses in the US are owned by individuals, many of whom may not pay attention to climate risk. This may be irrational in the sense that individuals are not taking into account costs that they will bear, whether these costs are realized through the direct effects of climate change, or reduced resale value due to elevated climate risks in the future. This may be compounded by the moral hazard created by government commitments to support rebuilding property

---

indicates that coastal and riverine flooding risks in Suffolk County, NY, are comparable to surrounding counties, which would point to relatively higher risk than depicted in Figure 1. In the same way, Clark County, NV, is measured to have lower climate risk than surrounding counties primarily due to lower wildfire and riverine flooding risk in the source data. Wildfire and riverine flooding risks in Clark County, NV, are higher in the FEMA National Risk Index, which would also point to relatively higher risk than depicted in Figure 1.

8. Lauren Liebhaber, [Undeterred by climate change, US homeowners are moving to climate-vulnerable areas](#), Stacker, June 21, 2022.

9. Economic growth is measured from 2001 to 2021 due to data constraints. Real GDP data by county are sourced from the Bureau

destroyed or damaged in climate disasters. Disregard for climate costs may also reflect “rational inattention” of individuals who do not expect to live sufficiently long to bear substantial costs of climate change, and do not intend to sell their property.

One factor which forces individuals to pay attention to climate change is the price of property insurance. Rising insurance prices due to higher assessed climate risks raise the cost of owning a home, and consequently should depress demand and prices for climate-exposed residential real estate. Households have been partially insulated from rising insurance costs by efforts of governments or regulators to limit price increases. These restrictions may prevent insurers from charging rates which are commensurate with their assessment of climate risk or lead them to cease providing insurance altogether in some areas.<sup>10</sup>

Using public use microdata from the US Census Bureau, we can assess whether the cost of property insurance has increased at higher rates in areas exposed to higher climate risk.<sup>11</sup> Since only a subset of US counties is identifiable in publicly available census microdata, the sample size is smaller than in our analysis of housing prices above, though the data still covers a large set of counties with meaningful variation in climate risk.

Figure 4 plots a scatter of the rate of property insurance cost growth between 2000 and 2022 against a measure of climate risk. Here, we adjust the measure of climate risk to focus strictly on destructive weather events which damage properties, rather than climatic events like heat which primarily affect amenity value instead of inflicting damage covered by insurance. For present purposes, climate risk is measured as the simple average of wildfire, coastal flooding, riverine flooding, sea level rise and hurricane risk in the *Climate Vulnerability Index* database. While there is a statistically significant positive relationship between property insurance cost growth and composite climate risk, this relationship is very weak in magnitude: a one standard deviation increase in climate risk is associated with a 0.07 percentage point pa increase in the rate of property insurance cost growth.

---

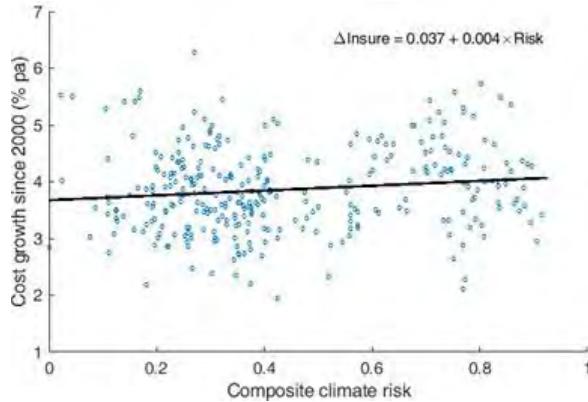
### of Economic Analysis.

10. For further discussion of climate risk and insurance, see [P&C Insurance 2024 Preview](#), Jimmy Bhullar and Pablo Singzon, January 8, 2024, and [Climate Adaptation](#), Virginia Martin Heriz et al., October 4, 2023.

11. Specifically, we use the 2022 *American Community Survey* and the 2000 Census 5% sample, sourced from IPUMS USA. See Steven Ruggles, Sarah Flood, Matthew Sobek, Daniel Backman, Annie Chen, Grace Cooper, Stephanie Richards, Renae Rogers and Megan Schouweiler, [IPUMS USA: Version 14.0](#) (2023) Minneapolis, MN.

Figure 4: Rate of property insurance cost growth versus exposure to climate risk

% pa. Observations are county-level property insurance cost growth rates from 2000 to 2022. Black line is linear regression.

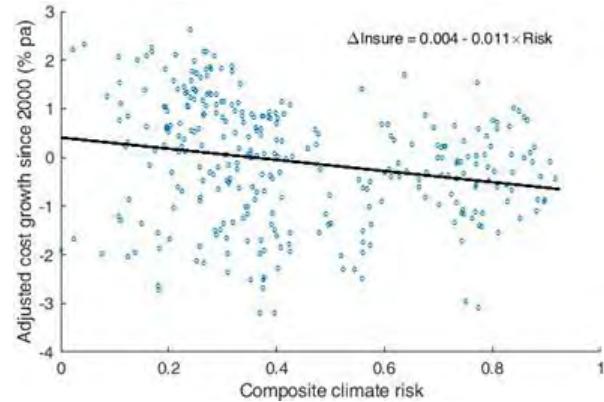


Source: J.P. Morgan, US Census Bureau, Climate Vulnerability Index, Lewis et al. (2023), IPUMS USA, Ruggles et al. (2023).

This analysis is complicated by the fact that, as we documented above, higher climate risk has been associated with higher house price growth. Since property insurance costs will rise with the assessed value of a property, this could lead to faster than average insurance cost growth in areas with higher climate risk, though this has little to do with any assessment of rising climate risk. To adjust for this, Figure 5 plots the rate of property insurance cost growth in excess of the rate of house price growth between 2000 and 2022 against climate risk. If the price of property insurance is rising due to climate risk itself, one would expect this adjusted outcome measure to be positively related to climate risk. In fact, we observe a negative relationship between property insurance cost growth in excess of HPI growth and climate risk that is statistically significant at the 1% level of significance. On average, a one standard deviation increase in composite climate risk is associated with a 0.19 percentage point pa decrease in the rate of insurance cost growth in excess of house price growth. Whether due to government regulation or policies, different appraisals of climate risk or otherwise, it is far from clear that property insurance costs have grown meaningfully due to climate risk. That being the case, it is little surprise that households do not appear to be appropriately pricing climate risk.

Figure 5: Rate of property insurance cost growth in excess of HPI appreciation versus exposure to climate risk

% pa. Observations are county-level property insurance cost growth rates in excess of HPI appreciation from 2000 to 2022. Black line is linear regression.



Source: J.P. Morgan, FHFA, Bogin et al. (2019), US Census Bureau, Climate Vulnerability Index, Lewis et al. (2023), IPUMS USA, Ruggles et al. (2023).



# Demographics

## The Long-term Strategist

### The looming competition for skilled immigration

- Many countries are now, or will soon be, grappling with difficulties posed by shrinking working-age populations, which will stress government budgets and pension systems.
- Cutting entitlements or raising taxes are painful responses to this challenge. As stress grows, raising high-skilled immigration is likely to be seen as an attractive way of reducing that cost.
- We have previously shown that immigration raises long-term growth, outright and in per capita terms, and reduces debt-to-GDP in turn. In this note, we find that the growth effects of *high-skilled* immigration are larger.
- The global stock of highly educated workers prepared to leave their country is only so large, so demographic challenges seem likely to lead to a competition between countries to attract these workers.
- Until now, countries in the Anglosphere have been the most successful in attracting highly educated immigrants. The share of immigrants who are highly-educated is above 40% in all six countries – Australia, Canada, Ireland, New Zealand, the UK, and the US. Nordic countries have also been quite successful.
- OECD data suggest that these countries remain very attractive to highly educated workers due to their quality of life and opportunity, integration and inclusiveness.
- The stronger effects on growth of high-skilled migration cut both ways. So-called “brain drain” would be particularly damaging for economies. Many countries may need new and possibly costly incentives just to retain high-skill natives.
- Emigration would raise the burden of supporting social services on the workers who remain, in turn encouraging them to consider leaving, creating the risk of a damaging feedback loop.
- Our analysis shows it is both the level and skill composition of immigration that matter in the long term. Countries with proportionally more highly educated immigrants have also seen higher overall levels of immigration, perhaps as they see the biggest benefits.
- These results reinforce our conviction in our strategic overweight on Anglosphere ex-US equities (which does not include the US due to its expensiveness).

#### Long-term Strategy

Alexander Wise <sup>AC</sup>  
(1-212) 622-6205  
alexander.c.wise@jpmchase.com  
**Jan Loeys**  
(1-917) 602-9440  
jan.loeys@jpmorgan.com  
J.P. Morgan Securities LLC

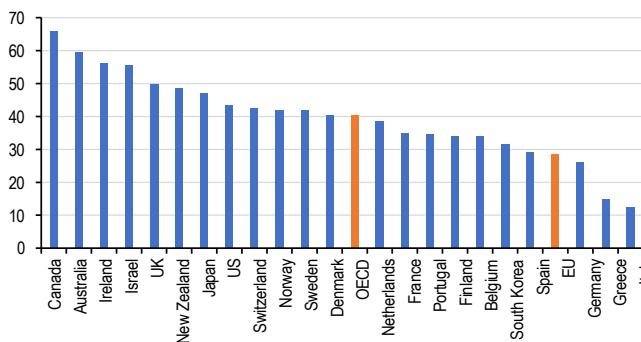
---

Many countries are now, or will soon be, grappling with the difficulties posed by shrinking working-age populations, including growing stress on government budgets and threats to the viability of their pension systems. Some policy responses to these challenges – such as cutting pensions and entitlements or raising taxes – are particularly painful and potentially politically inviable. One policy response that would likely reduce the need for these actions is increasing immigration, which we have shown raises long-term growth and reduces the debt burden. As these challenges grow ever more acute, we expect that there will increasingly be **competition among countries for immigrants**, particularly those who are **highly educated or skilled**. In this note, we explore the effects of skilled immigration, which countries are most likely to succeed in these efforts, and the consequences for the long-term investor.

## Landscape of skilled immigration

In most sources of immigration data, “skill” is defined along the lines of education, which is more readily observable than the full set of abilities we might be inclined to call skills. We will follow this convention, meaning subsequent references to “skill” in this note will refer to educational attainment. In the OECD data that we rely on, a highly educated individual is defined as someone with a tertiary education.

**Figure 1: Share of foreign-born population that is highly educated**  
 %, 2021 or latest available. Highly educated defined by OECD. Share within stock of immigrants aged 15-64 not in education. Orange indicates cross-country aggregate.



Source: J.P. Morgan, OECD.

As a first examination of the data, we look at the **skill composition of immigration to different countries**. Figure 1 shows the shares of immigrants aged 15-64 and not currently in education who are highly educated, as defined by the OECD, in a selection of countries. At the higher end of the spectrum, this share is above 40% in all six countries in the Anglosphere – Canada, Australia, Ireland, the UK, New Zealand, and the US – and three of the five Nordic countries – Norway, Sweden and Denmark. The share is also above 40%

in Israel, Japan and Switzerland. Highly educated shares are somewhat lower, though still quite high, in most of the remaining countries in continental Europe.

## Effects of skilled immigration

In this note, our focus is on establishing whether the growth effects of immigration depend on the skill level of immigrants. To do so, we estimate the following regression using a panel of data covering 41 countries from 1960 to 2023:

$$Growth_{it} = \beta_0 + \beta_1 Immig_{it} + \beta_2 Immig_{it} * Skill_i + \beta_3 \ln(PC_{it}) + \gamma_i + \sigma_t + \epsilon_{it}$$

where  $Growth_{it}$  is real GDP growth in country  $i$  in year  $t$ ,  $Immig_{it}$  is net migration as a share of the population in that country and year,  $Skill_i$  is the share of the immigrant stock aged between 15 and 64 in a country in 2021 that is highly educated,  $\ln(PC_{it})$  is the log of real GDP per capita in that country in that year,  $\gamma_i$  are country fixed effects, and  $\sigma_t$  are year fixed effects.<sup>1</sup> We estimate the regression with two different outcomes of interest: **real GDP growth** and **real GDP per capita growth**.

Note that, due to data constraints, the skill measure used here is defined as the highly educated share of foreign-born people in a country in 2021. It is not a time-varying measure of the highly educated share of immigrants coming into a country in each year. Ideally, we would have liked to look at the education of the cohort of immigrants coming in each year. Still, we do not think that this adjustment is likely to be problematic in practice given the education level of all foreign-born people in a country by 2021 will reflect the immigrants who have entered the country over an extended period of time before that point.

The regression variable constructed by multiplying  $Immig_{it}$  by  $Skill_i$  allows us to examine whether the effect of immigration differs based on typical immigrant skill. In these regressions, the marginal effect of an increase in immigration on growth is estimated to be  $\beta_1 + \beta_2 Skill_i$ . This means that the effect of an increase in immigration on growth depends on the level of immigrant education. If  $\beta_2$  is significantly positive, which it is in both regressions, the growth effects of immigration are more favorable when immigrants are more highly educated on average.

The results from these regressions are presented in Table 1. We are interested here in the differences in the growth effect of immigration based on education level, not the overall

1. We control for the level of development as immigrants may prefer to move to highly developed countries, and growth rates typically decline at higher levels of development.

effect of immigration. Our [previous study](#) on the effects of immigration on growth – which was directed specifically at that question – found clear positive effects of immigration on long-term growth, both outright and in per capita terms. What is clear from the analysis in this paper is that the **growth effects improve with the average education of immigrants**. For every 1%-point increase in the highly educated immigrant share, the effect on growth of a net inflow of immigrants equal to 1% of the population on growth increases by 0.04%-points. In more tractable language, if the share of highly educated immigrants is 60%, the growth effect of a net inflow of immigrants equal to 1% of the population would be ~1.2%-points higher than if the highly educated share were 30%. We find a comparable impact of immigrant education on growth in per capita terms.

**Table 1: Effect of skilled immigration on growth in real GDP and GDP per capita**

Standard errors clustered at the country level and reported in brackets. \*\* indicates statistical significance at 5% level, \* indicates statistical significance at 10% level.

	Growth	Per capita growth
Immigration	-0.589 (0.786)	-1.174 (0.842)
Immigration × Skill	0.040** (0.016)	0.034* (0.017)
ln(GDP per capita)	0.540 (1.171)	0.807 (0.940)
Constant	0.128 (9.851)	-4.063 (7.882)
Country FE	Yes	Yes
Time FE	Yes	Yes

Source: J.P. Morgan, UN, World Bank, OECD.

An alternative approach is to look at the growth effect when immigration raises the share of people who are highly educated in a country. To assess this, we can replace  $Skill_i$  in the above regressions with the difference in the highly educated share of immigrants and the highly educated share of natives. The results of these regressions are reported in Table 2 and are broadly comparable with those presented above. When immigrants are more highly educated than natives on average, the effect of immigration on growth is again higher.

**Table 2: Effect of immigrant-to-native skill difference on growth in real GDP and GDP per capita**

Standard errors clustered at the country level and reported in brackets. \*\* indicates statistical significance at 5% level, \* indicates statistical significance at 10% level.

	Growth	Per capita growth
Immigration	0.854** (0.323)	0.038 (0.334)
Immigration × Diff	0.037* (0.020)	0.037* (0.020)
ln(GDP per capita)	0.554 (1.154)	0.823 (0.923)
Constant	0.022 (9.706)	-4.199 (7.744)
Country FE	Yes	Yes
Time FE	Yes	Yes

Source: J.P. Morgan, UN, World Bank, OECD.

It is clear from our analysis that **both the level and composition of immigration matter for long-term growth**. One hypothesis we have not yet explored is that more highly educated immigration may support higher and more stable levels of immigration in the long run, perhaps out of self-interest as it is seen to bring larger economic benefits. As a simple test, we find that regressing annual net migration on the skill measure used above shows that **countries receiving proportionally more highly educated immigrants have also seen higher net inflows**. These net inflows, however, have been more volatile. Our interpretation of this finding is not so much that highly educated immigration is more prone to boom and bust by its nature, but rather that places where immigration is high will tend to see more volatility. In the extreme, a country that does not allow any immigration will clearly see no volatility in immigration, whereas a country that sees immigration as very beneficial, and is thus very open to it, will naturally see volatility as global migration ebbs and flows.

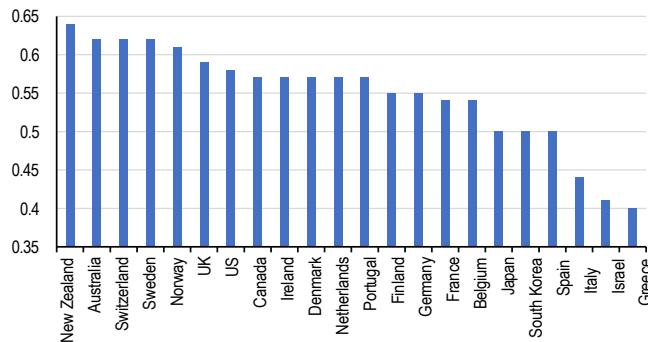
## Competing for skilled immigration

As many countries face population aging and increasingly [working-age depopulation](#), and the resulting stress on their [pension systems](#) grows more and more acute, it seems likely that attracting more skilled immigrants will be seen as an appealing policy response, particularly in comparison to painful actions like making large cuts to pensions. Almost all developed countries are facing weakening demographics, albeit to differing degrees, and the global stock of highly educated workers prepared to leave their country is only so large, so this seems likely to lead to **competition between countries to attract these workers**. Indeed, there already appears to us to be a [growing discussion](#) about the need to attract or at least retain highly educated workers.

In what we expect to be the intensifying competition for skilled immigration, some countries are likely to be more attractive than others. The OECD constructs a measure of **attractiveness of countries to highly educated workers** based on a number of factors, including quality of opportunity, taxes, integration, family environment, inclusiveness, and quality of life. Figure 2 shows the overall attractiveness scores for a selection of countries in 2023. This attractiveness measure is reasonably correlated with the share of immigrants who are highly educated in countries shown in Figure 1, which is unsurprising given immigrants will “vote with their feet”. All six countries in the Anglosphere are rated above the average among these countries. To the factors considered by the OECD, we would also add language as a structural advantage for these countries, as English is the most widely spoken first or second language in the world. All five Nordic countries also rate as quite attractive in the OECD data. In the rest of continental Europe, Switzerland, the Netherlands, and Portugal fare best.

Figure 2: Attractiveness of countries to highly educated workers

2023. Attractiveness and highly-educated defined by OECD. Higher corresponds to more attractive. Numbers rounded to the second decimal place.



Source: J.P. Morgan, OECD.

These results speak not just to where highly educated people want to **immigrate**, but also where they might want to **emigrate**. The result in our analysis above that the growth effect of migration is stronger with more highly-educated migrants cuts both ways. Countries seeing emigration of highly-educated people – so-called “**brain drain**” – would be particularly adversely affected and would see little to no return on their costly investment in emigrants’ educations. In general, large-scale emigration is likely a more serious risk for EM countries due to their lesser development. Among countries in the OECD, countries in Southern and Eastern Europe, East Asia, and Latin America appear most susceptible to this risk, based on the OECD measure. However, sparse reporting of emigration data means it is difficult to empirically assess whether this corresponds to emigration patterns.

In a worst-case scenario, one could envision a particularly damaging **feedback loop** in which the emigration of skilled workers raises the burden of sustaining vulnerable pension systems on the remaining workers (such as by requiring higher income taxes) which then in turn makes emigration more attractive to them, and so on.

## Investment implications

These results reinforce our conviction in our [strategic overweight](#) on **Anglosphere ex-US equities** (which excludes the US due to its expensiveness). All of these countries have received relatively large inflows of highly educated immigrants, and evidently remain very attractive destinations for skilled workers. This is in addition to (and in some cases related to) their relatively favorable demographics, well-funded pension systems, lower climate risk, less restrictive regulation, and reasonably attractive valuations. In principle, the Nordic markets are also quite attractive based on these considerations, though they are very small from a global perspective, accounting for ~2% of MSCI World, compared to ~9% for the Anglosphere ex-US.

## The Long-term Strategist

Longevity: What do investors need to know?

- Life expectancy has been trending up steadily across the world over the past century, with life expectancy at birth rising by 1 year every 4 years since 1990.
- The gains in the developed have slowed, though, while those in EM have continued to rise and are steadily catching up.
- Longevity *inequality* has worsened as it correlates closely with inequality in income, wealth, education, and type of job.
- US and UK have been lagging other developed countries over the past 15 years due to drugs, obesity and weaker access to healthcare.
- Covid caused some ~19 million excess deaths around the world and thus badly lowered period life expectancy measures that depend solely on current mortality. Consensus is that Covid will turn out a one-off as the world is now much better prepared.
- AI, mRNA, and GLP-1, and reduced drinking by Gen Z make us optimistic that life expectancy will continue to grow over the next 1-2 decades.
- The pressures of longer life spans have induced DM workers to work longer, delaying their retirement ages in line with improved longevity since 2000. This has stabilized years in retirement at ~18 years for men and ~23 years for women.
- Longer life spans are not all lived in full health, with the average 60-year-old worker in DM countries facing a quarter of their remaining life to be in bad health. That  $\frac{1}{4}$  share of unhealthy to total life expectancy has been quite stable over time and nearly the same across countries.
- With workers retiring later as they live longer, their same years in retirement remain the same, but they will have on average fewer *healthy* years in retirement.
- Take aways for investor include a steady rise in the demand for old-age medical services and products; funding pressures on governments to fund these services, thus still putting upside pressure on real interest rates; an angry voter base disadvantaged by not only unequal income and wealth but also unequal life expectancy and declining healthy years in retirement; and greater competition for skilled immigrants to support the increasingly frail elderly. The latter gives us reason to prefer the markets in the Anglosphere and Scandinavia that also benefit from funded pension systems.

### Long-term Strategy

**Alexander Wise** AC

(1-212) 622-6205

alexander.c.wise@jpmchase.com

**Jan Loeys**

(1-917) 602-9440

jan.loeys@jpmorgan.com

J.P. Morgan Securities LLC

In our previous notes on demographics and markets (see Library further down), we have frequently mentioned rising life expectancy as one driver of the aging of most DM societies. There is an enormous literature on longevity as it has huge implications for pension funds, insurance companies, personal finances, sector performance, health care and public finances. In this note, we discuss what we know about longevity through 11 stylized facts, how we expect these to develop over the next few decades, and how we believe they will impact markets and investing.

## What is longevity and how do we measure it?

**Longevity**, also known as life expectancy and expected lifespan, is **the number of years you can expect to live**. It is statistically **the mean of the probability distribution** of dying in any particular year in the future. A newborn baby with a life expectancy of 80 years thus has 50/50 odds of living longer or shorter than 80 years.

Life expectancy can be measured from birth or from any other starting age, with remaining years to live declining with each passing year. It can differ from person to person and is generally related to gender, lifestyle, genetics, education, and your social and economic environment. There are plenty of free life-expectancy calculators on the web provided by life insurers and annuity providers where you can plug in your personal details and get your own personalized estimate.

Given our macro focus here, we will only look at life expectancy for large groups of people. For a country, these start with annual **life tables** that show the percent of men or women of each cohort year dying in that particular year. The number of, say, 70-year men dying in a year divided by the population of 70-year-old men still alive defines the **age-specific mortality rate** for 70-year men that year.

Life tables form the basis for two different measures of life expectancy. The first measure, **Period Life Expectancy**, assumes mortality rates do not change over time. Period life expectancy *at birth* uses the most recent life table and is measured as the age at which just half the babies born that year would still be alive if they were all subject to the age-specific mortality rates of that year. In the last available official US [Actuarial Life Table](#) life table (2021), period life expectancy was 73.5 years for men and 79.3 years for women.

A second measure of life expectancy recognizes that mortality rates have been trending down over the years and decades and that somebody born today will likely face lower mortality risk in later years than that of people of that age today. For example, the chance that an individual aged 65 will die ten years

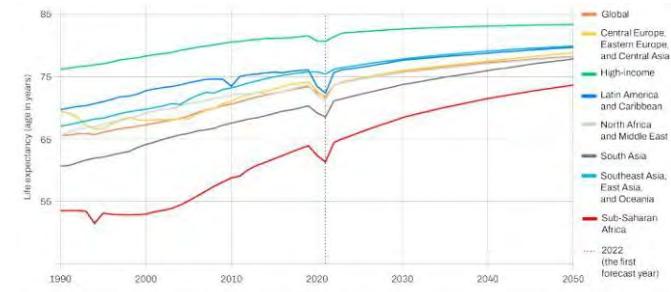
from now will be defined by the mortality rate of people aged 75 in 2035, not of those aged 75 at the moment. This does require one to forecast how fast mortality rates will come down over coming years. Such **Cohort Life Expectancy** will thus be higher than the period one based on current mortality rates.

## Stylized facts

**1. Getting better over time.** Life expectancy has been on a steady upward trend since WWII with mortality falling over the years in most parts of the world, on average at ~1% per annum. That means that if the mortality rate for a 65-year-old US male was 2% in 2021, which it was, it is fair to expect it to have fallen to 1.98% the following year, and to 1.81% 10 years later.

Life expectancy at birth among OECD countries has risen by 7.4 years for men and 5.7% years for women since 1990<sup>1</sup>. An average baby born over this period could have expected to live 2.5 months longer than one born a year earlier. Life expectancy at age 65 grew by 4.1 years and 3.7 years for men and women, respectively.

Figure 1: Global and super-regional life expectancy, 1990–2050  
 Years, forecasts after 2022.



Source: [Global Burden of Disease](#), Institute for Health Metrics and Evaluation (IHME), Findings from the 2021 GBD Study, p. 18.

**2. There have been multiple drivers of longer lifespans.** The earliest driver was reduced infant mortality, followed later by improved hygiene, medical advances, especially on the treatment of cardiovascular diseases, and changes in behavior, foremost the reduction in smoking. Smokers generally die about 10 years earlier than non-smokers. Longevity correlates closely with economic development and the steady rise in GDP per capita across the world was thus the ultimate driver of gains in longevity over recent decades.

**3. The gains in longevity are slowing, in particular for the elderly.** Mortality rates in mid age have been coming down

1. [Mortality and the provision of retirement income](#), OECD, February 2, 2023.

14 February 2025

faster than those for people aged above 80. Some of this is due to the bottoming out of the gains from reduced smoking, and the slowing improvement in cardiovascular diseases, but also quite possibly as the elderly generation may be bumping into an ultimate maximum life span (see below).

A second driver of slowing progress on longevity, which is mostly in the developed world, is growing obesity, diabetes, drug addiction, a worsening set of epidemics of which Covid was the worst, alcohol abuse, and the [Deaths of Despair](#) in the US. For those over 80, the rise of dementia was probably also a factor in slowing the gains on longevity in the developed world.

**4. There may be a maximum lifespan.** One possible driver of slowing gains in longevity may be that the older we get, we closer we get to the maximum lifespan that many demographers suspect there is. This is not full consensus or scientifically proven, but we have not found anybody yet who has grown older than 122 years. **Japan**, which is furthest ahead in the rise in old-age dependency, may actually be the exception to this rule as it is seeing a significant increase in the number of centenarians in the country. Many researchers working in *geroscience* are trying to prove this consensus wrong but there remains a lot more hope/hype than reality here.

**5. Global convergence.** There are dramatic differences in life expectancy across countries, largely aligning with their degree of economic development. Just as emerging economies have been steadily catching up with the developed world, so has their life expectancy, as the latter is highly correlated with economic growth. Figure 1 above shows how regions with low life expectancy are gaining faster than the higher-income countries with higher life expectancy.

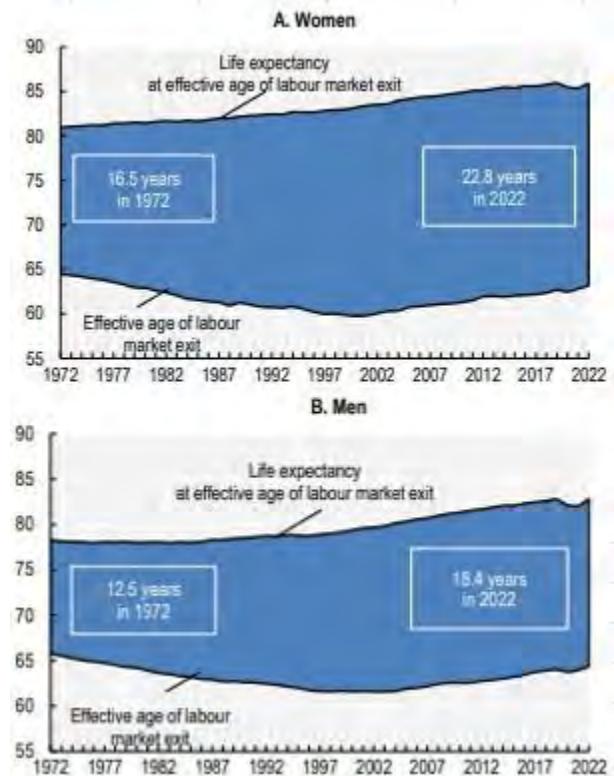
**6. Some developed countries are seriously lagging behind.** The US and the UK have seen very little gain in life expectancy over the past 10 years, even before Covid dramatically raised mortality. US life expectancy at age 15 saw only a gain of half a month per year between 2010 and 2023. The [UK](#) saw only a gain of half a year between 2011 and 2018, compared with 2.5 years the previous 8 years.

**7. Years-in-retirement rose until 25 years ago but have since stabilized.** Effective retirement ages have been coming down over the years in the DMs but stabilized around 2000 and have since risen at about the same pace – 2 years up to 2018 -- as overall life expectancy for 65-year-olds (Figure 2). This is quite likely because workers entering their mid-60s are finding they are generally in better health than previous generations at that age and but also in greater need to fund retirement over a longer life span. Hence, their choice or need to try and work longer and beyond the traditional age 65 end

of working life.

Figure 2: Expected life years after labor market exit, OECD average, for women and men.

Years

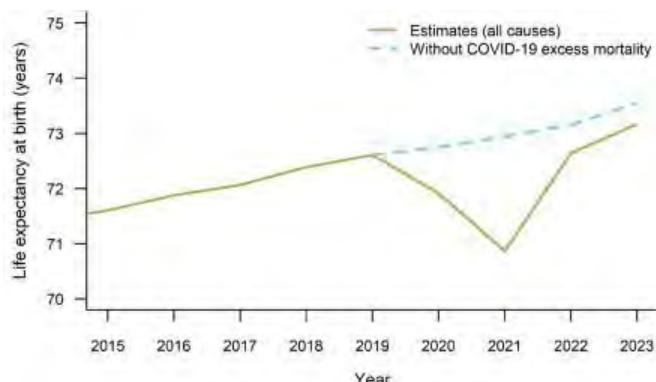


Source: [Pensions at a Glance 2023](#), OECD, February 2024, p. 193

**8. Mortality rates rose dramatically during Covid** but have since returned to near their long-term trend. Period life expectancy, which depends solely on current mortality rates, fell well below its long-term trend during Covid, but has similarly since bounced back towards trend. The Covid pandemic, which lasted from March 2020 to May 2023, officially killed 7 million people, but excess deaths over trend during this period amounted to a much higher [18 to 33 million deaths](#).

Figure 3: Global life expectancy at birth (as observed) and counterfactual scenario without Covid excess mortality.

Years.



Source: [UN World Population Prospects 2024, Summary of Results](#), Fig. 1.7.

**9. Longevity inequality** is high and worsening, though mostly for people over 65. Life expectancy is an average for a population or cohort, but there is wide variation around this average, depending on individual particular conditions and health. Across countries, the range of life expectancies at birth has actually been narrowing, due to the dramatic decline in infant mortality and EM/DM convergence. Global mortality inequality at mid-age has not been changing much, but the **range of mortality rates for those over 65 has been steadily widening in most countries across the world.**

The drivers of this widening inequality are largely the same that have been holding back gains in life expectancy in a number of developed countries: smoking, alcohol, obesity, unhealthy diet and lack of physical activity, raising the prevalence of cardiovascular diseases among “disadvantaged” social economic groups. These are people with lower education, income, and wealth and with more manual occupations<sup>2</sup>.

**10. Healthy life expectancy (HLE) is growing more slowly than total life expectancy.** The longer we live, the longer the time that most of us will live with illnesses and disabilities. Increases in longevity and morbidity go hand in hand. This is mostly so for the higher-income developed world, with the evidence still mixed for EM, partly due to weaker data there and the fact that EM life expectancy has not risen as much yet.

To measure unhealthy life spans, the WHO constructs the concept of **health-adjusted life expectancy (HALE)** as the sum of healthy life span and a fraction of the years with some form of disease, injury, or disability. Since 2000, global life expectancy at age 60 rose by ~2.3 years for both men and

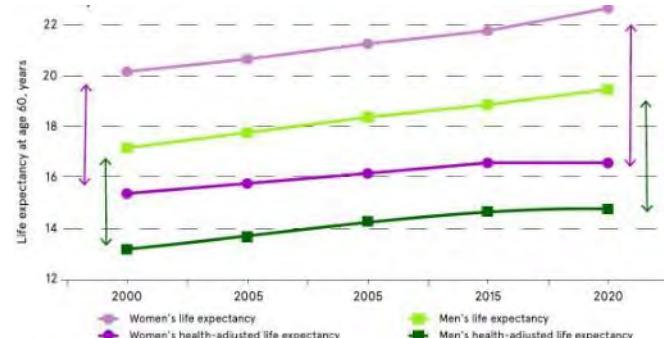
2. Trends in longevity inequalities, [Mortality and the provision of retirement income](#), OECD, pp 15-20, February 2, 2023.

women, but health-adjusted life expectancy rose on about half as fast (Figure 4 below). The difference -- your “unhealthy years” -- grew to 4.7 years for men and 6 years for women, with large variation across and within countries.

Starting at age 60, the average person in the world can expect to **spend one quarter of their remaining life in ill health or disability** with differences across and within countries driven by the same socio-economic factors of income, wealth, education, and occupation that drive overall life expectancy. The share of such unhealthy years in your remaining life span after you hit 60 has remained remarkably stable. **For every year of extra life span in our old age, on average we can expect an extra 3 months of unhealthy life.**

There is only modest variation across OECD countries as to the **ratio of healthy to overall remaining life expectancy at age 60**. It ranges from 71% in the US to 78% in France, where 60-year people can expect on average another 20 years of healthy living<sup>3</sup>.

Figure 4: Life expectancy and health-adjusted life expectancy at age 60 by gender, 183 countries with available data.



Source: [World Social Report 2023, Leaving nobody behind in an aging world](#), Fig 2.2, p. 43. World Health Organization.

**11. Recipients of pension and annuity income have a period life expectancy that is on average 2.0 - 2.5 years longer** than that of the overall population’s period life tables<sup>4</sup>. Taking account also of trend improvement in life expectancy, pension and annuity providers should assume that the official life tables underestimate remaining life expectancy of their 65-year-old customers by 3.0-3.5 years. This is likely because people who can afford to save for old age are generally higher income and higher education which correlate strongly with longer life spans.

3. [Pensions at a Glance 2023](#), OECD, February 2024, p. 24.

4. [Mortality and the provision of retirement income](#), OECD, p. 85, February 2, 2023.

## The future of longevity

What can we say about how these trend developments in life expectancy are likely to change, persist or reverse over the next 1-2 decades?

**1. Are we approaching peak longevity?** Most likely not, or at least not over the next 1-2 decades. The main driver of improved longevity has been economic growth as it fuels research and spending on medical advances. We have argued that the coming decline in working age populations in the developed world and rising old-age dependency are set to lower innovation and overall economic growth. At the same time, we see four new innovations and developments that make us **optimistic** about continued improvement in global longevity: **mRNA, GLP-1, AI, and reduced drinking by younger people.**

Covid was a true killer and the first force since WWII to dramatically raise mortality on a global basis. It could have been a lot worse if it had not been for the unexpectedly rapid innovation of memory RNA technology early in the pandemic. This led to rapid, broad, and effective vaccination programs that likely cut eventual mortality by half, at least. We now have this technology and experience in mass mobilization of industry and societies that should make us better prepared the next outbreak.

A second supportive factor is the sudden application of diabetes drugs for weight control, especially those based on semaglutide, part of a class of drugs known as **GLP-1 agonists**. The rapid rise of GLP-1 prescriptions has quite likely helped stop the rise in US obesity rates for the first time in a decade and in one study reduced it marginally in 2023. The obesity rate fell to 45.6% of US adults from 46% the year before, and the average body-mass index (BMI) fell to 30.21 from 30.24. These are small gains, but are promising, as the rise in obesity is probably the most important driver of the near peaking of US life expectancy over the past decade and a half.

**AI** is a third factor to make us optimistic on longevity. Given its advantages in analyzing large data sets, AI is likely to be effective in speeding up the discovery of new compounds and drugs, analyzing past medical histories for personalized medicine, figuring out what genes help predict future illnesses, and providing early alerts that can help with preventive and proactive medical interventions or behavioral changes.

Finally, with alcohol abuse one driver of the flattening out of longevity gains in the US, it is good to see that younger adults are starting to drink less alcohol. Gallup reported recently that 1 out of 4 young adult Americans (aged 18-34) did not drink 20 years ago, but by now, close to 40% of them abstain from alcohol. Overall US drinking has not changed as reducing

drinking by the young is offset by increased drinking by the elderly. Your health and longevity are driven not as much by what you drink and eat today, but more by what you ate and drink 20-30 years ago.

**2. New or old drivers of longevity?** The discussion in our first point above suggest that the main drivers of further longevity gains will probably move more to innovations in medical and drug technology and be less reliant on reduced smoking rates.

**3. Will longevity gains continue to slow?** This is probably the same question as whether there is a maximum life span. We would postulate that immortality does not exist, but also that science and technology will probably continue to improve longevity and slowly push up the maximum life span that the best, richest, or luckiest of us can achieve. That said, the gradual slowing in longevity gains have been with us for some time. We thus think it safe to assume that longevity gains will continue to slow over coming decades.

**4. Will EM longevity continue to converge?** Just as less developed countries get ahead by copying productivity ideas from the more developed ones, countries with lower life expectancy can copy medical advances from more developed countries. We should thus expect that life expectancy differences across major countries and regions will likely continue to come down gradually.

**5. Will the US and UK continue to lag global gains in longevity?** Over the past 15 years, gains in life expectancy in the UK and US have lagged much of the rest of the developed world. Part of that was due to a higher Covid death rate, but the underperformance predates Covid for both countries. In the US, the opioid crisis, a more sedentary life style, the growing consumption of ultra-processed foods, and worsening obesity greatly contributed to this slowing. In the UK, commentators frequently refer to worsening access to NHS health care, driven by years of public sector austerity, as the main driver for UK longevity lagging the rest of Europe. US obesity rates are starting to come down on the steady rise in GLP-1 uptake, while death from drug overdoses also fell last year by ~10%, although at 100K deaths, they remain well above pre-Covid. There is thus reason to expect gains in US longevity to pick up again. The UK is harder to get optimistic on as its difficult fiscal situation and lack of economic growth do not make one hopeful about a ramp-up in NHS spending.

**6. Will years-in-retirement grow again, or actually reverse?** We have discussed in our series on retirement finances (see Library in the back) that the move from defined-benefit to defined-contribution pension systems has left many lower-income workers with insufficient financial resources to

fund a comfortable old age. With the overall rise in old-age dependency, we see significant pressures on public pension systems, in particular those of the pay-as-you-go type that will force them to keep raising the full benefit retirement age while reducing benefits in retirement<sup>5</sup>. We thus suspect that the risk is biased to many workers to have to delay their retirement for longer than any increase in life expectancy over time and **that the average worker will see fewer years in retirement than they have at the moment.**

7. While being overall optimistic on continued gains on longevity for much of the world, one must recognize that **Covid** was a both a big “shocker” and a warning to the world. Consensus is that we are now better prepared. But not everyone agrees that it won’t happen again.<sup>6</sup>. The most recent assessment of the [Global Preparedness Monitoring Board](#) sees instead escalating pandemic risk due to climate change and the increasing encroachment of human activities on nature. A November 2023 [study](#) at BMJ Global Health argues that “historic trends demonstrate a pattern of increasingly frequent and severe spillover events if high-consequence zoonotic viruses”.

Hence, we should probably think in terms of continued trend gains in longevity with the risk of periodic drops if and when a new epidemic emerges.

8. **Will longevity inequality continue to worsen?** Longevity inequality, both across and within countries, is largely driven by the same drivers of economic inequality, income and wealth. Wealth and pre-tax income inequality have continued to worsen in the US, less so in the rest of the world. But inequality after-tax and benefits, in disposable income, has flat-lined over the past 1-2 decades, as benefits to lower-income people have risen. Still, with greater fiscal pressures and Tech dominance, it will not be easy to reduce economic inequality. We are thus not optimistic on reducing longevity within countries.

9. **Will healthy life expectancy improve or simply keep rising in line with total life expectancy?** The ratio of healthy to overall life expectancy for people in their 60s has been remarkably stable over time and across countries at ~75%. That is for each 10 years of life expectancy, the average person in OECD countries can expect 7.5 years of healthy remaining life. And for every year of higher life expectancy over time, one should probably expect ¼ year of longer mor-

5. See our note of a few weeks ago, [Depopulation and pay-as-you-go pensions](#), Jan 24, 2025.

6. A good review of the increased risk of pandemics can be found in [The rising threat of deadly diseases jumping from animals to humans](#), Michael Peel, Financial Times, January 10, 2025.

bidity. We have not seen data as to whether this can be applied to individuals and assume there must be huge variation across people on this. People who are healthier on their 60s than their age cohort ought to assume a longer life expectancy. However, we all eventually succumb to the pressure of time and there is likely no guarantee that your years in ill health will be accordingly fewer.

10. We see no reason for either a widening or shrinking in the **longevity gap for receivers of private pensions and annuities and will thus assume the gap will stay at recent levels of 3.0-3.5 years**, including trend improvements, over official period life expectancy for the broad population.

## Longevity and markets

The main macro impact of trend longevity gains in the future ought to be driven by how they affect the supply and demand for capital (savings vs investment) as well as spending, working, financing and investment decisions of individuals and governments as the average age of the population keeps rising.

We have argued before in a number of notes (most recently [Demography and Markets](#), Sep 24, 2024) that the rise of the number of people no longer working relative to the working population should put upward pressure in interest rates as the exit from the labor market will put more people in dissaving mode, relatively to the savings of the shrinking number of people still working. We argued that this old-age dependency would rise as a result of both the fall in fertility rate and longer life spans of retired people.

The results above, that in recent years retirement ages have been rising as fast as life expectancy (Figure 2 above), indicate that the **rising longevity by itself is no longer raising old age dependency for the average OECD country**. There are indeed more elderly people and the average age is still increasing, but **average years in retirement has been stable** since ~2000. On net, there is still upward pressure on interest rates from the growth in the number of inactive people relative to the active ones, but part of the pressure is offset by people in their 60s deciding to work longer.

More disconcerting are our findings that while total years in retirement in OECD countries have been quite stable over the past 2 decades, **healthy years in retirement are not and have been falling**. For a country where both life expectancy and effective retirement age of an average 65-year-old rose by 2 years since 2000, health life expectancy rose only ~1.5 years, reducing their healthy years in retirement by half a year.

**Who will pay for the increased unhealthy years in retirement?** If retirees have not saved enough, and family members

do not have the money, then it will fall to the government and its medical insurance for the elderly (Medicare in the US) to make up the difference. Hence, we cannot be relaxed about the benefit from retirement ages rising in line with longevity as the call on government support for unhealth years will likely become more acute. **On net, this keeps us with a view of further upside pressure on real interest rates in OECD countries.**

**Spending by and for the elderly** will change the composition of the typical consumption basket. Most important will be the increased demand for a broad set of medical services, with increased focus on preventive medicine and health maintenance, rather than healing the sick<sup>7</sup>.

We keep the view that the shorter time horizon of the wealthy elderly will steadily induce them to allocate more to fixed income, in particular among Americans who still hold record high allocation to equities. This will push up the US equity risk premium over fixed income that is currently close to zero.

We argued in [Depopulation and PAYG pensions](#) (Jan 24, 2025) that countries that depend on unfunded pay-as-you-go public pension systems will be under severe fiscal pressure due to the rise in old age dependency, preventing them from spending on boosting economic growth. One partial solution would be to increase immigration of people of working age. The problem is, though, that countries with unfunded pension do not tend to be the countries that are most able to attract and assimilate skilled immigrants. The English-speaking countries are generally more attractive to immigrants and also have well-funded pension system. Hence our preference for the equity markets for countries that are relatively open to immigrants and that have funded pension systems: most countries in the Anglosphere, as well Scandinavia.

---

7. For a more extensive treatment, see [The Economics of Longevity: An Introduction](#), Andrew Scott, Journal of the Economics of Aging, Feb 2023

## The Long-term Strategist

### Depopulation and PAYG pensions

- Working-age depopulation is a special threat to countries that have Pay-As-You-Go (PAYG) pension systems.
- A funded pension is backed by assets that have been accumulated and appreciated during your working years and that are ready to be distributed when you are ready to retire. A PAYG pension system instead pays out retirement income from the contributions or tax payments of people still working today. PAYG is quite vulnerable to increases in old-age dependency – when the number of retirees are rising relative to the working population.
- Falling birth rates, declining working-age populations, political opposition to later retirement ages and rising longevity are conspiring to put PAYG pensions into significant deficits. This hampers a government's ability to make other investments that could boost growth or simply puts upward pressure on interest rates that crowds out private sector investing.
- There are enormous differences in the funding status of countries' pension systems across the world.
- In most countries in the Anglo world, Scandinavia, plus the Netherlands and Switzerland, workers have for long contributed to pensions that have by now accumulated assets that average ~100% of GDP. In contrast, pension systems in countries that include Germany, France, and most of Southern and Eastern Europe, China and EM have assets that average only ~10% of their GDP. A few, like Japan, South Korea and Belgium, fall in between these two extremes. Quite a few countries, such as Norway and a number of EMs, have accumulated assets through their sovereign wealth funds that may not directly back public pension systems but that could be called upon in times of need.
- As long-term strategists, we would prefer to be in countries that have relatively strong demographics from birth rates and/or immigration of skilled labor, that have put capital aside to fund the increasing needs of their growing elderly populations, and that are least threatened by climate change. That is why we would prefer to be in Anglosphere countries – Canada, UK, Ireland, Australia and New Zealand, but not US as it is very expensive – adding here the Scandies also, as they tick each of these three boxes of better demographics, pension funding and climate protection.

#### Long-term Strategy

##### Alexander Wise <sup>AC</sup>

(1-212) 622-6205  
alexander.c.wise@jpmchase.com

##### Jan Loeys

(1-917) 602-9440  
jan.loeys@jpmorgan.com  
J.P. Morgan Securities LLC

In a [recent note](#), we discussed the start of **working-age depopulation** in DM and noted that it should put upward pressure on bond yields and downward pressure on long-term equity returns. Higher real interest rates should come from dissaving by the growing share of the “grey cohorts” in countries and higher capex as companies need more capital to offset the scarcity of labor. The impact on interest rates would be greatest in countries with relatively large **underfunded or pay-as-you-go (PAYG) pension systems**.

In a PAYG pension system, pension distributions to retirees are paid out of the contributions of people still working, while in a funded pension system, they are paid out of the assets accumulated from earlier contributions. If the working-age population is shrinking while the elderly population is still growing, PAYG and underfunded pensions systems will invariably come under considerable stress, likely requiring additional support from the sponsoring government or employer.

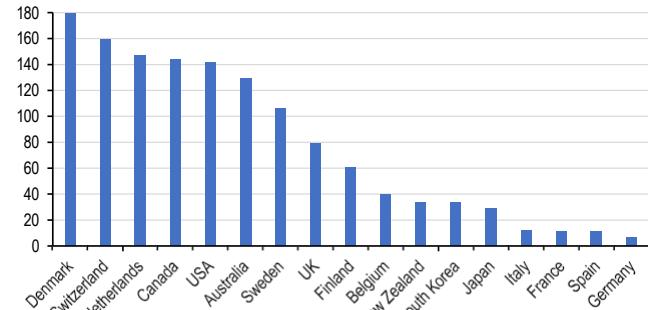
Such funding stress can happen at both the national level, when a state pension plan is solely PAYG, and at the more regional, city and company level. Funding stress can easily create a negative spiral where funds needed to fill a pension hole require reduced spending elsewhere, such as on elementary public services, infrastructure, education, and broad capital spending. Many a city or company in the US Northeast and its car and airline industries have experienced such a negative spiral over the past 4-5 decades.

At a country level, the onus to provide support could also fall on governments with underfunded pension systems more generally, as shoring up these systems is likely to be particularly onerous with shrinking workforces and income tax bases. Providing the needed support seems likely to reduce long-term growth by crowding out productive public investments, constraining the ability of governments to act as ‘insurers of last resort’ in times of economic need, and ‘unproductively’ expanding the footprint of governments<sup>1</sup>.

Important for us as long-term asset allocators is that there are dramatic differences in the funded status of national systems. Figure 1 shows the assets earmarked for retirement in a select number of OECD countries relative to GDP.

Figure 1: Assets earmarked for retirement in select jurisdictions.

% of GDP.



Source: J.P. Morgan, [OECD Pensions Outlook 2024, Fig 1.1, p. 12](#).

Scandinavian countries, Switzerland, Netherlands, plus the US, Canada and Australia come out on top here, while Germany, Italy, Spain and France rely mostly on PAYG pensions with only small amounts of assets backing up occupational pension plans.

Looking only at total assets earmarked for retirement provides only a very crude assessment of the sustainability of country pension plans. A number of countries are accumulating assets through a sovereign wealth fund with the aim of providing for the needs of future generations. They are thus a form of intergenerational pension fund. Such assets are not included in these OECD calculations. Consider Norway as an example. In the OECD calculations, not shown in the chart, Norway’s pension assets amount to only 10% of its GDP, despite the fact that its Government Pension Fund holds AUM in excess of 3x its GDP.

To get a fuller picture, we can use data from the 2024 Mercer CFA Institute [Global Pension Index](#). The overall index constructs ratings of pension systems using a large set of measures. Thus, the overall index is broader than we consider ideal for our present purposes, so we use the ratings of pension systems in three specific sub-categories (paraphrased below<sup>2</sup>):

1. What proportion of the working-age population are members of retirement savings plans?
2. What is the level of public or private pension assets as a percentage of GDP?
3. How high are mandatory contributions set aside for future benefits?

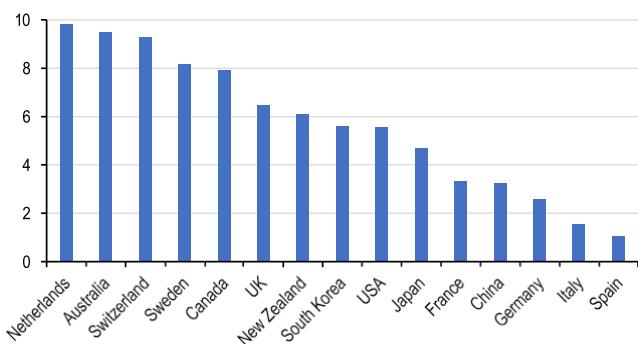
1. We recently showed that higher government spending is associated with lower long-term economic growth. See [Longer-term challenges to managing retirement savings](#), November 22, 2024.

2. This paraphrases criteria S1, S2 and S4 in the index. The precise wording of each criterion can be found in the full report.

Governments are more likely to be compelled to provide additional support where fewer people have saved for retirement, when pension systems are currently underfunded, and when savings set aside for future benefits are low. The average ratings of a selection of pension systems based on these three characteristics are reported in Figure 5, where 0 is the worst possible score and 10 is the best possible score. By this measure, the four largest economies in the **Euro Area** are all poorly rated – Spain, Italy, Germany and France all receive a combined rating of less than 4. In **East Asia**, China is lowly rated, while Japan and South Korea are towards the lower-middle end of the range among developed countries. Pension systems in **Northern Europe** and the **Anglosphere ex-US** fare best in general, while the US is towards the middle of the range.

Figure 2: Average pension system rating on selected sustainability characteristics

2024. Ratings range from 0 (worst rating) to 10 (best rating). Rating reported here is the average of three sub-component ratings: S1, S2, and S4 from the Mercer CFA Institute [Global Pension Index](#).

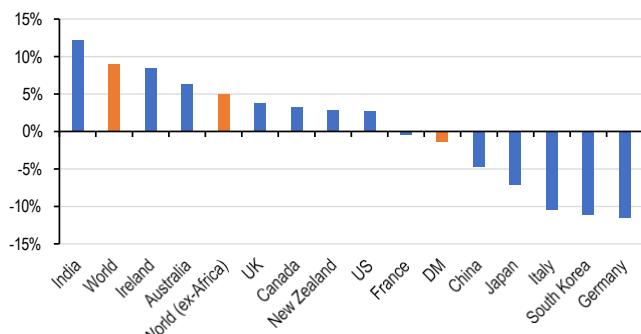


Source: J.P. Morgan, Mercer CFA Institute.

There is **considerable overlap** between the countries with **vulnerable pension system characteristics** and expected future **working-age depopulation**. As shown in Figure 3, Germany, South Korea, Italy, Japan, China and France are all expected to see working-age depopulation in the next decade, and all lie towards the lower end of pension ratings. Outside the US, countries in the Anglosphere have pension systems that generally fare better – in particular Australia and Canada – and are also not expected to see working-age depopulation in the next decade. This provides yet more evidence in support of our strategic overweight to [Anglosphere ex-US equities](#), and our view that DM European and Japanese equities are ‘value traps’ for the long-term investor.

Figure 3: Working-age population growth between 2024 and 2034

%, 2024-2034. Medium variant UN projections. Working age defined as 20-64. Orange indicates aggregates.



Source: J.P. Morgan, UN.

These results do show significant differentiation within Europe. Most of Continental Europe and especially Eastern Europe will see serious demographic decline over the next 10-20 years given low and still falling birth rates that will be exacerbated by the lack of proper funding of pension systems. Our PAYG data are showing that the Northern and Western edges of Europe are much better prepared for this demographic decline. Scandinavia, Netherlands, Switzerland and the UK come out best here, while Germany, France and Southern Europe will face dramatic fiscal pressures from the rise of old-age dependency that will prevent them from spending in areas that could boost economic growth.

For most EM countries, ex-China, having fully funded pension systems is a less urgent need as quite a few still have a younger population and higher birth rates. But these birth rates are still coming down in most EMs, thus putting the onus on moving their PAYG pensions system that most still rely on towards a more funded basis. Latin America stands out here as many have followed Chile’s early decision in 1981 to switch from a public PAYG to a private funded pension system. Most Latin countries have pension assets that had grown to ~20-75% of GDP by 2020, with its largest economy, Brazil, sitting near the bottom at 13%, by [World Bank estimates](#). Most other EMs have less than 10% of GDP in pension assets, with China in 2020 barely at 2%, which creates a serious fiscal challenge as its own working age population is set to shrink by 70% over the remainder of this century, as discussed [last week](#).

## The Long-term Strategist

Working-age depopulation has arrived

- Working-age depopulation is a reality today. The working-age population of DM began to shrink in 2024, and this will accelerate in years to come.
- Large cohorts of Baby Boomers are flowing out of the working-age population, replaced by smaller cohorts of the young born after the large and the sustained fall in fertility rates since the 1970s.
- While the working-age population of DM as a whole is now shrinking, there is a lot of variation across countries. Japan and Germany saw their working-age populations peak already in the 1990s, while the US is not expected to peak this century due to continued immigration.
- Though mostly a DM phenomenon, China's working-age population is set to shrink by 70% by 2100, when it should be only 1.25x that of the US, compared to the current 4.5x.
- Growth in the labor supply has closely tracked growth in the working-age population in past decades, suggesting the labor supply will also shrink. While shares of people working at various ages have risen, this was offset by a fall in the average hours worked by each worker.
- This should reduce the rate of economic growth in affected countries to below the rate of labor productivity growth. Productivity growth is itself likely to fall as larger and younger populations drive innovation.
- Immigration is likely to be a critical differentiator between countries in the years ahead as countries will need immigrants to slow or reverse working-age depopulation, and not each country is equally attractive to immigrants.
- Longer term, working-age depopulation implies higher interest rates and lower equity returns.
- Shrinking labor forces and rising old-age dependency should lower **saving** by individuals and governments, reducing the supply of capital and pushing up bond and equity yields.
- In addition to the effect on equity valuations, slower economic growth or even economic contraction should lower long-term earnings growth.
- There is a stark difference in outlooks between Anglosphere countries, which should still see rising working-age populations given their higher immigration and fertility rates, and the rest of DM, which is now already in decline.
- Working-age depopulation thus supports our equity **overweight** on Anglosphere ex-US equities (US is very expensive) and the exclusion of China from our allocation to EM equities.
- Given the shares of the US and China in DM and EM equities, and their different outlooks, there is no clear implication for DM vs. EM equities. While working-age depopulation should favor EM ex-China, we are more concerned by their serious **vulnerability** to climate change.

### Long-term Strategy

Alexander Wise <sup>AC</sup>

(1-212) 622-6205  
alexander.c.wise@jpmchase.com

Jan Loeys

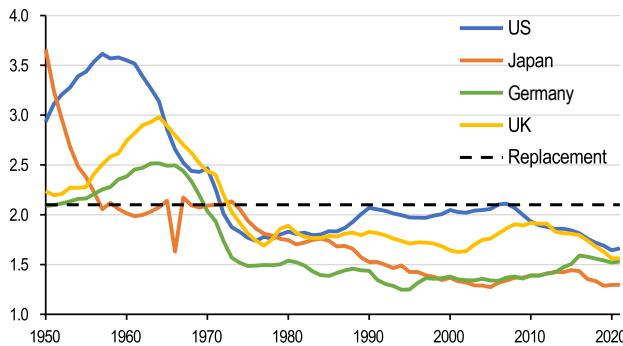
(1-917) 602-9440  
jan.loeys@jpmorgan.com  
J.P. Morgan Securities LLC

Since the 1970s, fertility rates in many DM countries have steadily fallen to well below the long-term replacement level of 2.1 births per woman over her lifetime. Eventually, this collapse in birth rates will bring populations down as longevity is not improving fast enough to offset it. In some countries, the lower birth rates can be offset by [immigration](#), but this then clearly worsens the situation for the countries that people are leaving.

The impact of birth rates on population size is slow and takes decades as today's population size is determined by births minus deaths over the past 100 years. In much of the developed world, large cohorts of Baby Boomers are now flowing out of the working-age population and being replaced at the other end by smaller cohorts of the young that are the product of low fertility rates in recent decades. The consequence is that working-age populations will be declining in many places, even as the overall population continues to grow with high and still-rising longevity. This **working-age depopulation** is most prevalent among, but not exclusive to, DM countries, with China being the most notable instance in EM.

[Figure 1: Fertility rates in four selected DM countries](#)

Births per woman, 1950-2021, annual.



Source: J.P. Morgan, UN.

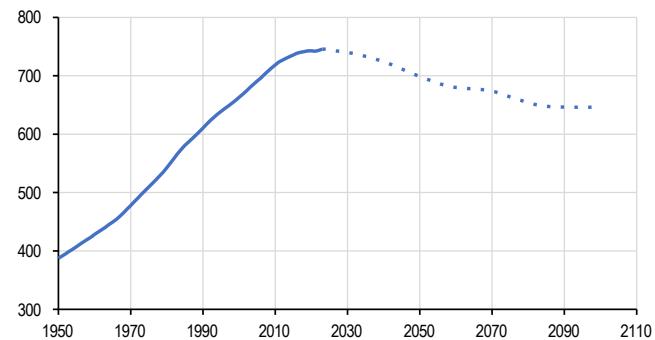
Figure 2 shows the working-age (20-64) population of UN-defined high-income countries.<sup>1</sup> In aggregate, the **working-age population in DM countries peaked at 746 million in 2023**. In its medium variant projections, the UN forecasts that the DM working-age population will fall by 11 million from this peak in the next decade, by 47 million by 2050, and by 100 million by 2100. The main uncertainty about the next few decades comes from immigration flows as death rates of younger people are very low and quite stable. Though the decline is likely to be reasonably modest initially, it marks a sharp reversal from the moderate growth observed in the

1. High-income countries is the term used by the UN for what we have called developed markets (DM). We will use the shorter "DM" in this note.

not-too-distant past.

[Figure 2: Working-age population of DM countries](#)

Millions, 1950-2100, annual. High-income countries as defined by the UN. Medium variant UN projections from 2024. Working age defined as 20-64.

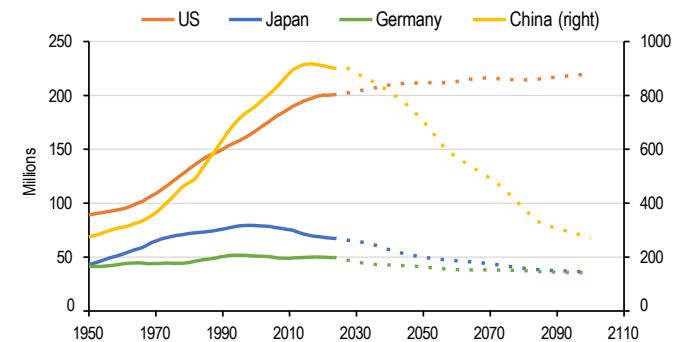


Source: J.P. Morgan, UN.

There is considerable heterogeneity in past and projected working-age population growth across countries, as shown in Figure 3. Some countries reached their peak working-age population decades ago, such as **Japan** in 1998 and **Germany** in 1996. Other countries have not yet reached their peak working-age population, such as the **US**, which is not expected to see long-term working-age depopulation in the 21st century. The most striking projected decline is in **China**, where the working-age population peaked in 2016 and is expected to fall by half from its peak by 2073 and by a remarkable ~70% by 2100, leaving it with a working-age population only 24% higher than that of the US by that point.

[Figure 3: Working-age population in selected countries](#)

Millions, 1950-2100, annual. Medium variant UN projections from 2024. Working age defined as 20-64. China shown on right axis.



Source: J.P. Morgan, UN.

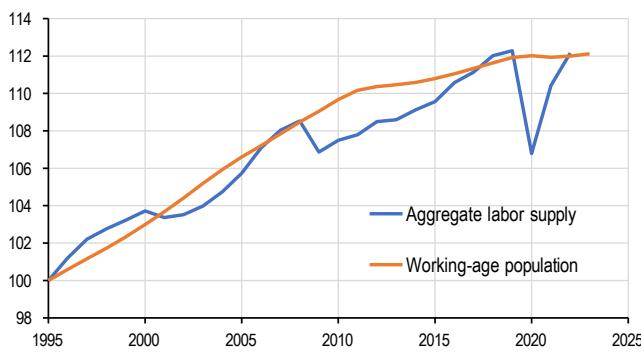
Shrinking working-age populations do not necessarily imply shrinking supplies of labor – measured as total hours worked in an economy. For one, labor force participation rates by age have generally increased in recent decades. Between 2000 and 2023, **labor force participation** in the OECD increased by ~4%-points among people of traditional working-age, and

~7%-points among people older than 65, reflecting the slow but steady rise in effective retirement ages. Further, the over-65 population will continue to grow in most countries, though only ~16% of that cohort was in the labor force in 2023.

However, average **hours worked per worker** fell by 5.2% in the OECD between 2000 and 2023. We can directly assess the net effect of these competing forces using data on the number of people in the labor force and average hours worked per worker. Figure 4 shows the growth in aggregate hours worked in 21 DM countries alongside the growth of their working-age populations.<sup>2</sup> Since 1995, the aggregate labor supply has closely tracked the working-age population, looking through cyclical pressures. This suggests to us that changes in the working-age population are the dominant driver of the labor supply and, thus, that we should expect a shrinking labor supply in DM over the coming decade.

Figure 4: Growth in aggregate labor supply and working-age population in 21 DM countries

Index, 1995-2023, annual. Both series indexed to 100 in 1995. For included countries, see footnote 2. Aggregate labor supply is labor force multiplied by average hours worked per worker.



Source: J.P. Morgan, UN, World Bank, ILO.

As working-age depopulation intensifies, so too may the desire to increase **immigration** to grow the labor force. As discussed above, the path for immigration was the greatest source of uncertainty about the future trajectory of working-age populations for at least the next two decades. The UN makes assumptions about immigration in their population projections, but the realized outcome could be quite different if immigration is increasingly used as a policy tool to respond to natural demographic pressures. For now, political impetus generally appears to be toward lower immigration in many countries, though demographic realities may prompt a shift in the near future. Conceted efforts to raise immigration would likely lead to a competition for immigrants, particularly those

2. Countries included are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Spain, Sweden, Switzerland, UK, US.

who are skilled. In our view, immigration is almost certain to be a critical **long-term differentiator** between countries in coming decades.

### Long-term investment implications

Broadly speaking, we expect the implications of working-age depopulation to be **higher interest rates** and **lower long-term equity returns**. People generally save most in their working years and spend out of their accumulated savings in retirement. Fewer people of working-age and more people of retirement age should thus imply lower private sector saving, as we have [previously](#) argued. It is also likely to impose significant budgetary costs on countries with underfunded or pay-as-you-go (PAYG) pension systems, reducing public sector saving. Lower saving implies a contraction in the supply of capital in the economy, which should put upward pressure on both bond and equity yields (i.e., lower equity valuations). Given global capital market integration, these effects are likely to be seen broadly in financially integrated economies around the world, though they are likely to be most pronounced in the countries experiencing faster working-age depopulation, all else being equal, given the home bias of investors.

Given economic growth comes from increases in the labor supply or improvements in labor productivity, any contraction of aggregate labor supply should quite clearly **reduce long-term economic growth** to below the rate of labor productivity growth. Labor productivity growth is likely itself to be adversely affected by shrinking working-age populations. People of working age are likely to drive the innovation that underpins long-term productivity growth. This is consistent with our [previous finding](#) that long-term growth in GDP per worker slows as the elderly share of the population increases, and a longstanding research literature that relates population growth and age to innovation and productivity. In addition to reducing the level of growth, working-age depopulation probably raises **uncertainty about growth**. For one, growth is likely to depend more on immigration, which can be quite volatile for political reasons as the perceived balance between economic benefits and costs of immigration ebbs and flows. Whether countries are in recession or not will also come to depend nearly entirely on productivity growth, which the economics profession is not able to forecast well.

Readers may recall that economic growth is itself a factor in our [framework](#) to assess **long-term changes in interest rates**. By itself, slower growth should point to lower interest rates, but, as we have previously [discussed](#), the relationship between economic growth and interest rates is weaker than widely supposed. Relatedly, our [analysis](#) of the effects of demographic change on interest rates – which supported our higher interest rate view – empirically allowed for any nega-

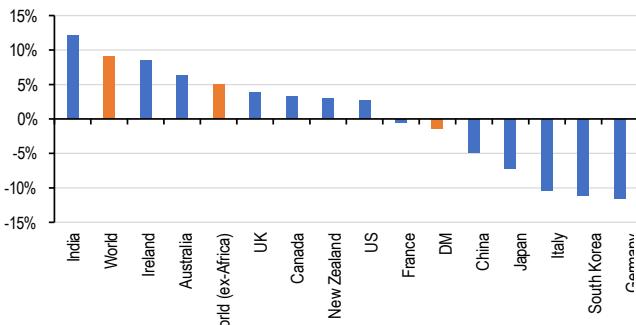
tive effect due to the impact on growth. Allowing for this impact did not affect our ultimate conclusion.

For equities, we have [recently](#) shown that lower long-term economic growth comes with lower **long-term EPS growth** in DM, though there was no clear relationship in EM. Hence, we consider it likely that working-age depopulation will also reduce long-term equity returns in DM through its negative effect on earnings growth.

At first glance, the likelihood of working-age depopulation in many developed countries appears to be a negative for DM equities versus EM. However, the US accounts for a very large share of DM equities, at ~73% of the market capitalization of the MSCI World Index, and is not expected to see working-age depopulation in the 21st century. By contrast, China accounts for a sizable share of EM equities, at ~25% of the MSCI EM Index, and is expected to see accelerating long-term depopulation. An argument can perhaps be more credibly made that working-age depopulation should then favor EM ex-China equities over DM in the long term, particularly given India should see substantial working-age population growth over the coming decade. While this is a reasonable argument in principle, we are more concerned by the serious [vulnerability](#) of EM ex-China assets to climate change, which does not appear to be priced in, particularly in the case of India.

Looking more closely at individual countries, Figure 5 shows the expected change in working-age populations over the next decade in a selection of countries and three aggregates. Within DM, every country in the **Anglosphere** is expected to see working-age population growth over the coming decade. By contrast, the largest economies in **Europe and East Asia** are expected to see working-age depopulation. Of these countries, Germany, South Korea, and Italy are likely to see the most extreme declines, on the order of 10% over the decade. As shown in Figure 6, the Anglosphere working-age population is expected to continue growing through the 21st century, while the DM ex-Anglosphere working-age population steadily shrinks. This fits with our views that, within DM, [Anglosphere ex-US equities](#) are likely to outperform in the long run, while DM European and Japanese equities represent a long-term “**value trap**.” Accelerating working-age depopulation is also consistent with our exclusion of China from our strategic allocation to EM equities.

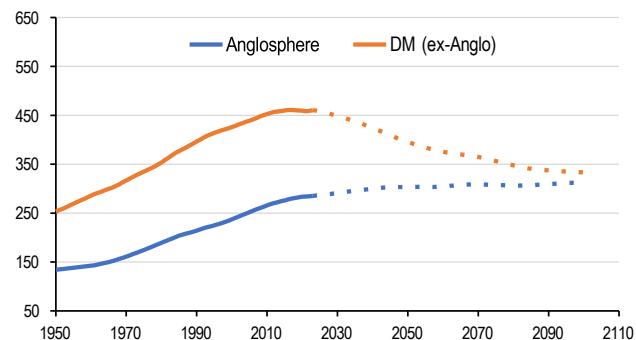
Figure 5: Working-age population growth between 2024 and 2034 %, 2024-2034. Medium variant UN projections. Working age defined as 20-64. Orange indicates aggregates.



Source: J.P. Morgan, UN.

Figure 6: Working-age population in Anglosphere and DM ex-Anglosphere

Millions, 1950-2100, annual. Medium variant UN projections. Working age defined as 20-64. Anglosphere includes US, UK, Canada, Australia, New Zealand, Ireland.

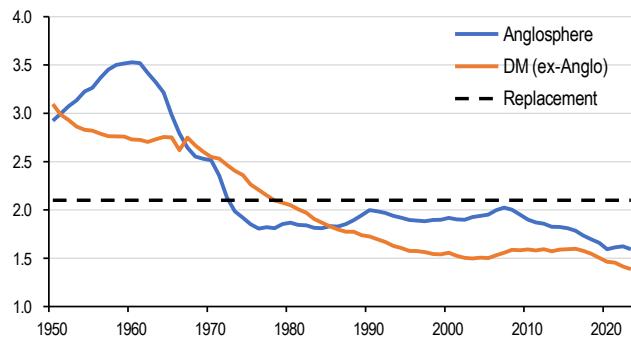


Source: J.P. Morgan, UN.

The different working-age population trajectories of the **Anglosphere** and **DM ex-Anglosphere** reflect a few key differences. First, as we have [written](#), Anglosphere countries have comparatively large immigrant populations, and high immigration tends to raise the working-age population both immediately and steadily over time as immigrants are disproportionately of working age and, based on US *American Community Survey* data, have slightly higher fertility rates than native-born people. Second, as shown in Figure 7, fertility rates have been somewhat higher in the Anglosphere than in the rest of DM since the mid 1980s, with an average gap in that time of ~0.3 births per woman over her lifetime. Third, working-age population growth will depend on the structure of the population. For instance, a country with a very high share of elderly is likely to see fewer absolute births because a smaller share of the population is in their childbearing years.

Figure 7: Fertility rates in Anglosphere and DM ex-Anglosphere

Births per woman, 1950-2021, annual. Fertility rates constructed as the population-weighted average across countries. Anglosphere includes US, UK, Canada, Australia, New Zealand, Ireland.



Source: J.P. Morgan, UN.

## The Long-term Strategist

### Demography and markets

- Demography is destiny and thus a prime consideration to the long-term investor.
- Past stylized facts include a fast-growing world population, rising longevity, population aging, and increasing migration flows.
- For the next 1-2 decades, we see further falling birth rates, slower gains in longevity, slower world population gains with eventual peaking and then decline, faster aging, upward pressure on migration – pushed by climate and pulled by aging – and wider divergences across countries.
- Aging typically pushes up real interest rates and lowers equity returns as savings rates fall and the elderly rotate into fixed income. The health care sector outperforms.
- Slower population growth plus aging has historically reduced economic growth and weakened equity markets.
- This creates an opening, if not motivation, for countries to undo the demographic damage to their economies and markets by attracting and integrating immigrants into their economies.
- Countries that are best at attracting and assimilating skilled immigrants should see better growth and equity markets as well as greater fiscal sustainability compared to other countries less willing to raise immigration.
- Combining the demographics of aging and population growth, India, Australia, the UK, Ireland, and the US have particularly favorable demographics when it comes to equity market performance. At the other end of the spectrum, Taiwan, South Korea, Italy, Mainland China, and Germany have particularly unfavorable demographics.
- Using aging and longevity growth, demographics should support higher *relative* interest rates in South Korea, Italy, Spain, Switzerland and France, and lower *relative* interest rates in India, Ireland, the UK, China and Japan.

#### Long-term Strategy

##### Alexander Wise <sup>AC</sup>

(1-212) 622-6205

alexander.c.wise@jpmchase.com

##### Jan Loeys

(1-917) 602-9440

jan.loeys@jpmorgan.com

J.P. Morgan Securities LLC

Over the past few years, we have written a series of notes on the **long-term effects of demographics on economies and markets**. In this note, we take stock of our findings, and explore the implications of the **latest demographic projections for the decade ahead**.

## Demography

Demography is the science of populations. It is primarily driven by **births, deaths, and migration**. These in turn determine **how fast populations grow, their age distribution and how long people live**.

The **stylized facts** of demographics are that the world population has grown from 3 to 8 billion over the past 60 years, rising by a near constant 850 million each 10 years since 1980, which still gives a slowing growth rate. Birth/fertility rates are falling fast across the world, faster than death rates and thus steadily raising life expectancy but also old age dependency. Migration flows are rising steadily, and the global foreign-born population has risen from 2.9% to 3.6% as a share of world population since 1990.<sup>1</sup> These global averages obscure dramatic differences across countries and regions.

## Interest rates

Two and a half years ago, we argued that demographic change **historically contributed to the decline in real interest rates** from 1980 to the 2010s, but that it was likely to put **upward pressure on interest rates into the future**. This was one factor behind our overarching view that US real interest rates were likely to structurally rise somewhat relative to lows in the 2010s.<sup>2</sup>

We considered the effect of demographics in a framework in which **real interest rates are determined by savings and investment**, representing the supply and demand of capital respectively. Empirically, we found that **increases in life expectancy were associated with higher savings and investment**, with the former effect likely due to the need for individuals to save more in anticipation of a longer retirement. We found that the effect on savings, representing the supply of capital, was larger than the effect on investment, representing the demand for capital, implying that **increases in life expectancy should reduce real interest rates**.

We also found that **increases in old age dependency**, measured as the size of the elderly population relative to the working age population, were **associated with decreases in savings and investment**, with the former effect likely due to the fact that retirees tend to run down their savings, while workers are saving for their retirement. Again, we found the effect on savings was larger than the effect on investment, implying that **increases in old age dependency should raise real interest rates**.

When it comes to private savings and investment behavior, we thus find that the effect of demographics comes down to **whether the effect of rising life expectancy or rising old age dependency dominates** at any given point in time. Going back a few decades, life expectancy was growing quite quickly, while old age dependency was relatively stable, meaning the life expectancy effect dominated, reducing real interest rates. Looking into the future, the rise in old age dependency is projected to be quite rapid, while longevity growth is expected to continue to slow. As the old age dependency effect comes to the fore, it seems more likely to us that demographics should put upward pressure on real interest rates.<sup>3</sup>

To add to this, **aging populations appear likely to strain government budgets**, with relatively fewer taxpaying workers and more retirees, putting upward pressure on public debt, which should itself put upward pressure on real interest rates.

These empirical results led us to conclude that demographic change would be one force putting upward pressure on global interest rates. We subsequently explored the possibility that **local demographic change affects interest rates relative to the US**. Empirically, we found similar effects to those discussed above. Firstly, faster old age dependency growth in a country was associated with higher relative interest rates, while faster longevity growth was associated with lower relative interest rates. In that analysis, we forecast **future country interest rate spreads relative to the US** using a selection of factors, including demographics, and found that interest rates in the US were likely to be among the highest in DM, behind only New Zealand, for a variety of reasons. With respect to demographic drivers, the widening gap in life expectancy in the US, where life declined between 2014 and 2022, and most of the rest of DM, was one factor supporting this conclusion.

1. [World Migration Report 2022](#), International Organization for Migration, 2024.

2. We initially argued this in [Long-term forces point to higher US bond yields](#), April 4, 2022. We have since revised these long-term forecasts modestly lower in [Lowering our long-run US bond yield forecast](#), November 28, 2023.

3. Note that, when assessing the historical and future effects of demographics, we considered demographic change in a set of the world's largest economies, as global capital mobility means that demographic change among financially integrated countries should affect interest rates, not merely domestic demographic change.

In short, we believe that demographic change is more likely than not to put upward pressure on real interest rates, though there has been a long-standing academic debate about this, which we have since discussed further. While there is also much debate about the possible effect of demographics on inflation, we believe there is **unlikely to be any effect in the long term, when inflation is ultimately a policy choice**. If there were no effect on long-term inflation, it seems unlikely that there would be an effect on long-term inflation expectations. Thus, our view that demographics is likely to put upward pressure on real interest rates also means that **it is likely to put upward pressure on nominal interest rates**.

In principle, aging should induce the elderly not only to spend their accumulated savings, but also to rotate their portfolios into bonds, something that has yet to take place in the US, where households have pushed equity allocations to all-time highs. In many other countries, household allocations to equities are comparatively low to begin with, so the scope for reallocation may be somewhat more limited anyway. In theory, the question would be whether declining savings or asset rotation are stronger, but until we see large-scale reallocations, we stay with a view that aging pushes real interest rates up on net.

## Equities

More recently, we examined the relationship between demographics and equities and found that population aging was associated with lower long-term equity returns as a result of **lower earnings growth, lower valuations, and weaker currencies**. Empirically, we found that a 1%-point increase in the old age share of the population in a 10-year period was associated with a 0.92%-point decline in the annual rate of return on equities in that time.<sup>4</sup>

**Domestic population aging may reduce earnings growth for several reasons.** It leads to slower workforce growth, reducing domestic economic growth, and there is also evidence that aging can reduce innovation and productivity growth.<sup>5</sup> To the extent that companies derive revenue from

4. Note that, in this context, the demographic variable of interest was the old age population share, as we expected that this would be more tightly related to earnings growth, and thus equity returns, than old age dependency. Still, we found similar results using old age dependency. When considering savings rates, as we did when studying interest rates, old age dependency appeared more relevant as it should be the size of the low-saving cohort (retirees) relative to the high-saving cohort (working age population) that matters most.

5. Nicola Maestas, Kathleen Mullen and David Powell, The Effect of Population Aging on Economic Growth, the Labor Force, and Productivity (2023) 15(2) *American Economic Journal: Macroeconomics* 306-332.

international operations, it is likely that global population aging also reduces earnings growth, though we do not believe the data permit us to credibly test this hypothesis.

There are also several channels through which **domestic population aging could reduce valuations**. First, as discussed above, the elderly tend to run down their savings, reducing the supply of capital. Just as this could raise bond yields, it could also raise equity yields (i.e. lower P/E multiples). Further, as we discussed more recently, people tend to reduce their allocations to equities as they age, which could put even more downward pressure on equity prices. Population aging may also lead to lower earnings growth expectations, justifying cheaper valuations. Given there is home bias in equity holdings, there is a reasonable argument that valuations are likely to be more closely related to local demographic change than they are to global demographic change, though again we do not believe the data allow us to convincingly test this hypothesis.

In our analysis, we found a stronger relationship between population aging and equity returns in USD than in local currency, suggesting that **faster aging in one country is also associated with currency depreciation** against a country with slower or no aging, reducing returns in USD by about the same amount as earnings and valuations.

In that same analysis, we also found that **population aging was positively related to excess returns on the health care sector relative to the market**, driven entirely by faster earnings growth. Over a 10-year period, a 1%-point increase in the old age share of the population is associated with a 0.85%-point increase in the average annual return on the sector relative to the overall market. This makes sense, as the elderly spend more money on health care (in both absolute and relative terms). In the BLS 2022 Consumer Expenditure Survey, health care accounted for an average of ~13.0% (\$7,540) of the consumption expenditure of people aged 65 and older, compared to ~5.2% (\$3,560) for people aged 25 to 34, for example. Spending by the government is also very likely to rise on top of these personal expenditures.

## Immigration

In recent analysis, we also explored the implications of immigration on the demographic profiles of countries. Given immigrants are typically relatively young, on average, we found that **higher rates of immigration slow population aging and increase the working age share of the population**. Of course, higher immigration also comes with higher population growth.

Estimating the direct effect of immigration on interest rates and equity markets produced mixed results. On average, high-

**er immigration tended to coincide with lower nominal and real interest rates, outright and relative to the US.** This appears consistent with our findings about the effects of demographics on interest rates as well as our findings about the effects of immigration on the demographic profile of a country. It is also consistent with our finding that higher immigration reduces debt-to-GDP in the long run.

At the same time, we found **no clear relationship between immigration and equity returns or earnings growth.** At first glance, this appears somewhat inconsistent with our more recent [finding](#) that higher economic growth is associated with higher equity returns in DM. In principle, there could be some fundamental reason that immigration is not related to equity performance, even though it raises growth. More likely, in our view, is the fact that our analysis of immigration, which primarily focused on long-term macroeconomic effects, was based on a sample of 23 DM economies, many of which have very small equity markets, which may be driven by the idiosyncratic fortunes of a very small number of companies. This probably creates a disconnect between the macroeconomy and the performance of the equity market in these countries. By contrast, our recent analysis of the relationship between growth and equity returns focused on a smaller set of large equity markets, for which this is unlikely to be an issue. Restricting our analysis of equity markets to only large markets in our study on immigration would, in our view, leave us with an unsatisfactorily small sample size given the constraints on immigration data, meaning we cannot formally test this. On a different note, immigration may have lagged effects on innovation, which could support equity markets in the long run, but not contemporaneously, which we focused on.

Given our results about the clear positive relationship between economic growth and equity returns, earnings growth and valuations in DM, and the clear positive relationship between immigration and growth, we are now biased to the view that **immigration is more likely than not to be positively related to long-run equity performance in countries with larger equity markets,** though not more generally.

## Demographics in the coming decades

For our long-term strategy, we need to consider how these past trends can change over the next few decades. We focus on the set of economies with the 15 largest equity and bond markets.<sup>6</sup> The demographic projections presented are sourced

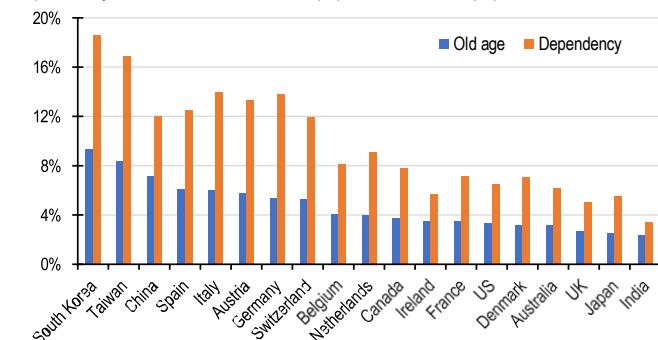
6. For equities, this is based on current market capitalization shares within the MSCI ACWI index. For bonds, this is based on current market outstandings on JPM's GBI-Broad traded market index. Unsurprisingly, there is considerable overlap between the sets of the 15 largest equity and bond markets.

from the UN's *World Population Prospects*. Given expected immigration should show up in the demographic projections discussed here, we will discuss it separately below and focus here on the fundamental demographic profiles of countries.

Starting with **population aging**, Figure 1 plots the forecast growth of the old age share and old age dependency in these economies over the coming decade. Both are expected to increase everywhere over the coming decade. In most cases, the expected rate of population aging is likely to be higher in the future than historically. **The future rate of population aging is expected to highest in South Korea, Taiwan, and Mainland China, followed by most European countries.** On the other end of the spectrum, the rate of aging is expected to be lowest in India, Japan – given its the population has already aged substantially – and the Anglosphere.

Figure 1: Forecast growth in old age share and old age dependency rate from 2024 to 2034

% points, 2024-2034. Based on UN Medium Variant Projections. Old age dependency measured as ratio of 65+ population to 20-64 population.



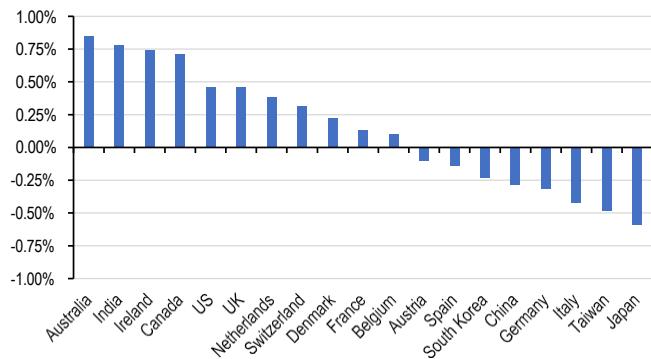
Source: J.P. Morgan, UN.

What about **population growth?** We have briefly written before about what we consider to be the serious risk that the populations of many markets, and the world, will be declining in just a couple of decades from now.<sup>7</sup> We have referred to this risk as "**depopulation**". Over the coming decade, **populations are expected to decline in Japan, Taiwan, Italy, Germany, Mainland China, South Korea, Spain, and Austria.** Some markets, particularly those that might reasonably be expected to receive stronger immigration flows given historical patterns, should continue to experience population growth. As we have previously [observed](#), population growth is an important determinant of long-term economic growth, suggesting that countries experiencing population decline are likely to grow at a slower rate for demographic reasons, all else being equal.

7. See point 3 in [Top 10 Strategic Themes for 2024 and Beyond](#), Joyce Chang et al., January 9, 2024.

Figure 2: Forecast population growth from 2024 to 2034

% pa, 2024-2034. Based on UN Medium Variant projections.

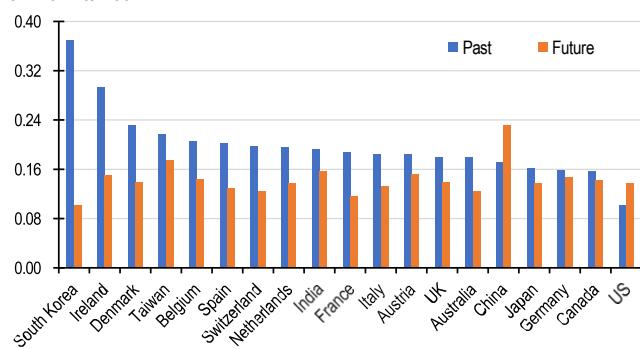


Source: J.P. Morgan, UN.

Lastly, we examine expected **longevity** growth. Figure 3 shows the projected annual rate of growth of life expectancy at age 15 between 2024 and 2034, alongside the actual observed annual growth rate between 2000 and 2019.<sup>8</sup> While there is considerable uncertainty about future longevity growth, with the exception of the US and China, every country is **expected to see slower longevity growth than observed in between 2000 and the pandemic**, which was itself a period of slower longevity growth than preceding decades. Looking across countries, differences in expected longevity growth are quite small.

Figure 3: Historical and forecast rate of growth of life expectancy at age 15

Years per annum, 2000-2034. Historical based on annual increase in longevity from 2000 to 2019 to omit pandemic effects. Future based on annual expected increase from 2024 to 2034.



Source: J.P. Morgan, UN.

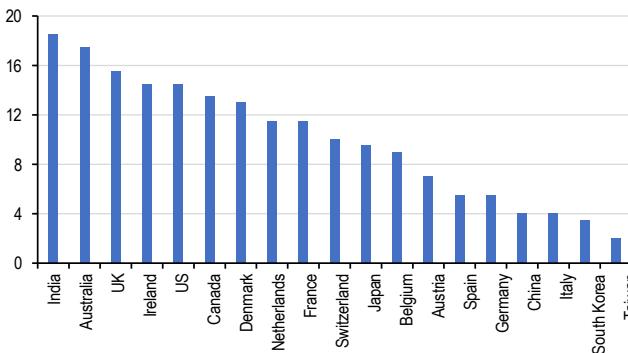
Our previous analysis suggests countries experiencing faster population aging and slower population growth are likely to

8. We focus on longevity at age 15 as that ought to be the most relevant factor to someone entering the labor force when considering how much of their income they ought to save. Longevity at birth is substantially affected by childhood mortality, which ought to be irrelevant for the savings behavior of a person of working age.

see lower equity returns. To combine these two different dimensions of demographic change, we can take an average of the rank order for old age share growth (in descending order) and the rank order for population growth (in ascending order).<sup>9</sup> This produces a composite score for the favorability of demographics for equities, where a higher score is better. These composite scores are shown in Figure 4. Based on this measure, **India, Australia, the UK, Ireland and the US have particularly favorable demographics** when it comes to equity market performance. At the other end of the spectrum, **Taiwan, South Korea, Italy, China and Germany have particularly unfavorable demographics**. Looking beyond these relative differences, given most countries are expected to see faster population aging and slower population growth than observed historically, **demographic change is generally a negative signal for future equity returns relative to the past**.

Figure 4: Demographic favorability for equity returns

Based on average rank order for population aging and population growth. Higher score corresponds to more favorable demographics.



Source: J.P. Morgan, UN.

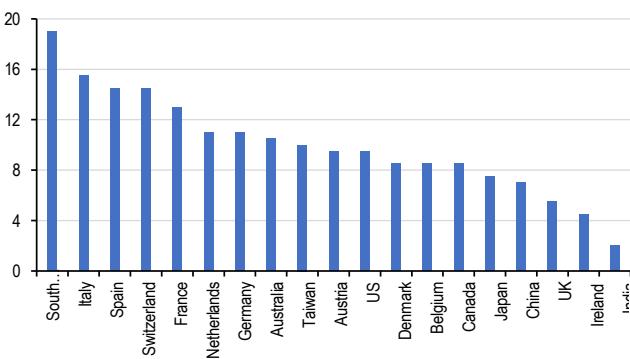
We can perform a similar analysis for interest rates, this time by looking at rankings of expected old age dependency growth and longevity growth, which are the two key variables. Our previous analysis suggests that countries experiencing slower longevity growth and faster old age dependency growth should see higher interest rates. We can again construct a composite score for demographic support for higher relative interest rates. These composite scores are shown in Figure 5, where a higher score indicates support for higher relative interest rates. Based on this measure, demographics should support **higher relative interest rates in South Korea, Italy, Spain, Switzerland and France, and lower relative interest rates in India, Ireland, the UK, China and Japan**. With respect to China, while old age dependency is expected to rise quickly – which would ordinarily

9. We alternate between ascending/descending order because higher population aging points to lower returns, but higher population growth points to higher returns.

put upward pressure on relative interest rates – longevity is also expected to rise at a faster rate than any of the other countries considered. Given the magnitude of expected increases in old age dependency and the expected slow rate of longevity growth, we continue to expect that **demographics will put upward pressure on world interest rates in general.**

**Figure 5: Demographic support for higher relative interest rates**

Based on average rank order for old age dependency growth and longevity growth. Higher score corresponds to more demographic support for increasing relative interest rates.



Source: J.P. Morgan, UN.

## FUTURE IMMIGRATION

Here, we will briefly discuss **forces that stand to shape the pattern of immigration into the future**, with consequences for the demographic profiles of these countries. First and foremost, in our view, immigration flows depend on policy, so the question about where immigration flows will be strongest depends in no small part on where policy will be most receptive to those flows.

Fundamentally, we believe immigration is likely to be **most stable and sustainable over time when immigration policy is almost exclusively based on meeting domestic needs and interests**, and not on any moral or exterior motives. From this perspective, the Canadian and Australian skills-focused immigration systems, for example, appear more sustainable and stable than those in countries where immigration policy is agnostic to local economic needs. That said, the level of immigration has seemingly become an area of political debate even in Canada and Australia, ostensibly due, at least in part, to concerns about housing affordability, so there is no guarantee that immigration flows will be stable even in those countries which aim to most strongly prioritize domestic interests.

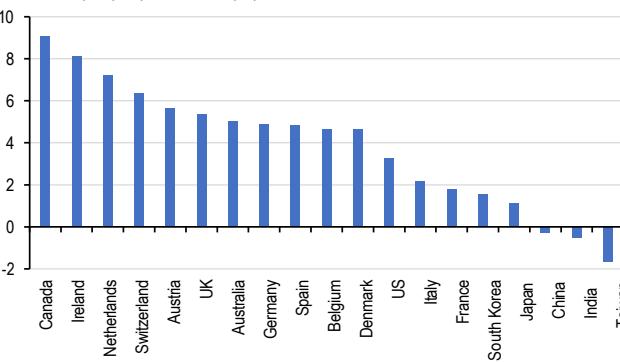
Beyond immigration policy, many **other structural differences are likely to determine which countries see strong immigration flows** and which do not. General quality of life is an important factor. Beyond that, language is seen as one factor that makes countries in the Anglosphere a relatively

attractive destination for prospective immigrants, for instance.

Figure 6 shows **recent historical migration rates in the same set of countries**, measured as the average net inflow of people per 1000 in population from 2019 to 2024. Over the past five years, **Canada, Ireland, the Netherlands, Switzerland and Austria have received the largest net inflows of migrants**. In general, immigration flows into Asia have been weakest, with **Taiwan, India and China experiencing net outflows**.

**Figure 6: Average net migration rate from 2019 to 2024**

Net inflow of people per 1000 in population, 2019-2024.



Source: J.P. Morgan, UN.

While it is likely to be very difficult to accurately forecast immigration flows into the future, particularly given their volatility over time, **the pattern of recent immigration inflows seems consistent with expected future demographic changes**. For instance, as shown in Figure 2 above, negative population growth is expected in Japan, Mainland China, Taiwan, and South Korea, all of which have seen very weak immigrant flows in the recent past. With the exception of Japan, each is also expected to see substantial population aging over the next decade.

## The Long-term Strategist

### Long-term impact of aging on equity markets

- Population aging has profound economic effects and is expected to accelerate in many countries in coming decades. In this note, we examine the likely implications for equity markets.
- We find a negative relationship between aging and equity market returns, earnings growth, valuations. Over a 10-year period, a 1%-point increase in the share of the population aged over 65 is associated with a 0.92%-point decline in the pa return on their equity market.
- About half of this is due to a negative effect on earnings growth. Population aging should bring slower growth, which we have shown comes with slower earnings growth in DM. This slower economic growth is probably from slower workforce growth, reduced innovation and lower investment.
- The other half is due to a negative effect on valuations. As shown before, population aging reduces savings as the elderly consume out of their retirement savings. It should also lead to some reallocation out of equities. Both should cheapen equities, by reducing P/E multiples. Lower earnings growth expectations could also contribute.
- Aging also has an effect on currencies. Faster-aging countries thus tend to see their currencies weaker against slower-aging ones. This further decreases USD returns by a similar magnitude to earnings and valuations.
- The elderly also have different spending needs, with implications for equity sector performance. They spend more on health care in both absolute terms and as a share of their total consumption.
- We find a positive relationship between aging and long-term excess returns on the health care sector, driven entirely by faster earnings growth. Over a 10-year period, a 1%-point increase in the old age share of the population is associated with a 0.85%-point increase in the health care pa return in excess of the market.
- These results provide further support for a strategic overweight on the health care sector, which we have long advocated.
- Over the next decade, countries are expected to age at very different rates. Of the world's largest equity markets, China is expected to age fastest, followed by EMU, while the US is expected to age more slowly. India is expected to age even more slowly. Other DM countries are expected to partially catch up to Japan in the elderly share.
- These factors provide further support of a strategic underweight of Chinese stocks. Ignoring all other forces, the aging factor by itself is one force that supports continued US equity outperformance within DM.
- Given we have previously argued that aging should raise long-term interest rates in the future, aging seems likely to initially cheapen bonds, but at some point offer attractive entry points for long-term investors in fixed income.

#### Long-term Strategy

**Alexander Wise** AC  
(1-212) 622-6205  
alexander.c.wise@jpmchase.com

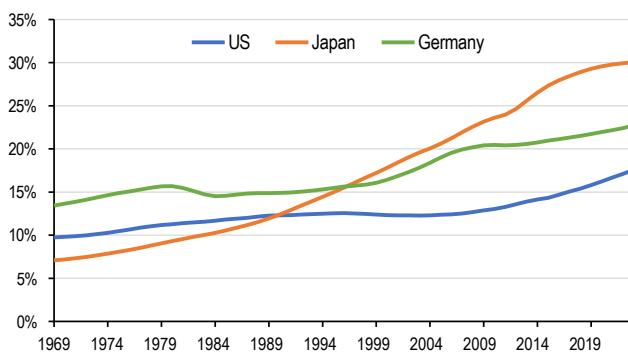
**Jan Loeys**  
(1-917) 602-9440  
jan.loeys@jpmorgan.com  
J.P. Morgan Securities LLC

**Population aging has profound economic effects and is expected to accelerate in many countries in coming decades.** It could also affect long-term equity performance, potentially by reducing earnings growth or leading to portfolio rotation out of equities. Given the different spending needs of the elderly, it is conceivable that the effect will differ across sectors. In this note, we assess the likely long-term implications of population aging for equity markets.

**Countries have aged at very different rates in the past several decades,** even within the set of highly developed countries. For example, Figure 1 shows the old age (65+) share of the total population in the US, Japan and Germany. In 1969, the first year of our analysis, Germany had the highest share of elderly of the three, followed by US and then Japan. In the following years, the elderly share has rapidly grown in Japan, overtaking both Germany and the US. In Germany and the US, the rate of aging has fluctuated periodically, buffeted by immigration and the “echo” effects of the Baby Boom and potentially war, amongst other forces. Variation in these rates of aging—through time and across countries—allows us to estimate the effects of aging.

Figure 1: Old age (65+) share of the population

%, 1969-2023, annual. Data in 2022 and 2023 are based on UN Medium Variant estimates.



Source: J.P. Morgan, UN.

In our analysis, we estimate the relationship between aging and equity returns, earnings growth, and valuation changes. In addition to the overall equity market, we consider the effects of aging on the health care sector, as it is commonly argued that aging populations should support long-term out-performance of the sector. To do so, we use a panel of equity data for the nine largest DM equity markets.<sup>1</sup> We restrict our

1. Based on market capitalization shares of the MSCI World Index as of August 2024. These are the US, Japan, the UK, Canada, Switzerland, France, Germany, Australia and the Netherlands. Our results are very similar if further restricting the sample by dropping Australia and the Netherlands (the two smallest remaining markets in our analysis).

focus to larger markets, as smaller ones may be less representative of their overall economy. For each country, we use indices which provide broad market coverage with sectoral disaggregation.<sup>2</sup>

To assess the effects of aging on equities, we estimate the following regression:

$$Y_{it} = \beta_0 + \beta_1 Aging_{it} + \gamma_i + \lambda_t + \epsilon_{it}$$

where  $Y_{it}$  is the outcome of interest,  $Aging_{it}$  is the growth of the old age share of the population in country  $i$  during time period  $t$ ,  $\gamma_i$  are country fixed effects, and  $\lambda_t$  are time period fixed effects.<sup>3</sup> For the overall equity market, the outcomes of interest are returns, earnings growth, and valuation growth. For the health care sector, these outcomes are measured relative to the overall market. In this regression, observations are rolling 10-year periods in each country.

One of the key questions at hand is about the relative significance of **local versus global demographic change**. The nature of the data means that it is difficult to reliably estimate the effect of *global* demographic change directly. However, including time period fixed effects in the regression effectively controls for global demographic change, which jointly affects all countries, when estimating the effect of local demographic change. Our estimates should be interpreted as the effects of domestic aging on domestic equities. However, we believe it is a reasonable presumption that global aging has qualitatively similar effects given the likely mechanisms at work, like slower growth.

One might hypothesize that local demographic change is likely to be relatively more important in the largest markets, such as the US. To shed light on this prior, we estimate two versions of the regression equation specified above: one with unweighted observations, and another with observations weighted by relative population size. The latter variant gives

2. We use Datastream Total Market indices from Refinitiv/LSEG Data and Analytics as these provide broad coverage for a long period of time and allow analysis of specific sectors. Our empirical results are generally consistent if we use MSCI country indices, which primarily consist of large caps, as alternatives which cover a similar period of time.

3. In our analysis, we estimate the effects of an increase in the old age share of the population. In our view, the nexus with returns should be clearest with the increase in old agedness. For example, as the share of elderly increases, one should expect slower workforce growth or even contraction, leading to slower economic growth and, hypothetically, slower earnings growth. It is unclear that simply having a high elderly share level should imply the same. More succinctly, we believe it makes most sense to relate one change

greater weight in the regression to the effect of demographic change in larger markets. The results are generally quite similar, which suggests that **the effect of domestic aging may be quite uniform across countries, large and small alike.**

Table 1 presents the estimated effects of domestic population aging on overall equity market returns, earnings growth, and valuation growth. Across the board, we find that aging has a **negative relationship with returns, earnings growth, and valuations**. Over a 10-year period, a 1%-point increase in the old age share of the population is associated with a 0.92%-point decrease in the average annual return on the overall market in the unweighted sample. Slower earnings growth and declines in valuations each account for about half of this effect. In the size-weighted sample, the overall estimate is very similar, but relatively more of the observed change is due to declines in valuations. We find even larger impacts on market returns in USD, where a 1%-point increase in the old age share is associated with a 1.38%-point decrease in the average annual return. This difference suggests that **faster aging in one country is also associated with currency depreciation against a country with slower or no aging**, reducing returns in USD by about the same amount as earnings and valuations.

Table 1: Effects of aging on equity market returns, earnings growth, and valuation growth

% pa, 1969-2023. Based on regression with country and time fixed effects. 10yr rolling periods. 'Size-weighted' weights observations by start-of-period population share within 'High-Income Countries' per the UN. Statistical Significance: \*\*\* = 1%, \*\* = 5%, \* = 10%. Standard errors in parentheses.

	Unweighted	Size-weighted
Return	-0.916*** (0.233)	-0.901*** (0.218)
EPS	-0.426* (0.227)	-0.231 (0.200)
PE	-0.473*** (0.178)	-0.828*** (0.166)

Source: J.P. Morgan, UN, Refinitiv/LSEG Data and Analytics.

Domestic population aging may **reduce earnings growth** for several reasons. It leads to slower workforce growth, **reducing domestic economic growth**. There is also evidence that aging can **reduce innovation and productivity growth**.<sup>4</sup>

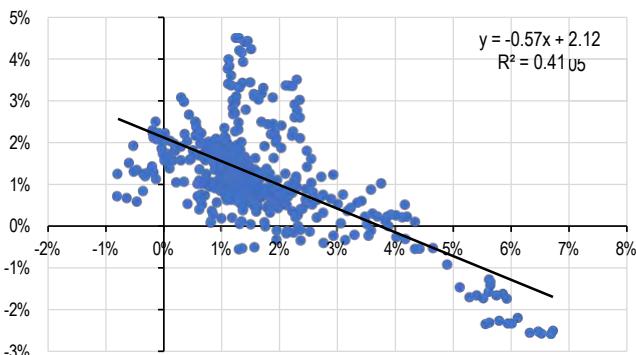
(prices or earnings) to another change.

4. For similar results, see Nicola Maestas, Kathleen Mullen and David Powell, [The Effect of Population Aging on Economic Growth, the Labor Force, and Productivity](#) (2023) 15(2) *American Economic Journal: Macroeconomics* 306-332.

Figure 2 shows that, for each 1%-point increase in the old age population share, growth per worker declines by 0.58%-points.<sup>5</sup> The impact on outright growth is even larger as it also reflects the decline in work force growth due to aging. We have recently shown that declines in economic growth are associated with slower EPS growth in DM ([Does higher growth boost long-term equity returns?](#) Aug 23, 2024). The elderly also have different spending habits, and tend to consume less overall.

Figure 2: Long-run growth in GDP per worker vs. old age share growth

% Data based on UN Medium Variant estimates. Data are presented after subtracting country fixed effects from a regression, i.e. level shifting observations from each country.



Source: J.P. Morgan, UN, World Bank, Penn World Table, Feenstra, Inklaar and Timmer (2015).

To the extent that companies derive revenue from international operations, it is likely that **global population aging also reduces earnings growth**. For companies that derive more of their revenue from abroad, like multinationals, global population aging (in a GDP-weighted sense) is likely to be more consequential for earnings growth than local population aging. Thus, we suspect that one would observe a stronger relationship between local population aging and earnings growth for a broad equity market index which includes small- and mid-caps, than would be observed for an equity index consisting exclusively of large caps. Comparing results based on the MSCI country indices (which consist primarily of large caps) and those based on the Datastream broad market indices suggests this is the case. While the estimated relationship between local aging and earnings growth remains negative when using the MSCI country indices, it is smaller in magnitude.

5. Draws on employment data from the Penn World Table. See Robert Feenstra, Robert Inklaar and Marcel Timmer, [The Next Generation of the Penn World Table](#) (2015) 105(10) *American Economic Review* 3150-3182.

There are also several channels through which domestic population aging could **reduce valuations**. Firstly, we have previously argued that population aging **reduces national savings** as the elderly consume out of their retirement savings, thereby raising bond yields. By the same logic, population aging should raise equity yields (i.e. lower P/E multiples). Further, as we discussed more recently, people tend to **reduce their allocations to equities as they age**, which should put even more downward pressure on equity prices. Population aging may also lead to **lower earnings growth expectations**, justifying cheaper valuations. Given there is home bias in equity holdings, there is a reasonable argument that valuations are likely to be more closely related to local demographic change than they are to global demographic change, though we do not believe the data permit us to credibly test this hypothesis.

Turning to sectors, the well-documented fact that the **elderly spend more money on health care** (in both absolute and relative terms) is commonly cited as one justification for a strategic overweight on the sector as populations age. In the BLS 2022 Consumer Expenditure Survey, health care accounted for an average of ~13.0% (\$7,540) of the consumption expenditure of people aged 65 and older, compared to ~5.2% (\$3,560) for people aged 25 to 34, for example. **Spending by the government** is also very likely to rise on top of these personal expenditures.

Table 2: Effects of aging on health care excess returns, excess earnings growth, and excess valuation growth

% pa, 1969-2023. Based on regression with country and time fixed effects. 10yr rolling periods. 'Size-weighted' weights observations by start-of-period population share within 'High-Income Countries' per the UN. Statistical significance: \*\*\* = 1%, \*\* = 5%, \* = 10%. Standard errors in parentheses. Dots outlier PE growth observations.

	Unweighted	Size-weighted
Return	0.846*** (0.264)	1.081*** (0.168)
EPS	1.031** (0.422)	0.987*** (0.240)
PE	-0.386 (0.441)	0.013 (0.257)

Source: J.P. Morgan, UN, Refinitiv/LSEG Data and Analytics.

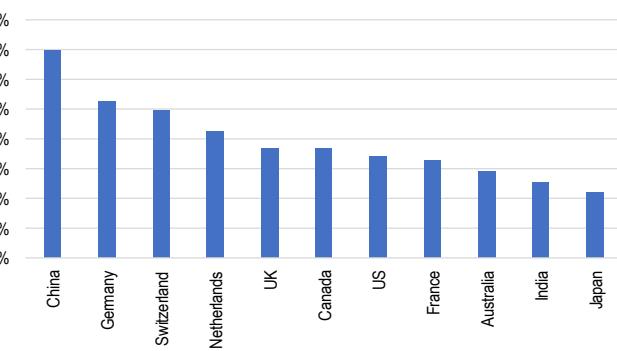
Table 2 presents the estimated effects of domestic population aging on health care sector excess returns, earnings growth, and valuation growth relative to the overall market. We find a clear **positive relationship between aging and excess returns on the sector, driven entirely by faster earnings growth**. Over a 10-year period, a 1%-point increase in the old

age share of the population is associated with a 0.85%-point increase in the average annual return on the sector relative to the overall market. We find no relationship between population aging and relative sector valuations. Overall, the evidence is generally supportive of a **strategic overweight on health care**, which we have advocated for some time for several reasons.

## Future population aging

**Countries are set to age at quite different rates over the coming decade.** Figure 3 shows the expected increase in the old age population share for a set of countries with the largest equity markets, and Figure 4 shows the distribution of historical population aging in 10-year periods for comparison.<sup>6</sup> Of these countries, China is expected to age most rapidly by this measure, followed by Germany and Switzerland. In **China**, the old age share of the population is expected to increase 7%-points from 14.6% to 21.6% over the next decade. As can be seen in Figure 4, this would be the **fastest rate of aging in a 10-year period on record** for the countries considered in our analysis. The US is towards the middle of the spectrum of expected future aging, with the old age population share expected to increase 3.4%-points from 18.1% to 21.5%. While Japan has historically aged very quickly by this measure, making it the oldest population in the world, the old age population share is expected to increase noticeably slower from here over the coming decade.

Figure 3: Expected increase in old age population share, 2024-2034 % points, 2024-20234. Data based on UN Medium Variant estimates.

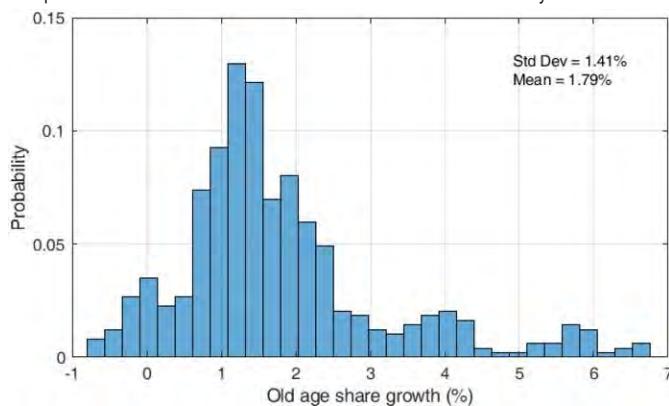


Source: J.P. Morgan, UN.

6. Based on UN medium variant population projections for 2024-2034.

Figure 4: Distribution of historical old age share growth

1960-2023. 10yr rolling periods. Data based on UN Medium Variant estimates.  
 Sample consists of the set of countries included in econometric analysis.



Source: J.P. Morgan, UN.

## Asset allocation implications

While long-term equity returns will be shaped by many factors, population aging has historically accounted for an economically meaningful portion of the variation in returns. In our sample, a simple univariate regression of long-term equity returns on population aging has an  $R^2$  of ~0.24. Further, relative to more purely economic or financial phenomena, population aging is likely to be somewhat more predictable. This suggests that expected population aging would be **one reasonable input into the strategic asset allocation process**. Given companies in a country are likely to be disproportionately exposed to local demographic change, and global demographic change is likely to similarly impact all countries, expected differences in population aging may have signaling value for **cross-country strategic asset allocation**.

Of the countries with large equity markets, UN forecasts suggest **China is likely to be most adversely affected** by population aging. **EMU is also likely to be adversely affected**, albeit to a lesser degree. At the other end of the spectrum, population aging is likely to **weigh relatively less on the US**. There is an argument that, given Japan has historically been at the vanguard of population aging, the worst effects have already been realized in relative terms, as other countries begin to ‘catch up’.

The **juxtaposition of expected aging in China versus India** is noteworthy. In our [SAA portfolio](#), our allocation to EM equities has excluded China primarily on the basis of their greater focus on national security and Common Prosperity, which we think does not provide good long-term support for its equity market. It follows that, within EM, we are overweight India. Our results suggest that the demographic disparity between China and India supports these decisions.



# Emerging Markets

## The Long-Term Strategist

### Strategic questions on EM allocations

- We look at a set of long-term strategic questions on Emerging Markets, such as what are they, why distinguish them from DM, what returns to expect vs. DM, do they offer diversification, where is value, how much to hold, and how the rise of China is changing the asset class.
- Over the full period since their entry into global markets, taken as the inception of their indices, EM has beaten DM across equities, bonds, credit, and FX. But performance has been far from straight line.
- EM has been a story of two feast and famine cycles, each roughly seven years up and then down, driven by growth cycles. The last famine phase is now seven years old, but we do not yet see signs of rebirth of globalization and governance needed for long-term EM outperformance.
- Paradoxically, we find that to harvest EM's higher long-term growth, one should focus on local bonds and currencies and not on equities or credit as growth has not produced faster earnings growth but instead higher interest rates. Equities are the right asset for any reacceleration of EM growth, even as we are still awaiting the right signal for that.
- EM equities have produced only the same earnings growth as DM since 1995, despite higher GDP growth. Current relative valuations are slightly/modestly cheap. High volatility and correlations to DM limit diversification value. We are currently tactically OW.
- EM currencies carry risk premia with a long-term return to risk similar to other risk assets. Against USD, EM FX is 2/3rd sigma cheap to long-term averages.
- EM local bonds do not generally offer higher term premia than DM, with the yield excess over DM coming from their currencies, but they currently do offer good entry value, given QE-driven DM richness, and good diversification vs. DM duration, when currency hedged.
- EM credit from sovereign and corporate hard-currency debt offers ~50bp risk premium over DM in HG. The asset class beats DM when EM equities rally vs. DM and largely holds par with DM when EM equities underperform. Diversification value is not large. Entry points vs. DM are neutral to rich. Its by now massive size, though, offers opportunities to express views on individual EM companies.
- China's economy is now almost half of overall EM and is reshaping the asset class as it grows in size, and its markets will at some point enter global indices. In FI, this lowers overall EM carry but makes it more reliable. In equities, China has yet to produce good earnings growth and returns to pull in more DM capital.

#### Long-term Strategy

##### Jan Loeyς <sup>AC</sup>

(1-212) 834-5874

jan.loeyς@jpmorgan.com

Bloomberg JPMA VIEW <GO>

J.P. Morgan Securities LLC

##### Shiny Kundu

(91-22) 6157-3373

shiny.kundu@jpmorgan.com

J.P. Morgan India Private Limited

#### Emerging Markets Economic and Policy Research

##### Jahangir Aziz

(1-212) 834-4328

jahangir.x.aziz@jpmorgan.com

J.P. Morgan Securities LLC

##### Sin Beng Ong

(65) 6882-1623

sinbeng.ong@jpmorgan.com

JPMorgan Chase Bank, N.A., Singapore Branch

#### EM Local Markets and Sovereign Debt Strategy

##### Jonny Goulden

(44-20) 7134-4470

jonathan.m.goulden@jpmorgan.com

J.P. Morgan Securities plc

#### Emerging Markets Corporate Strategy

##### Alisa Meyers

(1-212) 834-9151

alisa.meyers@jpmorgan.com

J.P. Morgan Securities LLC

##### Yang-Myung Hong

(1-212) 834-4274

ym.hong@jpmorgan.com

J.P. Morgan Securities LLC

#### Emerging Markets Equity Strategy

##### Pedro Martins Junior, CFA

(55-11) 4950-4121

pedro.x.martins@jpmcchase.com

Banco J.P. Morgan S.A.

#### CEEMEA & South Africa Equity Strategy

##### David Aserkoff, CFA

(44-20) 7134-5887

david.aserkoff@jpmorgan.com

J.P. Morgan Securities plc

Jan Loeys  
(1-212) 834-5874  
jan.loeys@jpmorgan.com

Shiny Kundu  
(91-22) 6157-3373  
shiny.kundu@jpmorgan.com

Jahangir Aziz  
(1-212) 834-4328  
jahangir.x.aziz@jpmorgan.com

Sin Beng Ong  
(65) 6882-1623  
sinbeng.ong@jpmorgan.com

Global Markets Strategy  
The Long-Term Strategist  
28 September 2018

J.P.Morgan

Since Emerging Markets have been opening up in the 1980s and 1990s, global investors have been pouring in, in search of returns from high EM growth and convergence on DM. But the 1990s' EM crises and underperformance in the current decade are now raising the question whether EM is really worth its high volatility.

We look here at a set of **strategic issues** on how global investors should be approaching EM. What is an EM? What returns we can expect relative to DM across equities, bonds, currencies, and credit? Does the past give us any guidance? Is today a good entry point? Where is long-term value? What will make EM equities produce higher returns again? Is there enough return potential for TAA vs. DM and what skill do you need? Is EM still good diversification and where? How can we monetize the higher growth that EM economies produce? Will tomorrow's EM still be anything like yesterday's, especially with China starting to dominate more than ever? What can we say about how much EM you should hold strategically in your global portfolio over the next decade?

We consider EM **from a DM investor point of view**, largely in USD and focus on investable assets covered by the major indices managed by MSCI, J.P. Morgan, and Barclays Bloomberg. Government bonds to us mean central government debt issued in local currency, measured by our GBI index family. Debt issued by EM sovereigns in dollars and euros—our EMBIG index—is subject to default risk, and we thus analyze it as credit, even as some indices and analysts only consider corporate bonds to be credit.

## What is EM?

Emerging Markets (EMs) used to be called *underdeveloped* countries, and then developing countries, or in French, *pays en voie de développement* (countries on the way to development). An EM must thus be seen to be developing something, generally understood to be their **standard of living**, for which the best single measure is taken to be income per capita.

**Income per capita** comes from labor productivity (income per worker) and labor participation (share of workers in the population). Productivity can be improved through capital spending, physical and human (education, know-how, management), as well as better functioning institutions, labor and capital markets. In Appendix I, we show how different institutions and index providers define what they consider EM countries and their counterpart, DM, for developed markets.

In general, index providers start with a **Gross National Income (GNI) per capita cutoff**, above which a country becomes a DM, and then combine these with quantitative and qualitative measures of liquidity and market access to judge how developed it is financially. There is thus no single accepted official definition of what is an EM, even as there is a lot of commonality. Some countries live around the border between EM and DM, with Korea being part of DM in FTSE equity and JPM bond indices but of EM in MSCI equities. Over time, some EMs do emerge and graduate into the DM category, while some later are downgraded back into EM when conditions worsen. As the criteria are continuous, some index providers in turn distinguish among EM, calling the lesser developed ones Frontier markets, or Next Generation.

One area where this **diversity** within EM is important and persisting is in the **different country composition of the EM indices across asset classes**. Appendix II lists the country weights across four EM asset classes—equities, local government bonds, external sovereign, and external corporate credit. EM equities are dominated by China with the latter already at a 31% weight, set to rise as the domestic market opens up to international investors. China is not yet in local bond indices, but this will change from next year on. These differences do affect performance and value, just as country and sector weight differences affect DM equity and bond indices. At the end of the day, though, the indices describe what is on offer to international investors and thus have to be considered as is.

## Why distinguish EM from DM?

To keep the investment process manageable, investors generally break it up in stages, at the simplest level first deciding how to allocate across asset classes, such as bonds and equities, then dividing by region, before deciding how to invest within these regional asset classes. Geography is the obvious way to define regions, with funds usually spread across the Americas, Europe, Asia, and Africa. But why would one then combine a group of countries from different parts of the world on the basis of economic and financial development into a separate region if not overall asset class? For this to work, **it must be the case that there is something fundamentally different about EM**.

It can be argued that EM investing requires different analysis and consideration of factors that do not come up much in DM, such as the risk of regime change or expropriation, a weak rule of law, low liquidity, and

Jan Loeys  
(1-212) 834-5874  
jan.loeys@jpmorgan.com

Shiny Kundu  
(91-22) 6157-3373  
shiny.kundu@jpmorgan.com

Jahangir Aziz  
(1-212) 834-4328  
jahangir.x.aziz@jpmorgan.com

Sin Beng Ong  
(65) 6882-1623  
sinbeng.ong@jpmorgan.com

Global Markets Strategy  
The Long-Term Strategist  
28 September 2018

J.P.Morgan

extreme volatility. EM risk and price action are **at times discontinuous** and subject to gaps that cannot be traded. DM price action is much more continuous with markets rarely shutting down. EM investing thus requires a different mindset and risk management. Asset managers and market makers—the buy and the sell side—have therefore traditionally separated their EM business from their DM one as **EM markets require a different type of risk management**.

As EMs develop, their income levels and risk profiles will gradually mature and graduate to those of DM markets. Portugal and Israel, e.g., graduated some 20 years ago from EM to DM, while Greece first moved up and then down again into EM.

**Distinguishing EM as an asset class against DM remains relevant today** as there is a steady supply of new EMs that are not yet part of any index, or only of Frontier indices, that are opening their markets and developing their economies to enter the existing EM indices. This movement of countries across the EM/DM divide is similar to the steady move of companies between investment grade and sub-investment grade (high yield) indices in the corporate bond world, which we also consider different asset classes requiring different analysis and risk management.

## What long-term return on EM vs. DM?

Any higher future expected returns on EM vs. DM could come from three sources: (1) any persistent **risk premia** to compensate for higher EM risk or information gaps on EM economies and companies; (2) any relative **current cheapness** that is expected to correct itself over the long term; and/or (3) any expectation that EM will surprise on the upside more than DM over the medium term.

We start by analyzing past return differences between EM and DM equities, bonds, credits, and currencies over the longest time series that we can find to look for patterns to help us project future relative returns for the next decade. Table 1 shows that **EM has beaten DM across the main asset classes since inception** of each of their respective indices: equities; government bonds, currency hedged and unhedged; FX; and credit, high-grade and high yield, sovereign and corporate. These high past EM returns have created the belief of many that EM is both a high-growth and high-return asset class. Below we discuss for each whether we can extrapolate these excess returns, or if the past is a good guide to the future. The conclusion will be a bit of both.

**Table 1: Total Returns of different EM and DM asset classes**

% compound annual returns, in USD

Asset Class	EM	DM	EM-DM	EM Sharpe	DM Sharpe	Since
Equities	10.84%	8.05%	2.79%	0.32	0.31	Dec'87
GBI	6.40%	4.00%	2.40%	0.41	0.38	Dec'02
GBI Hedged	4.34%	3.99%	0.36%	0.65	0.79	Dec'02
EMBI HG vs US Corp IG	7.45%	5.84%	1.61%	0.62	0.57	Dec'93
EMBI HY vs US Dom HY	9.44%	7.53%	1.92%	0.47	0.60	Dec'93
CEMBI HG vs JULI	6.32%	5.92%	0.40%	0.70	0.84	Dec'01
CEMBI HY vs US Dom HY	8.97%	8.41%	0.55%	0.58	0.82	Dec'01
EMFX	5.29%			0.34		Dec'93

Source: J.P. Morgan, MSCI. Last obs is Aug 2018

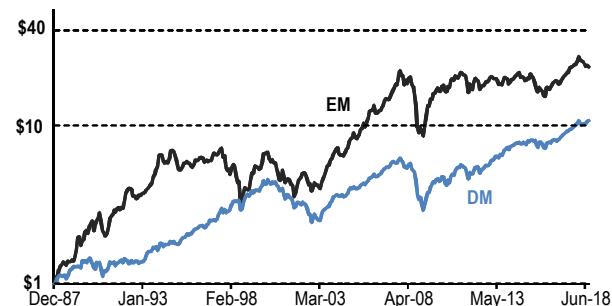
Indices used: MSCI EM, MSCI World, GBI EM Diversified, GBI DM Diversified, GBI EM Global Diversified Hedged, GBI DM Diversified Hedged, EMBI Global IG, US Bloomberg Barclays Corporate IG, EMBI Global non-IG, JPM US Domestic HY, CEMBI Broad IG, JULI ex EM, CEMBI Broad non-IG, JPM US Domestic HY, ELM Plus.

## EQUITIES

**The data:** Figure 1 shows the cumulative total return on the MSCI EM index and its DM equivalent (MSCI World) in common currency (US\$) since inception of the EM index at the end of 1987, on a log scale. EM did outperform by 2.8% over this period vs. a DM annual compound return of 8%. EM produced much higher volatility at 23% vs. 15% for DM, discussed and shown below in Table 4 under Diversification. Over this period, EM exhibited a beta of 1.16 to DM.

**Figure 1: MSCI EM and DM (World) Total Return Indices**

Dec 1987 = 1 in natural log scale, monthly



Source: J.P. Morgan, MSCI. Last obs is Aug 2018

Figure 2 shows the same in ratio terms. It highlights that the excess return from EM is highly dependent on where we start from. The full **30-year history** is really one of a **roughly seven-year EM feast followed by seven years of famine, and then again the same roundtrip**. Starting only five years later, EM had the same performance as DM equities.

Jan Loeys  
(1-212) 834-5874  
jan.loeys@jpmorgan.com

Shiny Kundu  
(91-22) 6157-3373  
shiny.kundu@jpmorgan.com

Jahangir Aziz  
(1-212) 834-4328  
jahangir.x.aziz@jpmorgan.com

Sin Beng Ong  
(65) 6882-1623  
sinbeng.ong@jpmorgan.com

**Global Markets Strategy**  
The Long-Term Strategist  
28 September 2018

**J.P.Morgan**

### Figure 2: MSCI EM to DM (World) Total Return Index

Ratio, Dec 1987 = 100, monthly



Source: J.P. Morgan, MSCI. Last obs is Aug 2018

**What drove this relative return pattern?** Equity returns come from **income (dividends)** and **capital gains**, which in turn consist of **earnings growth** and **multiple changes** (P/E). We can decompose the return gap between these three factors only since Sep 1995 as dividend and actual earnings data start then. In Table 2, we do this for the feast/famine periods we can detect, since 1995: 1995-2001; 2001-09, 2009-15; 2015-today. It shows that in each period, **relative earnings growth explains most** of the EM/DM rolling return difference, with multiple changes amplifying the impact of earnings growth differentials in the first two periods but not adding much in the latter two.

**Table 2: Total return composition of MSCI DM vs EM return gap %, pa.**

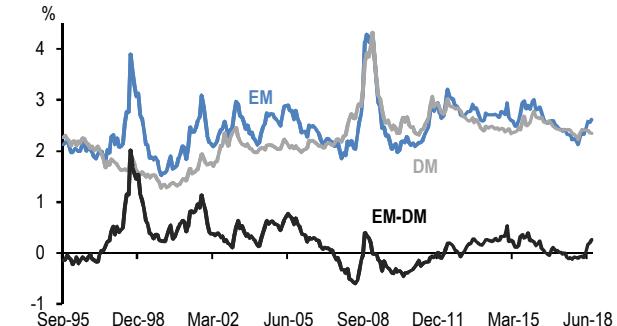
Period	Return Gap	Dividend Gap	EPS growth Gap	Multiple change Gap
95-'01	-11.52%	0.45%	-5.80%	-6.03%
01-'09	14.05%	0.20%	9.12%	3.76%
09-'15	-9.76%	0.04%	-10.28%	-0.09%
15-today	0.90%	0.04%	0.05%	0.57%
95-today	-1.12%	0.21%	-1.09%	-0.32%

Source: J.P. Morgan, MSCI. Last obs is Aug 2018

To show this more graphically, Figure 3 charts the dividend yields of MSCI World and EM, showing only an average 20bp higher yield on EM between the two and little variation in the gap. Dividends were **not a big source of return differences**.

### Figure 3: Dividend yields on MSCI DM and EM

Dec 1987 = 100, monthly

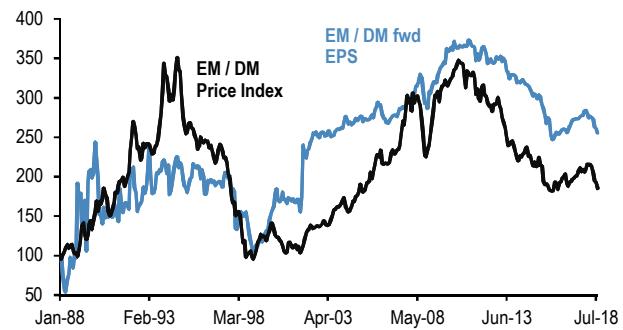


Source: J.P. Morgan, MSCI. Last obs is Aug 2018

Return gaps must thus come more from different earnings growth or **multiple** changes. Figure 4 shows the ratio of operating forward \$ EPS of EM over DM as well as the relative price index ratios. EM outperformed when analysts raised earnings projections for EM more than for DM, and vice-versa. EM equity prices followed, one-for one in the second feast/famine period, but less than one-for one in the first.

**Figure 4: EM/DM 12m forward EPS ratio & corresponding Price Index Ratio**

Jan 1988 = 100, monthly



Source: J.P. Morgan, IBES, MSCI. Last obs is Aug 2018

Figure 5 shows the same chart, but for **actual, trailing earnings** for which we have data only since 1995. Here we find that EM/DM relative performance in equities was simply a question of relative earnings growth as relative prices moved virtually one for one with relative earnings delivery. 1995 was the end of one seven-year feast in EM and thus indeed an expensive starting point for EM.

Jan Loeys  
(1-212) 834-5874  
jan.loeys@jpmorgan.com

Shiny Kundu  
(91-22) 6157-3373  
shiny.kundu@jpmorgan.com

Jahangir Aziz  
(1-212) 834-4328  
jahangir.x.aziz@jpmorgan.com

Sin Beng Ong  
(65) 6882-1623  
sinbeng.ong@jpmorgan.com

**Global Markets Strategy**  
The Long-Term Strategist  
28 September 2018

**J.P.Morgan**

**Figure 5: EM/DM 12m trailing EPS & the corresponding Price Index Ratio**

Sept 1995 = 100, monthly



Source: J.P. Morgan, MSCI. Last obs is Aug 2018

Figure 5 does indicate that **EM outperforms when its companies produce stronger earnings growth than DM**: Over the full period since 1995, **EM earnings in USD did not grow faster than DM**. But is it not the case that in GDP terms, EM economies grow faster than DM in both real and nominal terms, in both local terms and in common currency? **Faster economic growth in a country does not mean faster earnings growth** for companies that happen to be listed there but that are frequently doing business worldwide and thus depend more on global than on domestic growth. In addition, in both EM and DM, growth comes mostly from new companies that are not yet in the large-cap indices. That is why, in the U.S., SPX EPS growth has run below nominal GDP growth over the long run. Finally, any faster growth that is due to inflation should by Purchasing Power Parity be lost through currency losses. Since 1995, EM produced the same EPS growth as DM in US\$ terms despite the fact that EM economies grew from 20% to close to 40% of world nominal GDP in USD terms.

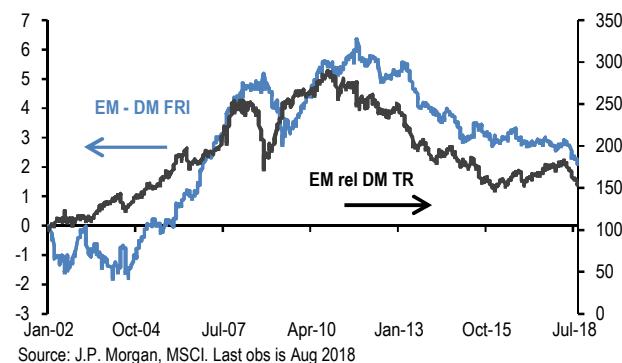
A better way to link EM performance to economic growth is in **surprise terms** as it should only be unexpected growth that drives asset price movements. Figure 6 shows the relative performance of EM vs. DM equities as well as the cumulative difference between our economic real GDP forecast changes for EM and DM. If our economists are not changing their forecasts over a certain period, then the accumulated information over that period cannot have been a surprise. The figure shows clearly that EM will outperform DM when our economists raise EM growth more than they raise DM, or lower it less, and vice versa. It is thus not the difference in growth between EM and DM that determines relative equity performance but the changes in growth expectations of one versus the other. It is only when we expect that the market will be consistently more surprised

by EM positively than by DM that we can expect EM to outperform DM over a longer period.

Some will argue here that we do not have to rely on economists' forecasts but can simply **monitor relative growth rate changes**. We tested this and could find some correlation, with the best one depicted in Figure 7 that shows year-on-year EM/DM relative growth rate changes as well as relative equity performance. Relative growth acceleration or deceleration does correlate with relative equity performance, but the fit is not as good as the one with our relative growth forecast changes.

**Figure 6: EM vs DM Forecast Revision Indices (FRI) & corresponding Total Return Index Ratio**

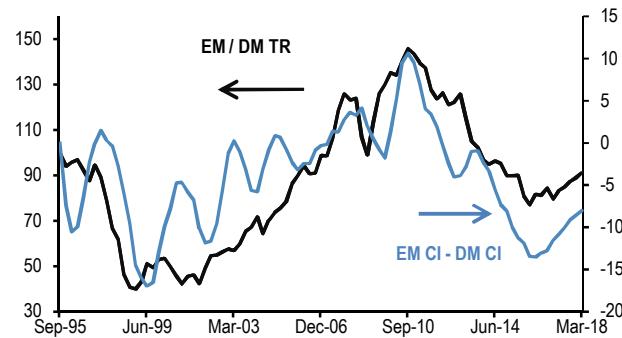
Jan 4 2002=100, weekly



**Figure 7: Change Index of Real GDP EM/ DM and corresponding Total Return Index Ratio**

Sep 1995 = 100

$C_t = C_{t-1} + (Q_t/Q_{t-4}-Q_{t-4}/Q_{t-8})^*100$ , quarterly

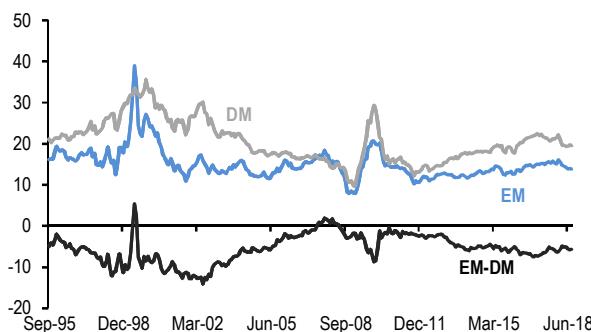


Source: J.P. Morgan. Last obs is Q1 2018 as per availability

**Relative multiple changes:** Figure 8-Figure 9 show the trailing and forward P/E multiples of EM and DM as well the difference between the two. On average, EM has lower multiples, as one would expect for a riskier asset class. This gap, reversed, is the extra risk premium on EM over DM. The 5.4 point EM multiple discount since 1995 is thus worth 1 ¾% extra IRR on EM equities. The bullish case for EM assets usually consists of arguments

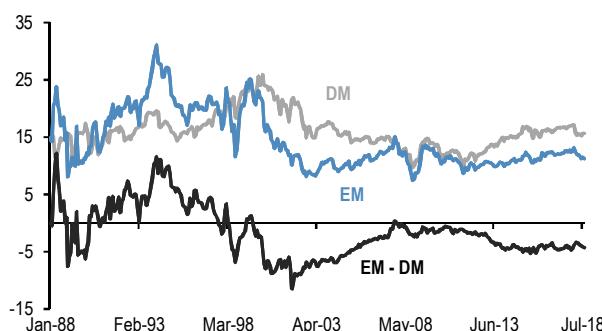
that EM grows faster and is indeed emerging and converging on DM levels of productivity, governance and policy standards. This ought to bring EM volatility and risk premia down and their multiples to converge on DM ones. Volatility has come down, but so has DM vol (discussed lower). Figure 8-Figure 9 show that multiples have not converged yet, despite clearly better EM macro policy governance since the 1990s crises (see, e.g., Aziz et al., [1990s' lessons helped EM avoid GFC crisis, Ten Years after the GFC: A Changed world](#), J.P. Morgan Perspectives, Sep 4).

**Figure 8: 12m trailing EM vs DM P/E ratios monthly**



Source: J.P. Morgan, MSCI. Last obs is Aug 2018

**Figure 9: 12m forward EM vs DM P/E ratios monthly**



Source: J.P. Morgan, IBES, MSCI. Last obs is Aug 2018

**In short**, over the full data history since 1987, EM equities have beaten DM, but much of that is due to the first few years of the EM economies and asset class entering the world economy and markets. Starting only five years later, EM performed on par with DM. The full 30-year period can best be described as a double-act of two roughly seven-year feast and famine periods, with feasts coming from steady growth upgrades and famines from downgrades. EM equities offer little in extra dividend, the same \$ earnings growth, and have so far shown no inclination for their multiples to converge on DM levels.

### Implications for future long-term performance:

Arguments to expect higher returns on any EM asset must come from any structural income/risk premium advantage (carry); value, or an advantageous entry point; or better than expected macro performance.

As to **income/carry**, at a 20bp extra dividend yield, both historically and at the moment, there is **not much from an income side to prefer either EM or DM**. Income-oriented investors, [as we are](#), should focus on high-dividend stocks in *both* EM and DM, but this is not a reason to prefer one over the other. US high-dividend stocks pay close to 4%, while EM and non-US DM pay around 5%.

As to **Value**, we need to check whether EM multiples are cheap/wide versus DM ones. Table 3 below reviews relative EM/DM valuation metrics and finds that on a *trailing* multiple basis, the EM/DM gap is only 0.06 sigma wide to its historical mean, while it is 0.59 sigma wide on a *forward* basis. The forward gap at 4.15 points below DM is similar to the 5.65 point discount on trailing earnings, but has been a lot tighter, and above DM in the first decade of global investors entering EM. The forward multiple has the advantage of a longer history, but it has not been mean reverting cleanly and has been below its 30-year mean for most of the past 20 years. At the same time, trailing is by definition backward looking.

Clearly the EM valuation/multiple discount vs. DM is a focus for investors who have seen their EM holdings underperform severely over the past seven years. As strategists, we are currently **tactically OW EM** vs. DM (see [Global Asset Allocation](#), Sep 18) on the discount in forward multiples, a belief that trade war is priced in, and the observation that after a seven-year relative bear market, the international investor is underinvested EM.

Can we expect better **macro outperformance** relative to current expectations? In particular, after just having passed the last roughly seven-year famine period, should we now not be at the start of a new seven-year feast? We know that there is significant [serial correlation in growth forecast changes](#), but this is giving us an EM underperformance signal as our economists have been downgrading DM (and upgrading the US) less than EM in recent months (see Figure 6, above). In EM's defense, though, this signal by itself is more tactical than strategic. We can see that long-lasting surprises on growth expectations are driven by structural, supply-side changes, in particular productivity, which are hard for investors to project in advance, or even to understand ex post. Macro economists are better at understanding and forecasting the demand side than the supply side. Figure

Jan Loeys  
(1-212) 834-5874  
jan.loeys@jpmorgan.com

Shiny Kundu  
(91-22) 6157-3373  
shiny.kundu@jpmorgan.com

Jahangir Aziz  
(1-212) 834-4328  
jahangir.x.aziz@jpmorgan.com

Sin Beng Ong  
(65) 6882-1623  
sinbeng.ong@jpmorgan.com

**Global Markets Strategy**  
The Long-Term Strategist  
28 September 2018

**J.P.Morgan**

10 shows that the steady upside surprises in US growth coincided with and were probably caused by the 1990s' acceleration in productivity growth, much as the post-GFC steady downside surprise on growth coincided with a slowing in productivity growth.

**Table 3: EM vs DM valuation histories**

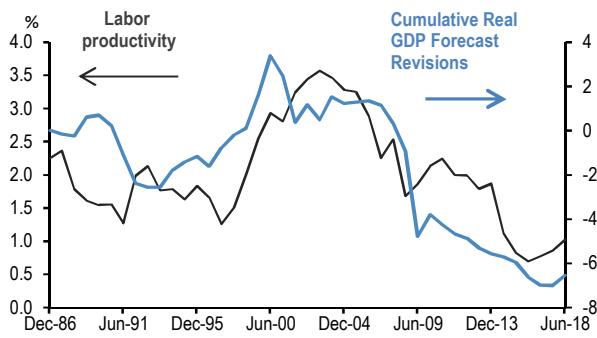
Asset Class	Average	Current	Standard Deviations from Mean	Since
EMBI HG-BBarclays HG YTM	0.96	1.01	0.08	Dec'93
EMBI HY-US DOM HY YTW	0.44	3.36	1.32	Dec'01
CEMBI HG-JULI ex EM HG YTM	0.68	0.65	-0.11	Dec'01
CEMBI HY-US DOM HY YTW	1.33	1.25	-0.04	Dec'01
GBI EM nominal yield	6.77	6.62	-0.25	Jan'04
GBI Global nominal yield	2.40	1.67	-0.88	Jan'04
GBI EM-Global nominal yield	4.37	4.95	0.88	Jan'04
GBI EM real yield	2.44	2.96	0.61	Jan'04
GBI Global real yield	1.02	0.71	-0.44	Jan'04
GBI EM-Global real yield	1.42	2.26	1.03	Jan'04
12m trailing PE EM	15.14	13.80	-0.36	Sept'1995
12m trailing PE DM	20.57	19.45	-0.22	Sept'1995
12m trailing PE EM-DM	-5.43	-5.65	-0.06	Sept'1995
12m forward PE EM	14.51	11.28	-0.64	Sept'1995
12m forward PE DM	16.03	15.62	-0.13	Jan'1988
12m forward PE EM-DM	-1.52	-4.15	-0.59	Jan'1988
EM FX real bilateral Index	115.03	106.25	-0.68	Jan'1992

Source: J.P. Morgan, MSCI. Last obs is Aug 2018.

Standard Deviation is calculated in level terms. GBI Global has 13 core DMs.

**Figure 10: US productivity growth and cumulative consensus growth forecast changes**

%, quarterly



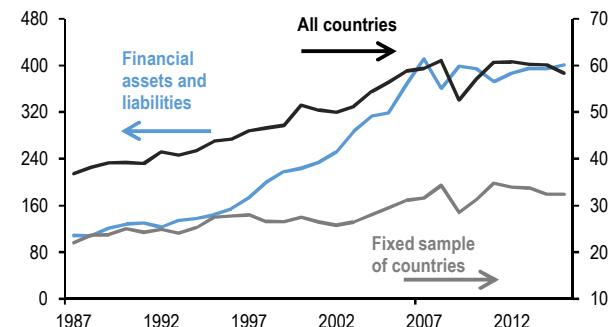
Source: J.P. Morgan. Last obs is Q2 2018

As discussed below Figure 11, a reacceleration of EM vs. DM growth will likely highly depend on renewed globalization in trade and finance, both of which peaked at the start of the decade (Figure 11), not surprisingly also the time when the current relative bear market in EM took off. Currently, we are not seeing any sign that

globalization is about to pick up again, and if anything, trade war risks point the other way.

**Figure 11: Globalization in trade and finance**

% of GDP



Source: J.P. Morgan, BIS. Last obs is 2015. The All country line is global trade to GDP. The Fixed sample line follows only the countries that existed at the start of BIS analysis (1835).

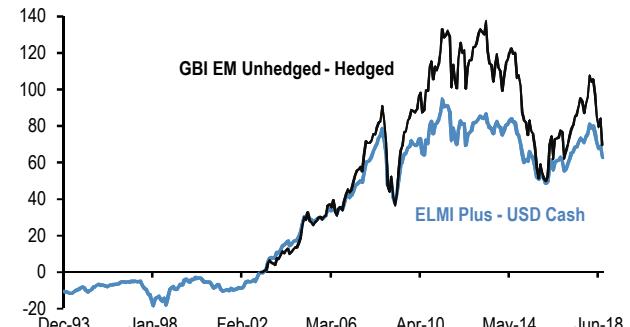
In conclusion, we see **little income, value, or macro advantage or disadvantage for EM to perform better or worse than DM equities** over a period as long as the next 10 years. Our strategic signals are neutral here.

## CURRENCIES

Figure 12 shows the cumulative return of owning **EM currency cash-like instruments**, funded in dollars (thus deducting US\$ 1-month cash) on our ELMI+ index since 1994. As an alternative measure, it also depicts since 2002 the cumulative returns on the EM currency element of our GBI-EM Global Diversified index of local EM government bonds, further reviewed in the next section. This measure of EM FX returns takes GBI-EM unhedged returns minus the same hedged in USD and thus also takes out USD funding costs.

**Figure 12: Cumulative returns of EM currencies against USD**

Dec 2002 = 100, ELMI+ minus USD cash; GBI-EM Global Diversified Unhedged in USD minus hedged into USD



Source: J.P. Morgan. Last obs is Aug 2018

Jan Loeys  
(1-212) 834-5874  
jan.loeys@jpmorgan.com

Shiny Kundu  
(91-22) 6157-3373  
shiny.kundu@jpmorgan.com

Jahangir Aziz  
(1-212) 834-4328  
jahangir.x.aziz@jpmorgan.com

Sin Beng Ong  
(65) 6882-1623  
sinbeng.ong@jpmorgan.com

Global Markets Strategy  
The Long-Term Strategist  
28 September 2018

J.P.Morgan

The chart shows that EM currencies gained against US dollar cash since inception of our ELMI+ index at the start at Dec 1993. Over that period, ELMI+ earned 5.3% p.a. in US\$ terms. Taking out the average funding cost of 2.8% in US\$ left **2.5% excess return p.a. of EM over USD cash**. During this period, the average yield on ELMI+ was 9.32%, showing that EM currencies over the period actually depreciated against the dollar, but by 2.5% less than implied by the interest rate differential (Uncovered Interest Parity, UIP). The difference between our GBI EM hedged and unhedged return, for the shorter sample since end 2002, at 2.4% p.a. produced a similar result, despite its different country composition. **ELMI+ since 1993 produced an excess return to risk of 0.34**, while the FX component of our EM local bond index **since 2002 gave us a Sharpe of 0.28**. Both are very close to the returns to risk earned on US equities, bonds, and credit over the past 90 years and thus can be considered **normal**. EM FX performance looks to have been concentrated in the 2002-06 period, which corresponded to China's emergence, the commodity boom, and the impact of the EM reforms following the Asia financial crisis. For the decade prior to 2002 and the decade since 2008, EM FX returns have been flat.

### Implications for future long-term performance

EM FX has earned over the past 25 years what can be considered a normal return to risk. This risk premium was likely there to compensate investors for the extra risk discussed on p. 2 of investing in EM instead of DM. **Can we count on this EM risk premium to still be there over the next decade?**

If all EMs have become “developed” by now, then this risk premium should have disappeared. Some EM countries have indeed emerged and have joined the DM bond and equity indices. And the overall region, especially Asia, has learned much from the 1990s’ crises and is now running more stability-oriented policies that should thus have reduced the required risk premium (Aziz et al., [1990s lessons helped EM avoid GFC crisis](#), Sep 4). However, the persistence of higher interest rates in EM than in DM tells us that the world investor does not think that the overall EM block has fully emerged by now and continues to require an extra premium on EM currencies and local assets. Current EM countries may well emerge over time, but new frontier countries will likely continue to join the investable EM asset class and thus retain the case for an EM risk premium.

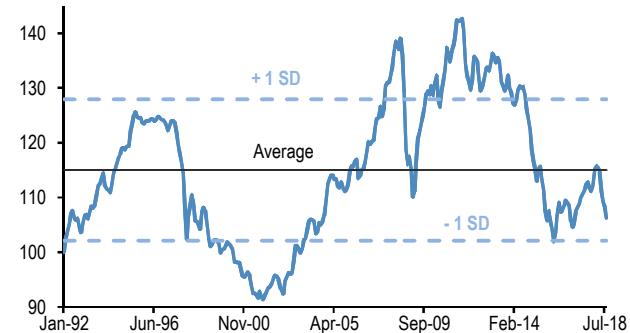
### Is there attractive long-term Value in EM FX today?

With empirical observation telling us that the main part of carry on EM FX is higher EM inflation than DM, one should inspect whether EM FX offers good entry points

today by looking at real, inflation-adjusted FX values. Figure 13 aims to do that by taking the average of 20 inflation-adjusted EM exchange rates against the US dollar. It shows slow but clean mean reversion in real EM FX, which is what we need to make a value judgement. Earlier this year, that average real EM exchange rate was close to its historical mean and thus did not offer an attractive entry point into a strategic long position. By now, with concerns about trade wars, softening growth expectations relative to the US, and idiosyncratic shocks in EM, the average real EM FX rate has cheapened 5% against the dollar and is at end August 8%, or 2/3<sup>rd</sup> sigma below its historical mean. Yes, from this long-term mean reversion point of view, **EM FX is cheap against the dollar** today and thus offers an **attractive reentry point for long-term investors**.

Figure 13: 20 country EM FX real spot index equally weighted vs USD

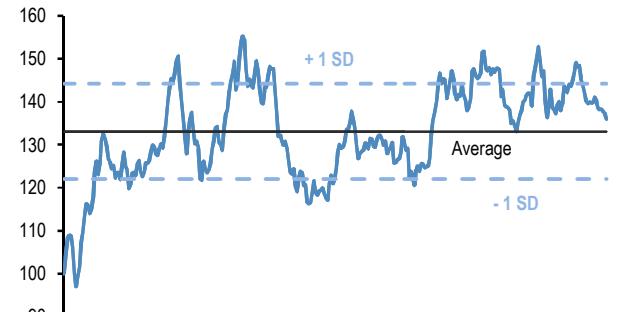
Monthly, deflated with relative PPIs.



Source: J.P. Morgan. Last obs is Aug 2018

Figure 14-Figure 15 show the same real EM FX values against the euro and yen. Against the euro, EM FX is close to average valued. Against the yen, there has been no mean reversion of EM FX because the yen itself has steadily fallen in real, inflation-adjusted terms against the dollar, making it hard to make any value argument for EM FX vs. the yen.

Figure 14: EM FX Real Bilateral Index vs Euro



Source: J.P. Morgan. Last obs is Aug 2018

Jan Loeys  
(1-212) 834-5874  
jan.loeys@jpmorgan.com

Shiny Kundu  
(91-22) 6157-3373  
shiny.kundu@jpmorgan.com

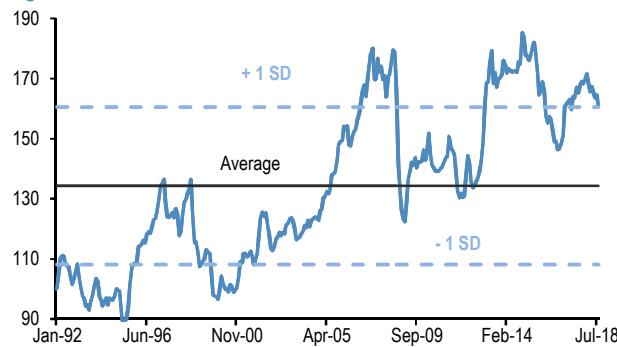
Jahangir Aziz  
(1-212) 834-4328  
jahangir.x.aziz@jpmorgan.com

Sin Beng Ong  
(65) 6882-1623  
sinbeng.ong@jpmorgan.com

**Global Markets Strategy**  
The Long-Term Strategist  
28 September 2018

**J.P.Morgan**

**Figure 15: EM FX Real Bilateral Index vs Yen**



Source: J.P. Morgan. Last obs is Aug 2018

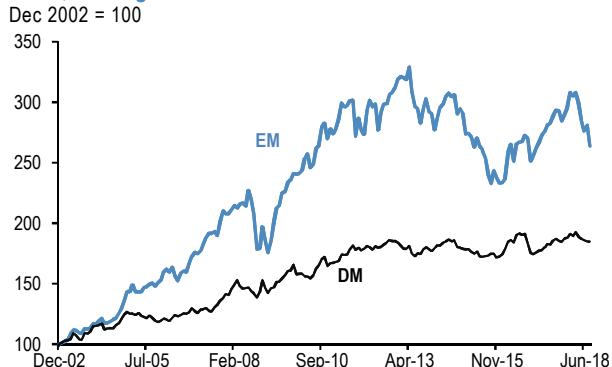
Value is very much a question of how far one looks into the future. Real FX mean reversion takes some 5-10 years, and Figure 13 does not suggest real EM FX levels are necessarily stretched or approaching an imminent turning point. For investors looking at shorter time horizons we have developed other fair value tools in [Assessing EM FX Fair Value](#), Jan 2017, Christovova et al. These standard REER models use variables such as productivity differentials, terms of trade, interest rate differentials, external balances, and growth and also show that EM FX is currently cheap. However, other stressed (FEER) valuation models that look at EM FX in an environment of capital flow stoppage do not show the same cheapness across the board (see [2018 Midyear Emerging Markets Outlook & Strategy](#), Jun 2018, Oganes & Goulden).

## BONDS

Figure 16-Figure17 show the cumulative total returns on our EM and DM government bond indices in both currency-hedged and unhedged terms in USD. Since the inception of our GBI-EM Diversified local government bond index in Dec 2002, EM local bonds have earned 6.4% p.a. in USD, on a currency unhedged basis, and 4.3% after hedging into USD. Our DM GBI earned over this period 4% both hedged and unhedged. Figure 18 shows the same as total return ratios of EM over DM bonds.

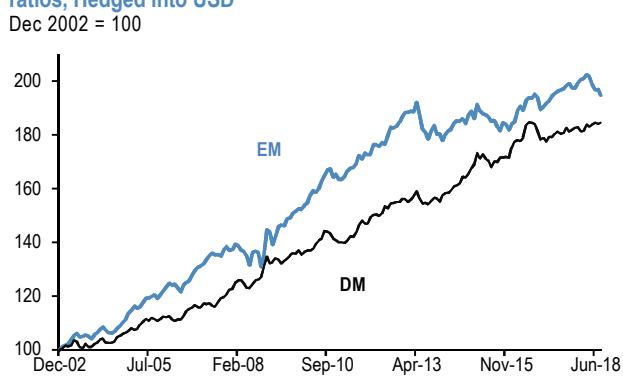
Since 2002, EM has thus beaten DM bonds by 2.4% pa, but almost all due to currency appreciation and carry, which we discussed in the *Currency* section above. **In currency-hedged terms, EM has outperformed by only 36bp pa.** As with equities, EM relative performance went through feast and famine periods, around the same time as equities. And here too, starting from a different entry period changes the results.

**Figure 16: GBI EM and DM Cumulative Total Return Indices ratios, Unhedged in USD**



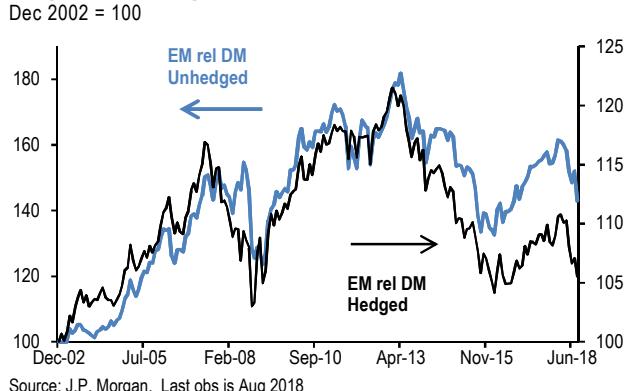
Source: J.P. Morgan. Last obs is Aug 2018  
EM: GBI-EM Global Diversified  
DM: GBI-DM Diversified rebased to Dec'02

**Figure 17: GBI EM and DM Cumulative Total Return Indices ratios, Hedged into USD**



Source: J.P. Morgan. Last obs is Aug 2018

**Figure 18: GBI EM to DM relative Total Return Indices ratios, Hedged and Unhedged**



Source: J.P. Morgan. Last obs is Aug 2018

EM local government bonds pay **higher yields** than DM ones both in nominal and real terms, using past inflation as a measure of inflation expectations (Figure 19).

The higher nominal yield reflects a higher inflation rate among most EMs. The higher *real* yield largely reflects

Jan Loeys  
(1-212) 834-5874  
jan.loeys@jpmorgan.com

Shiny Kundu  
(91-22) 6157-3373  
shiny.kundu@jpmorgan.com

Jahangir Aziz  
(1-212) 834-4328  
jahangir.x.aziz@jpmorgan.com

Sin Beng Ong  
(65) 6882-1623  
sinbeng.ong@jpmorgan.com

**Global Markets Strategy**  
The Long-Term Strategist  
28 September 2018

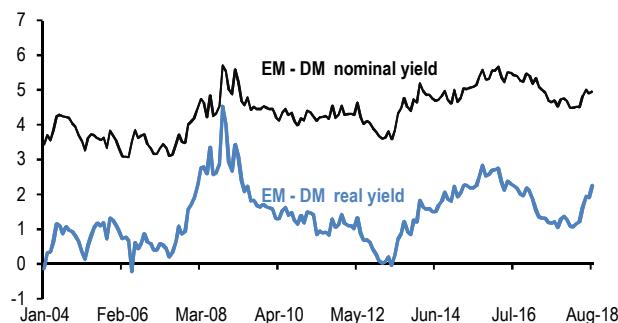
**J.P.Morgan**

higher real economic growth and risk and perhaps the perceived inability of EM to cope with higher fiscal deficits or debt loads, even as the latter are on average actually much lower than those in DM (Figure 20)

Weaker governance, past debt crises, and a reliance on foreign capital inflows are probably the reason why most EMs cannot run the same high deficits of many DMs.

**Figure 19: EM vs DM real and nominal yield**

%, Dec 1999 = 100, monthly

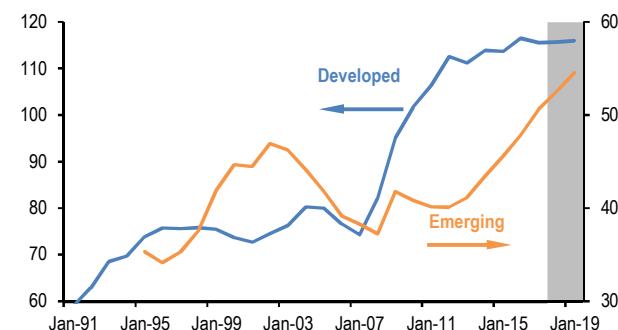


Source: J.P. Morgan. Last obs is Aug 2018.

EM is GBI EM Global Diversified while DM is GBI Global

**Figure 20: Gross debt. General government**

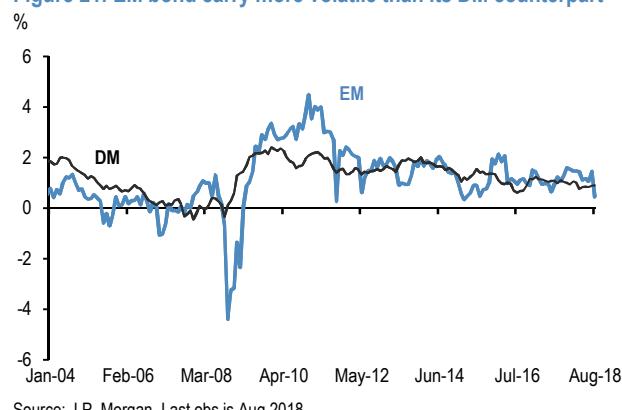
% of GDP



Source: J.P. Morgan. Last obs is June 2019, shaded areas are forecasts.

One could argue and expect that higher inflation and governance risk on EM should create a higher term premium than DM and thus steeper yield curves that global investors can harvest by strategically overweighting EM local bonds. The fact that our currency hedged EM local bond index barely beat its DM equivalent suggests that may not be the case, although that could be due to the short sample period. However, we do find, in Figure 21, that when we look at the average carry along the curve of EM bond markets, it is virtually the same at that on DM bonds, even as EM carry is clearly a lot more volatile.

**Figure 21: EM bond carry more volatile than its DM counterpart**



Source: J.P. Morgan. Last obs is Aug 2018

### Implications for future long-term performance

We have found a persistent risk premium on EM FX, due to the failure of UIP, but have **not found evidence of a higher bond term premium on EM bonds than on DM**. Hence, we see no reason to expect systematic EM outperformance on EM local bonds, aside from the currency element that cannot be gained without incurring local EM duration risk.

Is there a good **Value/Entry point today?**

Figure 19 and Table 3 earlier show that both the nominal and real yield gaps between EM and DM markets are some 1 sigma higher than their historical means, suggesting a good entry point for EM. There appears to be an uptrend in the EM/DM yield gap that could thwart mean reversion and EM outperformance, but this is probably largely due to some \$10tr in QE buying by DM central banks post the GFC. Both the real and the nominal yield gap have mean reverted quite cleanly over these 14 years and are thus meeting the most important condition to make a relative value judgement. It can be countered here that this year's rise in EM yields is driven by the 4% and 7% rise in the yields of Argentina and Turkey where inflation is now rising rapidly. However, these two countries account only for ~10bp of the 50bp rise in the index yield YTD and are thus not enough to eliminate the relative cheapness of EM local bonds.

The **EM-DM bond yield gap is thus decently above its mean** since 2004, which is not a long history, with longer term outperformance of EM local bonds hostage to DM central bank balance sheet normalization. At a 84bp wider real yield gap than its historic mean, five-year index duration for EM, and assuming no change in the relative inflation expectations, yield convergence would produce an extra 4.2% price return on EM local bonds over DM, FX hedged, or 42bp over 10 years—a decent

Jan Loeys  
(1-212) 834-5874  
jan.loeys@jpmorgan.com

Shiny Kundu  
(91-22) 6157-3373  
shiny.kundu@jpmorgan.com

Jahangir Aziz  
(1-212) 834-4328  
jahangir.x.aziz@jpmorgan.com

Sin Beng Ong  
(65) 6882-1623  
sinbeng.ong@jpmorgan.com

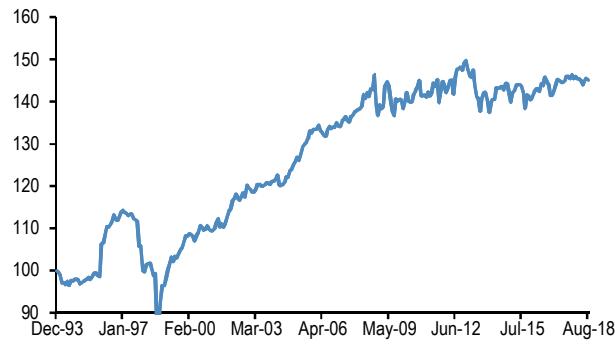
return pickup. In nominal terms, the yield gap is only 58bp wider than the mean, giving us a 10-year out 29bp return pickup, still worth it.

## CREDIT

Global investors largely access EM credit risk through bonds issued by **EM sovereigns and corporates in the US dollar bond market**. Their returns are best captured by J.P. Morgan's market leading EMBIG (sovereign) and CEMBI (corporate) indices (Gloria Kim, [J.P. Morgan Index Product Guide](#), May 10). Figure 22-Figure 25 show the total return ratios of both the high grade and high yield component of these indices relative to their US corporate bond equivalents since inception end-1993 for EM sovereigns and end-2001 for EM corporates.

**Figure 22: EMBI HG vs Bloomberg Barclays Corporate IG Total Return Index**

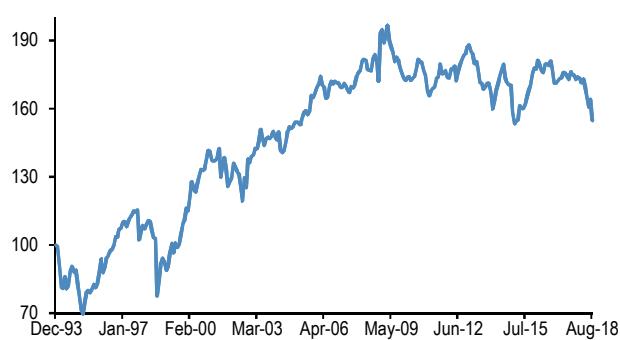
Dec 1999 = 100, monthly



Source: J.P. Morgan. Last obs is Aug 2018

**Figure 23: EMBI HY vs US Domestic HY Total Return Index**

Dec 1993 = 100, monthly



Source: J.P. Morgan. Last obs is Aug 2018

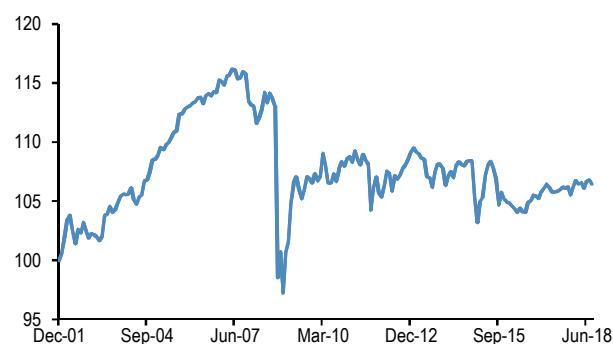
## Global Markets Strategy

The Long-Term Strategist  
28 September 2018

**J.P.Morgan**

**Figure 24: CEMBI HG vs US JULI HG Total Return Index**

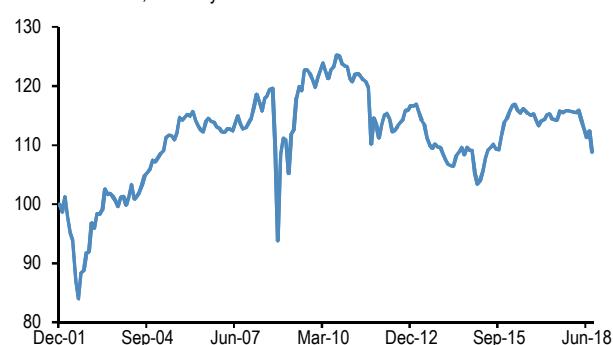
Dec 2001 = 100, monthly



Source: J.P. Morgan. JULI HG is Ex EM. Last obs is Aug 2018

**Figure 25: CEMBI HY vs US Domestic HY Total Return Index**

Dec 2001 = 100, monthly



Source: J.P. Morgan. Last obs is Aug 2018

These charts show a similar rhythm to equities with one major difference: **when EM outperforms DM, so does EM credit; but when EM equities underperform DM, EM credit performs largely on par to slightly down vs. DM**, allowing EM credit to net outperform over the EM equity feast-and-famine cycle. Credit is about downside. As long as the growth downgrades that are pulling EM equities and currencies down against DM do not worsen EM default risk too much versus DM, EM credit can hold its own vs. DM credit. The longer term EM credit outperformance signals to us that **EM credit earns a risk premium above DM credit**.

## Implications for future long-term performance

In fixed income, for one asset class to outperform over the long term, it needs to offer a yield premium that should be visible by comparing the different index yields. Figure 26-Figure 29 below show the yield histories for HG and HY EMBIG and CEMBI as well as their US corporate equivalents and the spread between them. Each has systematically offered a higher yield than their US corporate counterparts.

Jan Loeys  
(1-212) 834-5874  
jan.loeys@jpmorgan.com

Shiny Kundu  
(91-22) 6157-3373  
shiny.kundu@jpmorgan.com

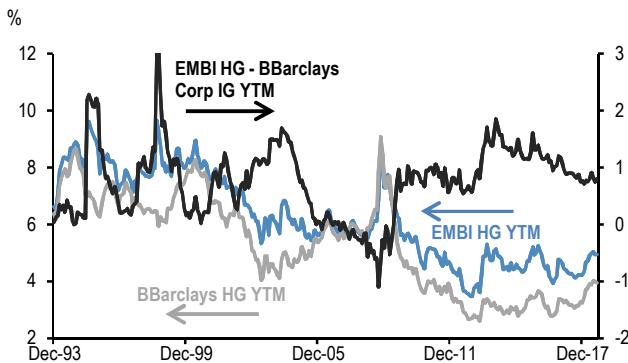
Jahangir Aziz  
(1-212) 834-4328  
jahangir.x.aziz@jpmorgan.com

Sin Beng Ong  
(65) 6882-1623  
sinbeng.ong@jpmorgan.com

**Global Markets Strategy**  
The Long-Term Strategist  
28 September 2018

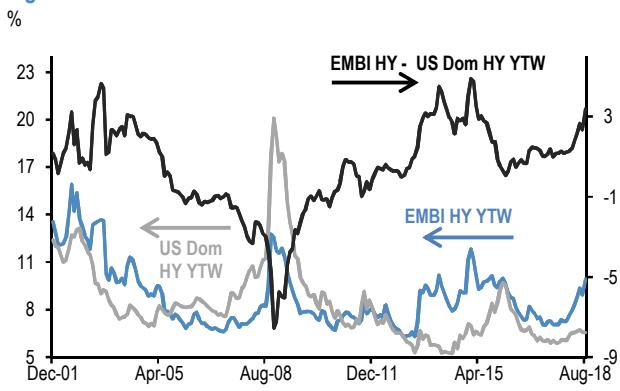
**J.P.Morgan**

**Figure 26: EMBI HG YTM vs Bloomberg Barclays Corporate IG YTM**



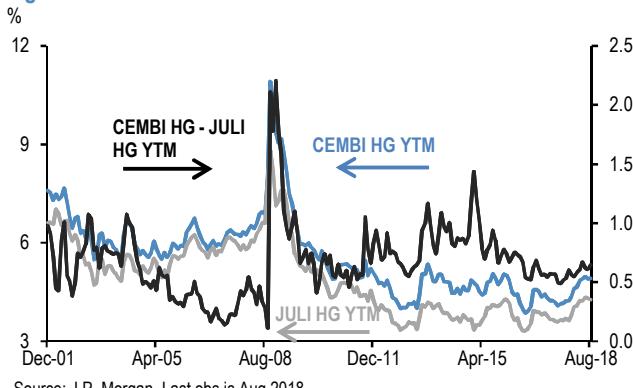
Source: J.P. Morgan. Last obs is Aug 2018

**Figure 27: EMBI HY YTW vs US Domestic HY YTW**



Source: J.P. Morgan. Last obs is Aug 2018

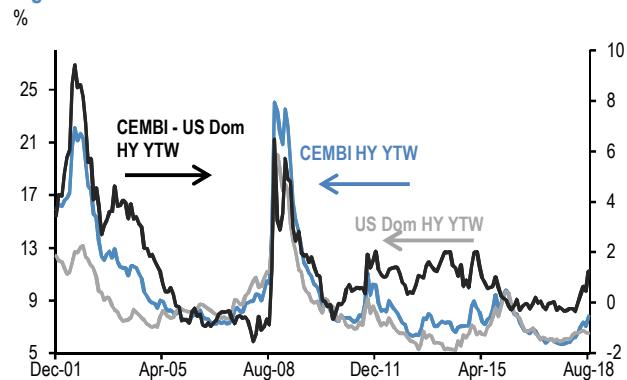
**Figure 28: CEMBI HG YTM vs US JULI HG YTM**



Source: J.P. Morgan. Last obs is Aug 2018

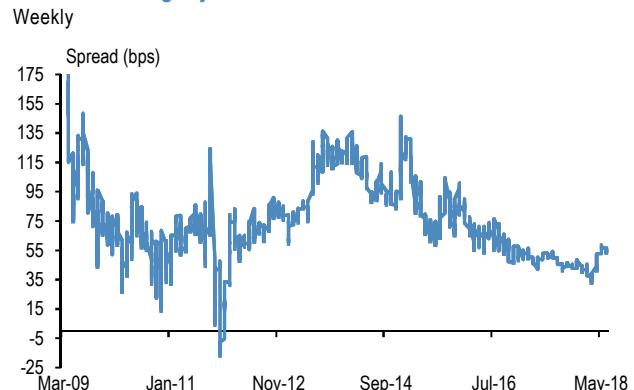
There are obvious questions about whether duration, sector, and rating differences could have caused these yield differences. To check this, our EM and Credit research team has created a yield series of HG EM corporates in our CEMBI index matched against the yield on US corporate bonds with the same duration, sector, and rating (Figure 30, [EM vs US HG Relative Value report](#)).

**Figure 29: CEMBI HY YTW vs US Domestic HY YTW**



Source: J.P. Morgan. Last obs is Aug 2018

**Figure 30: CEMBI HG vs US HG spread adjusted for duration, sector and rating adjusted**



Source: J.P. Morgan. Last obs is June 2018

This shows that **EM corporates have paid on average 75bp more than their US equivalent**, likely reflecting compensation for lower liquidity, greater uncertainty as to what can be recovered in default, and the higher costs of managing an EM bond portfolio. Currently, end investors can access EM credit quite efficiently through ETFs, but here we find that the 50bp average expense on 18 US listed EM credit ETFs exceeds easily the typical 10bp charged on US HG corporate bond ETFs.

In the case of EM corporates, the yield spread to the US is **directional**, widening out during recessions, which would be an argument for an extra risk premium, as a recession is not a time you are looking for underperformance. In the case of EM sovereigns, we are finding the reverse as the spread to US corporates comes in during a US recession, giving EMBIG good diversification value.

Why EM credit offers a more permanent risk premia to DM could be seen as an EM branch of the broader **“credit spread puzzle” phenomenon** (see [The Credit](#)

Jan Loeys  
(1-212) 834-5874  
jan.loeys@jpmorgan.com

Shiny Kundu  
(91-22) 6157-3373  
shiny.kundu@jpmorgan.com

Jahangir Aziz  
(1-212) 834-4328  
jahangir.x.aziz@jpmorgan.com

Sin Beng Ong  
(65) 6882-1623  
sinbeng.ong@jpmorgan.com

## Global Markets Strategy

The Long-Term Strategist

28 September 2018

J.P.Morgan

[Spread Puzzle](#), Amato & Remolona, 2003), where credit spreads are observed to persistently offer excess compensation beyond their experienced default risk. This may be due to the challenge markets have in assessing the probabilities of unlikely events. In DM corporates, the market is largely assessing the *ability* of a company subject to a predictable legal framework to pay. For EM sovereigns, the market also needs to assess the *willingness* of a government to pay debts it has incurred with only limited recourse of investors to the country's assets. This adds an additional credit risk assessment that markets need to make for EM countries. The persistence of long-term risk premia in EM credit vs. DM could be seen as evidence of an overestimation of this downside for EM-specific credit risk (see [Interpreting sovereign spreads](#), Remolona et al, 2007).

### Implications for future long-term performance

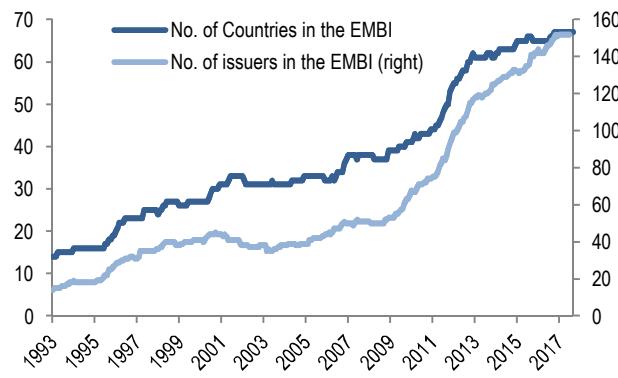
The persistent yield premium on EM HG credit over US HG corporate credit gives a good indication that over the next decade, one should expect EM HG to outperform, probably by order of magnitude 50-100bp pa.

**Value and entry points:** Table 3 above shows that the current spread of each of our four EM credit asset classes is close to its historical mean, with the exception of HY Sovereigns (EMBIG), which is over 1 sigma wide (see recent analysis for CEMBI in Steve Dulake et al., [Sifting through the EM Credit Rubble. A Perspective on EM vs DM corporate credit valuations](#), Sep 24).

Forecasting based on the long-term EM history needs to acknowledge that today's **EM credit universe is not the same as the one we knew in the 1990s and 2000s**. Here we find indeed that the composition of the market has changed dramatically. In 2009, there were 30 countries in EMBIG; by now there are nearly 70 (Figure 31), with the new entrants best described as Next Generation, or Frontier issuers. The large expansion of the EM corporate universe (Figure 32) has also seen a meaningful increase in quasi-sovereign issuers, which explains the number of issuers in the EMBIG rising from 14 to 152 currently. The ratings improvement of the index that took place for 20 years from 1994 and helped drive EM returns also looks to have started to reverse from 2015, with the percentage of HG-rated debt in the EMBIG peaking at 75% in 2015 and now down to 58%. Some of the needed adjustment for the changed composition is done because we compare HG with HG and HY with HY, but overall, it likely biases the spread to US up, though not enough to completely explain away the above historical mean yield spread, and thus keeping HY EM sovereign wide vs. US HY.

**Figure 31: Expansion of the countries and issuers in the EMBI sovereign index...**

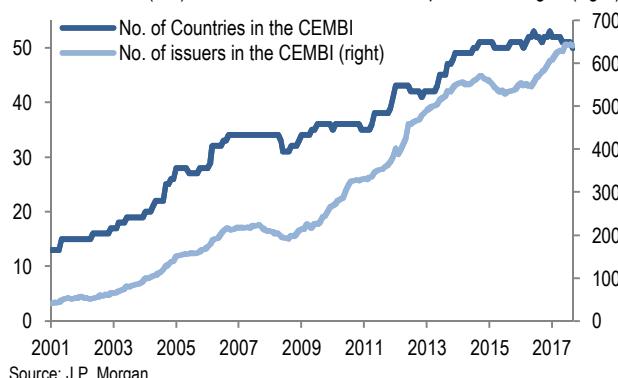
No. of countries (left) and issuers which includes quasi-sovereigns (right)



Source: J.P. Morgan.

**Figure 32: ... and expansion of the countries and issuers in the CEMBI (corporate) index**

No. of countries (left) and issuers which includes quasi-sovereigns (right)



Source: J.P. Morgan.

**Summary on long-term returns EM vs DM:** We have found no strong case for EM long-term outperformance in equities; a normal risk premium on EM FX to compensate for FX volatility, similar to the risk premia on other types of risk; a cheap entry into EM local bonds, but no persisting extra term premium over DM; a ~1/2% risk premium on EM HG credit, with EM HY sovereigns currently wide to historical averages.

### Does EM offer good diversification?

The case for higher returns on EM over DM in line with its higher economic growth thus very much depends on the asset class, with local FX and bonds giving more exposure to growth over the very long run and equities more over the short to medium term. But surely we should also look at whether exposure to EM economies through EM assets could provide risk diversification for portfolios that are largely allocated to DM. The impact on portfolio risk of adding EM assets to DM portfolios depends on how volatile EM returns are compared with DM and how correlated they are with DM. The lower

Jan Loeys  
(1-212) 834-5874  
jan.loeys@jpmorgan.com

Shiny Kundu  
(91-22) 6157-3373  
shiny.kundu@jpmorgan.com

Jahangir Aziz  
(1-212) 834-4328  
jahangir.x.aziz@jpmorgan.com

Sin Beng Ong  
(65) 6882-1623  
sinbeng.ong@jpmorgan.com

**Global Markets Strategy**  
The Long-Term Strategist  
28 September 2018

**J.P.Morgan**

EM vol is and the lower its correlation with DM, the more adding EM to DM portfolios will lower portfolio risk.

Table 4 shows the return volatility of the EM and DM asset classes discussed above over the different EM histories we have, as well as the correlation between the two. In the case of government bonds, we use the 1-10-year part on the DM side as otherwise the relative volatility will be driven by the much higher duration of DM. The table shows that **EM has had higher volatility than DM in each case**. In equities and credit, the correlations are relatively high, generally ~0.7. But they are lower in government bonds, at ~0.5, across the broad EM/DM divide, and much lower when we position EM bonds currency hedged against the US, Japanese, UK and Euro government bonds markets on their own.

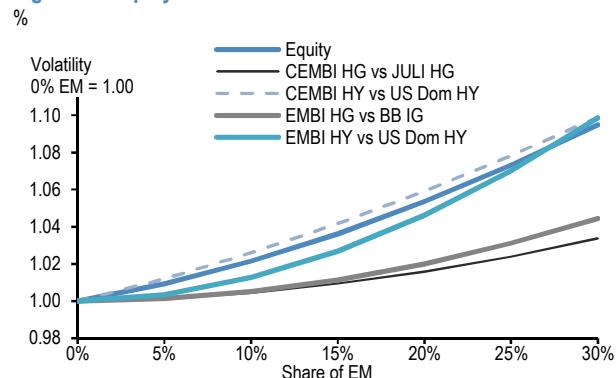
**Table 4: Volatility and Correlation of the different asset classes**

	EM Vol	DM Vol	Correlations	Since
Equity	22.93%	14.61%	0.74	Dec'87
GBI (1-10)Y vs EM Div Unhedged	11.87%	5.78%	0.54	Dec'02
GBI (1-10)Y Global vs GBI EM Div Hedged	4.32%	1.98%	0.42	Dec'02
CEMBI HG & JULI	6.83%	5.22%	0.77	Dec'01
CEMBI HY & US HY	12.68%	8.41%	0.81	Dec'01
EMBI HG & BB IG	7.50%	5.29%	0.70	Dec'93
EMBI HY & US Dom HY	13.97%	7.79%	0.57	Dec'93
GBI EM Hedged & (1-10)Y JGBs in Yen	4.34%	1.38%	0.11	Jan'03
GBI EM Hedged in Sterling & (1-10)Y UK Gilts in Sterling	4.46%	3.11%	0.39	Jan'03
GBI EM Hedged & (1-10)Y UST in USD	4.32%	3.03%	0.40	Jan'03
GBI EM Hedged & (1-10)Y EMU in Euro	4.19%	2.85%	0.36	Jan'03

Source: J.P. Morgan. Last obs is Aug 2018.

Figure 33-Figure 34 show this differently by sequentially **adding EM to DM portfolios in 5% segments**. They assume equal EM and DM returns and then measure how this changes portfolio volatility. Figure 33 shows that the high volatility of EM stocks and their relative high correlation with MSCI World means that any move into EM raises portfolio vol, although the impact is small. Adding 10% EM to a DM equity portfolio raises vol from 14.6% to 14.9%. In Credit, this is the case also for HY, though less so for HG where adding EM for 10-15% of the portfolio raises portfolio volatility only by 5bp to 5.27%.

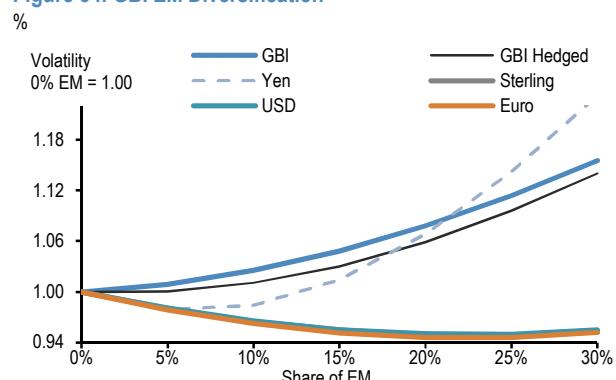
**Figure 33: Equity & Credit EM Diversification**



Source: J.P. Morgan. Last obs is Aug 2018. The vertical axis rebases DM portfolio volatility to 1.00. A 1.02 volatility level for a 10% EM allocation means that portfolio vol rises to 1.02 times that of the 0% EM allocation, pure DM portfolio.

Figure 34 looks only at domestic government bonds. Adding the overall GBI-EM asset class to our DM government bonds index, both currency hedged and unhedged raises volatility, though only slightly when currency hedged. Most investors, however, hold only domestic bonds as they have nominal liabilities in their own currency. They would thus “launch” an EM venture from their own bond market. Figure 34 shows that adding EM bonds currency-hedged to US Treasuries, UK gilts, or Japanese JGBs does significantly lower overall bond portfolio volatility, even at 20% allocations, largely due to the very low correlation with EM, shown in Table 4. In the case of JGBs, this reduced volatility reverses at over 15% EM allocation as the JGB market has so little volatility on its own.

**Figure 34: GBI EM Diversification**



Source: J.P. Morgan. Last obs is Aug 2018. The vertical axis rebases DM portfolio volatility to 1.00. A 1.02 volatility level for a 10% EM allocation means that portfolio vol rises to 1.02 times that of the 0% EM allocation, pure DM portfolio.

GBI: GBI Global (1-10)Y vs GBI-EM Global Diversified

GBI Hedged: GBI Global (1-10)Y Hedged vs GBI-EM Global Diversified Hedged

Yen: GBI EM Hedged in Yen vs GBI Japan (1-10)Y in Yen

Sterling: GBI EM Global Diversified Hedged in Sterling vs GBI UK (1-10)Y in Sterling

USD: GBI EM Global Diversified Hedged in USD vs GBI US (1-10)Y in USD

Euro: GBI EM Global Diversified Hedged in Euro vs EMU (1-10)Y in Euro

Jan Loeys  
(1-212) 834-5874  
jan.loeys@jpmorgan.com

Shiny Kundu  
(91-22) 6157-3373  
shiny.kundu@jpmorgan.com

Jahangir Aziz  
(1-212) 834-4328  
jahangir.x.aziz@jpmorgan.com

Sin Beng Ong  
(65) 6882-1623  
sinbeng.ong@jpmorgan.com

**Global Markets Strategy**  
The Long-Term Strategist  
28 September 2018

**J.P.Morgan**

## EM equities as a tactical asset class

By itself, it is hard to make a strong long-term case for DM investors to hold EM equities as the latter are more volatile and do not appear to offer stronger earnings growth to pay for the extra risk. But this same volatility does offer an opportunity and reason to hold EM for investors with a more active investment approach. That is, **an EM allocation can be a source of alpha.**

In a nutshell, the EM-DM equity return differential is both volatile and trending, as seen in Figure 12, above. Its apparent non-randomness and seven-year long trends should make it predictable. Many investors are unable to go outright short and thus have to hold some EM in order to both under- and overweight the asset class. We will show below that under not implausible assumptions on correlations, you need to have success rate of slightly below 60% on choosing the right side of EM vs. DM equities on a quarterly basis to earn a return-to-risk on trading of 0.3 to compete with simply passively holding on to a broad DM equity portfolio.

Consider a simple once-a-quarter decision to go UW or OW EM vs. DM equities, with a position size equal to P (e.g., 10% of portfolio). Your success rate in choosing the right side is S (e.g., 60%). Your trading return TR as a % of the portfolio is

$$(1) \quad TR = P * (S * |R_{EM} - R_{DM}| - (1-S) * |R_{EM} - R_{DM}|)$$

$$= P * (2S-1) * |R_{EM} - R_{DM}|$$

$R_{EM}$  is the return on EM equities that quarter in USD and  $R_{DM}$  the DM return. The vertical lines || denote absolute value. The mean of the absolute value of a random variable with normal distribution is  $\sqrt{2/\Pi} * \text{quarterly volatility}$  (i.e.,  $0.8 * \sigma q(R_{EM} - R_{DM})$ ). Your expected trading return per quarter is then

$$(2) \quad E(TRq) = P * (2S-1) * 0.8 * \sigma q(R_{EM} - R_{DM})$$

On an annual basis, you make this four times, and using annualized vol this becomes

$$(3) \quad E(TR) = 4 * P * (2S-1) * 0.8 * \sigma(R_{EM} - R_{DM}) / (\sqrt{4})$$

With a position size of 10%, a 60% success rate, and a 15.6% historic annual vol of the EM-DM return gap, the expected return to this trader becomes 50bp. This needs to be adjusted for transaction and market impact costs, which we guesstimate generously at 25bp for EM and 15bp for DM, or 40bp total. If you move from UW to OW, then you pay this  $2 * P$  each quarter, but if you stay

on the same side, then you pay nothing. Assuming half the time no change, that means your trading costs  $4 * P * 40\text{bp}$ , or 16bp. That leaves 34bp profits after transaction costs.

**Is this enough to pay for the extra risk?** Making initially the assumption that trading returns are not serially correlated, the *trading* volatility of the equity portfolio that toggles each quarter between zero and  $2 * P$  in EM will have annualized trading vol of

$$(4) \quad \text{Trading vol} = P * \sqrt{4 * \sqrt{(E(TRq^2) - (E(TRq))^2)}}$$

With a success rate of 50/50, the standard deviation of our trading return would equal the absolute gain to be made ( $0.8 * \sigma q(R_{EM} - R_{DM})$ ). With a success rate of 60/40, it is slightly lower, at 0.98 times the absolute gain, making it 1.25% trading volatility.

We now need to add this to our underlying portfolio volatility, which now has 10% in EM needed to go 10% UW EM. As Figure 33 shows, adding 10% EM equities to DM raises portfolio vol slightly (1.02 times) from 14.6% since 1988 to 14.9%.

Making the not unreasonable assumption that these trading gains and losses are not correlated to the underlying benchmark (i.e., not directional), we can then build the volatility of this active portfolio as

$$(5) \quad \text{Active portfolio vol, 10\% in EM}$$

$$= \sqrt{((\sigma(P * R_{EM} + (1-P) * R_{DM}))^2 + (P * \sqrt{4 * \sqrt{(E(TRq^2) - (E(TRq))^2)}})^2)}$$

This moves overall portfolio vol from 14.9% to 14.95%, barely noticeable.

With many models only seeing 5% on DM Equities over the next decade, or a 0.33 Sharpe, which is still at its historical mean, adding 34bp pa alpha from EM-DM trading is surely meaningful as it comes with little added overall portfolio risk. We could relax our assumptions of no serial correlation and no directionality in trading gains, but this would likely not have that much impact. Making in extremis the even more unrealistic assumption of perfect directionality and 100% correlation between trading and benchmark returns would raise overall portfolio vol from 14.9% to 16.15% and still leave the portfolio Sharpe the same as the passive DM equity portfolio. Relaxing the success rate from 60% to 55% lowers the after transaction cost returns to 9bp (25bp-16bp), requiring the manager to use cheaper forms of positioning, such as through ETFs.

Jan Loeys  
(1-212) 834-5874  
jan.loeys@jpmorgan.com

Shiny Kundu  
(91-22) 6157-3373  
shiny.kundu@jpmorgan.com

Jahangir Aziz  
(1-212) 834-4328  
jahangir.x.aziz@jpmorgan.com

Sin Beng Ong  
(65) 6882-1623  
sinbeng.ong@jpmorgan.com

**How much** should you allocate to EM to have enough to gain from tactical trading opportunities thus depends largely on one's ability to call the market relative to the transaction and management cost of moving large parts of one's AUM in and out of EM. For most of the managers we know, a quarterly 10% move in and out of EM is probably the max they can handle.

## Will tomorrow's EM be like yesterday's?

The above analysis assumes it will be and that Emerging Markets will always be emerging with mean-reverting, though stationary economic and market characteristics described by growth, risk premia, volatilities, and correlations relative to DM. If DM changes, EM comes along, but the gap is assumed to stay stationary. Some EMs will graduate to DM, but the asset class will be replenished steadily by new EMs coming from the frontier or beyond. EM stays EM.

Is that a good assumption? We see three challenges to this unchanged EM assumption coming from the rise of China, de-globalization, and the eventual opening of EM to global investors.

On the **rise of China**, its economy is now 43% of EM, virtually the same as the US's 44% share of DM GDP (Zina Sajjid, [Global convergence resumes: Updating the 2017 weights](#), Sep 18). During the 30 years up to the GFC, China's GDP averaged only 17% of EM. Should we then not accept that **tomorrow's EM will be driven more by China** and will change character? Yes. Replicating the analyses above with China instead of overall EM, we find some differences—more equity vol, lower earnings growth, less carry, less FX and bond vol, lower bond correlation—but they reinforce our preference for EM FX and bonds over equities as a way to tap EM growth.

**China's equity** market has been more volatile than the rest of EM, had lower returns and earnings growth, but lower correlation to DM. Its **currency** produced positive carry vs. USD, less than overall EM, but with much less volatility and thus a better Sharpe ratio. Chinese companies' external debt is offering the same spread over comparable US ones as the rest of EM, with the same volatility and correlations as overall EM. The measured volatility of China USD HY was much higher than overall EM due to a short-term collapse in prices during the GFC. Otherwise, Chinese HY had the same vol as the rest of EM. China's local bond market similarly performed less strongly than the rest of EM, but with significantly less vol and thus better returns to risk, and also with half the correlation to DM that overall EM had.

**Global Markets Strategy**  
The Long-Term Strategist  
28 September 2018

**J.P.Morgan**

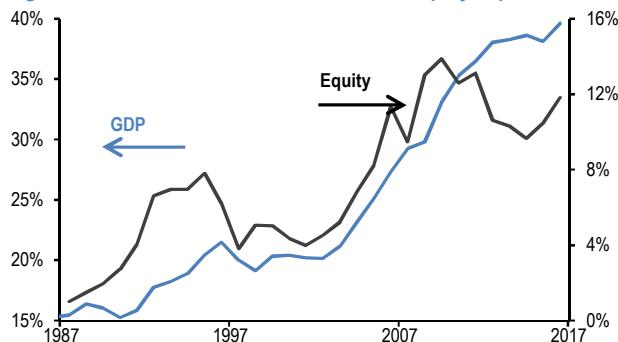
Overall, **Chinese equities perform worse and with higher vol than overall EM, but its bond markets and currency, though offering less yield and return pickup, are a lot more stable and less correlated with DM than overall EM.** Hence, EM becoming more dominated by China reinforces the case for local EM bonds and currencies as the better way to strategically harvest high EM economic growth.

As **globalization** has peaked, and EM growth depends less on trade, won't it both slow down and become more stable and less correlated to DM? Won't this improve the benefit from diversification out of DM markets? In principle, yes, as market volatility should follow fundamental volatility. Figure 11 shows the peak in globalization was about 2011. Since then, EM GDP growth volatility and its growth correlation to DM have indeed both come down dramatically. EM market volatility has fallen proportionally. However, the same has happened in DM, and the relative volatility of EM to DM has remained the same while its correlations have if anything inched up. EM has thus not yet become better diversification to DM. It is not impossible that this is simply a question of time. As globalization has peaked, and may be fading, EM growth may be even more driven by domestic forces that ought to bring down both their fundamental and financial beta and correlation with DM economies and markets.

A third challenge is the eventual **opening up of EM markets to foreign investors**, driving its share of world financial outstanding toward that of its 40% GDP weight. Figure 35 shows that as EM became a larger share of world GDP, so did their equity markets' share. Since 1990, EM doubled its share of world GDP and tripled its share in world equity capitalization, despite the recent setback.

The equity share should grow faster as EM has less than a third the DM Equitization Ratio (equity capitalization to GDP ratio). This is because a lot more companies are in private hands and thus not exchange listed yet. As EM grows, its companies will need access to larger pools of capital and will thus over time be forced into the public markets.

**Figure 35: Share of EM to Global, GDP and Equity capitalization**



Source: J.P. Morgan, MSCI.

The share of EM local bond markets in global indices is even lower, at 5% in our GBI, and has not grown as fast as the EM equity share as a variety of restrictions have limited the international access that is required to be in global bond indices. But this is changing, with all eyes on the coming entry, March next year, of Chinese local government and policy bank bonds into the Barclays Bloomberg Global Agg. As a proxy for how much local market opening can do to the EM share, our own GBI-EM Broad covers all local EM bond markets, including those not currently accessible and thus not in our GBI-EM Global. GBI-EM Broad is twice the size of GBI-EM Global (~\$2tr vs \$1tr), thus implying a doubling of the EM share if all EMs were to be equally accessible as DM markets to foreign investors.

Won't the steady rise in the EM share in global indices automatically force global investors into EM? Yes, to some extent, but not immediately and not for all. Some investors follow directly the CAPM rule of using relative market outstandings as benchmark weights. Most do not, though, and use all the standard SAA inputs—long-term returns, vols, correlations, investment objectives, liquidity needs, and base currency—to create their own EM/DM allocation.

In short, the rise of China, the end of globalization, and the steady markets opening should **stimulate DM holdings of EM most in local bond markets much more than in equities** as China's equities have been underperforming broad EM, have been more volatile, while overall EM equities have not yet de-correlated vs. DM. In contrast, China's bond markets, while not offering as much yield pickup to DM investors as the rest of EM, have offered more reliable excess returns, due to China's policy of currency stabilization. China's and broad EM local bonds are way behind in foreign access vs. equities and are thus set to gain much more as foreign access steadily improves in coming years.

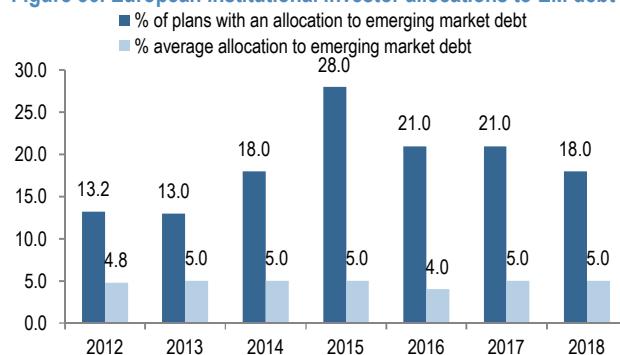
## Conclusion: How much EM?

How does one now translate these views on expected returns, risks, and correlations into an actual strategic allocation across EM and DM? In theory, we should plug these views into a quadratic optimizer to produce an efficient frontier that shows the weights that maximize returns for given levels of portfolio volatility. It is well known, though, that such results are highly sensitive to minor differences in returns and frequently lead to corner solutions (many zero weights) that do not appeal to prior concepts of diversification. It is possible to optimize only on deviations from index (Black-Litterman), but that also requires plenty of parameter estimates and assumptions.

We therefore prefer a more practical and qualitative approach that starts where most investors are currently allocated strategically on EM asset classes. We then see whether our return, value, risk, and macro arguments currently make a case for higher weightings in one of our four EM asset classes, lower weightings, or make no case either way and are thus indifferent (call this Neutral).

**How much do global investors have in EM?** We frequently hear from internationally active managers that they have generally some 5-10% in EM. Mercer's [European Asset Allocation Survey](#) shows European institutional investor allocations to EM debt of around 4-5% since 2012 (Figure 36), and anecdotal evidence suggests similar/slightly lower allocations for US institutional investors.

**Figure 36: European institutional investor allocations to EM debt**



Source: J.P. Morgan, [Mercer](#)

Starting from the truism that all assets are owned by all people, the average holdings should be simply a question of measuring how much of global outstandings are issued by EM entities. The problem here, though, is that many investors cannot freely invest abroad and many markets are not easily accessible to foreign buyers. Both these restrictions apply especially to EM countries. For this

Jan Loeys  
(1-212) 834-5874  
jan.loeys@jpmorgan.com

Shiny Kundu  
(91-22) 6157-3373  
shiny.kundu@jpmorgan.com

Jahangir Aziz  
(1-212) 834-4328  
jahangir.x.aziz@jpmorgan.com

Sin Beng Ong  
(65) 6882-1623  
sinbeng.ong@jpmorgan.com

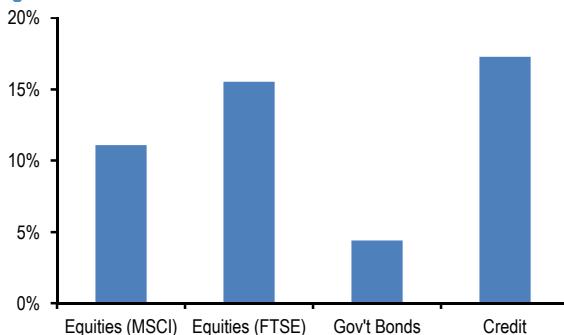
Global Markets Strategy  
The Long-Term Strategist  
28 September 2018

J.P.Morgan

reason, we have focused here mostly on globally accessible markets that are well measured by the global index providers we review in the Appendix.

Figure 37 shows that EM equities make up some 10-15% of global outstandings (MSCI and FTSE respectively); 5% of government bonds (J.P. Morgan GBI index family; and up to 17% in credit (Barclays Bloomberg bond index family). In the case of fixed income, government, and corporate bonds, these numbers are likely too high as a decent amount of them will be held by domestic investors, both as some are issued in their own currency and they are more familiar with the issuer. In the case of EM hard currency corporate bonds, we have estimated that more than half are bought by local investors ([Where in the world are EM corporate bonds?](#) YM Hong, et al., June 29).

Figure 37: Current share of EM



Source: J.P. Morgan.

Equities (MSCI): Market share of MSCI EM to Global (EM +DM) equities

Equities (FTSE): Market share of FTSE EM to Global (EM+DM) equities

Gov't Bonds: Market share of GBI EM (GBI EM Global) to Global (GBI EM Global + GBI Global) Gov't Bonds

Credit: Market share of Bloomberg Barclays EM hard currency Agg to Global Credit (IG+HY)

For EM (ex-China) local currency government bonds, international (non-domestic) investor holdings are near all-time highs at ~\$730bn (using national sources). Over the past decade, EM countries have increasingly shifted toward financing in domestic currency, propelling the growth of EM local markets and ownership by foreign investors. This rising foreign ownership of EM local bond markets has happened against a background of global asset allocations to EM debt having been fairly stable (Figure 36) as the value of global assets has risen and there may also be some reallocation from other parts of the EM debt market.

Given the many different currencies, liabilities, investment horizons, and risk tolerances that are out there, we think it best to advise EM allocations relative to a general international mean of ~10%. Given that in our mind, the EM/DM return and risk gaps depend on the

asset class, we should think of each EM % allocation as only applying to that asset class and not to the full multi-asset portfolio.

**Equities:** Over the next decade, we do not yet see a strong case for higher EM returns than in DM. There is slight cheapness in multiples and currencies, depending on how measured, but still a troublesome macro outlook given weaker globalization and no convincing sign of improved policy governance. But the high volatility of the return gap with EM does create tactical opportunities that require the active manager to have “skin in the game.” A 5-10% EM allocation thus seems reasonable.

**Local bonds and FX:** EM FX carry has offered and likely continues to offer a return to risk that is comparable with the main risk asset classes. Against the dollar, EM FX is cheap, but it is not against other currencies. EM FX is for return but costs you higher volatility. On their own, EM local bonds do not offer a risk premium versus DM as this is already captured by their currencies. EM local bonds do offer good relative value given the overvaluation of DM bonds caused by G4 QE buying. And currency-hedged EM local bonds offer good diversification against DM, especially for investors that hold at the moment only their domestic bond market. Ideally, fixed income investors hold some **5% plus of EM cash**, or short duration instruments for yield, and another **15% plus EM local bonds currency hedged** for diversification and yield convergence. Both numbers should be on the high side for euro- and yen-based bond investors given the low yield in their markets and on the lower side for dollar-based ones given higher yields in USD and much greater diversification opportunities within the USD markets, including into EM credit.

Investors who cannot currency hedge should probably hold some 10-15% in EM local debt, with the higher number for euro and yen based investors.

**Credit:** EM sovereign and corporate bonds continue to offer some 50bp risk premium vs. DM names for the same rating, sector, and maturity. They are relatively fairly valued at the moment. Diversification comes largely from the EM sovereigns. 15% plus allocations within a credit portfolio make sense.

Jan Loeys  
(1-212) 834-5874  
jan.loeys@jpmorgan.com

Shiny Kundu  
(91-22) 6157-3373  
shiny.kundu@jpmorgan.com

Jahangir Aziz  
(1-212) 834-4328  
jahangir.x.aziz@jpmorgan.com

Sin Beng Ong  
(65) 6882-1623  
sinbeng.ong@jpmorgan.com

**Global Markets Strategy**  
The Long-Term Strategist  
28 September 2018

**J.P.Morgan**

## Appendix I: What is an EM?

The **IMF's** World Economic Outlook (WEO) uses (1) per capita income level, (2) export diversification, and (3) the degree of integration into the global financial system to divide the world into advanced economies vs. emerging market and developing economies. This makes 31 out of 194 countries developed.

The **United Nations** Development Program (UNDP)'s Country Classification System divides the world into developed and developing countries based on the 75th percentile in its Human Development Index (HDI) distribution. HDI is based on life expectancy, education, and income.

The **World Bank** uses a development threshold of \$6,000 GNI per capita to divide the world into high-income vs low- and middle-income countries. In 2010, 26% of the world was developed. EM index providers generally start from the World Bank's GNI per capita measure to classify a country as EM or DM.

Below we show describe concisely how the main index providers in equities and fixed income define what is an Emerging Market, with links to more detailed descriptions.

		<b>MSCI</b>	<b>FTSE Russell</b>
<b>Income Level</b>	DM must have GNI per capita 25% above of the World Bank high income threshold—\$12,056 in 2017—for three consecutive years.		FTSE Quality of Markets Assessment Matrix takes World Bank GNI per capita rating 2015 as income criterion.
<b>Market Criteria</b>	<b>Market Accessibility Criteria:</b> openness to foreign ownership, ease of capital inflows/outflows, efficiency of operational framework, competitive landscape, and stability of the institutional framework.		<b>FTSE Quality of Markets Assessment Matrix</b> takes credit worthiness, market & regulatory environment, custody & settlement, dealing landscape & derivatives as other market eligibility criteria.
<b>References</b>	<a href="#">MSCI Market Classification</a> <a href="#">MSCI Market Classification Framework - May 2018</a> <a href="#">World Bank Country and Lending Groups</a>		<a href="#">FTSE Country Classification</a> <a href="#">FTSE Country Classification - March 2018</a> <a href="#">FTSE Country Classification Process</a>
<b>List of DM</b>	Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, , Singapore, Spain, Sweden, Switzerland, UK, US.		Australia, Austria, Belgium/Luxembourg, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Poland, Portugal, Singapore, South Korea, Spain, Sweden, Switzerland, UK, USA.
<b>List of EM</b>	Brazil, Chile, China, Colombia, Czech Republic, Egypt, Greece, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Pakistan, Peru, Philippines, Poland, Qatar, Russia, South Africa, Taiwan, Thailand, Turkey, United Arab Emirates.		<b>Advanced Emerging:</b> Brazil, Czech Republic, Greece, Hungary, Malaysia, Mexico, South Africa, Taiwan, Thailand, Turkey.  <b>Secondary Emerging:</b> Chile, China, Colombia, Egypt, India, Indonesia, Pakistan, Peru, Philippines, Qatar, Russia, UAE, Kuwait, Saudi Arabia
<b>List of FM</b>	Argentina, Bahrain, Bangladesh, Croatia, Estonia, Jordan, Kazakhstan, Kenya, Kuwait, Lebanon, Lithuania, Mauritius, Morocco, Nigeria, Oman, Romania, Serbia, Slovenia, Sri Lanka, Tunisia, Vietnam, WAEMU.		Argentina, Bahrain, Bangladesh, Botswana, Bulgaria, Côte d'Ivoire, Croatia, Cyprus, Estonia, Ghana, Jordan, Kazakhstan, Kenya, Latvia, Lithuania, Macedonia, Malta, Mauritius, Morocco, Nigeria, Oman, Palestine, Romania, Serbia, Slovakia, Slovenia, Sri Lanka, Tunisia, Vietnam.

Jan Loeys  
(1-212) 834-5874  
jan.loeys@jpmorgan.com

Jahangir Aziz  
(1-212) 834-4328  
jahangir.x.aziz@jpmorgan.com

**Global Markets Strategy**  
The Long-Term Strategist  
28 September 2018

Shiny Kundu  
(91-22) 6157-3373  
shiny.kundu@jpmorgan.com

Sin Beng Ong  
(65) 6882-1623  
sinbeng.ong@jpmorgan.com

**J.P.Morgan**

	<b>J.P. Morgan</b>	<b>Bloomberg Barclays</b>
<b>Income Level &amp; Credit</b>	EM has GNI per capita below the Index Income Ceiling (IIC) for three consecutive years, or from Jan 31, 2019, a \$ exchange rate that is over 2/3rds undervalued vs. PPP (only EMBI). As of January 2018, the IIC is \$18,769. GBI-DM has GNI per capita above the Index Income Ceiling (IIC) for three consecutive years plus satisfies any of the following: country rated A-/A3/A- or above for three consecutive years; or local currency government debt size of a country above the JPM defined Index Debt Ceiling (IDC) for three consecutive years for GBI-DM.	EM meets one of the following two criteria: World Bank Income group classification of low/middle income OR International Monetary Fund (IMF) classification as a non-advanced country.
<b>Market Criteria</b>	<b>Liquidity Criteria:</b> EMBI+: must pass a series of liquidity tests, EMBI Global, EMBI Diversified GBI Global: Daily available pricing from a third-party valuation vendor.	<b>Investability:</b> EM also includes high-income countries that investors classify as EM due to capital controls and/or geographic considerations.
<b>References</b>	<a href="#">EMBI Global and EMBI Diversified: Rules and Methodology</a> <a href="#">Government Bond Index - Emerging Markets Family of Indices</a> <a href="#">J.P. Morgan Index Product Guide 2018</a>	<a href="#">Bloomberg Barclays Index Methodology</a> <a href="#">EM Local Currency Government + China Index</a> <a href="#">Emerging Markets USD Aggregate Bond Index</a> <a href="#">EM Local Currency Government + China 10% Capped Index</a> <a href="#">Emerging Market Local Currency Sovereign Bond Index</a>
<b>List of DM</b>	<b>GBI-DM:</b> Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Israel, Italy, Japan, Korea, Netherlands, New Zealand, Portugal, Singapore, Spain, Sweden, United Kingdom, United States.	<b>DM Sovereign Bond Composite:</b> Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Hong Kong, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Slovenia, Slovakia, Singapore, Spain, United Kingdom, United States.
<b>List of EM</b>	All others.	All others. No list provided here as countries depend on the index used (local, external, corporate, sovereign) with sometimes bonds issued by DM subsidiaries of EM based countries.

Jan Loeys  
(1-212) 834-5874  
jan.loeys@jpmorgan.com

Jahangir Aziz  
(1-212) 834-4328  
jahangir.x.aziz@jpmorgan.com

**Global Markets Strategy**  
The Long-Term Strategist  
28 September 2018

Shiny Kundu  
(91-22) 6157-3373  
shiny.kundu@jpmorgan.com

Sin Beng Ong  
(65) 6882-1623  
sinbeng.ong@jpmorgan.com

**J.P.Morgan**

## Appendix II: Country weights in EM Indices

Country	MSCI Emerging Markets	GBI EM Global Diversified	EMBI Global Diversified	CEMBI Broad Diversified	Country	MSCI Emerging Markets	GBI EM Global Diversified	EMBI Global Diversified	CEMBI Broad Diversified
	MSCI EM	GBI EM	EMBI	CEMBI		MSCI EM	GBI EM	EMBI	CEMBI
China	30.94	-	4.45	8.27	Latvia	-	-	0.13	0.07
Korea	14.76	-	-	-	Macau	-	-	-	2.14
Taiwan	12.25	-	-	-	Mongolia	-	-	0.67	0.09
India	9.32	-	0.95	4.59	Morocco	-	-	0.44	0.64
South Africa	6.26	-	2.76	2.81	Nigeria	-	-	1.50	1.11
Brazil	5.79	9.97	3.16	6.17	Oman	-	-	2.67	0.68
Russia	3.38	7.67	3.53	4.96	Panama	-	-	2.88	1.05
Mexico	3.11	9.91	5.14	5.14	Paraguay	-	-	0.66	0.07
Malaysia	2.48	5.77	2.59	1.62	Saudi Arabia	-	-	-	1.66
Thailand	2.41	8.34	-	2.10	Singapore	-	-	-	3.12
Indonesia	1.99	9.26	4.28	2.45	Taiwan PoC	-	-	-	0.42
Poland	1.24	9.64	2.09	0.22	Tanzania Unit Rep.	-	-	-	0.13
Chile	1.07	2.64	2.76	4.25	Ukraine	-	-	2.56	0.96
Philippines	1.05	0.29	3.26	1.97	United Arab Emirates	-	-	-	4.59
Qatar	0.94	-	-	3.01	Zambia	-	-	0.40	1.30
UAE	0.67	-	-	-	Angola	-	-	1.03	-
Turkey	0.51	4.02	3.44	3.89	Armenia	-	-	0.20	-
Colombia	0.46	7.41	2.98	4.37	Azerbaijan	-	-	1.17	-
Peru	0.40	3.07	2.84	3.75	Belize	-	-	0.06	-
Hungary	0.29	4.75	2.71	-	Bolivia	-	-	0.37	-
Greece	0.28	-	-	-	Cameroon	-	-	0.15	-
Czech Republic	0.19	4.79	-	0.07	Costa Rica	-	-	1.08	-
Egypt	0.14	-	2.57	0.36	Cote D'Ivoire	-	-	0.82	-
Pakistan	0.06	-	1.14	-	Croatia	-	-	1.63	-
Argentina	-	0.61	2.98	3.07	Ecuador	-	-	2.65	-
Dominican Republic	-	0.10	2.64	0.07	Ethiopia	-	-	0.19	-
Romania	-	2.94	1.34	-	Gabon	-	-	0.40	-
S. Africa	-	8.57	-	-	Honduras	-	-	0.34	-
Uruguay	-	0.25	-	-	Kenya	-	-	0.74	-
Bahrain	-	-	-	0.29	Lebanon	-	-	2.28	-
Barbados	-	-	-	0.07	Lithuania	-	-	0.98	-
Belarus	-	-	0.39	0.08	Mozambique	-	-	0.11	-
El Salvador	-	-	1.13	0.22	Namibia	-	-	0.23	-
Georgia	-	-	0.20	0.14	Senegal	-	-	0.46	-
Ghana	-	-	0.79	0.38	Serbia	-	-	0.71	-
Guatemala	-	-	0.49	0.55	Slovak Republic	-	-	0.30	-
Hong Kong	-	-	-	4.94	Sri Lanka	-	-	2.00	-
Iraq	-	-	0.68	0.16	Suriname	-	-	0.11	-
Israel	-	-	-	4.18	Tajikistan	-	-	0.09	-
Jamaica	-	-	1.06	0.94	Trinidad And Tobago	-	-	0.39	-
Jordan	-	-	0.55	0.11	Tunisia	-	-	0.17	-
Kazakhstan	-	-	2.82	0.72	Uruguay	-	-	2.48	-
Korea Rep.	-	-	-	4.49	Venezuela	-	-	0.92	-
Kuwait	-	-	-	1.56	Vietnam	-	-	0.34	-
					<b>Sum</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>

Source: J.P. Morgan.



# Equities

## The Long-Term Strategist

### Strategic country scorecard

- We have recently written about a number of long-term signals for country equity selection, including valuations, demographics, growth, regulation, governance, and climate.
- In this note, we bring these signals together to broadly assess the long-term prospects of the world's largest equity markets.
- As we have discussed, the Anglosphere outside the US – Australia, Canada, Ireland, New Zealand, and the UK – appears quite attractive from the longer-term perspective.
- They are quite attractively priced, even though they have among the most favorable demographic trajectories supported by high-skilled immigration, relatively liberal regulatory environments, well-funded pensions, relative insulation from climate risks, and solid long-term growth outlooks.
- The Nordics are reasonably attractive in many of the same respects as the Anglosphere ex-US, but generally to a lesser degree.
- The US shares a relatively strong long-term demographic and economic outlook, but its expensiveness is a clear negative long-term signal. Some measures of governance have also deteriorated in recent years, the combination of which has typically foreshadowed long-term underperformance.
- Japan and much of DM Europe are at the forefront of population aging and working-age depopulation, and have more vulnerable pension systems and more restrictive regulation. These weaknesses likely offset their valuation advantage versus the US.
- China has a very weak demographic outlook, facing rapid population aging and working-age depopulation. It has a restrictive regulatory environment and has pursued forceful antitrust policies at the expense of corporates.
- EM ex-China countries are quite varied, but some of the largest markets also share a very weak demographic outlook. While other large markets have more favorable demographics, those same markets are among the most exposed to extreme climate risk that does not appear to be priced in.

#### Long-term Strategy

Alexander Wise <sup>AC</sup>

(1-212) 622-6205

alexander.c.wise@jpmchase.com

Jan Loeys

(1-917) 602-9440

jan.loeys@jpmorgan.com

J.P. Morgan Securities LLC

In recent months, we have written at length about a selection of long-term signals of equity market performance, including valuations, demographics and growth. In our preceding analysis, we have argued that each of these signals has value to the long-term investor when considering which countries to invest in. In this note, we synthesize this research and assess what these signals jointly tell us about the long-term prospects of the world's largest equity markets.

The key results of our preceding research on long-term country signals can be summarized briefly as follows:

1. Valuations are an important long-term signal in DM, with higher valuations a more bearish signal. The relationship is unclear in EM.
2. Higher long-term growth typically comes with higher long-term equity returns in DM. Evidence for an effect is mixed in EM.
3. Population aging and rising old-age dependency reduce long-term equity returns.
4. Immigration slows population aging and raises long-term growth, with the largest effects due to high-skilled immigration.
5. Less restrictive regulation is associated with higher long-term growth and equity returns.
6. Deterioration of democratic governance is generally followed by lower long-term equity returns.

We also hypothesized that exposure to climate risk and the sustainability of pension systems will be important differentiators between countries in the long term. As climate change is unprecedented, it is difficult to empirically assess any possible relationship with long-term equity returns, but we believe that the increasing frequency and intensity of extreme climate is making it macroeconomically consequential, and that the downside risk is only now starting to be priced in.

Similarly, given we are just now at the start of widespread working-age depopulation, we have not yet seen pension systems subjected to severe stresses of the magnitude that can be expected in the near future. In our view, this seems to us to be an inevitability for countries with underfunded or PAYG pension systems that will seriously constrain governments in the not-too-distant future, jeopardizing their ability to make productive investments and act as the 'insurer of last resort' during times of crisis. Pensions may also increasingly be moving into a decumulation phase, which could weigh on asset prices, particularly in countries with the most pronounced demographic weakness due to the typical home bias of investors.

Below, we compare the world's largest equity markets using a selection of long-term signals based on our earlier analysis.

Some of the smaller markets that are similar to other markets in important respects are combined into groups – the Anglo-sphere ex-US<sup>1</sup>, the Nordics<sup>2</sup>, the remainder of DM Europe<sup>3</sup>, and EM ex-China<sup>4</sup>. The long-term signals that we use are reported in Table 1. For further discussion of these signals, see the research notes cited above or in the library in the appendix of this note.

Table 1: Long-term signals

	Metric
Valuation	CAPE
Working age population	Growth of 20-64 (2025-2035)
Population aging	Increase in 65+ share (2025-2035)
Immigration	Net migration rate (2025-2035)
Regulation	Economic Freedom of the World
Pension systems	Pension sustainability (Mercer)
Climate	ND-GAIN Vulnerability
Growth	Long-term growth forecast
Democratic governance	Freedom in the World

Source: J.P. Morgan.

Table 2 shows how our long-term signals compare across countries. Each entry is a z-score for the country or group of countries among the full set of countries considered. The sign of the score is chosen such that a positive number is a more favorable long-term signal. Scores for groups of countries are either the unweighted average of the member countries, or the equity capitalization-weighted average.<sup>5</sup> The final row reports the simple average of the z-scores for each country or group. The weighted and unweighted scores generally offer a similar impression, with the most notable difference observed for EM ex-China, which we will discuss below.

Starting with broad impressions, one clear takeaway is that the Anglosphere outside the US – Australia, Canada, Ireland, New Zealand, and the UK – appears quite attractive from the longer-term perspective. This is an argument for which we have steadily found more support in our recent analysis.

These countries generally benefit from many of the same fundamental strengths as the US, but without the expensiveness of the US market. They have among the most favorable demographic trajectories supported by high-skilled immigration, relatively liberal regulatory environments, well-funded pensions, relative insulation from climate risks, and solid long-term growth outlooks.

1. Australia, Canada, Ireland, New Zealand, UK.

2. Denmark, Finland, Norway, Sweden.

3. France, Germany, Italy, Netherlands, Spain, Switzerland.

4. Brazil, India, Indonesia, Malaysia, Mexico, Saudi Arabia, South Africa, South Korea, Taiwan, Thailand, UAE.

5. The weights are based on market shares in MSCI World and MSCI EM indices as of March 7, 2025.

From a long-term perspective, we see the Nordics as the next most attractive after the Anglosphere ex-US. They are reasonably attractive in many of the same respects as the Anglosphere ex-US, but generally to a lesser degree. On this evidence, we believe a small long-term tilt towards Nordic equities would be reasonable, though these markets are collectively quite a bit smaller than those of the Anglosphere ex-US, at ~2% of MSCI World versus ~9%.

The US has both some important strengths and weaknesses. Like other countries in the Anglosphere, the US has relatively strong demographics, in addition to liberal regulation. However, valuation has repeatedly proven to be an important signal of future long-term returns and is clearly a negative signal for the US. Relative to those countries, the US also has a weaker pension system that depends substantially on Social Security – which is expected to exhaust its trust fund in the [early 2030s](#) – particularly given [nearly 45%](#) of Americans aged 55-64 had no private retirement savings as of 2022. This remains a challenge to be managed while public debt remains on a steady and steep upward trend from already elevated levels. Another bearish signal that we first wrote about nearly four years ago is the assessed deterioration in [democratic](#)

[governance](#) in recent years – measured by Freedom House's *Freedom in the World* index – which we showed typically presaged weaker long-term equity returns. This finding was consistent with other [research](#) that argues that improved democratic governance raises long-term growth. Another line of [research](#) has shown that populist government reduces long-term economic growth and raises macroeconomic instability, and the *Varieties of Democracy* [populism index](#) indicates that populism has increased appreciably in the US since the GFC, though many other countries have also seen increases to some degree in recent years.

Japan and the remainder of DM Europe also have some important structural weaknesses. They are at the forefront of [working-age depopulation](#), which suggests they are likely to see shrinking labor supplies over the coming decade. Relatedly, DM Europe is expected to age very rapidly over the coming decade, and Japan has already aged substantially. As well as affecting labor supply, our analysis shows that these changes are also consistent with less innovation and slower labor productivity growth. Labor supply contraction and relatively slow labor productivity growth point clearly to a weak long-

Table 2: Cross-country comparison of long-term signals

Z-scores among analyzed countries. Averages across countries, either unweighted or capitalization-weighted. Green is a more positive signal; red is a less positive signal. NA indicates limited signal value. Valuations as at 3/31/2025, using Q4/2024 CPI as latest in CAPE calculation.

	US	Anglo ex-US	Nordics	DM Europe	Japan	China	EM ex-China
Valuation	-2.7	0.1	0.4	0.1	0.0	NA	NA
Working age population	0.3	0.5	-0.1	-0.9	-1.1	-0.8	0.4
Population aging	0.5	0.3	0.5	-0.5	0.6	-1.9	0.0
Immigration	0.7	1.4	0.3	0.0	-0.6	-1.2	-0.6
Regulation	1.6	1.1	0.5	0.1	0.7	-1.8	-0.8
Pension systems	0.2	0.5	0.9	-0.2	-0.2	-0.7	-0.4
Climate	0.8	0.8	0.6	0.7	-0.4	-0.3	-1.1
Growth	0.8	0.9	-0.3	-0.4	-1.6	NA	NA
Democratic governance	0.1	0.6	0.6	0.6	0.6	-2.4	-0.7
<b>Average</b>	0.2	0.7	0.4	-0.1	-0.2	-1.3	-0.4

#### Weighted (market capitalization)

	US	Anglo ex-US	Nordics	DM Europe	Japan	China	EM ex-China
Valuation	-2.7	0.5	0.1	0.0	0.0	NA	NA
Working age population	0.3	0.4	0.0	-0.8	-1.1	-0.8	-0.1
Population aging	0.5	0.4	0.6	-0.4	0.6	-1.9	-0.6
Immigration	0.7	1.7	0.5	0.0	-0.6	-1.2	-1.0
Regulation	1.6	0.8	0.4	0.3	0.7	-1.8	-0.6
Pension systems	0.2	0.7	1.2	0.0	-0.2	-0.7	-0.4
Climate	0.8	1.0	0.3	0.9	-0.4	-0.3	-1.3
Growth	0.8	0.6	-0.5	-0.3	-1.6	NA	NA
Democratic governance	0.1	0.6	0.6	0.6	0.6	-2.4	0.0
<b>Average</b>	0.2	0.8	0.4	0.0	-0.2	-1.3	-0.6

Source: J.P. Morgan, MSCI, Refinitiv, UN, Fraser Institute, Gwartney, Lawson and Murphy (2024), Mercer CFA Institute, ND-GAIN, Freedom House.

term growth outlook. The burden of these demographic changes will likely be exacerbated for many by underfunded or PAYG pension systems, which will likely demand greater government support and crowd out other necessary investments. Relative to the Anglosphere, they also generally have more restrictive regulation, which typically lowers long-term growth and equity returns.

While we continue to assess their signaling value, we have previously shown that valuations and long-term growth have not been effective long-term cross-country signals in their own right for EM. Hence, we omit these signals from Table 2 for these countries. We believe that the other factors should have effects on long-term equity returns over and above their pure growth effects, and thus warrant examination even if long-term growth does not turn out to be very significant in and of itself.

Long-term signals appear quite concerning for the performance of Chinese equities in the coming decade. Growth in the elderly share of its population over the next decade is expected to be close to, if not the fastest ever observed in any country over a ten-year period. At the same time, China's working-age population is expected to shrink quite quickly, ultimately contracting by an expected ~70% by 2100. Natural demographic change is likely to be exacerbated slightly by net emigration over the coming decade, and there is a risk that this will be concentrated among the highly educated and skilled due to their greater mobility. The pension system appears to be vulnerable to the resulting substantial increase in old-age dependency, posing a serious challenge to be managed by the government. Further, the very high private savings rate – likely due at least in part to weakness in the pension system – is an obstacle to achieving consumption-led growth. Even compared with other large EM countries, the regulatory environment is assessed as restrictive by the Fraser Institute – which produces the *Economic Freedom of the World* index – inhibiting growth of the private sector companies that an investor owns. As seen in recent years, forceful antitrust and regulatory action also remains a serious risk for the long-term investor. Climate is also an appreciable long-term risk, albeit to a lesser degree than in much of the rest of EM.

Unsurprisingly, the picture is quite nuanced when it comes to EM ex-China. To start, there is a noticeable difference between the demographics scores of EM ex-China when considered in capitalization-weighted and unweighted terms. Given fertility rates typically decline as development increases, one might have expected that demographics would be relatively favorable in EM as less-developed countries. This is indeed the case for most EM countries, but the demographic trajectory is very weak in some of the largest equity markets

in the asset class, particularly Taiwan and South Korea, which account for nearly 40% of the market capitalization of MSCI EM ex-China. As a consequence, when considered in capitalization-weighted terms, the demographics scores for EM ex-China are *weaker* than those for the Anglosphere and Nordics. While the picture is quite varied, many EM countries (outside the Gulf States) also appear quite vulnerable to “brain drain.”

While a number of EM countries do have quite favorable demographics, many of those same countries are among the most exposed to extreme climate risk. India, for instance, is one of the most vulnerable countries outside of Sub-Saharan Africa based on the ND-GAIN index, and accounts for about another quarter of MSCI EM ex-China. Other EM countries in Southeast Asia and the Middle East are also more vulnerable than almost every DM country. In our analysis of extreme climate risk, we saw no clear evidence that this downside risk is priced into EM equities.

Finally, EM appears to be particularly susceptible to any geo-economic fragmentation, which seems to be a distinct possibility at this juncture, even if it ultimately turns out to be quite marginal. Indeed, very recent academic research provides empirical evidence that the most severe adverse effects are felt by EM countries.<sup>6</sup> All considered, EM ex-China equities thus do not appear to be a panacea to some of the structural challenges facing many DM equity markets.

---

6. Jesus Fernandez-Villaverde, Tomohide Mineyama and Dongho Song, Are We Fragmented Yet? Measuring Geopolitical Fragmentation and Its Causal Effects (2025) *Working Paper*.

## The Long-Term Strategist

How can valuations help long-term sector selection?

- Long-run sector performance is driven by price/value and earnings growth. Higher-priced sectors are generally also high-growth, and vice versa for low-priced sectors. The strategic allocator needs to look at both value and growth.
- In this note, we examine the performance of long-term value signals, PE and CAPE ratios, for US sectors. Growth signals will be examined in future work.
- Comparing the current gap between the valuation of a sector and the market to the long-term historical average gap helps predict excess returns relative to the market over the subsequent 10 years. CAPE ratios have performed better than PE ratios.
- When a sector is cheaper than the market than it has been on average in the past by this metric, it is more likely than not to outperform the market over the next decade, and vice versa.
- When the gap between sector and market CAPE ratios has risen by 1 point relative to the historical average, the annual excess return on that sector over the following decade has declined by ~0.4%-points, and vice versa.
- When a sector was more than 1 sigma expensive/cheap by this measure, it did worse/better than the market over the next decade more than 80% of the time.
- Current valuations alone imply the Technology and Utilities sectors should underperform the market by 2.1% and 1.5% pa over the next decade.
- At the other end of the spectrum, they imply the Consumer Staples and Health Care sectors should outperform the market by 5.2% and 4.3% pa in that time.
- In further analysis, we will assess other structural forces affecting the long-term growth of sectors, to avoid falling into a ‘value trap’ by overweighting sectors that may be justifiably cheap due to weak fundamentals, and vice versa.

### Long-term Strategy

**Alexander Wise** AC  
(1-212) 622-6205  
alexander.c.wise@jpmchase.com

**Jan Loeys**  
(1-917) 602-9440  
jan.loeys@jpmorgan.com  
J.P. Morgan Securities LLC

While **long-term sector allocation** is an important component of strategic asset allocation, there is remarkably little published research about effective predictors of long-term sector performance. To our knowledge, the only notable exception to this is Bunn and Shiller (2014), which uses cyclically adjusted price-to-earnings (CAPE) ratios for three sectors of the US stock market back to 1872 – industrials, utilities and railroads.<sup>1</sup> In essence, they look at sector valuations relative to the market compared to their long-term average valuation difference. This approach accounts for the fact that there are persistently low- or high-price earnings multiple sectors, so simply using current valuations without adjusting for historical sector differences is unlikely to be effective.

In this note, we examine the performance of relative valuations as a long-term return signal for a **broad selection of US industries** over the past several decades. In our analysis, we focus on the US, as its overall stock market has broad sectoral exposure compared to other equity markets, which can be very concentrated across sectors or overly dominated by very small numbers of companies.<sup>2</sup>

## Valuation signals

Two of the best-known market valuation signals used in asset allocation are the standard **trailing price-to-earnings (PE) multiple** and the **cyclically adjusted price-to-earnings (CAPE) multiple** proposed by Robert Shiller. The former divides equity prices by the last 12 months of earnings, while the latter typically divides equity prices by average inflation-adjusted earnings over the past decade.<sup>3</sup> The latter was conceived as an improved signal for long-term returns, as it smooths out shorter-term volatility that may not reflect long-term value. In lieu of any evidence that either is superior as a long-term sector signal, we examine the performance of both signals here.

Our empirical approach will be to compare current sector valuations relative to the market to historical valuations of that sector relative to the market. From the outset, there is a ques-

tion about how to best measure valuations of a sector relative to the market. Namely, are relative sector valuations best measured as the **difference** between the sector PE/CAPE multiple and that of the market or as the **ratio** of the former to the latter. Whichever measure is more stationary should be a more effective forecasting signal, in our view. Using the difference approach, high beta and growth sectors should screen as particularly expensive when the overall market is expensive, which may portend their underperformance in a market correction. Comparatively speaking, ratio measures are likely to vary less with the cycle, which may be a desirable feature for long-term forecasting beyond the cycle. In our analysis, we find no clear evidence that one approach is generally superior, so this choice is unlikely to be of great consequence. Here, we will focus on the difference (or gap) approach as it is likely to be more readily interpretable for many.<sup>4</sup>

Using the difference approach, Figures 1 and 2 plot relative sector valuation deviations against subsequent 10-year excess returns since 1993 using PE and CAPE multiples, respectively. Concretely, the sector relative PE deviation is defined as follows:

$$PE \text{ deviation}_i = (PE_i - \bar{PE}_M) - (\hat{PE}_i - \hat{\bar{PE}}_M)$$

where the  $i$  subscript refers to sector  $i$ , the  $M$  subscript refers to the market, and the hat over the rightmost term indicates that the difference is the historical average of the difference up until a given point in time.<sup>5</sup> The relative CAPE deviation is defined in the same way, simply substituting in CAPE differences for PE differences. To be clear, relative valuation deviations in these figures are calculated recursively, with historical averages calculated only on data up to each point in time. When validating this approach, it is important to do this, rather than calculating the average over all data now known to us, as in the latter case, low valuations relative to past and future levels could indicate a future run-up in sector valuations, which could clearly lead to a sector outperforming into the future.

1. Oliver Bunn and Robert Shiller, [Changing Times, Changing Values: A Historical Analysis of Sectors within the US Stock Market 1872-2013](#) (2014) NBER Working Paper #20370.

2. We use Datastream market and sector equity indices as they extend back to 1973 for the US. The length of data coverage is important when examining long-term returns, and this source provides longer sector data coverage than MSCI, for instance.

3. Due to data constraints on EPS data, trailing 12-month EPS is backed out from price and price-to-earnings indices for use in calculation of CAPE ratios, as these are available since index inception. Earnings are adjusted for inflation using CPI data sourced from the BLS. Note that there appears to be a measurement issue in these sector PE multiples as they are built up from the bottom only with companies that have positive earnings. That fact

notwithstanding, valuation signals constructed using these data demonstrate predictive power all the same.

4. One could make one additional adjustment, which we do not make here, as it does not greatly affect the present results. To account for long-term changes in the sectoral composition of the overall market, one could calculate historical market PE and CAPE ratios as the weighted average of sector valuations using sector capitalization shares at that point in time. In effect, this would be comparing current valuations of a sector relative to the market to the historical valuation of that sector relative to a synthetic market with the same sector shares.

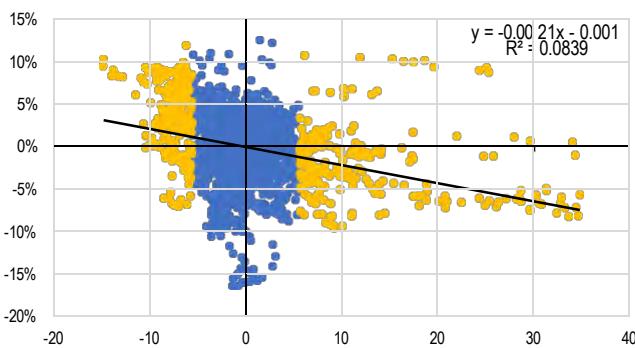
5. Here, we simply calculate valuations and returns relative to the overall market. Very similar results are found when we calculate the market ex-sector PE or CAPE multiple as the

**Both signals demonstrate a degree of long-term predictive power for returns.** For both PE and CAPE multiples, when a sector was cheaper by these metrics – relative to the market – than during its history, future long-term returns in excess of the market have generally higher, and vice versa. Based on the linear regressions, when the gap between the sector and market PE ratios increased by 1 point relative to its historical value – say from a gap of 5 to 6 – this has typically come with a 0.21%-point lower annual rate of return relative to the market over the following 10 years. For CAPE ratios, the corresponding decline would be 0.35%-point.

Beyond the fit of a linear regression of excess returns on these signals, one can also assess the performance of these signals by looking at the share of the time that a sector that was relatively cheaper than in the past by these metrics subsequently outperformed the market, and vice versa. Since 1993, these shares were 57.9% and 64.3% for the PE and CAPE signals, respectively. When both signals were in alignment, this share rises to 67.7%. When the deviation from the historical gap was greater than 1 standard deviation in magnitude, the shares rise to 76.7% and 81.5% for the PE and CAPE signals, respectively. This improvement suggests that these **signals are best relied upon when deviations are of at least moderate magnitude.** By both overall fit and prediction of over- or underperformance, the **CAPE signal appears to be superior** in aggregate. Thus, it will be our primary focus moving forward in this note.

Figure 1: Sector relative PE deviation against future long-term excess return

% pa, 1/1993-10/2024, monthly. Yellow indicates PE deviation of greater than 1 standard deviation. Relative PE deviation is the difference between the current gap in sector and market PE and the historical average gap.

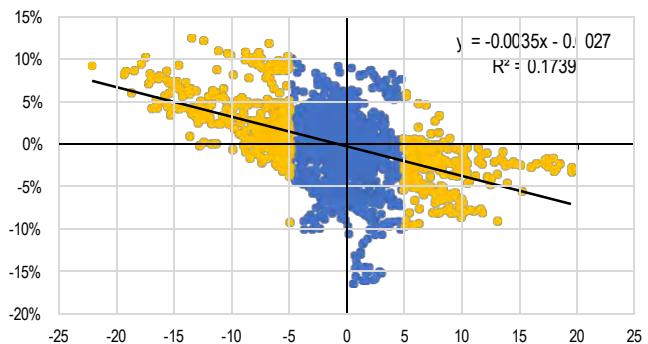


Source: J.P. Morgan, Refinitiv/LSEG Data and Analytics.

capitalization-weighted average PE or CAPE multiples of each sector, excluding the sector in question, and when market ex-sector total return indices are constructed using capitalization-weighted monthly returns of sectors, excluding the sector in question.

Figure 2: Sector relative CAPE deviation against future long-term excess return

% pa, 1/1993-10/2024, monthly. Yellow indicates CAPE deviation of greater than 1 standard deviation. Relative CAPE deviation is the difference between the current gap in sector and market CAPE and the historical average gap. Omits outliers with CAPE deviations of more than 20-points.



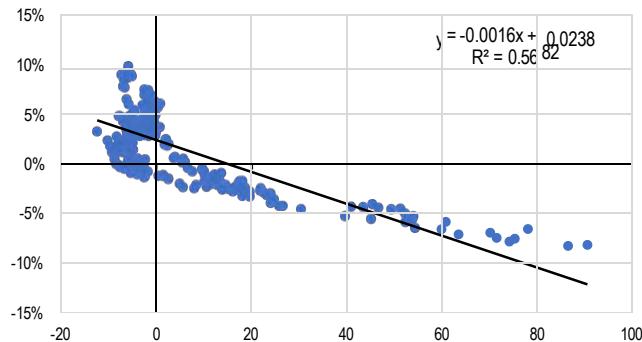
Source: J.P. Morgan, Refinitiv/LSEG Data and Analytics, Bureau of Labor Statistics.

It is worth noting that looking at this relationship between excess returns and starting relative valuations is quite a **demanding test of the signaling value**, particularly for the measure based on CAPE ratios. Using these Datastream equity indices, earnings data are first available for 1973, meaning the first CAPE ratio can be calculated in 1983. Thus, the first observed 10-year returns from 1993 shown in Figure 2 are associated with the deviations of relative sector CAPEs from historical averages only 10 years long (1983-1993). Looking forward from the present, we have the benefit of a considerably longer history of PE and CAPE ratios.

Combining every sector into a single figure may underestimate the performance of the signals if the **relationship between relative valuation and future performance is different across sectors**, which we find to be the case. We find, though, that our signals have performed better in some sectors than in others. Below, we show the relationship between relative CAPE deviations and excess returns for three large sectors – Technology, Health Care, and Industrials – with the remaining seven sectors shown in the appendix. Each of these three shows a reasonably strong relationship between the CAPE signal and subsequent performance. Similarly strong relationships are seen for the Consumer Staples, Telecoms, Basic Materials and Utilities sectors. Relationships are weaker for the Energy, Financials and Consumer Discretionary sectors, which we discuss later.

Figure 3: Technology relative CAPE deviation against future long-term excess return

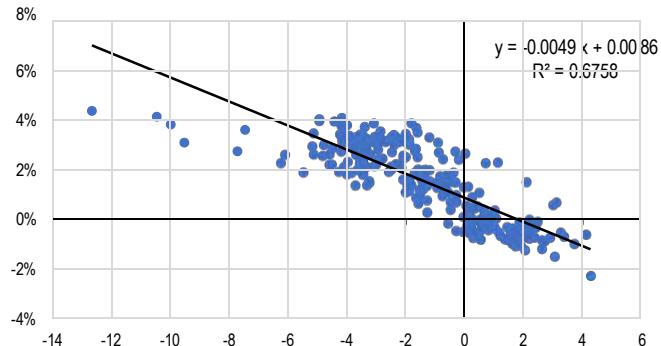
% pa, 1/1993-10/2024, monthly. Relative CAPE deviation is the difference between the current gap in sector and market CAPE and the historical average gap.



Source: J.P. Morgan, Refinitiv/LSEG Data and Analytics, Bureau of Labor Statistics.

Figure 4: Health Care relative CAPE deviation against future long-term excess return

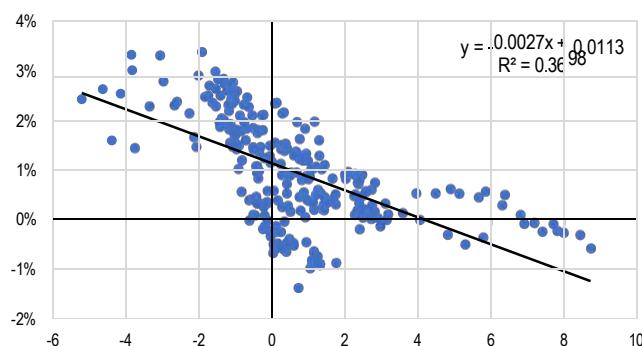
% pa, 1/1993-10/2024, monthly. Relative CAPE deviation is the difference between the current gap in sector and market CAPE and the historical average gap.



Source: J.P. Morgan, Refinitiv/LSEG Data and Analytics, Bureau of Labor Statistics.

Figure 5: Industrials relative CAPE deviation against future long-term excess return

% pa, 1/1993-10/2024, monthly. Relative CAPE deviation is the difference between the current gap in sector and market CAPE and the historical average gap.



Source: J.P. Morgan, Refinitiv/LSEG Data and Analytics, Bureau of Labor Statistics.

## Current return implications

Recursive analysis of the kind discussed above is used to validate that the fundamental approach – comparing relative sector valuations to their historic levels – has predictive power over future long-term excess returns. When it comes to making a long-term forecast, one can typically do better than simply reading off the return implied by the relationship shown in the recursive scatters. For instance, when we estimate the relationship between CAPE deviations and excess returns, we can calculate the former using the long-term historical average CAPE difference that is now known to us, not just the historical average preceding any given point in time. Our approach here will be to pool all the sectors into a single regression but allow for different intercepts for each sector. Econometrically, that entails running the following regression:

$$Return_{it} = \beta_0 + \beta_1 Deviation_{it} + \alpha_i + \epsilon_{it}$$

where  $i$  indexes sectors and  $t$  indexes time periods, and  $\alpha_i$  is a sector dummy.

Table 1 reports historic average CAPE gaps, current relative CAPE deviations, and implied long-term excess returns, alongside the  $R^2$  for each model from our recursive analysis above.<sup>6</sup> In reviewing these results, we jointly consider the magnitude of the CAPE deviation and the goodness of fit of the CAPE model in our validation exercises above. At one end of the spectrum, the US **Technology** sector currently is quite expensive by this metric, which, by itself, suggests that there is a serious chance that it will underperform over the coming decade – valuations alone imply a 2.1% pa underperformance of the market. Valuations also imply a 1.5% pa underperformance of **Utilities**, which, though not currently expensive, have generally only beaten the market at very favorable valuations. At the other end of the spectrum, valuations suggest there is a decent chance that **Consumer Staples** and **Health Care** will outperform the market over the coming decade, with implied returns in excess of the market of 5.2% and 4.3% pa, respectively. In our view, the clearest implications of valuations relate to these four sectors – Technology, Utilities, Consumer Staples and Health Care. While this forecasting methodology does not guarantee that these excess returns are jointly possible, the market capitalization-weighted average of the implied excess returns is very close to zero at 0.1%.

6. Note that this methodology does not guarantee that these excess returns are jointly possible and consistent.

Table 1: Current CAPE deviations and long-term excess return implications

% pa. Excess return implication as of 11/30/2024 based on CAPE model. R-squared is from recursive analysis shown in sector figures in main text and appendix. Relative CAPE deviation is the difference between the current gap in sector and market CAPE and the historical average gap. This methodology does not guarantee that these excess returns are jointly possible.

	Historical difference	CAPE deviation	Sigma	Recursive R <sup>2</sup>	Implied excess return
Consumer Staples	2.0	-14.4	-2.3	0.48	5.2%
Health Care	6.3	-9.9	-1.6	0.68	4.3%
Energy	-5.8	-9.9	-1.6	0.11	1.6%
Financials	-5.4	-6.6	-1.0	0.09	1.3%
Basic Materials	-3.3	-8.1	-1.3	0.63	0.8%
Industrials	1.2	-0.6	-0.1	0.37	0.8%
Telecoms	-4.5	-11.7	-1.8	0.67	-0.1%
Consumer Discretionary	2.2	4.0	0.6	0.00	-0.9%
Utilities	-7.9	-1.4	-0.2	0.35	-1.5%
Technology	11.4	14.9	2.4	0.57	-2.1%

Source: J.P. Morgan, Refinitiv/LSEG Data and Analytics, Bureau of Labor Statistics.

The performance of the CAPE model since 1993 has been weaker in the **Energy**, **Financials** and **Consumer Discretionary** sectors, shown by their lower R<sup>2</sup> in our recursive analysis. As shown in the appendix, this appears to be the result of **regime shifts** in the middle of the sample, which shifted equilibrium valuation gaps relative to the market. In each case, dividing the sample into two periods shows clearer relationships between CAPE gaps and excess returns. For **Financials**, the relationship appears to shift down after the 10-year period that starts in 1999 and end in 2009. The Global Financial Crisis clearly depressed excess returns in the sector for a period of time and also likely led to a persistent downward revision in growth expectations given the subsequent ratcheting up of bank regulation. The latter should reduce the equilibrium valuation gap relative to the market, shifting the relationship down. In this new post-GFC regime – which we are still in – relative valuations have been an effective signal, giving us greater confidence in our valuation signals than implied at face value by the recursive model fit for Financials.

There appears to be a similar structural shift in the **Energy** sector after 2008, which roughly aligns with the intensification of efforts to reduce reliance on fossil fuels and the growth of ESG investing. Both would, again, structurally shift the equilibrium valuation gap. The flatness of the relationship between valuations and excess returns in the post-2008 period would be consistent with this process unfolding steadily, rather than abruptly like for Financials, which, again, we think is reasonable.

Finally, there also appears to be a regime change for the **Consumer Discretionary** sector, this time with an apparent increase in the equilibrium valuation gap. The causes of this shift are less clear to us than for Energy and Financials, though we note that, again, we appear to be in a regime in

which relative valuations help predict future excess returns in the sector.

## Implications for SAA

While valuations have repeatedly shown to be important long-term return signals in various settings, they are not the end of the story. There is, for instance, ongoing debate about whether AI can drive long-term outperformance of the Technology sector, even from the currently expensive entry point. Just as we did for long-term [country](#) selection, in further analysis, we will assess other structural forces affecting the long-term growth of sectors to avoid falling into a ‘**value trap**’ by overweighting sectors that may be justifiably cheap due to weak fundamentals, and vice versa. For now, we will make a couple of preliminary observations about Technology and Health Care valuations, as we are overweight both sectors in our benchmark SAA portfolio.

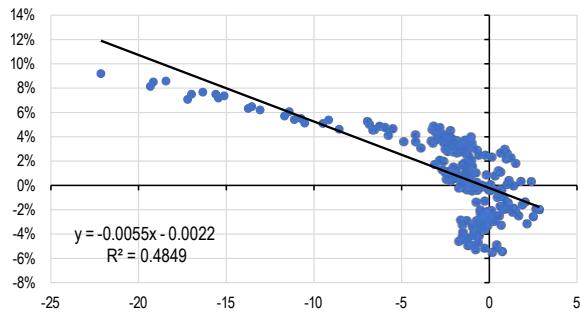
We are currently overweight the **global Technology sector**, in line with the argument that ‘in a gold rush, sell shovels’ (as discussed at greater length in the appendix). In light of the results in this note, we make two comments about that allocation. Firstly, we have restricted our sector analysis here to the US, while the allocation is to the global Technology sector, though the US is admittedly a very large share of current global market capitalization in the Technology sector. Secondly, while Technology currently is relatively expensive in the US based on CAPE, valuations have not yet approached the peaks observed during the Dotcom boom. The CAPE gap between the Technology sector and the overall market peaked at 101 points in March 2000, compared to the current 26 points, and the long-term historical average of 11 points since 1983. For reference, prior to the peak of the Dotcom boom, the CAPE gap of the Technology sector was previously around the current level in mid-1998.

We also have a strategic overweight on the **global Health Care sector**, primarily on the basis of the very long-term historic outperformance of the sector and the likely effects of population aging, which we have [recently shown](#) was historically associated with long-term Health Care outperformance. In our view, the results presented in this paper are fully supportive of this allocation. Just as population aging is accelerating in many countries, the US Health Care sector is relatively cheaper than it has historically been based on relative CAPE ratios.

## Appendix — Remaining sectors

Figure 6: Consumer Staples relative CAPE deviation against future long-term excess return

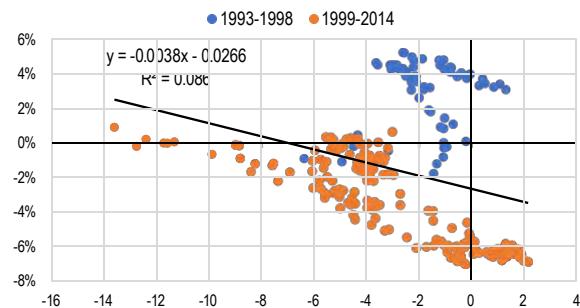
% pa, 1/1993-10/2024, monthly. Relative CAPE deviation is the difference between the current gap in sector and market CAPE and the historical average gap.



Source: J.P. Morgan, Refinitiv/LSEG Data and Analytics, Bureau of Labor Statistics.

Figure 7: Financials relative CAPE deviation against future long-term excess return

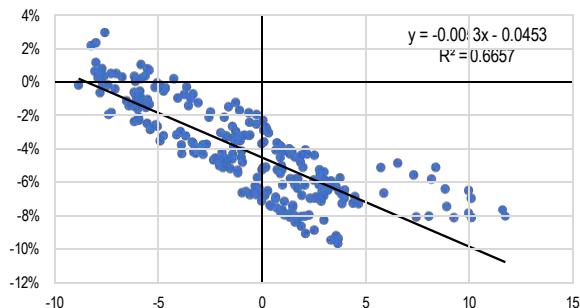
% pa, 1/1993-10/2024, monthly. Relative CAPE deviation is the difference between the current gap in sector and market CAPE and the historical average gap. Orange indicates 10-year periods starting after 1999, through to the last 10-year period starting in 2014.



Source: J.P. Morgan, Refinitiv/LSEG Data and Analytics, Bureau of Labor Statistics.

Figure 8: Telecoms relative CAPE deviation against future long-term excess return

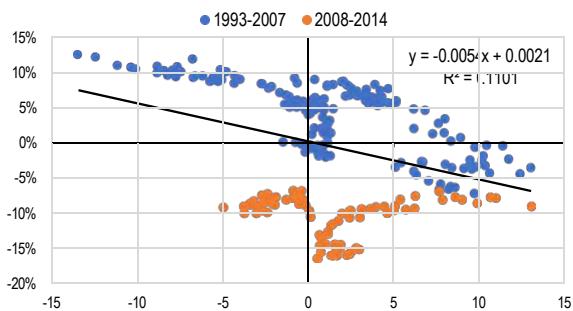
% pa, 1/1993-10/2024, monthly. Relative CAPE deviation is the difference between the current gap in sector and market CAPE and the historical average gap.



Source: J.P. Morgan, Refinitiv/LSEG Data and Analytics, Bureau of Labor Statistics.

Figure 9: Energy relative CAPE deviation against future long-term excess return

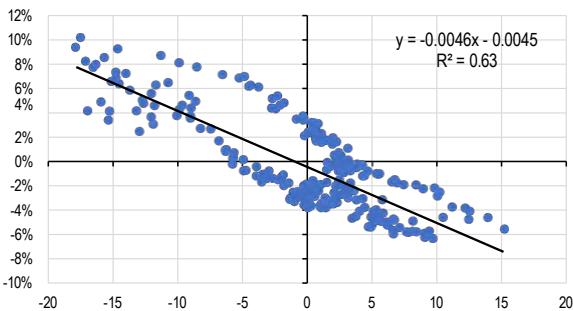
% pa, 1/1993-10/2024, monthly. Relative CAPE deviation is the difference between the current gap in sector and market CAPE and the historical average gap. Orange indicates 10-year periods starting after 2008, through to the last 10-year period starting in 2014.



Source: J.P. Morgan, Refinitiv/LSEG Data and Analytics, Bureau of Labor Statistics.

Figure 10: Basic Materials relative CAPE deviation against future long-term excess return

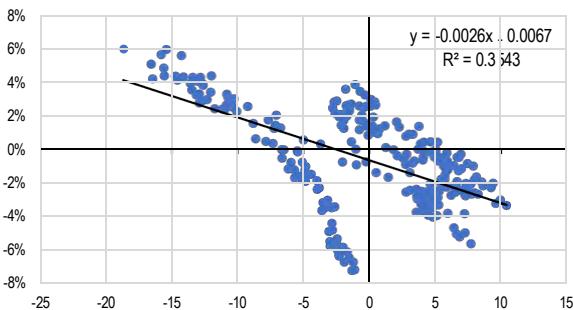
% pa, 1/1993-10/2024, monthly. Relative CAPE deviation is the difference between the current gap in sector and market CAPE and the historical average gap.



Source: J.P. Morgan, Refinitiv/LSEG Data and Analytics, Bureau of Labor Statistics.

Figure 11: Utilities relative CAPE deviation against future long-term excess return

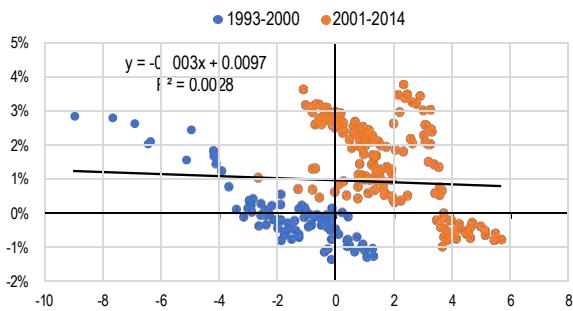
% pa, 1/1993-10/2024, monthly. Relative CAPE deviation is the difference between the current gap in sector and market CAPE and the historical average gap.



Source: J.P. Morgan, Refinitiv/LSEG Data and Analytics, Bureau of Labor Statistics.

Figure 12: Consumer Discretionary relative CAPE deviation against future long-term excess return

% pa, 1/1993-10/2024, monthly. Relative CAPE deviation is the difference between the current gap in sector and market CAPE and the historical average gap. Orange indicates 10-year periods starting after 2001, through to the last 10-year period starting in 2014.



Source: J.P. Morgan, Refinitiv/LSEG Data and Analytics, Bureau of Labor Statistics.

## The Long-term Strategist

Long-term equity returns across DM ex-US

- This note brings together the effects of valuation, economic growth and population aging on future long-term DM equity returns that we explored separately in previous notes.
- Consistent with previous results, cheaper starting valuations, higher economic growth, and slower population aging point to higher long-term returns, and vice versa.
- Of the largest DM equity markets, expected 10yr returns are highest in the UK and Australia, at 7.5% and 7.3% pa, and lowest in the Netherlands and Switzerland, at 3.8% and 4.8% pa, all in local currency. This compares to our 5.4% pa forecast on US equities.
- Jointly, these forecasts point to a 5.6% pa return on MSCI World over 10 years, and 6.0% pa on MSCI World ex-US, both in local currency.
- Relative to the US, the largest other DMs all benefit from cheaper starting valuations. But their economic and demographic fundamentals are quite different.
- Overall, the Anglosphere ex-US countries (UK, Canada, Australia) benefit both from favorable valuations and neutral-to-favorable growth and demographic fundamentals. Jointly, they are expected to return 7.0% pa in the next decade.
- European markets tend to have smaller starting valuation advantages relative to the US and have weaker growth and demographic fundamentals. This nets out to give very low or negative expected excess returns vs. the US over the next decade.
- Relative to the US, Japan benefits from being both relatively cheap and being expected to age more slowly in the future as it has already aged substantially. However, this is offset by very weak growth, giving the same expected return on net.
- To us, these results suggest a strategic overweight on Anglosphere ex-US equity markets. They have cheaper valuations, but still relatively strong fundamentals, likely due in part to the past and expected future impacts of immigration.

### Long-term Strategy

**Alexander Wise** AC  
(1-212) 622-6205  
alexander.c.wise@jpmchase.com

**Jan Loeys**  
(1-917) 602-9440  
jan.loeys@jpmorgan.com  
J.P. Morgan Securities LLC

In recent weeks, we have explored the effects of [valuations](#), [economic growth](#) and [population aging](#) on long-term equity returns. There was a relationship between each of these factors and long-term returns in DM equity markets, with higher returns expected in periods defined by cheaper starting valuations, faster economic growth, and slower aging of the population. In this paper, we combine these factors into a **unified framework to assess the long-run performance of a broader set of country equity markets**, beyond our existing long-run forecasts for US equities, and enter new strategic allocations based on these results.

Our recent analysis for DM equity markets can be summarized as follows.<sup>1</sup> Cheaper **starting valuations** – measured by the country CAPE ratio – are associated with higher subsequent long-term equity returns. Faster **real economic growth** comes with higher long-term equity returns due to faster earnings growth, higher valuations, and strengthening domestic currencies. And faster **population aging** is associated with lower long-term equity returns due to slower earnings growth, lower valuations, and currency weakening.

To combine these three relationships into one, we estimate a regression that relates long-term returns to these three factors using data from the **8 largest DM equity markets after the US**.<sup>2</sup> At this stage, we focus on **returns in local currency**. These forecasts can subsequently be combined with long-term currency forecasts, which depend mostly on another signal – the real exchange rate – to derive common currency forecasts. We omit the US from this regression analysis as we have longer time series for a broader array of signals which we draw upon in our existing long-term forecasts for US equities, which currently point to a 5.4% pa 10yr return on the S&P 500.

Using data since Q4/1979, we estimate the following regression:

$$Return_{it} = \beta_0 + \beta_1 \log(CAPE_{it}) + \beta_2 Growth_{it} + \beta_3 Aging_{it} + \beta_4 Forecast_{ust} + \epsilon_{it}$$

where  $Return_{it}$  is the 10yr local currency return in country  $i$  during time period  $t$ ,  $CAPE_{it}$  is the CAPE ratio at the start of the period,  $Growth_{it}$  is the growth rate of real GDP during the period,  $Aging_{it}$  is the change in the 65+ share of the population during the period, and  $Forecast_{ust}$  is the 10yr return forecast on the S&P 500 for the period based on our long-term US equity signals.

1. We do not yet have satisfactory empirical results for EM long-term equity returns to draw conclusions when choosing between EM countries and regions.
2. Based on market capitalization shares of MSCI World as of September 30, 2024: Japan, UK, Canada, Switzerland, France, Germany, Australia, Netherlands.

The results from this regression are reported in Table 1. In this unified framework:

- a 10% increase in starting CAPE is associated with a 0.53% pa decrease in returns in the subsequent decade;<sup>3</sup>
- a 1% pa increase in real GDP growth is associated with a 0.91% pa increase in returns;
- a 1%-point increase in the old age share of the population is associated with a 0.35% pa decline in returns; and,
- a 1% pa increase in the starting long-term US equity forecast is associated with a 0.26% pa increase in returns.

This latter positive relationship seems reasonable given the centrality of the US in the global financial cycle<sup>4</sup> and its sizable growth spillovers to the rest of the world,<sup>5</sup> while the fact that the coefficient is less than one is consistent with the historical long-term low beta nature of DM ex-US.<sup>6</sup> The **estimated effects of valuations, growth, and population aging are qualitatively comparable** to those documented in a univariate context, though differ slightly in magnitude, which is to be expected.

Table 1: Regression results

Q4/1979-Q2/2024. Based on MSCI country indices for Japan, UK, Canada, Switzerland, France, Germany, Australia, Netherlands.

Variable	Coefficient	Mean	Standard deviation
$\log(CAPE)$	-0.056	2.95	0.48
$Growth$	0.910	2.18%	0.93%
$Aging$	-0.351	1.98%	1.53%
$US\ forecast$	0.260	10.33%	4.47%
$Constant$	0.213	--	--

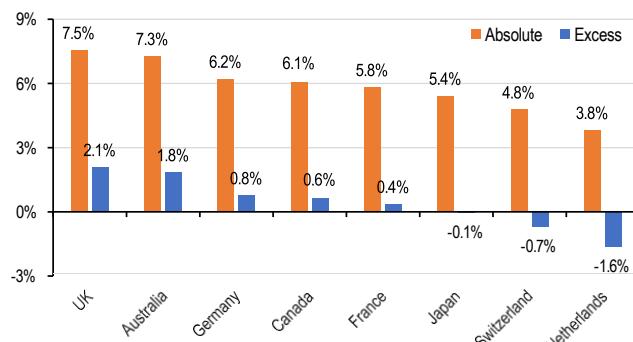
Source: J.P. Morgan, MSCI, IMF, UN, World Bank, Board of Governors of the Federal Reserve System, Bureau of Labor Statistics, Bureau of Economic Analysis, Robert Shiller, Refinitiv, S&P, Bloomberg Finance L.P.

3. As this CAPE variable is log-transformed, the reported coefficient divided by 100 is typically interpreted as the effect of a 1% increase in the variable in question. The -0.056 coefficient suggests the effect of that increase would be to reduce long-term returns by 0.056% pa. The estimated effect of a 10% increase is not exactly 10x the size due to the non-linearity of logs, though it is quite close.
4. Silvia Miranda-Agricocco and Helene Rey, [The Global Financial Cycle](#) (2022) 6, *Handbook of International Economics* 1-43.
5. See [A house divided can stand if built on a US foundation](#), Joseph Lupton and Bruce Kasman, August 8, 2023.
6. The beta of a regression of MSCI World ex-US 10yr USD returns on MSCI US 10yr returns since 1969 is about 0.24.

Using these estimates, we construct forecasts of 10yr local currency returns for these 8 DM countries, using current valuations, our long-term growth [forecasts](#), UN medium variant population projections, and our current long-term US equity forecast of 5.4%. Figure 1 plots long-term forecast returns outright and relative to the US S&P 500. The **highest long-term returns are forecast in the UK and Australia, at 7.5% and 7.3% pa, respectively. Returns in Germany, Canada and France are forecast to be around 6% pa, while returns are expected to be lowest in the Netherlands, Switzerland and Japan, at 3.8%, 4.8% and 5.4% pa respectively.** While all forecasts come with uncertainty, expected returns in excess of US equities are, in our view, meaningfully positive in the UK and Australia, and meaningfully negative in the Netherlands and Switzerland.

[Figure 1: Forecast 10yr returns on MSCI country indices in local currency, absolute and relative to S&P500](#)

% pa. Based on MSCI country indices in local currency. Returns forecast from September 30, 2024. Aging based on UN Medium Variant population forecasts. Growth based on our long-term growth forecasts.



Source: J.P. Morgan, MSCI, IMF, UN, World Bank, Board of Governors of the Federal Reserve System, Bureau of Labor Statistics, Bureau of Economic Analysis, Robert Shiller, Feenstra et al. (2015), Ha et al. (2022), Refinitiv, S&P, Bloomberg Finance L.P.

As these countries, with the US, account for the vast majority (~94%) of the capitalization of MSCI World, these forecasts can reasonably be used to forecast long-term returns on DM and DM ex-US equities. Based on current market capitalization shares, these forecasts imply a **5.6% pa 10yr return on MSCI World and a 6.0% pa 10yr return on MSCI World ex-US**, both in local currency terms.<sup>7</sup> These projections also imply a **10yr return of 7.0% pa on the largest Anglosphere markets outside the US** (UK, Canada

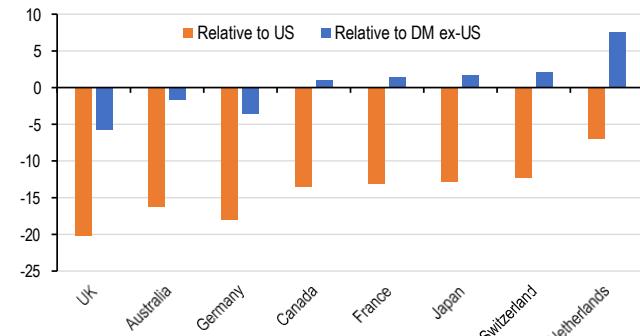
and Australia here), to which we will return later.<sup>8</sup>

## What drives country equity return differences?

In our framework, **cross-country differences in expected returns are explained by differences in starting valuations, economic growth, and demographics**. While the expected return on US equities does affect absolute returns on other markets, it has an equal effect on each of these 8 DM countries, and so does not account for any of those cross-country differences.

Starting with valuations, Figure 2 shows the CAPE ratios of these equity markets relative to the US, and relative to the average among these markets. Countries are presented in descending order by our long-term expected return. Based on CAPE ratio, **all of these markets are cheaper than the US equity market**, by quite meaningful margins, with CAPE ratios ranging from 7 to 20 points lower. Relative to the other non-US markets, **the UK, Australia and Germany are on the cheap side, while the Netherlands in particular is on the expensive side**.

[Figure 2: CAPE ratios in excess of the US and the DM ex-US average](#)  
 Based on MSCI country indices. DM ex-US is unweighted average of these countries.



Source: J.P. Morgan, MSCI, IMF, Refinitiv, Bloomberg Finance L.P.

Turning to expected growth, Figure 3 shows forecast real economic growth over 10 years, again relative to the US and the DM ex-US average. Our long-term [forecasts](#) are based on fundamentals like demographics, investment and human capital. Only **Australia and Canada are expected to experience faster growth than the US**. **Germany, Switzerland, the Netherlands, the UK, and, in particular, Japan are expect-**

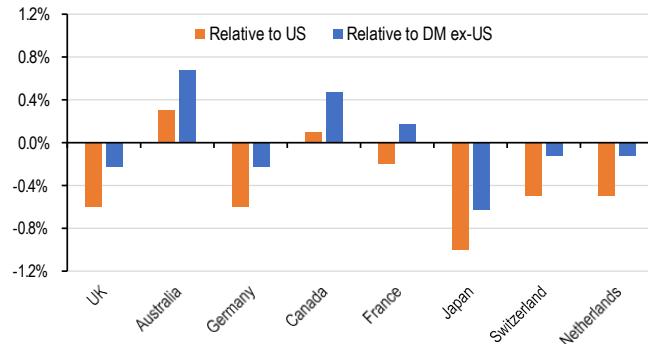
7. For the US, we use our existing forecast of a 5.4% pa return on the S&P 500 as that forecast is based on broader and longer-term data than the estimates in this paper. As MSCI USA currently consists of ~590 companies, the coverage is likely not hugely different from that of the S&P 500.

8. While New Zealand is part of the Anglosphere, the capitalization of the MSCI New Zealand index is only ~3% of that of MSCI Australia, the smallest of these other three countries. Thus, its omission from this calculation is unlikely to be of much consequence.

ed to grow more slowly.

Figure 3: Forecast real economic growth rate over 10 years in excess of the US and the DM ex-US average

% pa. Based on long-run economic growth forecasts published [here](#). DM ex-US is unweighted average of these countries.

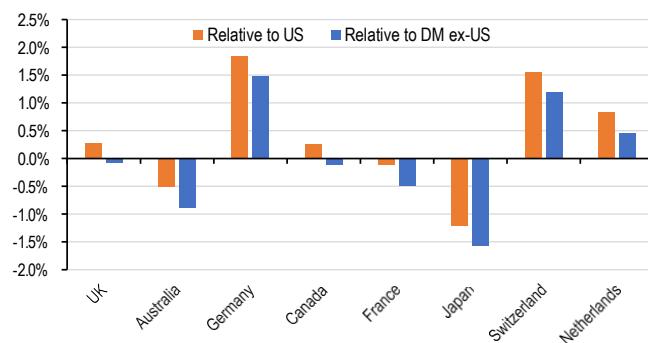


Source: J.P. Morgan, IMF, UN, World Bank, Feenstra et al. (2015), Ha et al. (2022).

Finally, Figure 4 shows the expected increase in old age shares of populations over the next decade relative to the US and the DM ex-US average. The **Anglosphere countries (UK, Australia, Canada, and US)** are expected to age at comparable rates over the next decade, as is France. Japan is expected to age at a slower rate since it has already aged substantially faster than the other countries, which are set to partially catch up. Germany, Switzerland and the Netherlands are expected to age faster than their peers.

Figure 4: Forecast increase in the old age (65+) share of the population over 10 years in excess of the US and the DM ex-US average

% points. Based UN Medium Variant population projections. DM ex-US is unweighted average of these countries.



Source: J.P. Morgan, UN.

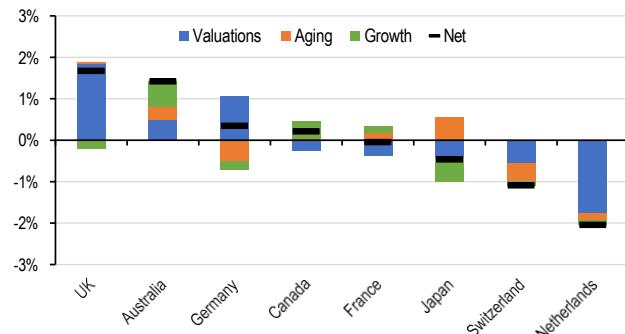
To a degree, these differences in economic growth and population aging reflect past and expected future **differences in immigration**. We recently showed that immigration slows the pace of population aging as immigrants tend to be younger than the domestic population on average. Immigration also

raises economic growth, particularly as immigrants are more likely to be of working age. Immigration inflows go some way to explaining the relative strength of Australia and Canada, for instance, when it comes to expected future growth and population aging.

Each of these factors – valuations, aging and growth – affects long-term expected returns. Figure 5 presents a **decomposition of the effects of each force on expected long-term returns** relative to the other non-US DM countries. At the high end of return expectations, the UK benefits from an inexpensive entry point, and neutral long-term economic and demographic fundamentals. Australia is the beneficiary of both favorable valuations, and growth and demographic fundamentals. While German valuations are cheap, this is offset to a large degree by weaker fundamentals. At the low end of the spectrum, expensive valuations and weak growth and demographic fundamentals weigh on expected returns in the Netherlands and Switzerland. Expected returns in Japan are also lowered by very weak growth expectations. Canada and France are lie roughly in the middle on all three counts.

Figure 5: Decomposition of expected excess return relative to DM ex-US average

% pa. Based on MSCI country indices in local currency. Returns forecast from September 30, 2024. DM ex-US is unweighted average of these countries.



Source: J.P. Morgan, MSCI, IMF, UN, World Bank, Board of Governors of the Federal Reserve System, Bureau of Labor Statistics, Bureau of Economic Analysis, Robert Shiller, Feenstra et al. (2015), Ha et al. (2022), Refinitiv, S&P, Bloomberg Finance L.P.

This decomposition also sheds light on why some markets are expected to outperform the US over the next decade, and why others are not. Each of these markets is inexpensive relative to the US, though to varying degrees. On average, we find that non-US countries in the **Anglosphere (UK, Canada, Australia)** benefit both from favorable valuations and neutral-to-favorable growth and demographic fundamentals. Relative to these Anglosphere countries, **European markets are slightly more expensive on average, and generally have worse growth and demographic fundamentals**. While Germany is particularly cheap, we are wary of the possibility that this may be due to underlying structural shifts in the economy as it adjusts to the loss of a cheap source of gas

from Russia and dependence on exports to China while its relationship with Europe is apparently evolving. For Europe, these weak fundamentals largely offset the valuation advantage vis-à-vis the US, giving very low or negative expected excess returns. While **Japan has a moderate valuation advantage relative to the US, this is offset entirely by relatively weak growth expectations.**

Finally, we will make one more general point about expected long-term performance relative to the US. As we noted earlier, **DM ex-US have historically been long-term low beta**, which is reflected in the coefficient on the US forecast in our regression, which is positive but well below 1. As previously discussed, we expect **reasonably low returns on US equities** over the coming decade, primarily due to elevated valuations. For other DM countries, the historical record suggests that these are the sorts of circumstances in which they are more likely to outperform the US.

## The Long-term Strategist

### CAPE and country long-term equity returns

- This note examines whether one can use basic valuation metrics to assess future long-term returns on different countries' equity markets.
- We find that Robert Shiller's standard cyclically adjusted price-earnings ratio (CAPE) is quite useful to project the 10-year-out total returns on equity markets for the major DM countries but is only hit and miss in EM.
- A 10% decrease in CAPE, say from 20x to 18x, improves the implied 10-year out compound equity return of that country stock market by ~0.80% pa. And vice versa when a country's CAPE becomes 10% more expensive.
- Similarly, a 10% fall in a country's CAPE relative to that of MSCI World raises its likely outperformance versus world by ~0.80% pa over the coming decade.
- These CAPE-based projections come with a ~3.5% pa error term, which is quite good using only a single driver. Using CAPE for short-term forecasting was not useful at all, producing massive ~20% error terms for one-year out equity returns.
- Currently, US equities are most expensive with a 34.8x CAPE. On its own, this implies only ~3.9% pa US equity return over the next decade. The UK is cheapest with a CAPE just under 15x, implying a 11.2% return in sterling over the next decade. Japan, Australia, Canada, Switzerland, Germany, and France all come in with CAPE-based return projections of 7-10% pa over the next decade, in local currency.
- We will combine these CAPE-based return implications in future work with other drivers, such as economic growth and demographics that we have highlighted in recent notes (see Library).

#### Long-term Strategy

##### Alexander Wise <sup>AC</sup>

(1-212) 622-6205  
alexander.c.wise@jpmchase.com

##### Jan Loeys

(1-917) 602-9440  
jan.loeys@jpmorgan.com  
J.P. Morgan Securities LLC

Valuations are a critical input in strategic asset allocation, with a large finance literature documenting the utility of various signals in forecasting long-term returns. In this paper, we **explore the role of valuations when making strategic equity allocations within and across countries**. This complements our recent research on the effects of [economic growth](#) and [population aging](#) on long-run equity market performance and allows us to develop a unified framework to assess the long-run performance of a broader set of country equity markets, beyond our existing long-run forecasts for US equities.

## Long-term valuation signals

Two of the best-known market valuation signals used in asset allocation are the standard **trailing price-to-earnings (PE) multiple** and the **cyclically adjusted price-to-earnings (CAPE) multiple** proposed by Robert Shiller. The former divides equity prices by the last 12 months of earnings, while the latter typically divides equity prices by average inflation-adjusted earnings over the past decade.<sup>1</sup> The latter was conceived as an improved signal for long-term returns as it smooths out shorter-term volatility that may not reflect long-term value.

In our analysis, we assess the performance of these valuation signals using a data set consisting of the nine largest DM equity markets and nine of the largest EM equity markets.<sup>2</sup> As will be discussed below, we find a very weak relationship between valuations and long-term equity returns within the set of EM countries, so we will **primarily focus on the results within DM**.

As long argued by Shiller, we find that the **CAPE ratio outperforms the PE ratio as a signal of 10-year returns on country equity markets**, so we focus on the results based on the CAPE ratio for the remainder of this paper. Figure 1 plots the starting CAPE ratio on nine DM equity markets (log transformed) against the annualized local currency market return over the subsequent 10 years.<sup>3</sup> We find that a **10%**

1. Due to data constraints on EPS data, trailing 12-month EPS is backed out from MSCI price and price-to-earnings indices for use in calculation of CAPE ratios as these are available since index inception. This approach is used throughout to ensure consistency. Earnings are adjusted for inflation using CPI data sourced from the IMF.

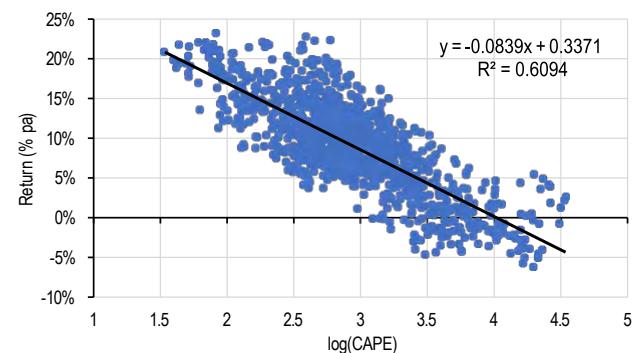
2. Based on market capitalization shares in MSCI World and MSCI EM indices. DM is the US, Japan, the UK, Canada, Switzerland, France, Germany, Australia, and the Netherlands. EM is Mainland China, India, Taiwan, South Korea, Brazil, South Africa, Mexico, Indonesia, and Malaysia. Of the largest EM markets, Saudi Arabia is excluded due to insufficient MSCI data coverage to assess long-run performance.

3. Examination of the residuals of a linear regression of returns on

**increase in the starting CAPE ratio is associated with a ~0.80% decrease in the pa rate of return over the coming decade.** If the market CAPE ratio were to rise from 20 to 25 – a 25% rise – predicted returns in the next decade would fall from 8.6% pa to 6.7% pa according to this simple univariate model.

Figure 1: CAPE multiples and subsequent 10yr equity market returns in DM

% pa, Q4/1979-Q2/2024, quarterly. Returns in local currency. 10yr rolling periods. US, Japan, UK, Canada, Switzerland, France, Germany, Australia, Netherlands. Standard error: ~3.5%.



Source: J.P. Morgan, MSCI, IMF, Refinitiv, Bloomberg Finance L.P.

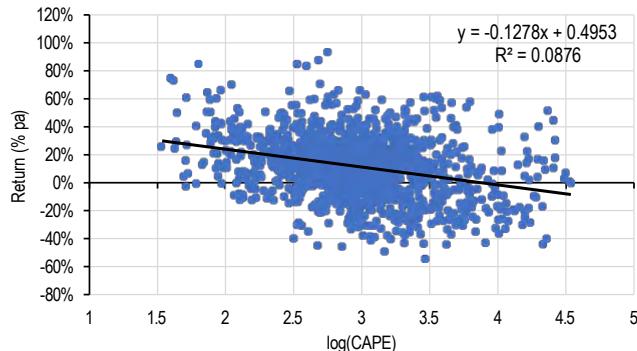
As shown in Figure 1, CAPE ratios explain a substantial part (~61%) of the variation in long-term equity returns, at least in DM. CAPE based projections come with 3.5% standard error, meaning that ~2/3 times, the following 10-year compound return was within 3.5% pa from the fitted value. This is quite good for a single-variable regression. It is further evidence that valuations shape long-term returns, as we have previously shown using the real exchange rate to forecast currencies movements, using the starting yield on an index to forecast returns on bonds, and using a selection of valuation measures to forecast US equity returns.

It is worth contrasting this result with the poor explanatory power of CAPE ratios over returns in the subsequent year, where this signal accounts for only a small part (~9%) of the variation in returns, as shown in Figure 2. CAPE-based projections for one-year out returns come with a massive ~20% standard error. **While valuations are an important signal for strategic asset allocation, they are not useful for tactical asset allocation**, as they tell us little about market timing. As we have previously argued, shorter-term returns are more significantly driven by momentum in markets and the economy, which our tactical analysts regularly incorporate into their analysis.

CAPE ratios shows evidence of non-linearity in the relationship, hence the log transformation. The relationship between returns and CAPE ratios is roughly linear when the latter is log transformed.

Figure 2: CAPE multiples and subsequent 1yr equity market returns in DM

% pa, Q4/1979-Q2/2024, quarterly. Returns in local currency. 1yr rolling periods. US, Japan, UK, Canada, Switzerland, France, Germany, Australia, Netherlands. Standard error: ~20%.



Source: J.P. Morgan, MSCI, IMF, Refinitiv, Bloomberg Finance L.P.

Above, we documented a strong relationship between CAPE ratios and long-term equity returns *in local currency terms*. In our view, it would be reasonable to expect that **there would be a tighter relationship with returns in local currency than with returns in USD** in the absence of meaningful predictive power of CAPE ratios over currency movements. We find that this is the case, with CAPE ratios accounting for a lower ~40% of variation in 10-year returns in USD terms (not depicted).

As alluded to above, evidence of a **relationship between CAPE ratios and subsequent 10-year returns is much weaker within EM**.<sup>4</sup> After calculating CAPE ratios, which require 10 years of earnings data, the sample size is admittedly quite limited within EM due to their later index start dates. However, we see no clear evidence of a relationship in a simple regression of returns on CAPE ratios.<sup>5</sup> Examination of the time series for each country suggests that it has predictive power through time within some EM markets, such as India, Mexico, and Indonesia, but not more generally. Given the mixed evidence, we focus on DM hereafter.

4. Specifically, we focus on 10-year returns in USD as some included EM countries have at times experienced very high rates of inflation, producing very high local currency equity returns. Purchasing Power Parity theory suggests that higher inflation should be offset in the long run by currency depreciation, limiting the scope for extremely high returns in USD.

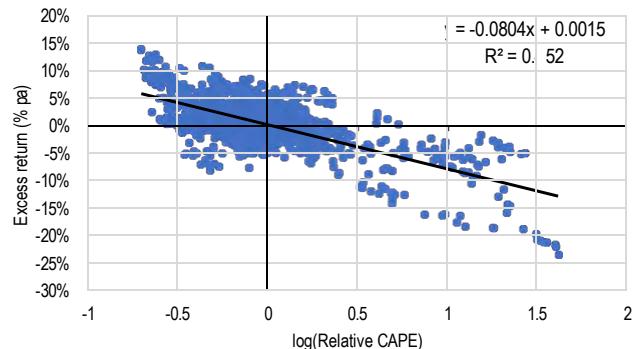
5. It is possible that EM more frequently go through structural changes, meaning valuation multiples do not revert as much. Or it could be that EM markets are driven more by international capital that does not look so closely at local valuations, but rather growth stories.

Our analysis above has focused on **absolute returns**. Now, we turn to **country excess returns relative to the world**

**benchmark** as that is what is needed to decide whether to strategically over- or underweight the equity markets of different countries. Figure 3 plots a scatter of 10-year local currency returns relative to MSCI World against the CAPE ratio relative to MSCI World – in both instances excluding the country in question from MSCI World where suitable data are available.<sup>6</sup> We find evidence that relative valuations are an effective signal of future long-term return differences across countries, with a **10% increase in the ratio of the country CAPE to world CAPE associated with an ~0.80% decrease in the pa rate of returns relative to the world over the coming decade**. For the sake of illustration, if a country CAPE were to increase from 23 to 27, for example, while the world CAPE remained at 25, the predicted country return in excess of the world over the next decade would fall from 0.8% pa to -0.5% pa.

Figure 3: Relative CAPE multiples and subsequent 10yr equity market returns in excess of MSCI World, local currency

% pa, Q4/1979-Q2/2024, quarterly. 10yr rolling periods. US, Japan, UK, Canada, Switzerland, France, Germany, Australia, Netherlands. See footnote 6 for data details. Standard error: ~3.5%.



Source: J.P. Morgan, MSCI, IMF, Refinitiv, Bloomberg Finance L.P.

Another way of assessing the effectiveness of relative CAPE yields as a signal of long-term excess returns is to calculate

6. We do this for the US, Japan, and the UK. Based on current market outstandings, these are the three largest constituent markets of MSCI World. The next largest market (Canada) accounts for 3.2% of MSCI World, meaning that any mismeasurement from not excluding the other countries is likely to be very small and should not substantially affect the results. Calculation of a CAPE ratio for these world indices requires some assumptions as we need a consumer price index to construct real earnings. To do so, we construct a weighted average inflation index using the capitalization weights of the set of countries we study here in the MSCI World index as of Sep 30, 2024, as we do not have a full time series of weights. For world indices excluding a country, the weights are determined by shares after exclusion of the country in question. In practice, the significance of these weighting decisions is diminished

the share of instances in which a relatively expensive market subsequently underperformed the world, or a relatively cheap market subsequently outperformed. Graphically, this is the share of observations in the top-left and bottom-right quadrants in the figure above. In this sample, **relative CAPE yields correctly indicated long-term under- or outperformance ~68% of the time.**

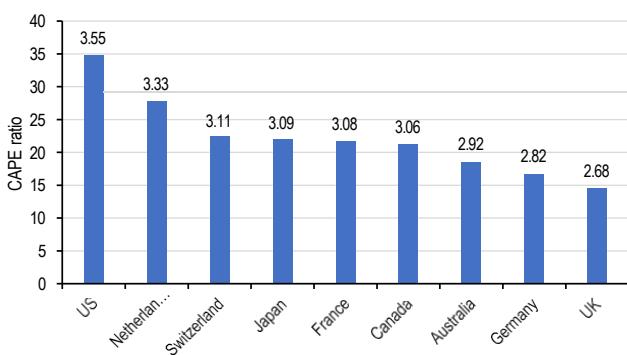
All of the results presented above have been based on the **level of the CAPE ratio**. One might have hypothesized that another effective signal would be the deviation of the CAPE ratio at a point in time from the average CAPE ratio in an equity market before that point. Looking across these countries, regressing returns on CAPE deviations yields a weaker relationship here.

## Current valuations

Figure 4 shows CAPE ratios for these large DM equity markets as of the end of September 2024, with the log transformed level reported above each bar for comparison to the results above.<sup>7</sup> By this measure, the **US equity market is the most expensive large market in DM**, with a CAPE ratio of 34.8, followed by the Netherlands, with a CAPE ratio of 27.8. Valuations in Switzerland, Japan, France, and Canada are broadly comparable in the middle of the distribution, with CAPE ratios in the 21-23 range. In this set of markets, valuations are the lowest in the UK, with a CAPE ratio of 14.6, followed by Germany and Australia.

Figure 4: CAPE ratios in largest developed markets

CAPE ratios on left axis. Log(CAPE) reported above each bar. See footnote 7 for data details.



Source: J.P. Morgan, MSCI, IMF, Refinitiv, Bloomberg Finance L.P.

While valuations are just one factor, as we discuss further below, one can calculate a rough forecast range implied by the regression equation from Figure 1. Figure 5 plots the 10yr

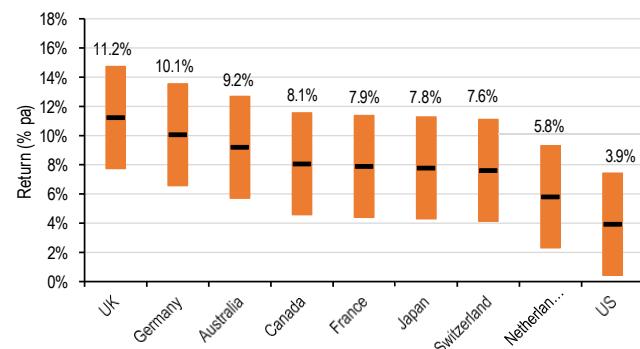
by the covariance of inflation in these countries.

7. In lieu of a consumer price index reading for September, we extrapolate the rate of inflation between Q1 and Q2 of 2024 to Q3.

returns implied by the regression equation for each DM country based only on the CAPE ratio (the black bar), with a range from one standard error below the implied value to one standard error above the implied value. The rank order of returns is the reverse of the rank order of CAPE ratios, ranging from a central estimate of 11.2% pa in the UK to 3.9% pa in the US. These are estimates based solely on the CAPE ratio and thus do not incorporate other factors or signals.

Figure 5: 10yr local currency returns implied by CAPE ratio regression

% pa. Black line is predicted value from regression. Orange bar indicates one standard error range from regression. Number above the bar corresponds to the central predicted value.



Source: J.P. Morgan, MSCI, IMF, Refinitiv, Bloomberg Finance L.P.

## The bigger picture

Current valuations are an important signal of long-term future equity returns. Still, as our recent research shows, **other factors do matter**. Specifically, we found that higher **economic growth** is associated with higher long-term equity returns due to faster earnings growth and higher valuations. We also found that **population aging** was associated with lower long-term equity returns due to slower earnings growth and lower valuations. While these three factors – **current valuations, growth, and demographics** – are correlated, they could be combined to construct broad-based long-term equity forecasts for large DMs. This can be combined with long-term **currency forecasts** as a guide for a strategic investor allocating capital across markets. Making use of richer and longer data series in the US, we currently make long-term forecasts for US equities that are likely to perform better than a simple model based on these three factors.

## The Long-term Strategist

What drives low future US equity returns?

- Our return model for the S&P 500 projects a 5.7% annual return for the next decade, barely more than half its post WWII average.
- This comes mostly from the current 23.7x trailing operating multiple, that makes SPX ~25% expensive versus its average 19x multiple of the past 35 year.
- This note looks at the longer-term forces that could bring about this reversion to mean valuation and potential depressants to earnings growth, ignoring shorter-term cyclical factors such as recession risk that continues to hover on the horizon.
- These longer-term depressants are not in the price today as they are still just risks and not yet realities. If each were to become active, multiples could fall well below their 35-year mean.
- Multiples could come down because aging induces the growing cohort of elderly baby boomers to lower their equity allocations, currently at all-time highs, in line with their shrinking investment horizons.
- We have been warning over the last few years about the risk of a coming end of the Great Moderation because of more active fiscal policies and a reduced fixation with inflation control. This would raise risk premia and thus depress equity multiples. We have been wrong on this view so far as the high political cost of the Covid inflation spike and rising concerns about the steady rise in government debt appear to solidify a political consensus on the importance of keeping inflation low.
- De-dollarization and de-globalization are similarly much discussed and feared risks, but they remain unrealized. If they were to become real, demand for USD assets and SPX multiples would fall. The weaponization of the dollar has pushed countries fearful of sanctions to look for alternative payment vehicles that might not involve the dollar. We see de-dollarization as only a serious risk over a horizon much longer than our 10-year horizon.
- Beyond expensive valuation, a second potential SPX depressant would be a reversal of the 30-year long rise in US profit margins that allowed earnings to grow much faster than the overall economy. Such a reversal could come from a secular rise in interest rates or corporate tax rates or a forceful return of antitrust. Each of these has started to take place over the past 2-3 years but we currently do not see them go very far and thus judge them as only a mild depressant to earnings growth and thus long-term equity returns. But they clearly require monitoring.

### Long-term Strategy

**Jan Loeys** AC

(1-917) 602-9440

jan.loeys@jpmorgan.com

**Alexander Wise**

(1-212) 622-6205

alexander.c.wise@jpmchase.com

J.P. Morgan Securities LLC

Our equity [model](#) currently gives us 5.7% pa return on the S&P 500 over the next 10 years and 8.1% pa over the next 20 years. This compares with 11% average annual return over the 80 years since WWII. What is driving lower future returns, both within the confines of our model and outside of it and what are the risks around this projection?

Equity returns consist of dividends and index price changes. The price is earnings per share (EPS) times the price of these earnings, the price-to-earnings (PE) ratio. Dividend yields are very stable, and we assume they will stay near recent levels. The low future return projection of our model, which is built on the same empirical regularities that other forecasters use, emanates almost all from the **current above-average PE multiple**, with current EPS levels smack on their long-run trend. Earnings should not be taken for granted, though, as there are valid questions whether its fast growth of the past few decades can be maintained. Over the past 30 years, SPX EPS grew at a 7% pa pace, much faster than the overall economy's growth pace since of 4.5% pa, nominal.

## EARNINGS

Earning growth is the growth of the economy and any changes the ratio of corporate earnings to the underlying economy. The latter comes down to the relative size of the private sector and the margins that listed companies earn on their business. It is this last factor, the near doubling of US company profit margins over the past 30 years, that has contributed the most to high equity returns and US outperformance versus the rest of the world. Figure 1 shows this for the S&P 500 (data only since 1990) and for the overall economy, including small and unlisted companies.

It has always been assumed by strategic asset investors that profit margins should be stationary and mean reverting: when companies make a lot of money, they will invest more and hire more people, driving up wages, interest rates and commodity prices which will eat into their margins. Vice versa when they lose money.

From the mid-1990s on, earnings have started growing steadily faster than the overall economy, in our mind quite plausibly because **globalization and growing market concentration** changed the power position of large corporates relative to labor and government.<sup>1</sup> Multinationals could roam the world in search of the cheapest labor, land, regulations, and taxation. Labor and government remain primarily nation bound and have not been able to effectively collaborate across borders to match corporate power. Real wages thus lagged

corporate profit growth. Companies have been able to force governments to compete against each other for their business through lower tax burdens. The effective tax rate on US companies has fallen from ~35% in the mid-80s to just under 15% today (Figure 2). Only mobile highly skilled labor has been able to match corporate power and has thus shared in its financial returns. The secular decline in interest rates from the 80s on until just 2 years ago similarly benefitted corporate earnings.

[Figure 1: US corporate profit margins](#)

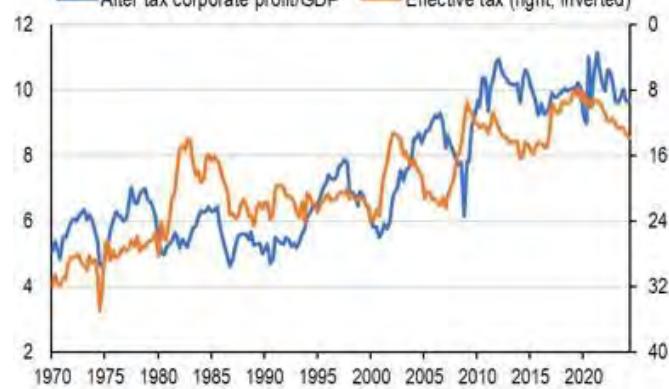
%, Q1/1950-Q2/2024, quarterly. Corporate profits after tax with inventory valuation and capital consumption adjustments divided by GDP



Source: J.P. Morgan, Bureau of Economic Analysis, S&P, Bloomberg Finance LP.

[Figure 2: US corporate profit margins and effective corporate taxes](#)

%, Q1/1970-Q2/2024, quarterly. Corporate profits after tax with inventory valuation and capital consumption adjustments divided by GDP. Effective tax is federal corporate tax receipts divided by corporate profits before tax with inventory valuation and capital consumption adjustments.



Source: J.P. Morgan, Bureau of Economic Analysis.

1. See, e.g., Thomas Philippon, [The Great Reversal](#), 2019, and our own [Business Concentration](#), Sep 30, 2020.

The question of profit margins is thus one of the medium-term direction of **interest rates, economies of scale, network effects, and antitrust policy.**

On **interest rates**, we have argued<sup>2</sup> before that a number of secular forces, aging, rising government debt, the dramatic need for climate change investing, and US-China competition, will raise the demand for capital in the West while depressing savings rates and thus push up real rates. Our modal projection is for **real bond yields to end the decade only ~1/2% above today but see upside risk on that view.**

The growing importance of **network effects and economies of scale**, especially in tech, have been powerful forces raising business concentration and with it the pricing power of the dominant company in each sector. The sudden emergence of AI had the initial promise of upending the power of mega tech companies and democratizing the new tech world. However, it soon became apparent that AI is requiring massive capital investment and data bases that strengthen further the dominance of the largest tech companies.

The main threats to the dominance of the mega caps and market leaders in each sector is a return of **antitrust**. Antitrust focuses on anticompetitive behavior, including preemptive acquisition of emerging technologies that could compete against market leader's position; deregulation of excessive barriers to entry; and simple cutting back on market size and market share. We have written [before](#) (in 2020) about the economic and political case for a return to antitrust and that this suggested being overweight small caps. We have been wrong (so far) as a small outperformance outside the US was more than offset by large underperformance in the US of small caps. We were forced to go back to neutral small caps in [October](#) of last year. One might say we had the "right" view, but the wrong country as it was China where years ago the government started tightening up its antitrust laws and implementation, having the depressing impact on its equity market that we had feared for the US.

Both the EU and the US, on both sides of the aisle, still appear to want to bring antitrust back as they recognize the economic power concentration that ever larger corporates bring. History teaches us that economic and capital power<sup>3</sup> ultimate becomes political power . What is missing from the antitrust equation to truly bring down business concentration is **popular anger**. The origins of antitrust in the 1890s and its

first actual usage under President Teddy Roosevelt do not lie in economic thinking about the negative welfare effects of monopoly pricing but instead in the growing anger about labor abuse and the dismal social and physical conditions of urban workers. Today, consumers do not appear to have problems relying on the services and products of the top 1-2 smart phone brands, app stores, search engines, online merchants, cloud managers, online video music streamers, ETF producers, passive mutual fund managers, and banks, just to mention these industries.

Hence, it is not obvious to us that there is a lot of political currency to be gained for US legislators to try and break up the mega-cap service providers that most of their voters are dependent on daily, if not every waking hour.

#### Democracy, populism and polarization.

One last risk to earnings growth emanates from the political world. In our [Democracy metrics and equity markets](#), (Oct 21, 2021), we found that changes in democracy ratings have been a valuable signal of future long-term asset returns in countries. Stock markets in countries which are downgraded tend to underperform stock markets in countries which are upgraded in the subsequent years by ~5% pa over a 10-year period and tend to underperform stock markets in countries with an unchanged rating by ~2.5% pa over a 10-year period. These observations reflect the fact that downgraded countries tend to exhibit lower local currency stock market returns, due to weaker earnings growth, and experience larger currency depreciations.

**The US has been downgraded several times over the past few years on the worsening the quality of its democracy** due to voter repression, partisan polarization, and the outsized influence of special interests in politics<sup>4</sup> . We feared this would do damage to the US economy and equity market, but these have remained quite resilient over the past 8 years. The effect upon stock market returns is theoretically ambiguous, however. On one hand, one might hypothesize that stable democracies give rise to effective governance, promoting a dynamic and competitive economic environment in which businesses prosper. On the other hand, a system of governance which does not prioritize and promote the interests of the people may instead become captured by special interests, such as those of corporates. These could induce legislators and regulators to raise barriers to entry and soften consumer protection and antitrust enforcement,

2. Discussed more in depth in [Long-term forces point to higher US bond yields](#), Apr 4, 2022.

3. Tim Wu, The Curse of Bigness, [Antitrust in the New Gilded Age](#), 2018.

4. Freedom House has been putting together indices of voting rights, electoral processes, political pluralism and participation, and the functioning of government, inter alia. See its report on the US: [From Crisis to Reform: A call to strengthen America's battered democracy](#).

allowing large corporates to raise profit margins, boosting share prices even as these measures weaken overall economic growth. In empirical studies of the economic and financial effects of democracy, the weight of the evidence indicates that democratic improvements are supportive of both economic growth<sup>5</sup> and stock market returns.<sup>6</sup>

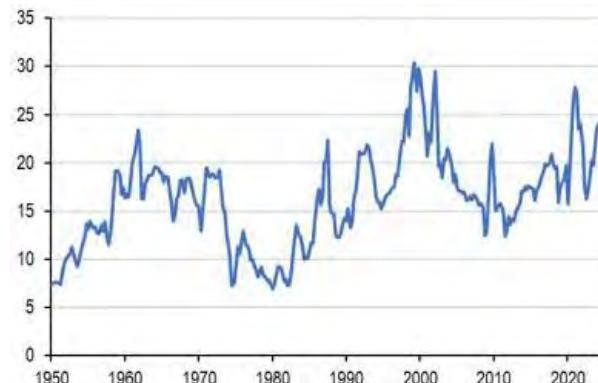
**A negative impact of US political turmoil on its economy and market remains a risk** in the future, but we do not want to exaggerate it as **the resilience of the system has been remarkable and keeps us hopeful** that the US political system can absorb these threats. We thus now rate these threats to US governance and growth as quite modest.

## VALUATION

The lion share of the low future rets on SPX in our model comes off mean reversion in valuation and US household allocations to equities. Each of our SPX valuations is telling us the market is expensive relative to history. The trailing multiple on the last 12 month or operating EPS at 23.7x is decently above the last 35 years mean of 19x, even as it remains far below from the 2000 peak of 30x (Figure 3). At 23.7x, the trailing PE is 1 standard deviation above its average since 1990.

Figure 3: Trailing PE multiple of the S&P500

Q1/1950-Q3/2024, quarterly. Operating IBES PE. Q3/2024 as of August 20.



Source: J.P. Morgan, S&P, Refinitiv, Bloomberg Finance L.P.

5. See, e.g., Acemoglu, Naidu, Restrepo and Robinson, [Democracy Does Cause Growth](#) (2019) 127(1) *Journal of Political Economy* 47-100.

6. See, e.g., Axelrod and Leitner, [Correlation of Democracy Indicators and Markets Returns](#) (2016) *V-Dem Working Paper 2016:04*; Lehtonen and Heimonen, [Democracy, political risks and stock market performance](#) (2015) 59 *Journal of International Money and Finance* 77-99; Lei and Wisniewski, [Democracy and Stock Market Returns](#) (2018).

Two other valuation metrics we use are Robert Shiller's Cyclically Adjusted PE ratio, known as CAPE, and its reverse minus the real 10-year UST yield taken as the nominal one minus 10-year past inflation, the excess CAPE yield. CAPE itself stands currently at ~34.8x, which is 1 ¼ standard deviations above its 26.7x mean since 1990. The excess CAPE yield has been increasingly used and supported by Shiller as empirically a better forecasting signal of long-term returns. It also shows an expensive equity market but much less so, as it is taken relative to a historically still low real bond yield. On Shiller's calculation, the excess yield stands at 2%, compared with a 2.5% average since 1990, only half a standard deviation expensive.

**Beyond statistical mean reversion, what forces could bring US multiples back to their 35-year mean, if not below them?** Or are there instead conditions or forces that could keep PE rates relatively elevated in coming years? We have discussed a number of these over the past 5 years (see Library at end of this note). Each point towards lower multiples and higher equity risk premia. They are **aging** and a natural move towards fixed income as one's investment horizons shortens with age; a return of **macro volatility** requiring a move up in risk premia, including the one on equities; **de-dollarization** that would make international investors reluctant to hold US assets; and the event risk of a **government debt crisis** that would drive up bond yields dramatically and have a nefarious impact of confidence in US creditworthiness.

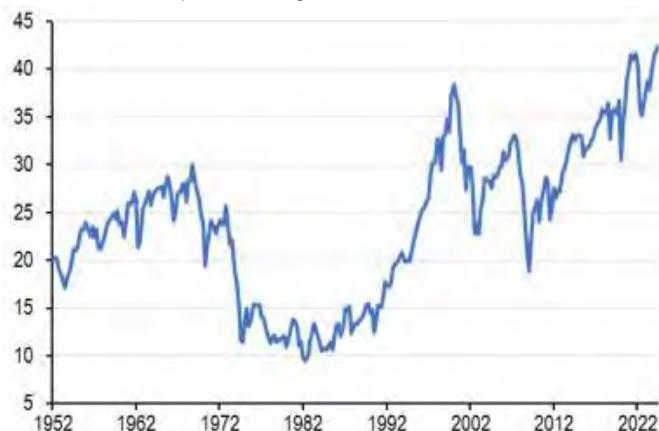
Importantly, **none of these four forces have yet shown up in full force**. They are currently just hovering as major event risks on our investment horizon. They are related, and one could easily bring on another one. **The fact that each point downward is what bothers us.**

### Aging

In a recent paper, we found that aging countries tend to have weaker returns on their equity markets, with a 1%-point rise in the ratio of people over 65 years old to those of working age coinciding across time and countries with a 3%-point lower return on equities over 10-year holding periods. This is likely due to lower economic growth and reduced innovation, but quite possibly also due to retired people following the old Rule of 100, according to which your allocation to equities should be 100 minus your age. The growing dominance of target-date funds in US 401(k) defined-contribution pension plans is one such mechanism that should reduce overall US equity holdings.

Figure 4: US household equity share of financial assets

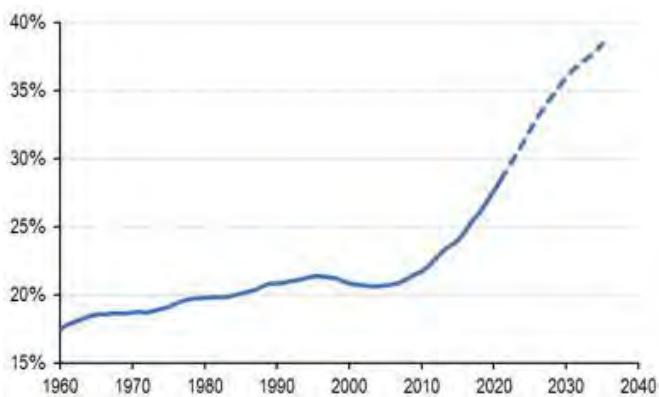
%, Q1/1952-Q3/2024, quarterly. Sum of equities held directly or via mutual fund shares or via Defined Contribution plans divided by total financial assets. Q2/2024 and Q3/2024 model imputed as of August 20.



Source: J.P. Morgan, Board of Governors of the Federal Reserve System.

Several caveats before we rely too much on the aging factor. First is that overall US households have not yet reduced their equity allocation which remains at a historic high (Figure 4). Second, and related, is that US old age dependency really started rising only ~10 years ago (Figure 5) and remains well below Europe or Japan. Third, also related, is that we tried including old age dependency in our long-term US equity return model but found it not statistically significant and dominated by the impact of valuations. Still, this may all be due to the fact that the aging factor is only a recent phenomenon in the US. But it creates downside risk to current valuations.

Figure 5: US old-age population as a share of middle-age population %, 1960-2021, annual. Dashed line is forecast.



Source: J.P. Morgan, UN Population Division.

### Great Moderation and macro volatility

We do not have great long-term valuation models of the multiple itself, aside from noting that it was much lower during the 70 and 80s when inflation was much higher and more volatile<sup>7</sup>. The period from the mid-1980s has been named the **Great Moderation** during which anti-cyclical macro policies and inflation targeting succeeded in reducing macro volatility and with it the number of recessions. Risk premia generally came down across the bond, credit and equity markets and made US investors more confident in holding equities, **doubling the equity multiple to ~20x**.

It has been our view<sup>8</sup> that the Great Moderation is at serious risk of reversing as the macro-economic stability it produced did not deliver the goal of greater long-term investment and growth and instead coincided with weaker growth and capital spending and much greater inequality. Hence our perception that the US would aim for a more active fiscal policy during recessions and that there would be pressure on central banks to focus more on jobs and less on inflation control, at least at the margin.

**So far, we have not been right on this view.** It may be early to call time on what is really a long-term view, and maybe we should allow it to run, but the high political costs paid by governments from the dramatic rise in inflation during Covid and seeming consensus on all sides to do what it takes to bring inflation under control suggest we are probably better off not to base our strategic allocation on higher and more volatile inflation over the coming decade than seen pre-Covid during the Great Moderation.

We thus prefer to stick with the 19x average multiple of the last 35 years as the mean reverting level of the trailing SPX multiple. The same would apply for the Shiller CAPE ratio which takes the last 10 years average EPS in real terms instead of just the last 12 months as denominator. This still keeps the equity market expensive but not to a level that signals an imminent reversal but just that at about 25% above its historic mean, SPX does need to come down about 2 1/4% pa relative to future earnings to get back to its long-term mean valuation.

7. Nearly 20 years ago, in an attempt to model US equities, we found its multiple negatively affected by macro volatility and real bond yields ([A fair value model for US Bonds, Credit and Equities](#), Panigirtzoglou and Loeys, Jun 2005, last reviewed in [Flows & Liquidity](#), May 23, 2024). While not a long-term forecasting model, as this would require forecasts of bond yields and macro volatility 10 years out, it does provide a fair-value level for SPX showing that the US equity market is indeed expensive, a conclusion we agree with.

8. See our [Inflation, markets and the end of the Great Moderation](#), Sep 27, 2021, on this topic.

### De-dollarization and de-globalization.

There are two risk factors that we have discussed a few times before on these pages. Our conclusions so far is that these are risks not realities, yet<sup>9</sup>. If they were to become realities they would in our mind do so under circumstances that would by themselves also be quite negative for the US equity markets. De-dollarization — not our base case for the coming decade — could come from economic and political turmoil in the US that would induce global investors to pull their money back from the US. You need not just bad growth and bad politics/policy making but these need to be much worse than in the rest of the world. We currently do not see reason to make this a seriously probability in our strategic thinking. A recession by itself would not do the job as this should be seen as just macro “vol” and part of a normal business cycle and thus not a reason to become long term pessimistic about the US.

### Interest rates and the risk of a US debt crisis.

We discussed above already how rising borrowing costs due to out-of-control federal deficits would also eat into corporate earnings. However, they also have a potential negative impact on multiples as their reverse, the equity yield, can be considered a UST yield plus an equity risk premium. In theory, the equity yield should rise one for one with UST yields and could rise more if this in turn makes investors more risk averse. In practice, though, we find that the impact is much more subdued with a 1%-point rise in UST yields on average pushing up equity yields by barely more than one tenth of that. At today's SPX multiple of 23.7x, the earnings yield is 4.22%. A 10bp earnings yield rise would lower the multiple to just above 23, which requires only a~ 2% drop in the index price, quite bearable.

## Conclusion

Our long-term US equity return model produces only a 5.7% annual return over the next decade. It comes largely off the high current trailing earnings multiple. We suspect that the great majority of long-term return projections by major asset owners generate the same low returns as the link between entry valuation is widely known. In this piece, we tried go beyond the model and think about the possible fundamental forces that could bring about a repricing of US equities to historic means in coming years. Pretty much each of these fundamental point to lower equity prices. The reason that they are not priced in is in our mind because each remain a risk factors that are not yet a full reality and may never become one. We do not need each one of them to become reality to bring us lower equity multiples. Just a few of them is probably enough.

**Valuations, asset IRRs, are great at informing us about returns over long holding periods but are quite poor at giving us a clean direction, up or down, over the near term.** For equities, they do not tell us much about the new few months or quarters. For that we need fundamental news, shocks, or events. An expensive equity market is not a good timing device to punt on an imminent market crash. For that we need “bad” economic data to drive down expectations of growth or push up inflation projections. That is to this analyst not the case today, or at least, not yet.

9. Discussed more in detail in Joyce Chang et al., [Dollar's demise: Not so fast](#), J.P. Morgan Perspectives, Sep 4, 2024.

## The Long-term Strategist

Does higher growth boost long-term equity returns?

- Economic growth is often used as an input into strategic asset allocation, based on an expectation that a country's higher GDP growth should produce higher earnings growth and thus higher equity returns.
- We explore whether this intuition is right and, if so, whether growth expectations are usable signals given the difficulty of forecasting long-run economic growth.
- We find that higher economic growth is associated with higher equity returns in DM, but not EM. Higher returns are observed both outright and also relative to other countries.
- In DM, a 1% increase in long-term real growth came with ~3% higher long-term equity returns on average.
- There is likely a disconnect between EM domestic growth and equities as their equity market caps are on average only 1/5<sup>th</sup> of their GDP, compared with 1.2x GDP in DM.
- About half of the return impact of higher growth in DM comes from higher earnings growth. Slightly less than half comes from higher valuations. The rest is from currency strengthening.
- However, as we have previously [shown](#), long-term growth forecasts come with large forecasting errors. We see no relationship between forecast growth and actual returns. Actual returns are also unrelated to recent past growth.
- Being mindful of the difficulties forecasting long-run growth, the results suggest it would still be reasonable for an investor to incorporate any high conviction views about growth or growth differences into their asset allocation process.
- Large long-term investors all need to make *assumptions* about future long-term returns on the asset classes they invest in. Our results suggest that these frameworks should take into account that higher growth in any country tends to go hand-in-hand with higher multiples and currencies.
- We have previously forecast decade-ahead growth of 1.8% pa for the US, 1.4% for the Euro area, and 0.8% for Japan. Bearing in mind the uncertainty, this is one factor suggesting outperformance of US equities can be sustained.
- We have been strategically underweight EM vs DM equities. If long-term economic growth were a useful signal for EM, we would have been wary to be underweight EM.

### Long-term Strategy

Alexander Wise <sup>AC</sup>

(1-212) 622-6205

alexander.c.wise@jpmchase.com

Jan Loeys

(1-917) 602-9440

jan.loeys@jpmorgan.com

J.P. Morgan Securities LLC

Economic growth is often used as an input in strategic asset allocation as faster GDP growth ought to boost company earnings and with it profits, while raising bond yields. Faster growing countries should thus see their stock market outperform. However, **when you buy stocks, you don't buy GDP** but instead an uncertain stream of future profits from a set of companies listed on that country's stock exchange, many of which do business across the world. **Starting with GDP, there are many things that can go "wrong" on the way to long-term company profits and valuations.**

In this paper, we explore whether you can use economic growth to **forecast equity returns and relative country performance over the next 10 years**. We use a panel of nine large DM equity markets and eight large EM ones.<sup>1</sup> We restrict our focus to larger markets as smaller ones will tend to derive a greater share of earnings from abroad and/or will have sector compositions that are not representative of their overall economies.

## Real or nominal growth?

When we talk about economic growth, we almost always do so in real terms, stripping inflation out of nominal growth. However, as we are trying to project nominal equity returns, it is reasonable to ask whether we should instead use nominal GDP growth, as it could correlate better with company revenues and earnings.

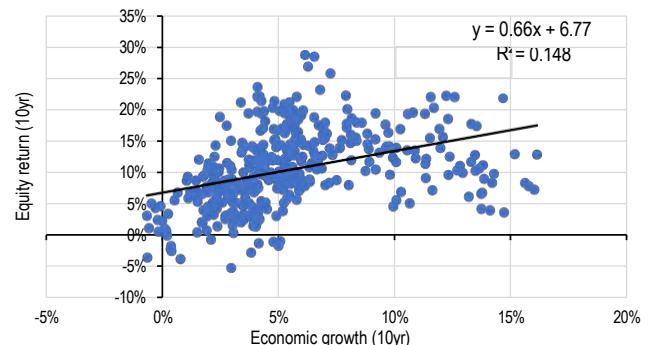
Figures 1 plots a scatter of *nominal* GDP growth over 10-year periods against USD equity returns for our panel of 9 DM countries, while Figure 2 does this for *real* GDP growth. Both show that **higher long-run economic growth is associated with higher equity returns**, but that the **relation is tighter for real growth**. Importantly, the **beta**, or marginal impact of a 1%-point higher GDP growth is only **0.66 for nominal growth and 3.1 for real growth**. As discussed below, we find broadly comparable results when examining local-currency returns, rather than USD returns.

We know that company profits are a leveraged "position" on overall GDP and thus **very much prefer the relation to real**

GDP, shown in Figure 2.<sup>2</sup> As a practical matter that we will touch on later, we have also previously noted that long-run forecasts of US nominal growth come with larger forecasting errors than do forecasts of real growth, diminishing the utility of the former as a signal relative to the latter.

Figure 1: DM countries — Long-run *nominal* GDP growth and equity returns

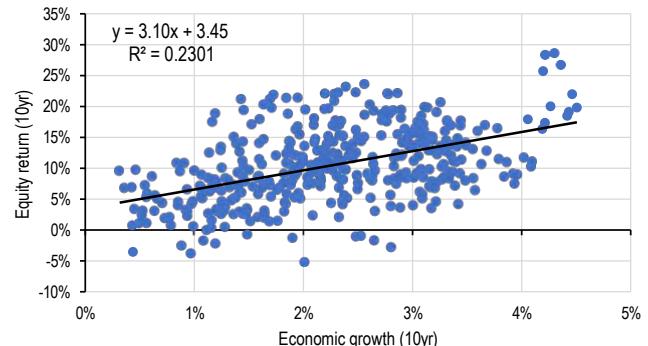
% pa, 1969-2023, annual. 10yr rolling periods. US, Japan, UK, Canada, Switzerland, France, Germany, Australia, Netherlands.



Source: J.P. Morgan, World Bank, MSCI, Refinitiv.

Figure 2: DM countries — Long-run *real* GDP growth and equity returns

% pa, 1969-2023, annual. 10yr rolling periods. US, Japan, UK, Canada, Switzerland, France, Germany, Australia, Netherlands.



Source: J.P. Morgan, World Bank, MSCI, Refinitiv.

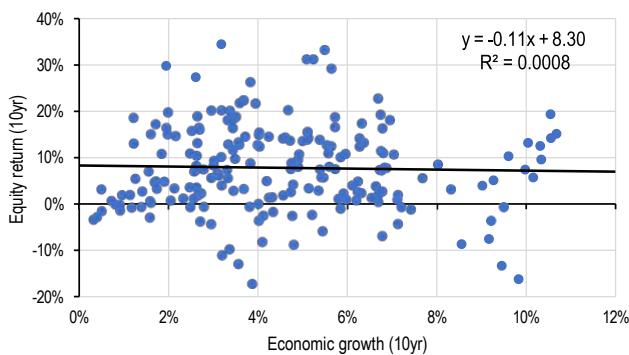
Figure 3 plots the same scatter of long-run real GDP growth against equity returns for our 8 **EM countries**. Unlike for DM, there is **no clear relationship** between long-run growth

2. We use equity returns in USD instead of local terms both because our focus is on the international investor and because even in the larger equity markets, the majority will have over half of their revenues coming from abroad. We do not replicate our local currency analysis (below) for EM because of the effects of high and volatile inflation on returns. This ought to be less of an issue for USD returns as high inflation is associated with long-run currency depreciation under Purchasing Power Parity (PPP) theory, which reasonably fits FX data in the long run.

and equity returns among EM countries. This is quite possibly because **listed companies are a much smaller part of the EM economies than of the DM ones**. MSCI World – the DM world – currently has a market cap that is ~1.2x the level of DM GDP, while the MSCI EM one is only ~0.2x EM GDP. EM companies are also more likely to be state- or family/pri-vately-owned, loosening the relation between the economy and the much smaller listed equity market, compared to that in DM.

Figure 3: EM countries — Long-run real GDP growth and equity returns

% pa, 1987-2023, annual. 10yr rolling periods. Mainland China, India, South Korea, Brazil, South Africa, Mexico, Indonesia, Malaysia.

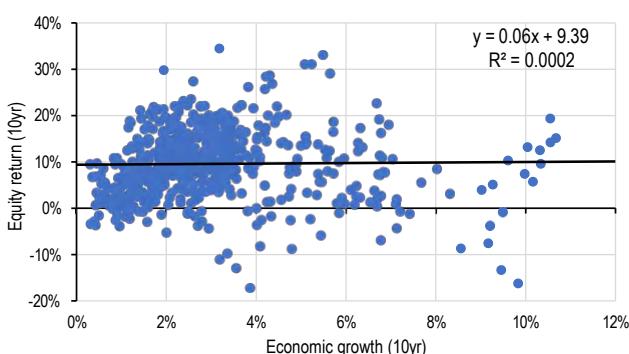


Source: J.P. Morgan, World Bank, MSCI, Refinitiv.

Combining DM and EM from Figures 2 and 3 produces Figure 4, which shows no relationship between long-run economic growth and equity returns. This suggests further that **economic growth is unlikely to be helpful when making strategic country choices across DM vs. EM equities**, even with perfect GDP forecasting. We thus **proceed with only our DM panel**.

Figure 4: DM and EM countries — Long-run real GDP growth and equity returns

% pa, 1969-2023, annual. 10yr rolling returns. Country list in footnote 1.



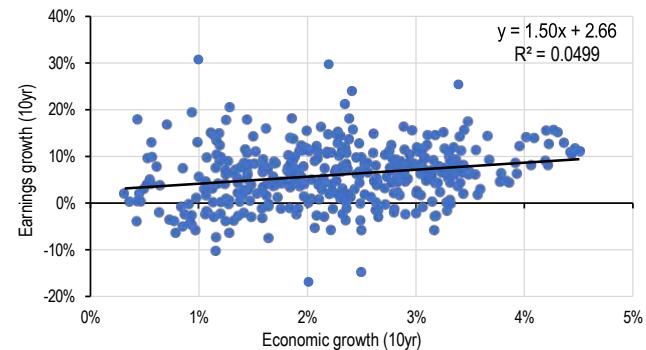
Source: J.P. Morgan, World Bank, MSCI, Refinitiv.

## What drives the growth-return relation: earnings, valuation, currency?

To address this question, we need to **decompose the effect of growth on equity returns into effects on EPS growth, valua-tions, and currency movements**.<sup>3</sup> Figures 5 and 6 do this for EPS growth and P/E changes respectively. The first shows EPS growth increases 1.5%-points for each 1%-point higher real growth. The second shows PE changes add an additional 1.1%-points of impact. Figure 7 confirms this result by showing an impact of 2.6%-points on local-currency equity returns, in effect the sum of the EPS and P/E impacts. This indicates that the remaining 0.5%-point impact (the difference between the 3.1%-point impact on USD returns and the 2.6%-points on local currency returns) is due to currencies.

Figure 5: DM countries — Long-run real GDP growth and EPS growth

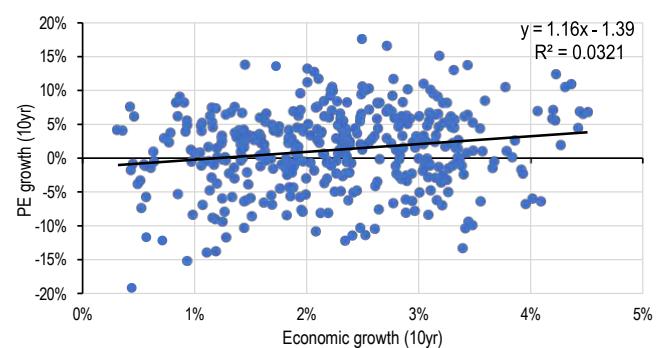
% pa, 1969-2023, annual. 10yr rolling periods. US, Japan, UK, Canada, Switzerland, France, Germany, Australia, Netherlands.



Source: J.P. Morgan, World Bank, MSCI, Refinitiv.

Figure 6: DM countries — Long-run real GDP growth and PE ratio growth

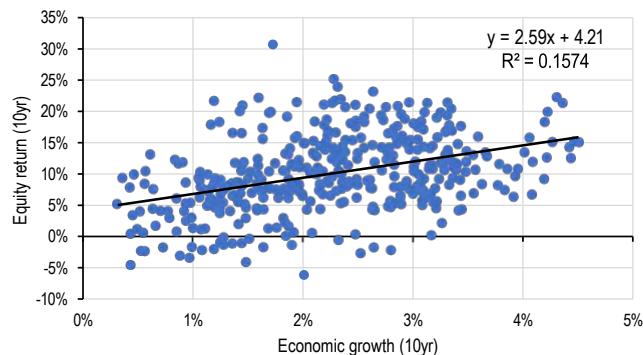
% pa, 1969-2023, annual. 10yr rolling periods. Annualized growth rate of PE multiple. US, Japan, UK, Canada, Switzerland, France, Germany, Australia, Netherlands.



Source: J.P. Morgan, World Bank, MSCI, Refinitiv.

3. Dividend yields do not change much over time and are thus ignored here.

Figure 7: DM countries — Long-run real GDP growth and equity returns in local currency  
 % pa, 1969-2023, annual. 10yr rolling periods. US, Japan, UK, Canada, Switzerland, France, Germany, Australia, Netherlands.



Source: J.P. Morgan, World Bank, MSCI, Refinitiv.

Hence, higher real GDP growth across countries and through time affects long-term equity returns not only by **raising earnings growth, but also by raising equity multiples and strengthening the country's currency**. Roughly half the impact is on earnings, 3/8<sup>th</sup>s on valuations, and 1/8<sup>th</sup> on currencies.

The impact on earnings growth was to be expected, but the additional effect on equity valuations and currencies<sup>4</sup> is, to some extent, a surprise. But there are reasonable arguments for these effects. Firstly, both **economic growth and equity valuations have a common driver** in the perceptions and expectations of economic agents. Optimism can simultaneously lead to higher investment and consumption, and bullishness in asset markets. Secondly, we have previously shown that even sophisticated economic forecasters form long-run expectations adaptively – by looking at the recent past. Stronger economic growth thus tends to lead investors in equity markets to **anticipate stronger future earnings growth, justifying a higher PE multiple**. There could also be an element of reverse causation in that higher equity valuations produce **wealth effects** that stimulate consumption, or **equity valuations that are attractive to issuers** may finance higher investment, thereby raising long-run economic growth.

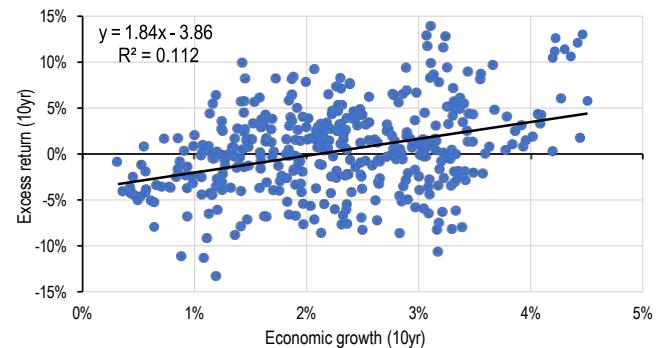
## Cross-country equity returns

4. This does not mean that a long-term FX forecasting model should incorporate economic growth, as extensive empirical analysis has shown that it does not improve the predictive power of simple models based on real valuations. This is likely because, while there is a positive relationship, it is quite weak. In our experience, this is true even if one takes as given actual future growth, which is of course unknown when forecasting.

The analysis above considered the relationship between long-run GDP growth and equity returns *in absolute terms*. Next, we examine the relationship between long-run economic growth and country equity returns relative to the rest of DM.<sup>5</sup> Figure 8 shows a clear **positive relationship between long-run growth and country excess returns**. We find a similar result when using economic growth relative to the other countries, rather than outright economic growth, as the independent variable.

Figure 8: DM countries — Long-run real GDP growth and country excess equity returns

% pa, 1969-2023, annual. 10yr rolling periods. US, Japan, UK, Canada, Switzerland, France, Germany, Australia, Netherlands. Returns relative to MSCI World excluding country — see footnote 5.



Source: J.P. Morgan, World Bank, MSCI, Refinitiv.

## Forecasting long-run growth

It is one thing to document a relationship between long-run economic growth and equity returns. It is another to be able to **forecast long-run economic growth in a way that allows the use of growth expectations as a signal**. In previous analysis, we showed that economists' long-run forecasts of economic outcomes come with large forecasting errors, and in some instances, a persistent statistical bias.

We have previously developed forecasts of long-run real economic growth. While these forecasts were roughly unbiased and came with tighter confidence intervals than other forecasting benchmarks, forecast errors were still quite large. In that previous note, we recursively estimated the model from 1990 to assess its historical performance. Though we do not have a real growth forecast for all countries in each 10-year period since 1990, we can test whether there is a relationship

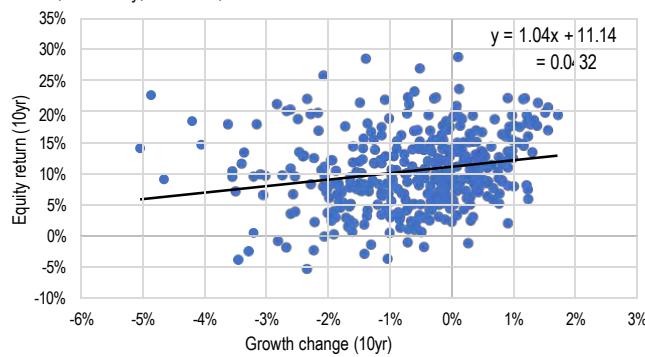
5. One would ideally want to calculate the excess return relative to a world index that omits the country in question. These indices do not exist for all countries in our sample. Where they do, we measure excess returns relative to the index excluding the country in question. Where they do not, we measure excess returns relative to MSCI World. Given its share of global equity markets, this issue is most pressing in relation to the US, where we do have such an index.

between those long-run real growth forecasts and realized returns. For both absolute and relative returns, we found **no relationship between our model-based long-run forecast growth and realized 10-year equity returns.**

## Should expected growth not be in the price already?

Finance theory teaches us that asset prices should move only on new information and that what everybody knows or believes should be in the price. Hence, it ought to be the unexpected part of economic growth that correlates with equity returns. We have found evidence that consensus long-run economic growth expectations are highly adaptive and correlate quite closely to a measure of past growth. In Figure 9 below, we thus replicate Figure 2 but now with 10-year growth minus growth over the previous 10 years. Unlike what theory tells us, we now find a **weaker relation between 10-year equity returns and the change in economic growth**, our proxy for the unexpected part of growth.

Figure 9: DM countries — Long-run real GDP growth changes and equity returns  
 % pa, 1970-2023, annual. 10yr rolling periods. US, Japan, UK, Canada, Switzerland, France, Germany, Australia, Netherlands.



Source: J.P. Morgan, World Bank, MSCI, Refinitiv.

Our main interpretation is that investors either focus primarily on short-term drivers of markets and/or do not put much credence in long-term growth projections.

## Tactical vs. strategic choices

How do our results square with the fact that the investing community spends a lot of time and energy assessing macroeconomic releases for tactical investing across world bond, equity, credit, bond, and commodity markets? Our experience here is that **economic growth and its many components can indeed be used profitably to take short-term positions across world markets**. Our own tactical strategists – Fabio Bassi in Rates, Meera Chandran in FX, Natasha Kaneva in Commodities, Steve Dulake in Credit, Jonny Goulden in EM, and Dubravko Lakos-Bujas in equities – have for many years

used macro signals, both discretionary and systematic, to produce profitable macro trade recommendations. We ourselves have found that GDP forecast revisions, which should result from new macro information, are a useful signal to assess FX, equity and bond market allocations over a period of several months (Lupton, Kasman, Lehman and Loeys, Know thyself, Evaluating and using J.P. Morgan Economic Forecasts, Sept 23, 2014).

This seeming dissonance between the short- and long-term usefulness of economic growth signals for investment purposes is in our mind largely due to serial correlation in shocks to productivity, profit margins, and P/E multiples that make macro-based long-term forecasts much less effective than those over shorter periods.

## Our main empirical findings

The **core findings of our analysis** of the relationship between long-run economic growth and equities can be summarized as follows:

1. Within large DM economies, there is a positive contemporaneous relationship between a country's real GDP growth and the nominal return on their stock market over 10-year holding periods.
2. The relationship is not extremely strong, but still explains ~1/4 of long-term equity return variation.
3. We have not found a relationship between domestic GDP growth and equity returns in EM countries.
4. The positive relation to growth in DM countries comes from not just earnings growth, but also P/E and FX gains.
5. DM countries which grow faster tend to outperform others, but this relation explains only ~1/10<sup>th</sup> of relative country equity returns.

## Implications for investors

There is good evidence that long-run economic growth is positively related to equity returns in DM countries, but not in EM ones. However, **economists, like us, have not been able to systematically forecast future growth with sufficient accuracy** to make those forecasts a reliably useful signal for strategic asset allocation.

We have published on our long-term return model for US equities which is based primarily on equity valuations and US investors' allocations to stocks. Both are quite high giving us only a ~5.5% pa return projection for the next 10 years and ~8.1% over 20 years, earlier this month (see Very long-term return forecasts for US equities and bonds, Aug 2, 2024). We currently do not see a convincing reason to change these forecasts based on still-robust US GDP growth. **Even if we had**

**perfect foresight of future US growth, this would not have improved the accuracy of our return forecasts based on current equity valuations,** that project 10-year SPX returns reasonably well.

We have not yet been able to find good long-term equity return models for **other countries** and would surely need to consider GDP as a **potential input**, despite the difficulties in making accurate long-term economic projections.

All large long-term investors need to make forecasts, or at least **assumptions**, about the return and risk on the major asset classes that they are considering investing in. Most of these frameworks entail making a judgement on the **building blocks** that make up asset class returns. In the case of equities, these typically consist of real growth, inflation, profit margins, foreign earnings, multiples, dividends, share buybacks and dilution. Our results above on how higher growth impacts not just earnings growth, but also multiples and currencies indicate that such frameworks/models should assume a **positive correlation between these three drivers of total equity returns**.

The difficulty in making accurate long-term growth projections does not mean that growth expectations should be treated as irrelevant to an investor. An inability to systematically forecast growth for a large set of countries over an extended period of time does not imply an inability to forecast growth in some more narrow circumstances. Thus, it would be reasonable for a **strategic investor with a high conviction view about growth in any particular DM country or countries** to incorporate this view when building their strategic portfolio. We have previously forecast decade-ahead growth of 1.8% pa for the US, 1.4% for the Euro area, and 0.8% for Japan. Bearing in mind the uncertainty, this is one factor suggesting **outperformance of US equities can be sustained**.

We ourselves have been **strategically underweight EM vs DM equities** for some time (see [Updating our SAA](#), June 21, 2024, which is also summarized in the next section). If long-term economic growth were indeed a useful signal, we would have been wary to underweight EM. We maintain the strategic underweight of EM instead on the basis of our concern about greater EM vulnerability to climate change, and to China's greater focus on national security and Common Prosperity, which we think does not provide good long-term support for its equity market.

Our results leave plenty of room to use macro signals for **tactical asset allocation decisions**. Using, for example, our 2014 forecast revision [model](#) mentioned above, our economists have steadily upgraded US growth relative to the rest of the world over the past 2 years, by itself signaling that the

time of US underperformance has probably not yet arrived. Similarly, our economists have been upgrading DM vs EM economic growth since the start of this year, and EM equities have accordingly underperformed since, continuing a negative relative momentum signal for EM.

## The Long-term Strategist

Will Americans continue to love equities?

- US households and non-profits have quadrupled their equity allocation over the past 40 years to a near-record high 41% this year. This did not happen in the rest of the world.
- This US love affair with stocks helped US equity multiples gain ~20 points versus the rest of the world over this period, making up half of the 5.1% pa US equity outperformance since 1987.
- Any decision on whether to strategically stay at today's US market weight of 64% of world equity outstandings, or to be higher or lower, requires as one input a view on whether US investors' much greater attachment to equities will continue to strengthen or will fade.
- Over the next five to 10 years, we see on balance a fading of the forces that propelled the US love affair with equities, supporting our current IRR based forecast of only ~6% on SPX 10 years out.
- A secular rise in US profit margins since the 90s boosted equity returns, optimism, higher allocations, higher multiples, and in turn greater return bullishness. The Great Moderation reduced macroeconomic uncertainty that turned investors even more confident about owning stocks. The success of Jeremy Siegel's *Stocks for the Long Run* then solidified the conviction that long-run investors should be primarily in stocks. Greater competition among asset managers and the innovation of mutual funds, ETFs, passive trackers, and electronic trading made it easier and cheaper to hold and trade equities.
- Over the next five to 10 years, US aging, the sudden dominance of target-date funds, the emergence of a competitive return on bonds, the flattening out of any further drop in the cost of holding and trading US equities, the risk of higher macro volatility, and thus renewed risk aversion, and a slow weakening of double-digit return expectations will in our mind slowly erode, though not destroy, the US love affair with equities and make it turn toward a more balanced allocation with fixed income.
- This move is not imminent and not a tactical call on our part but should be an important factor in deciding whether to stay fully allocated to US equities versus the rest of the world. From a strategic point of view, this team remains neutral.

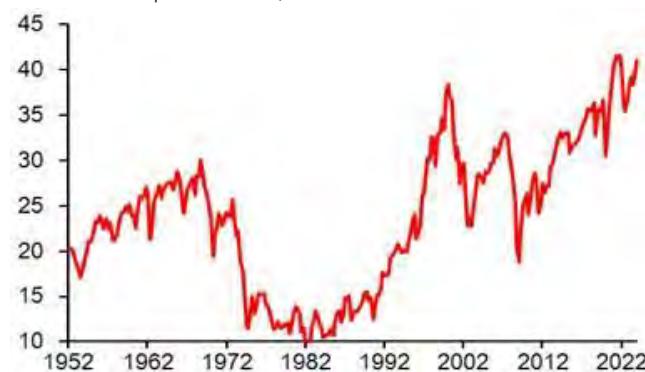
### Long-term Strategy

**Jan Loeys** AC  
(1-917) 602-9440  
[jan.loeys@jpmorgan.com](mailto:jan.loeys@jpmorgan.com)  
**Alexander Wise**  
(1-212) 622-6205  
[alexander.c.wise@jpmchase.com](mailto:alexander.c.wise@jpmchase.com)  
J.P. Morgan Securities LLC

US end investors have been steadily allocating more and more to equities in their financial assets over the past 40 years. By now, US households and non-profit organizations, such as university endowments, hold equities at a near record high 41% of their total financial assets, according to the Fed's US Financial Accounts (Figure 1). Only at the end of 2021 did they have slightly higher allocations.

Figure 1: Equity allocations of US households and nonprofit organizations

%. Directly and indirectly held corporate equities as a % of total financial assets.  
Q1/2024 model imputed to Feb 15, 2024



Source: J.P. Morgan, FRB of St. Louis FRED data base (BOGZ1FL153064486Q).

This 41% allocation to equities seems underwhelming relative to the classic 60/40 equity-bond allocation that many financial advisors use. This is both because the Fed's household financial assets include other assets, such as cash, and some 42% of US households do not invest at all in any corporate stocks, directly or indirectly through retirement accounts.<sup>1</sup>

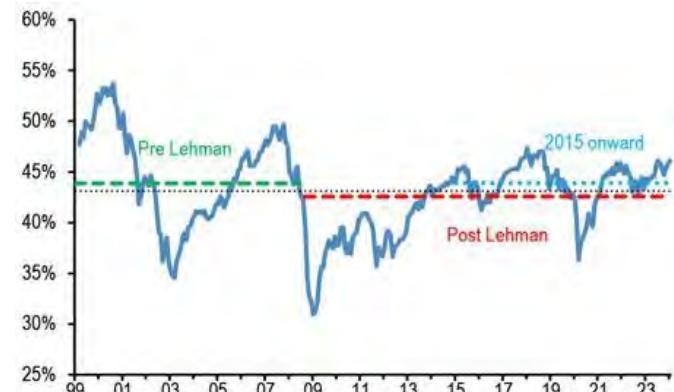
Two recent studies of the holdings of US investors with financial advisors<sup>2</sup> that use the Addepar financial platform show that at the end of 2018, US households in the top ~5% of wealth held 57% of their total investments in the form of equity, 8% in cash, and 23% in fixed income, the latter

consisting mostly of corporate and municipal bonds.<sup>3</sup> Looking only at equities and fixed income, these investors had a 70/30 equity bond allocation at that time.

The steady rise in US household investing in equities is not something that we see in the rest of the world. Figure 2 shows an aggregate outstanding-based measure of non-bank holdings of global equities and bonds. It is basically global bond, equity, and cash outstanding minus what is held by commercial banks, central banks, and reserve managers. Over the past 25 years, global investors, including US residents, have shown, if anything, a declining desire to hold equities, unlike the rising share held by US households shown in Figure 1.

Figure 2: Implied equity allocation of non-bank investors globally

Global equities as % of total holdings of equities/bonds/M2 of non-banks.



Source: J.P. Morgan [Flows & Liquidity](#), Bloomberg Finance L.P

Figure 3 below shows that households in Japan, Germany, and France have not increased their equity allocations over the past 30-40 years, unlike their US counterparts. Japan and Germany households have only 13% and 16%, respectively, invested in stocks, with France at 26%.

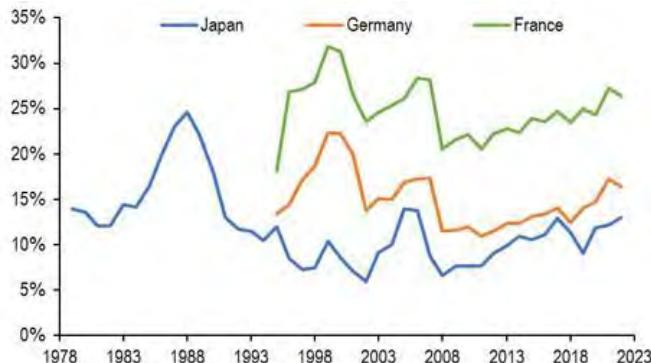
1. [Survey of Consumer Finance](#), Oct 2023, p. 58.

2. [Asset allocation and returns in the portfolios of the wealthy](#), Aug 2023, LSE, Balloch and Richers; and [Asset demand of US households](#), Xavier Gabaix et al., University of Chicago working paper, 2024-1. The portfolios studied have over \$2 trillion in assets held by ~180K individual investors.

3. The percentages are our own aggregation of the data in these studies. We take public equities, equity ETFs and mutual funds, private equity, venture capital, and equity hedge funds as our equity measure and bonds, bond funds, and non-equity hedge funds as our fixed income estimate. Percentages do not add up to 100 as there were several "other" and "unknown" categories that we could not assign to bonds or equities.

Figure 3: Equity allocations of households in Japan, Germany and France

% direct and through mutual funds of stocks as % of total financial assets.



Source: J.P.Morgan, Eurostat, Bank of Japan.

The **long-running love affair of US investors with stocks**, unlike elsewhere in the world, has contributed to the steady outperformance of US equities and helped create the paradigm of **US Exceptionalism**. Since 1987, half of the 5.1% pa US outperformance of MSCI World ex-US came from US multiples steadily rising versus the rest of the world (Figure 4), with the other half coming from faster earnings growth. Many asset allocators, including us until a year ago, have been advising to strategically underweight the US equity market given its relative P/E expensiveness and assumed future P/E convergence and an assumption that US profit margins will eventually converge back down toward their long-term mean.

Figure 4: P/E Multiple gap: MSCI USA minus MSCI World ex US  
Difference in P/E trailing ratios, 1987 to 2024.



Source: J.P. Morgan, Refinitiv.

Any decision on whether to go strategically underweight US equities needs to assess both relative earnings growth and how US multiples will move relative to those in the rest of the world. To help inform this decision, this issue of *The Long-term Strategist* will look at whether there is reason to believe

that the US secular rising preference for stocks over other asset classes (its “Equity Culture”) is set to peak and then to reverse or will instead stay strong. We will conclude that the US Equity Culture is biased to weaken in response to a now competitive return on bonds, the growing elderly cohort naturally reducing its equity allocations given the Rule of 100, and the growing dominance of target-date funds, the risk of higher macro uncertainty, and the completion of the race to zero fees by index trackers.

## What drove the US Equity Culture?

We see broadly five forces: (1) passive (and “happy”) acceptance of higher US equity returns; (2) rising confidence in sustained high US equity returns; (3) a perception of lower risk in the US than elsewhere; (4) the runaway success of Jerry Siegel’s *Stocks for the Long Run*; and (5) a secular improvement in the cost, ease, and liquidity of holding and trading equities as a result of greater competition and the growth of mutual funds, ETFs, 401K defined-contribution pension plans, target-date funds, and low-cost index trackers.

**(1) Passive acceptance of high equity returns.** One possibility, contrary to how we all like to think of strategic asset allocation, is that end investors may not really have a strong view, or even a vague one, on how much they want to allocate to different asset classes and simply “go with the flow”.<sup>4</sup> Over the past 35 years, US equities earned 10.8% pa, beating US bonds 5.2% by 5.6% pa. Compounding these returns over this time and as a simple exercise assuming no in- or outflows nor reallocations, non-equity assets earning the same as bonds, and no foreign assets produce a rise in equity allocations close to what Figure 1 shows as today’s allocations.

Such passive acceptance of high equity returns quite likely plays an important role in the **short run**<sup>5</sup>. If stock markets do particularly well in a certain year, pushing up the equity share above any notion of a desired level, investors do not appear in a hurry to sell into a rally, both as they understand the power

4. [US Financial Accounts \(Z.1 report\)](#), show that US investors, both households and more institutional investors such as pension funds and endowments, had on average only 18% of their equity holdings in foreign stocks at the end of Q3 2023. This is derived from Table L.224 where we take US residents’ holdings of foreign stocks divided by domestic stocks outstanding minus those owned by non-residents plus US residents’ holdings of foreign stocks.

5. The above cited [Xavier Gabaix et al. study](#) finds support for this passivity hypothesis among US high-net worth investors. The authors find that “These new facts paint the picture of quite inert households (even for the extremely wealthy, households), with low turnover and reaction to the aggregate stocks market developments, consistent with models of inertia, inattention and inelasticity.”

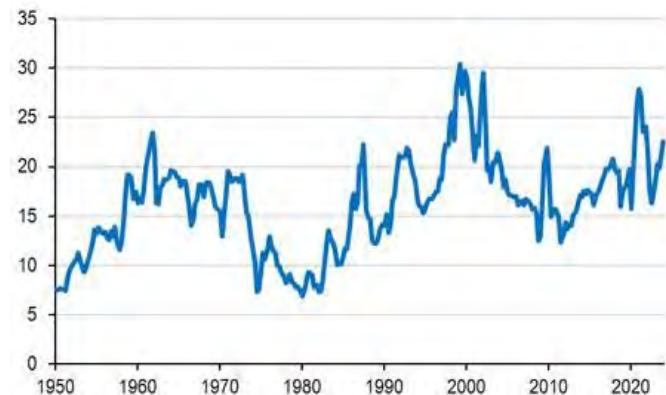
of momentum, and as taking profit early produces short-term capital gains that are not taxed lightly in the US.

Still, given the massive attention on asset allocation we see among financial advisors, we would assume that over periods of five to 10 years, end investors do look at how their savings are invested and make adjustments, usually through new savings to minimize taxes on capital gains. Such adjustments ought to have been made on the basis of changing perceptions of return and risk as well as when they would want to start spending their savings wealth.

(2) Our experience is that for the most part individual investors have “**adaptive**” expectations, meaning that they tend to **extrapolate** recent return trends some five to 10 years into the future<sup>6</sup>. In contrast, professional forecasters and advisors generally base their own projections on assumptions of economic growth and mean reversion in equity multiples and profit margins<sup>7</sup>. The surprising development over the past 20-30 years has been that neither US equity multiples nor profit margins have been reverting to their old averages but have instead surprised on the upside (Figures 5-6).

Figure 5: S&P500 trailing P/E ratios

Q1/1950 – Q1/2024, quarterly. Operating IBES trailing PE. Last obs.: Feb 15.



Source: J.P. Morgan, S&P, Refinitiv, Bloomberg Finance L.P.

6. See, e.g., our [How good are long-term forecasts?](#), June 14, 2022, as well as earlier empirical on individual (“retail”) return and risk expectations that have been shown to be highly related to past performance: Werner De Bondt, [Betting on Trends: Intuitive Forecasts of Financial Risk and Return](#), International Journal of Forecasting 9, 1993, 355–371, and Greenwood and Shleifer, [Expectations of Returns and Expected Returns](#), Review of Financial Studies 27, 2014, 714–746

7. See, e.g., [2024 Long-term Capital Market Assumptions](#), JPMorgan Asset Management.

Figure 6: US profit margins  
Q1/1950-Q4/2023.



Source: J.P. Morgan, Bureau of Economic Analysis, S&P, Bloomberg Finance L.P.

These expectations tend to be self-reinforcing as high equity returns relative to bonds will induce investors to allocate more to equities, boosting their returns and in turn rationalizing a higher equity allocation. It is therefore quite likely that US investors have been steadily raising their confidence in higher long-run US equity returns<sup>8</sup>.

(3) A third driver of the US equity culture has likely been a perception of reduced **long-term risk** on equities as well as on bonds, as the late 1980s defined the onset of what we call the *Great Moderation* of much reduced volatility and uncertainty about growth and inflation, with business cycles moving from an average of five-year expansions followed by recession to 10-year expansions<sup>9</sup>. The *Great Moderation* brought down risk premia across asset classes – term premia, credit spreads, as well as equity risk premia – but with equities as the longest-duration assets, it allowed equity returns to beat bond returns by a handsome margin.

(4) The perception of a reliable excess return on equities versus bonds got an enormous boost from the popularity of Jeremy Siegel’s [Stocks for the Long Run](#), first published in 1994 and now in its sixth edition with over 300,000 copies sold worldwide. It forged the conviction that the long-run investor should be primarily, if not exclusively, invested in stocks. Siegel consistently made the point that since 1802, US equities had beaten bonds 61% of the time in any particular year but

8. By our experience, the best signal on 10-year out equity or bonds returns is not their past return but instead today’s price, which dictates its yield, or IRR. That means that when equities been rallying for a sustained period, professional forecasters will be lowering their future return expectations, even as the actual owners of capital will tend to extrapolate these good returns into the future. See our [Long-term forecasts: Update January 2023](#), Jan 6, 2023.

9. See our analysis on this factor in [Inflation, markets and the end of the Great Moderation](#), Sept 27, 2021

92% in any 20-year period. The longer-term investor, which is almost all of us saving for old age, should thus be primarily invested in stocks. Since the first publication of Siegel's book in 1994, US households and non-profits have doubled the share of their assets allocated to stocks.

(5) A fifth, more structural force boosting the US Equity Culture consists of the **secular improvement in the cost and ease of holding and trading securities**, for equities. The move from trading paper stock and bond certificates to holding them in a central depository in the 1980s and then the rapid replacement of paper with electronic book entries made it much easier to trade and hold securities. Increased competition among asset managers, the growth in mutual funds, 401K private sector defined-contribution pension plans, ETFs, passive investing through cheap index trackers, and target-date funds similarly steadily lowered the expense ratios of mutual funds and ETFs, many of which have now fallen to zero<sup>10</sup>. The US, as the largest capital market in the world, could avail itself of huge economies of scale and competition that led to a secular fall in trading and investment costs in the US. The EU's Single Capital Market was supposed to create the same economies of scale and competitive environment but failed to do so as many member countries wanted to retain control over their own capital markets.

## What could change the US's love affair with equities?

Below, we look at each of the five drivers of the US Equity Culture to assess whether we can make a case for even higher equity allocation, range trading, or a reversal to a more balanced portfolio. We will argue for a bias toward the latter.

(1) A further sustained **bull market** in equities would have both the mechanical impact of boosting the share of equities in financial assets but also maintaining expectations of high future returns. Vice versa after a sustained bear market. Our own model projection of ~6%<sup>11</sup> annual returns over the coming decade is well below its 10.8% of the past 35 years and should thus gradually ease investor expectations as returns disappoint even as this would take a number of years to have an impact.

(2) The emergence of a **strong alternative** to equities could induce investors to switch allegiance. The main alternatives

10. [ICI](#) reports that actively managed mutual funds have seen their expense ratios fall by half since 1996 to 68bp and 48bp for equities and bonds, respectively, with a collapse to only 6bp for passive funds currently.

11. At the start of the year, our model produced a 10-year return forecasts of 6.4%. Updating these to today produces ~6%.

to equities for end investors consist of bonds and cash. Figure 7 below shows two measures of how investors ought to think about the expected long-term return between US equities and the US Aggregate Bond market, one in terms of our return forecasting models<sup>12</sup> and one simply in terms of their real yields. Both return spreads have come down to near zero and at their lowest points in 15 years. This has induced some buying of bonds through mutual funds<sup>13</sup>, but not yet enough to offset the impact of steady rises in equity prices. With US high grade corporates now yielding 5.5%, a modest further rise would give them a 6-handle, the same that we project for US equities over the coming decade<sup>14</sup>. This should over time entice a greater number of US investors to rebalance back into fixed income.

Figure 7: Difference between bond-equity real yields and 10yr return expectations based on our models

%, Q1/1982-Q1/2024. Real yield difference is CAPE yield on SPX minus real yield on US Agg. Expected return difference is 10yr forecast return on SPX minus 10yr forecast return on US Agg. Q1/2024 is as of Feb 15, 2024.



Source: J.P. Morgan, Federal Reserve Bank of Philadelphia, Board of Governors of the Federal Reserve System, Bureau of Labor Statistics, Bureau of Economic Analysis, Robert Shiller, Refinitiv, S&P, Bloomberg Finance L.P.

(3) **Risk and uncertainty.** The *Great Moderation* coming out of the volatile 1970s and 1980s clearly made investors much more willing to add to riskier asset classes, predominantly equities. The Covid inflation surge, fiscal over-easing, and late monetary tightening created to us a serious risk that the *Great Moderation* would lead to an era of **Great Macro Volatility**<sup>15</sup>. So far, central banks have probably been lucky or

12. [Long-term forecasts: Update January 2023](#), Jan 6, 2023.

13. See the weekly [Flows and Liquidity](#), Panigirtzoglou and Inkinen, tables and charts in Appendix.

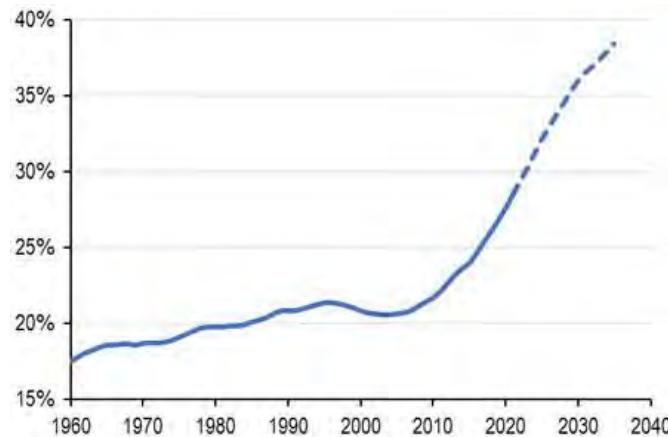
14. Our own projection that real 10-year US Treasury yields are set to average 2.25% later this decade ([Lowering our long-run US bond yield forecast](#), Nov 28, 2023), while adding some 2.5% in inflation and 170bp historic average HG credit spread produce an expectation of an average HG corporate yield of 6.5%.

15. [Where are we in Regime Change? Macro volatility, deglobalization, and secular rise in yields](#), Nov 8, 2022

very smart. US inflation has come down dramatically over the past year without any marked slowing in the economy or higher unemployment, although inflation is not yet back to its long-term target. Credit and equity risk premia have fallen back below historical means. Any return of excessive US fiscal pro-activeness or any interference in Fed decision making by a future administration could raise long-term uncertainty again, raising risk premia as US investors reduce their allocation to risky assets.

**(4) Aging:** The US population is aging as the average baby boomer is now over 65 years old, and the [nation's fertility rate at 1.66 children per mother](#) remains well below the population replacement rate of 2.1. The 65+ population is now growing relative to the working age population (Figure 8). The median age of Americans has steadily risen to a new high of 38.9 years, up from only 28 in 1970<sup>16</sup>. The classic Rule of 100 used by most financial advisors indicates that your equity allocation should be 100 minus your age. By this rule, Americans should over time be holding less and less of their savings in equities and more in cash and bonds, while selling both, as an increasing number moves into retirement.

Figure 8: Old-age population as a percent of middle-age population %, 1960-2021, annual data. Dashed lines are forecasts.



Source: J.P. Morgan, UN Population Division.

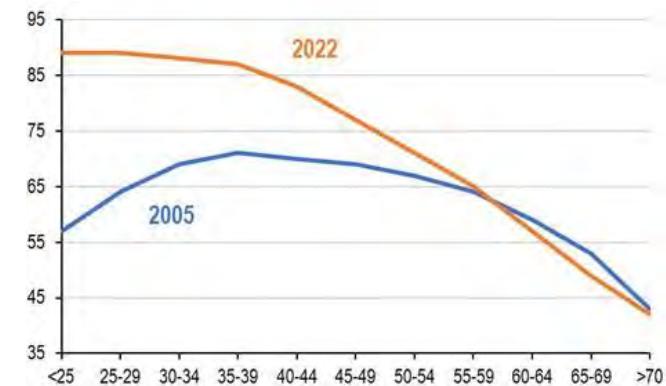
And there is indeed evidence that equity allocations tend to come down with age. Vanguard has documented the behavior of its customers investing through company-defined contribution retirement plans (now just under 5 million customers; 401K mostly) over the past 22 years. Up until some 20 years ago, equity allocation by age had a humped-shape relation “with younger participants adopting more conservative allocations, middle-aged participants holding the highest equity exposure, and older participants having equity exposure on par with younger participants. In 2022, the equity allocation

16. [America is getting older](#), US Census, June 22, 2023.

among Vanguard DC participants was downward sloping by age. This is tied directly to the growing use of target-date funds and managed account advice, both of which provide for a declining equity exposure with age.<sup>17</sup>

Figure 9 shows how Vanguard's younger customers saving for retirement allocate near 90% in stocks while those near retirement only have half as much. Data from [Empower Personal Dashboard](#), which include more self-reported holdings, show retail clients under 50 years of age had on average 50% in equities, versus 45% for those in their 50s and 60s, and 38% for those in their 70s.

Figure 9: Average equity allocation in defined contribution plans %, Average is participant weighted.



Source: J.P. Morgan, Vanguard.

The impact of aging on equity allocation has not yet shown up in the US Financial Account data shown in Figure 1, which has led to a lively debate on whether the desire of the elderly to leave a bequest to their children is keeping them into stocks<sup>18</sup>. Empirically, the effect of aging has been hard to disentangle from other drivers of higher equity allocations discussed above as they each tend to trend, producing multicollinearity. Still, the impact of aging is cumulative and, in our mind, needs to be combined with the massive rise in the allocation to Target-Date Funds that automatically lower the equity shares in every year that workers come closer to retirement. Hence, likely at the margin, the **aging of the US population should be considered a negative for future equity allocations**.

**(5) A rethink of the historic record.** The discovery of new data on bonds in the 19th century has in the last few years

17. [How America saves 2023](#), 22nd annual edition, Vanguard, June 22, 2023

18. See also [How do household portfolio shares vary with age?](#), Ameriks and Zeldes, NBER, Sep 2004.

challenged Siegel's findings<sup>19</sup> of US equities beating bonds over 20-year periods 92% of the time. These new data, not available to Siegel when he did his seminal work, have now lowered the frequency of US equities beating bonds over 20-year periods to 64% since 1792, largely by now finding that pre-WWII, US equities beat bonds only half the time. Siegel's 92% odds is now confirmed only for the period after 1941. Similarly, new and improved data sources on non-US equities since 1900 have shown equities to beat bonds there only half the time. Hence, the new historical record shows Siegel's 90% odds of stocks beating bonds is more about US exceptionalism for the post-WWII period than a more general rule that can be applied to all times and countries.

Individual US investors will probably not be affected that much by these new findings as they can argue, with some reason, that 19th and early 20th century equity markets tell us little about today's markets of global capital, revolutionary technology advances, and mega companies. Institutional investors will probably pay more attention, keeping them from going 100% into equities as some individual investors are now starting to think<sup>20</sup>.

## Conclusion

US households and non-profits have quadrupled the equity share of their financial assets over the past 40 years from just over 10% to over 40% now. This did not happen in the rest of the world. Together with superior earnings growth, this has propelled the US equity market to the strongest in the world over those decades to a point it is now 64% of world capitalization. Should we expect that this US exceptionalism will continue over the next decade?

We have not analyzed the prospect for US earnings growth relative to the rest of the world and have not developed a model to forecast multiples over either the short or the long run. We have only looked here at US household and non-profit allocation decisions over the long run. But these are the ultimate end investors. In our mind, the longer-term forces of US aging, the rapid growth of target-date funds, the emergence of a competitive yield on bonds, the flattening out of any further drop in the cost of holding and trading US equities, the risk of higher macro volatility producing renewed risk aversion, and a gradual move to more realistic long-term

19. Edward F. McQuarrie, [Stocks for the long run? Sometimes yes, sometimes no](#), Financial Analyst Journal, Nov 2023; [The US Bond Market before 1926: Investor Total Return from 1793, Comparing Federal, Municipal and Corporate Bonds Part II: 1857 to 1926](#), March 2021, and [A Re-Examination of Stock Market Returns from 1871 - 1897: Did Cowles Get It Right?](#), March 2021  
20. [Beyond the status quo: A critical reassessment of the life cycle investment advice](#), Anakulova et al., Nov 2023.

equity returns should steadily erode, though not destroy, the US love affair with equities and make US investors turn toward a more balanced allocation with fixed income<sup>21</sup>.

The move toward lower equity allocations by US households and non-profits is **not imminent** as return expectations are probably still quite bullish and households do not change allocations that fast. But our analysis does indicate that over the next five years or so, we should think of Americans on average allocating less to equities than they do today.

21. Our colleagues, Nikos Panigirtzoglou and Mika Inkkinen in their latest do not see a strong case for equity allocations to rise over the short term; [Flows and Liquidity, What would it take for equity allocations to rise to 2007 peaks](#), Feb 15.



## The Long-Term Strategist

### Democracy metrics and equity markets

- Many countries, including the US, have recently been downgraded in democracy ratings, such as Freedom House's *Freedom of the World* report.
- Long-term stock market returns are lower after countries experience a downgrade than after an upgrade or no rating change, in absolute terms and relative to the rest of the world.
- After a downgrade, equity returns are ~5% pa lower over a 10-year period than for markets where the country has been upgraded, and ~2.5% pa lower than for countries where there was no rating change.
- The lower returns of downgraded countries consist of both weaker earnings growth and a weaker currency rather than lower PE multiples.
- The downgrade of the US in 2017 adds to other concerns we highlighted recently that the last 14 years of US equity outperformance is more likely than not to reverse over the coming decade.
- Only one country in the MSCI ACWI Index has been upgraded since 2015: Greece. Therefore, our results suggest a *strategic* overweight on countries that have not been downgraded, concentrated in DM Europe and Japan.
- 8 of 27 EMs in the MSCI ACWI Index have been downgraded since 2015, which by itself is one factor indicating EM equity underperformance over the next decade. Note that our *strategic long-term* under/overweights may be different from the *tactical* recommendations of our Equity Strategy colleagues.
- [Video](#).

In its annual Freedom of the World report, Freedom House assesses political rights and civil liberties in the world. In 2021, it reported that “nearly 75 percent of the world’s population lived in a country that faced [democratic] deterioration last year.”<sup>1</sup> This continues an unbroken trend of global democratic decline that has persisted since 2005. According to Freedom House, these declines have been experienced broadly around the world, including in the United States, which was downgraded in 2017 and 2020.<sup>2</sup>

In this paper, we consider the implications of these democratic changes for a long-term strategic investor. While these circumstances may give rise to compelling ESG investment motives, we focus in this note upon the effects on long-term stock market returns. In doing so, our paper provides evidence that sovereign ESG ratings are important indicators of future investment performance.

<sup>1</sup> Freedom House, [Freedom in the World 2021: Democracy under siege](#) (2021).

<sup>2</sup> The ‘political rights’ rating of the United States was downgraded in 2017, while the ‘civil liberties’ rating was downgraded in 2020.

From the outset, the effect of democracy upon stock market returns is theoretically ambiguous. On one hand, one might hypothesize that stable democracies give rise to effective governance, promoting a dynamic and competitive economic environment in which businesses prosper. On the other hand, a system of governance that does not prioritize and promote the interests of the people may instead become captured by special interests, such as those of corporates. These could induce legislators and regulators to raise barriers to entry and soften consumer protection and antitrust enforcement, allowing large corporates to raise profit margins, boosting share prices even as these measures weaken overall economic growth. In **empirical studies** of the economic and financial effects of democracy, **the weight of the evidence indicates that democratic improvements are supportive of both economic growth<sup>3</sup> and stock market returns.<sup>4</sup>**

In this paper, we seek to document the nature of the relationship in a way that is most informative for a long-term investor.<sup>5</sup> To document the relationship between democracy ratings and returns, we implement an **event study design** in which we examine stock market returns in countries in the periods after they experience an upgrade or downgrade in democracy ratings. We find statistically significant evidence that, on average, countries that are upgraded exhibit higher long-term equity returns in subsequent years than countries which are downgraded. Furthermore, we find that these differences reflect both differences in equity returns in

<sup>3</sup> See, e.g., Acemoglu, Naidu, Restrepo and Robinson, [Democracy Does Cause Growth](#) (2019) 127(1) *Journal of Political Economy* 47-100.

<sup>4</sup> See, e.g., Axelrod and Leitner, [Correlation of Democracy Indicators and Markets Returns](#) (2016) *V-Dem Working Paper 2016:04*; Lehkonen and Heimonen, [Democracy, political risks and stock market performance](#) (2015) 59 *Journal of International Money and Finance* 77-99; Lei and Wisniewski, [Democracy and Stock Market Returns](#) (2018).

<sup>5</sup> Papers in the literature on stock market returns commonly estimate the effects of democracy conditional upon other variables, such as inflation or GDP per capita. For our purposes, we are interested in the relationship between democracy indicators and stock market returns *without* conditioning on economic variables, since the effect of democracy on stock market returns may manifest itself through those economic channels. For example, democratic declines may give rise to inflationary episodes, which may adversely affect stock market returns. In this paper, we do not take a stand on the mechanism by which democracy may affect stock market returns, but rather seek simply to document the nature of the relationship, since this is the object of primary interest to an investor.

local-currency terms and in currency returns. Robustness analysis using different empirical specifications and different data sources affirms the conclusions drawn in this exercise.

## Data

In our primary analysis, we make use of data from the *Freedom in the World 2021* report published by **Freedom House**, which includes ratings for 195 countries and 15 territories from 1972 to 2020. Specifically, we use the ‘political rights’ rating from 1 (strongest rights) to 7 (weakest rights). This measure is constructed by Freedom House analysts with regard to ‘electoral processes’, ‘political pluralism and participation’, and the ‘functioning of government’. We use this database because it has broad geographic coverage over a long period of time, and contains substantial time series variation which we will leverage in our event study empirical design.

In our final sample, there are 54 instances in which the democracy rating of a country was upgraded, 36 instances in which a country was downgraded, and 1059 instances in which a country’s rating was unchanged. Of the upgrades, 83% were an upgrade of a single point. Of the downgrades, 89% were a downgrade of a single point.

This ‘political rights’ measure is directly related to metrics that are used in the Social and Governance elements of many ESG ratings, including J.P. Morgan’s own sovereign ESG indices.<sup>6</sup> On the equity side, the MSCI ESG Government Ratings measure country exposure to governance risk by examining ‘political governance’ and ‘political rights’, among others. Therefore, our results presented in this paper directly bear upon the question of whether ESG ratings can be an indicator or predictor of asset returns.

We also replicate our analysis using an alternative source of democracy data: the Polity5 database constructed by the Center for Systemic Peace.<sup>7</sup> Our results with this alternative source of data are broadly comparable to those using the Freedom House data, indicating that there

<sup>6</sup> Our JESG suite of ESG indices cover EM sovereigns in dollars (JESG EMBI) and in local currency (JESG GBI-EM), as well as high-yield and EM corporates. We use inputs from *Sustainalytics* that include similar metrics in their Social and Governance ratings.

<sup>7</sup> In the Polity5 database, the appropriate democratic rating is the ‘democ’ rating from 0 to 10, with higher scores indicating stronger democracies.

is a robust positive relationship between democracy ratings and stock market returns.

We source stock market return data for 22 developed markets from 1972 to 1987 from the MSCI World Index, and then returns data for those 22 developed markets and an additional 18 emerging markets from the MSCI ACWI Index when it begins at the end of 1987 through to 2020.<sup>8</sup>

## Analysis

To begin, we examine stock market USD returns in the years *after* a country experiences a democratic upgrade or downgrade in the Freedom House data. In a typical event study, one examines the period immediately after an event.<sup>9</sup> In many cases, democratic conditions may have been deteriorating or improving in the years before the Freedom House ratings changed. Therefore, we think it is appropriate to examine returns data up to two calendar years prior to the official rating change, in order to include this period in which changes may be occurring which will culminate in a rating change. As indicated below, our results are not sensitive to this assumption.

In Table 1, we report summary statistics for three samples of returns. The first sample includes all 10-year periods in which a country experienced a net upgrade in its democratic rating in the first three years. The second sample includes all 10-year periods in which a country experienced a net downgrade in its democratic rating in the first three years. The third sample includes all 10-year periods in which there was no net change in a country's democratic rating.<sup>10</sup> For the first two samples,

<sup>8</sup> These panels are unbalanced, so coverage of each country begins in different years. 10 out of the 50 in the ACWI index are dropped due to insufficient equity data coverage for our purposes: Argentina, Czech Republic, Egypt, Ireland, Kuwait, Pakistan, Philippines, Qatar, Saudi Arabia, and the UAE.

<sup>9</sup> Many event studies in finance consider changes in circumstances relative to what was expected *ex ante*. Since the price of some financial asset will reflect expectations, it is the confounding of these expectations that is the 'event'. We have no consensus of expectations to draw on for democracy ratings, so simply define an event as the rating change.

<sup>10</sup> It is theoretically possible that a 10-year return is in one of the first two samples at the same time that it is in the third sample. For example, if a country were downgraded one point in 1981 and upgraded one point in 1984, the returns from 1980-1990 would be reported in both the downgrade and no change samples, as presently defined. In practice, these occurrences are very rare. The minimum returns in the no change and downgrade samples in Table 1 are one instance in our data in which this happens, and so are the same return of -23%. Importantly, the results are broadly comparable if we instead

we require that the democratic change occurred in the first three years to ensure that we exclude periods in which there was a late democratic change, without time for the consequences to be fully reflected in 10-year returns.<sup>11</sup> Our results are very similar if we instead require a democratic rating change in either the first year, or the first two years, of a 10-year period. Our results were also comparable when considering 5- or 15-year return windows instead of 10-year windows.

The mean and median returns after an upgrade are 11.6% and 12.3% pa, respectively, while the mean and median returns after a downgrade are 6.4% and 6.6% pa respectively. The mean and median annual returns after no change were 9.2% and 9.0% pa, respectively – between the upgrade and downgrade figures. The t-statistic for a test of whether the means of the upgrade and downgrade samples are equal is 3.07, implying that the hypothesis may be rejected at the 1% level of significance. Relative to the distribution of returns after a country experiences an upgrade, the distribution of returns when a country experiences a downgrade has a more negative skew and is leptokurtic, implying that there is more severe downside risk.

**Table 1: Summary statistics – Annualized 10-year USD returns after an upgrade, no change, and a downgrade**  
 %, 1972- 2020, annual

	Upgrade	No change	Downgrade
Mean	11.6%	9.2%	6.4%
Median	12.3%	9.0%	6.6%
Standard deviation	10.3%	7.3%	11.4%
Kurtosis	-0.41	0.93	0.39
Skewness	0.10	-0.13	-0.42
Range	50%	58%	53%
Minimum	-11%	-23%	-23%
Maximum	39%	34%	30%
Count	103	867	71

Sources: J.P. Morgan, Freedom House, MSCI.

The USD returns presented in Table 1 may be decomposed into a local-currency equity return component and a currency return component. In Table 2,

construct the no change sample by requiring no change in the first three years of a 10-year period, analogous to the upgrade and downgrade samples. In principle, we prefer the no change sample presented in the main analysis of this paper since we think it would be less reasonable to include data in the no change sample if a country were upgraded or downgraded in the fourth or later year of a 10-year period.

<sup>11</sup> Our results are also similar if we consider net changes in democracy ratings over the full 10-year period, though this is not our preferred specification, as indicated above.

we report summary statistics for **local-currency market returns** in the same three samples as above. For local returns, the means in the upgrade and downgrade samples are materially different from the median, reflecting the presence of substantial **outlying returns**, especially after a downgrade. For example, during hyperinflationary episodes between 1987 and 1997, the Brazilian local-currency equity market return was 652% pa, while the currency return was -623% pa. In this context, we argue that *median* returns – rather than *mean* returns – are more informative as a measure of the differences between local currency equity returns after an upgrade or downgrade. In the upgrade sample, the median local currency equity return is 13.7% pa, while the median return in the downgrade sample is 9.9% pa. In this instance, the median return after no change in ratings is very slightly below the median return after a downgrade.

**Table 2: Summary statistics -- Annualized 10-year local-currency equity returns after an upgrade, no change, and a downgrade**  
%, 1972- 2020, annual

	<b>Upgrade</b>	<b>No change</b>	<b>Downgrade</b>
Mean	15.8%	10.0%	16.8%
Median	13.7%	9.2%	9.9%
Standard deviation	14.7%	8.5%	34.3%
Kurtosis	8.57	24.48	36.09
Skewness	2.22	2.21	5.38
Range	100%	133%	281%
Minimum	-6%	-22%	-22%
Maximum	95%	111%	259%
Count	103	867	71

Sources: J.P. Morgan, Freedom House, MSCI.

In Table 3, we report summary statistics for **currency returns** in the same three samples. As was the case with local-currency equity returns, the means in the upgrade and downgrade samples differ substantially from the medians. As above, we therefore focus primarily upon the median returns. We observe relatively small differences in currency returns across the samples. After an upgrade, the median currency return in was -1.8% pa, whereas it was -2.5% pa after a downgrade.

**Taken together**, the results presented in Tables 1, 2 and 3 indicate that **stock market returns in USD after a democracy rating upgrade tend to exceed stock market returns after a democracy rating downgrade by ~5% pa**. This underperformance after a downgrade reflects both relatively lower local-currency market returns and relatively larger currency depreciations.

**Table 3: Summary statistics -- Annualized 10-year currency returns after an upgrade, no change, and a downgrade**  
%, 1972- 2020, annual

	<b>Upgrade</b>	<b>No change</b>	<b>Downgrade</b>
Mean	-4.2%	-0.9%	-10.4%
Median	-1.8%	-0.2%	-2.5%
Standard deviation	11.5%	4.9%	30.9%
Kurtosis	23.91	215.92	38.89
Skewness	-4.39	-10.64	-5.82
Range	90%	111%	236%
Minimum	-82%	-103%	-231%
Maximum	8%	8%	4%
Count	103	867	71

Sources: J.P. Morgan, Freedom House, MSCI.

It is conceivable that this pattern of results may be observed – even if downgrades did not lead to stock market underperformance – if downgrades typically occurred in periods when global equity returns were low, while upgrades typically occurred in periods when global equity returns were high. To address this concern, we also consider a specification in which we examine the stock market **return** in a country **relative to the world** over the same period of time. World returns are constructed using the MSCI World Index from 1972 to 1987, and then the MSCI ACWI Index when it begins at the end of 1987 through to 2020. In Table 4, we present the summary statistics for **relative returns** in USD after an upgrade or downgrade. We find that a democratic downgrade is associated with a mean long-term underperformance relative to the market of 2.4% pa, while a democratic upgrade is associated with a mean long-term outperformance relative to market of 2.8% pa.

**Table 4: Summary statistics -- Annualized 10-year USD returns in excess of the world after an upgrade and a downgrade**  
%, 1972- 2020, annual

	<b>Upgrade</b>	<b>No change</b>	<b>Downgrade</b>
Mean	2.8%	-0.2%	-2.4%
Median	3.1%	0.0%	-1.7%
Standard deviation	10.7%	6.2%	12.4%
Kurtosis	-0.06	2.73	0.42
Skewness	0.17	-0.39	-0.28
Range	52%	58%	59%
Minimum	-20%	-33%	-33%
Maximum	32%	24%	25%
Count	103	867	71

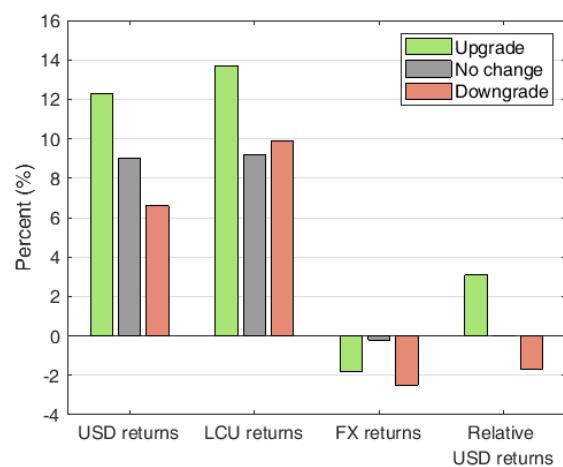
Sources: J.P. Morgan, Freedom House, MSCI.

A last set of tests investigates **whether the magnitude or number of down- or upgrades had an impact** on relative performance. Overall, we find that the magnitude

and number of rating changes **did not matter**. For example, countries with greater than one point democracy downgrades did not clearly perform worse than countries with one point downgrades, and vice versa after upgrades.

**Figure 1: Summary of results – Annualized median 10-year returns**

%, 1972- 2020, annual, LCU = local currency unit



Sources: J.P. Morgan, Freedom House, MSCI.

### Return decompositions

Finally, we consider a decomposition of the USD equity price returns into price-to-earnings multiples and earnings per share. In Table 5, we report multiple changes in the same three samples from above. For interpretative purposes, take the mean annualized change of 0.4% after an upgrade. If the initial multiple were 15, this would imply that the multiple would increase to approximately 15.61 after 10 years. The changes reported are both small in magnitude, and statistically indistinguishable after upgrades and downgrades, indicating that our results are not driven by multiples.

**Table 5: Summary statistics – Annualized 10-year changes in price multiples after an upgrade and a downgrade**

%, 1972- 2020, annual

	Upgrade	No change	Downgrade
Mean	0.4%	0.7%	0.8%
Median	-0.2%	0.9%	0.4%
Standard deviation	5.5%	6.2%	6.8%
Kurtosis	0.29	2.43	12.65
Skewness	-0.08	-0.16	2.49
Range	26%	56%	48%
Minimum	-14%	-27%	-12%
Maximum	12%	30%	35%
Count	67	806	50

Sources: J.P. Morgan, Freedom House, MSCI.

In Table 6, we report the changes in earnings per share in the same three samples from above.<sup>12</sup> The mean and median annualized changes in earnings per share after an upgrade were 9.3% and 9.8% pa, respectively, while the mean and median annualized changes in earnings per share after a downgrade were 4.5% and 5.3% pa, respectively. Therefore, it is clear that **differences between upgraded and downgraded countries in price returns are driven by differences in earnings growth**. This result dovetails with other research mentioned earlier, such as Acemoglu et al., which indicated that worsening democracy metrics have a negative impact on economic growth.

**Table 6: Summary statistics – Annualized 10-year changes in earnings per share after an upgrade and a downgrade**

%, 1972- 2020, annual

	Upgrade	No change	Downgrade
Mean	9.3%	5.5%	4.5%
Median	9.8%	5.7%	5.3%
Standard deviation	7.4%	8.5%	12.9%
Kurtosis	-0.58	2.96	2.19
Skewness	0.03	0.17	-0.76
Range	31%	81%	70%
Minimum	-4%	-33%	-33%
Maximum	27%	48%	37%
Count	67	806	50

Sources: J.P. Morgan, Freedom House, MSCI.

### Implications

There are two related interpretations of the results we have presented above. Firstly, it is apparent that the equity markets of countries that are downgraded tend to underperform those that are upgraded. Another interpretation – which is not inconsistent with the first – is that one should lower absolute return forecasts for a country on its own once it is downgraded. We believe that this second interpretation is *also* borne out in our results, since we find robust evidence that downgraded countries persistently underperform countries which experience no democratic change.

Taking these results as given, we now consider the implications for a long-term investor looking forward from 2021. We identify countries in the MSCI ACWI Index that have been upgraded or downgraded on net, or have experienced no democracy rating change, since 2015 in the Freedom House data, as measured by the

<sup>12</sup> There are fewer observations in this analysis due to limitations on multiples and earnings data. MSCI started price return and multiple data a few years after total return data for some countries.

'political rights' variable. Since 2015, 10 countries in the MSCI ACWI Index have been downgraded in the 'political rights' measure from Freedom House: Hungary, Israel, Pakistan, Peru, Poland, Russia, Thailand, Turkey, United Arab Emirates, and the United States. One country, Greece, was upgraded. The ratings of the remaining countries were unchanged. This serves as additional evidence in support of our view that there is a risk of US underperformance relative to the world in the coming decade ([Will US market exceptionalism last?](#) June 24, 2021). However, our results also indicate that there is a risk that a number of EM countries will underperform, given 8 out of 27 EMs in the MSCI ACWI Index have been downgraded on net since 2015.<sup>13</sup>

## Conclusion

Our results indicate that changes in democracy ratings have been a valuable signal of future long-term asset returns in countries. In USD returns, we find that stock markets in countries that are downgraded tend to underperform stock markets in countries that are upgraded in the subsequent years by ~5% pa over a 10-year period, and tend to underperform stock markets in countries with an unchanged rating by ~2.5% pa over a 10-year period. These observations reflect the fact that **downgraded countries tend to exhibit lower local-currency stock market returns, due to weaker earnings growth, and experience larger currency depreciations.**

A natural caveat at this point ought to be that the strategic investors should use democracy metrics only as an added signal to the other signals they use to make long-term country allocations. However, in our previous research, we have found there are relatively few effective leading signals.<sup>14</sup> From a strategic point of view, using relative multiples (buying low, selling high) has not been effective. Long-term, potential real GDP growth

differences correlate well with relative equity returns, but only between DM and EM. But, these differences must be forecast to project future relative returns. The variables that explain relative country equity returns, such as contemporaneous EPS growth and P/E changes, themselves have to be forecast – an equally demanding endeavor. In this context, the fact that democracy ratings are an effective leading signal is of great use to an investor.

<sup>13</sup> Within the set of EM countries, if one also considers changes in the 'civil liberties' variable in the Freedom House data, Brazil, Egypt, India, Mexico and the Philippines have also been downgraded on net since 2015. By one of these measures, 13 of 27 EM countries in the index have been downgraded since 2015. These countries account for approximately 28% of market capitalization in the MSCI EM index, or 43% ex-China.

<sup>14</sup> This comment only applies to 10-year out returns, and not to shorter-term tactical positions. Our equity strategy colleagues use a much broader set of price and fundamental signals to suggest country *tactical* over- and underweights. See, e.g., [Framework for Regional Equity Allocation, Country Selection based on Fundamental, Macro and Technical signals](#), Lakos-Bujas et al., July 15, 2014; [Global Developed Market Strategy Dashboard](#), Matejka et al., Oct 11; and [EM Equity Strategy Steering Dashboard](#), Pedro Martins Jr et al., Oct 7.

## The Long-term Strategist

Will US market exceptionalism last?



- US equities have beaten the rest of the world by 7% pa over the past 13 years. \$100 invested in the US end-2007 would have grown to \$385 by now versus only \$165 if invested only in the rest of the world.
- Over the past 50 years, 75% of US 10-yr out/underperformance runs were reversed the following decade, primarily due to reversals in relative earnings growth, the dollar and the Tech sector that dominates US indices.
- US multiples are now at all-time highs against the rest of the world and margins are high, but not versus elsewhere. Although neither multiples nor margins have had much value in signaling relative return 10 years out, over the coming cycle a return of US inflation and macro volatility could be the force that brings US equity valuations back to normal.
- Part of strong US earnings growth is arguably related to a steady increase in US business concentration and falloff in new company listings. This likely concentrated more of the gains from economic growth among existing listed companies. A reversal in US earnings growth versus elsewhere could come from a return of US antitrust that would focus foremost on Big Tech.
- The short-term momentum on the US equity bull market remains in place, outright and versus the rest of the world. History warns, though, that the music eventually stops, and reverses.
- The US now makes up 58% of MSCI AC, other DM 29% and EM 13%, of which China 5%. Investors who are partial to our mean reversion argument can easily move the US to a longer-term target of ~50%, or lower, putting the freed capital in other DM. We are wary about EM broadly, on weakening relative growth potential, but its weight is already quite low. Still, within EM we would move capital into China as China is everything that EM is not.
- [Video](#).

US equities have beaten the rest of the world by a wide margin since the GFC. The US beat Europe and EM by 7% pa since end 2007 and Japan by 6%. With hindsight, the global investor over these 13+ years would have been best off simply planting all their equity capital in the US and could have ignored the rest of the world. Any diversification gain from investing outside the US was more than offset by the superior return on US stocks.

The momentum of US outperformance, through to this year, as well as its liquidity and high correlation with the global market, makes it very tempting to simply keep all of one's eggs in US stocks. But history warns against everlasting bull markets. In this paper, we find strong evidence of mean reversion in relative 10-year US returns versus the rest of the world, coming from earnings, the dollar and the tech sector, producing a good case to hold less in the US than its 58% weight currently in MSCI AC World.

## Should one not expect different countries to produce similar returns to risk long run?

The premise of market efficiency under open capital markets teaches us that, absent restrictions on capital flows, different countries or sectors should be expected to produce the **same return to non-diversifiable risk**<sup>1</sup>. Hence the implication that the **world portfolio maximizes the return to risk and should thus be the starting point of the strategic investor**. The historical record on actual returns is rather mixed on this assumption, however. Table 1 shows equity markets returns, volatilities, and Sharpe ratios, as well as return components and GDP growth rates for the US, Europe, Japan and the DM world since 1972. Table 2 shows the same since 1995, now adding EM<sup>2</sup>.

**Table 1: Long-term equity market returns in USD since 1972**  
% pa, ratios, Q4 1972- Q4 2020

	US	DM ex US	Europe	JA	DM
EPS	6.1	5.5	4.0	5.8	4.2
PE	1.1	0.2	0.4	-0.1	0.6
DY Avg	2.9	3.0	3.8	1.5	2.9
Total Return	10.5	8.8	9.7	7.2	9.6
Volatility	16.8	25.2	19.2	22.5	16.9
Sharpe Ratio	0.34	0.17	0.26	0.12	0.29
Nom GDP(\$)	6.0	5.5	5.4	6.0	5.8
Real GDP	2.6	1.8	1.8	2.1	2.2

Source: Morningstar, MSCI, IMF, World Bank, J.P. Morgan. Europe GDP is sum of 7 major countries: GE, FR, SWI, IT, SP, UK, NE.

Sharpe ratios are far from identical across regions. Europe and the US were similar since 1972, but Japan was much lower, even if assessed in yen. Since 1995, when we can include EM EPS and multiples, the differences in returns to risk are even sharper.

Figures 1-4 show total return ratios for the US relative to the rest of the world, Europe, Japan and EM in common currency (USD), as well as Europe to Japan and the three

<sup>1</sup>The international version of the Capital Asset Pricing Model, *ICAPM*, asserts that under open markets and other restrictive assumptions on taxation and transaction costs investors should expect the same return to (non-diversifiable) risk, irrespective of currency risk. This does not prevent differences in *ex-post realized* returns and only asserts that investors should not be able to systematically anticipate such differences.

<sup>2</sup>MSCI has EM total return data since 1987, but only reports EM EPS since 1995. We will be using primarily MSCI data as MSCI is arguably the leading international equity benchmark, but will be combining with Refinitiv Datastream, which already includes some EM earlier than MSCI as well as CRSP, which has US data back to 1926.

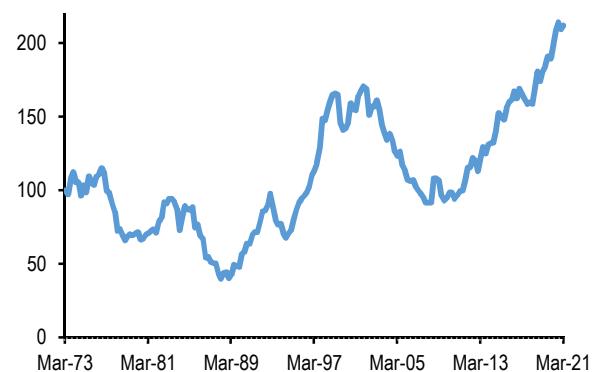
EM regions of Latam, Ceemea and Asia against each other. Rising lines show outperformance.

**Table 2: Long-term equity market returns in USD since 1995.**  
% pa, ratios, Q4 1995 – Q4 2020

	US	DM ex US	JA	DM	EM
EPS	5.0	3.2	6.6	4.1	3.5
PE	2.5	-0.4	-5.6	1.2	0.7
DY Avg	1.9	2.8	1.5	2.3	2.5
Total Return	9.7	5.6	2.2	7.7	7.0
Volatility	17.1	18.7	19.7	17.4	24.7
Sharpe Ratio	0.43	0.17	-0.01	0.31	0.19
Nom GDP(\$)	4.1	1.2	-0.4	2.5	7.3
Real GDP	2.2	1.0	0.6	1.5	5.0

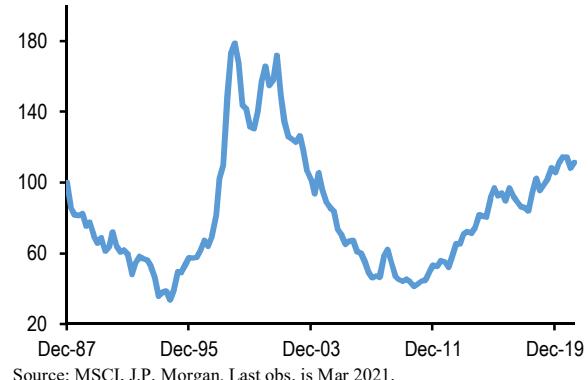
Source: Morningstar, MSCI, IMF, World Bank, J.P. Morgan. Europe GDP is sum of 7 major countries: GE, FR, SWI, IT, SP, UK, NE.

**Fig 1: US vs rest of world equity cumulative total return ratio**  
Ratios, USD returns, March 1973 = 100



Source: Refinitiv Datastream, J.P. Morgan. Rest of the world includes EM as and when they were included in Datastream indices. Last obs. Is Mar 2021

**Fig 2: US vs EM equity total return ratio**  
Ratios, Dec 1987= 100



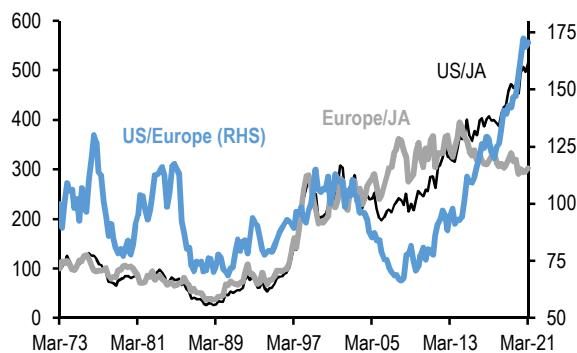
Source: MSCI, J.P. Morgan. Last obs. is Mar 2021.

They are clearly not what we call random walks, but show **significant trending over the years and eventual mean reversion**. The US underperformed the rest of the world during most of the '70s and '80s, outperformed in

the '90s during the Nasdaq boom, reversed course until the eve of the GFC, but has since been steadily outperforming (Fig 1). Against EM, it shows almost a biblical 7-year feast-and-fame cycle with the latest EM trend weakness now in its 10<sup>th</sup> year already (Fig 2).

US stocks range traded versus Europe in the '70s and '80s, outperformed through the '90s, gave most back in the next business cycle, but have been outperforming virtually straight line since 2007 (Fig 3). Japan outperformed during the '70s and '80s up to its own asset bubble bursting and has been underperforming the rest of the world since, range trading only vs the US during the pre-GFC business cycle.

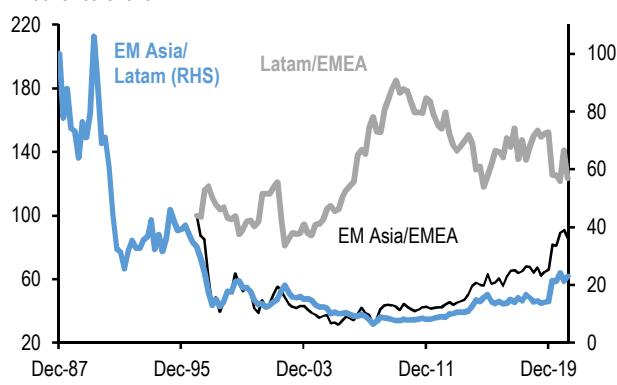
**Fig 3: US, Japan and Europe equity total return ratios in USD**  
Ratios, Mar 1973 = 100



Source: MSCI, J.P. Morgan. Last obs. is Mar 2021.

Within EM, where we have return data since 1987, Asia has been underperforming through the 90s, and the following cycle to GFC, but has been steadily outperforming since (Fig 4).

**Fig 4: EM Regional equity total return ratios in USD**  
Ratios, EMEA only available since 1996. 1987 = 100 for EM Asia/Latam. 1996 = 100 for other two.



Source: MSCI, J.P. Morgan. Last obs. is Mar 2021.

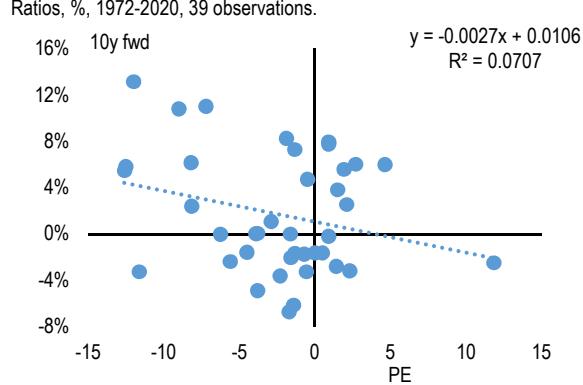
The **trending behavior of relative country performance** in Figs 1-4 indicates that the tactical investor should be able to make profitable country switches, if only by exploiting relative price momentum<sup>3</sup>. But the long-lasting nature and magnitude of these relative return trends indicate that the long-term investor could also consider strategically deviating from the max-diversification dictum of International CAPM.

## What drives long-term outperformance?

Investors who want to limit their strategic allocation to only a subset of countries out of the world portfolio must have confidence that they can actually forecast country returns over a long time horizon. We will look at three different methods that could in principle signal return differences across countries and regions over a 10-year period – **valuation, statistical, or fundamental**.

**Relative valuation** measures ought to be a good signal to decide allocations across countries, as they impact future returns. But the proof of the pudding is in the eating. Figs 5-6 show the US trailing multiple minus that on other DM (MSCI World ex US) and on Europe against the relative return 10 years out. Other regional comparisons similarly produce the same message: there has been **little or no value in using multiple gaps to predict return differences 10-year out**.

**Fig 5: Relative trailing PE of US minus rest of DM against 10-year future total return difference**  
Ratios, %, 1972-2020, 39 observations.

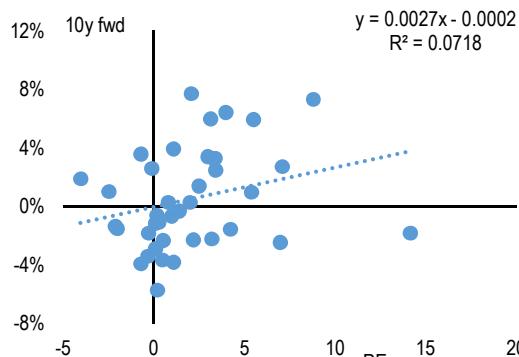


Source: MSCI, J.P. Morgan.

<sup>3</sup> Our equity strategists use a much broader set of price and fundamental signals to suggest country tactical over- and underweights. See, e.g., [Framework for Regional Equity Allocation, Country Selection based on Fundamental, Macro and Technical signals](#), Lakos-Bujas et al., July 15, 2014; [Global Developed Market Strategy Dashboard](#), Matejka et al., May 10; and [EM Equity Strategy Steering Dashboard](#), Pedro Martins Jr et al., May 13.

**Fig 6: Relative trailing PE of US minus Europe against 10-year future total return difference**

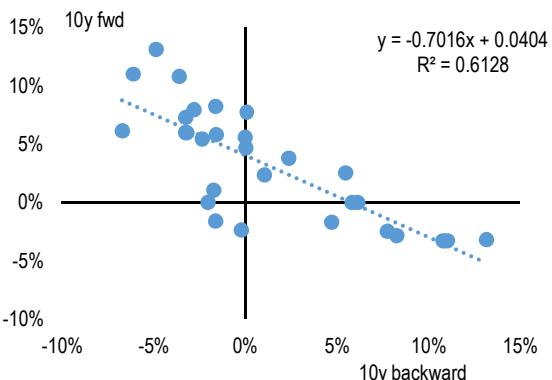
Ratios, %, 1972-2020, 39 observations.



What about **exploiting the serial correlation** in annual return differences that we saw in Figs 1-4? While the trending behavior of relative returns across countries and regions suggests that tactical investors could exploit momentum, looking across longer holding periods, we find that year-on-year momentum eventually peters out and reverses itself. Figure 7, below, shows 10-year return differences between the US and other DM equity markets (MSCI ex US, in \$) versus the previous 10 years. **Mean reversion** is clear with 3/4 observations in the negative correlation quadrants (NW and SE). The fitted line does not go through the origin as the US has outperformed non-US DM equity markets by 1.6% pa since 1972.

**Fig 7: US 10-year equity return gaps versus other DM (MSCI ex US) against previous 10 years**

%, 1972-2020, 28 observations.

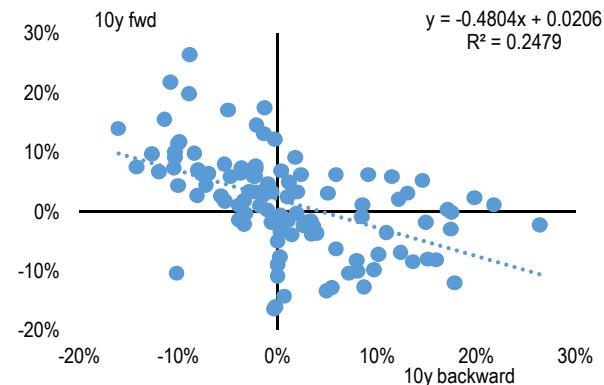


Looking at the US pairwise against individual regions – Europe, Japan and the three EM regions – with each pairwise return gap a separate observation (Fig 8) – also produces clear mean reversion in relative 10-year returns. The fit is not tight, as beta (the mean reversion parameter) varies from region to region, but we do find

that 3/4 of the observations are in the negative correlation quadrants (NW and SE). We found **no evidence of mean reversion on long-term return differences among non-US regions**.

**Fig 8: US 10-year equity return gaps versus alternatively Europe, Japan, and three EM regions in USD against previous 10 year.**

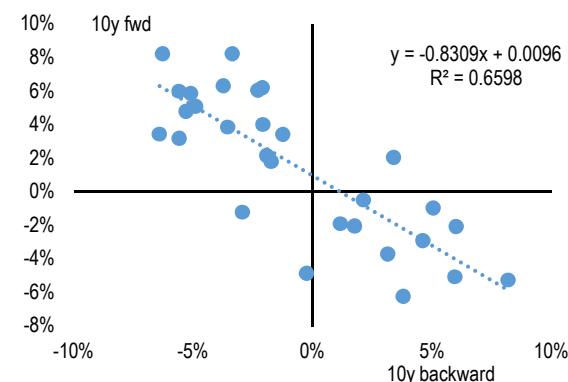
%, 1972-2020 for Japan and Europe; 1987-2020 for Latam and EM Asia; 1996-2020 for EMEA



**What drives this mean reversion** in long-term relative returns against the US? It must come from dividends, earnings, or multiples, as these three make up total returns. Dividends are not variable enough, leaving us earnings and multiples. Figs 9-10 show the same 10yr/10yr comparison of Fig 7, but decomposed into the return differences coming from relative EPS growth and multiple returns. The message is simple: **relative return mean reversion comes from relative earnings growth, not multiples**. For EPS, 9/10 observations fall in the NW and SE negative correlation quadrants.

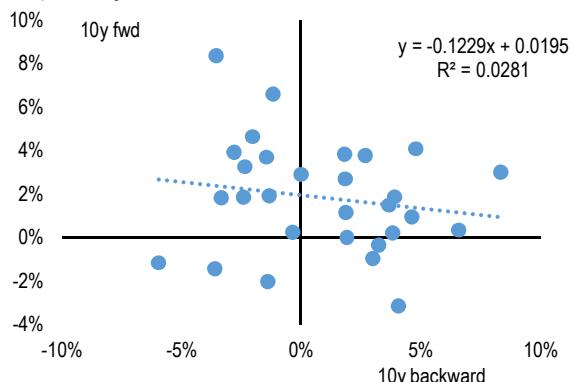
**Fig 9: US 10-year relative EPS growth versus other DM (MSCI ex US) against previous 10 years**

%, 1972-2020, 28 observations.



**Fig 10: US 10-year multiple returns versus other DM (MSCI ex US) against previous 10 years**

%, 1972-2020, 28 observations. Multiple returns are price gains due to multiple changes.

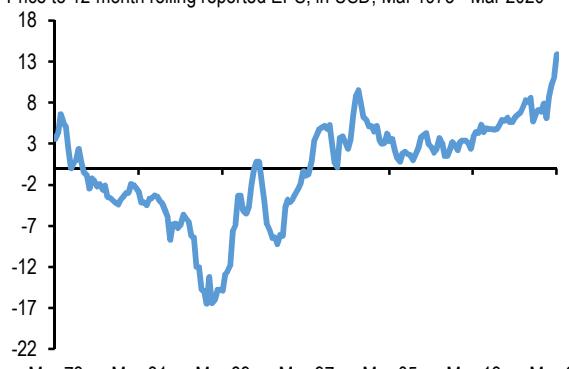


Source: MSCI, J.P. Morgan.

Fig 11 depicts the simple trailing PE ratio of the US versus the rest of the world since 1973. It shows no real mean reversion, making relative multiples such an unreliable signal of future relative performance. Yes, US multiples are today at all-time highs versus the rest of the world, but they have been above their historical mean for over 20 years now. Waiting for Godot is not a good strategy.

**Fig 11: US trailing PE minus the rest of the World**

Price to 12-month rolling reported EPS, in USD, Mar 1973 - Mar 2020

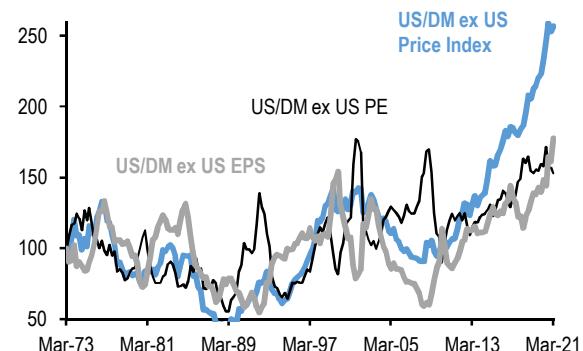


Source: Refinitiv Datastream, J.P. Morgan. Rest of the world includes EM as and when they were included in Datastream indices. Quarterly data.

Fig 12 provides a similar message through cumulative return ratios of the US versus other DM from relative price gains, earnings and multiples. The relative EPS return line matches over time more closely relative price returns, although US outperformance since 2007 has been benefiting from both better earnings growth and multiple gains.

**Fig 12: US cumulative Price return index, EPS and PE returns over DM ex US (MSCI WO ex US) in USD**

Ratios, 1973 =100



Source: MSCI, J.P. Morgan. Last obs. is Mar 2021.

## What drives relative earnings growth?

We can think simply of relative overall **economic growth**; profit **margins** (or earnings relative GDP); **currency** moves; and different **sector** composition, with special attention to **Technology**.

### 1. Is US outperformance due to the superior economic growth?

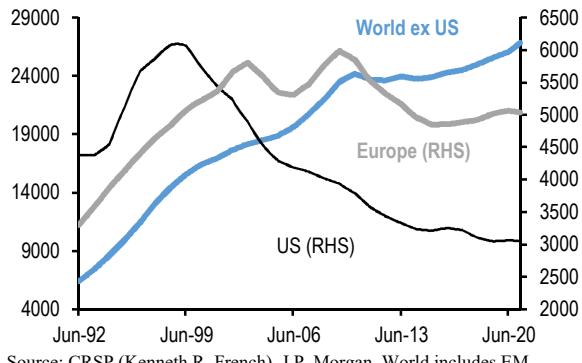
A first variable that one would expect to drive equity return differences across countries and regions, and that investors have opinions about, is economic growth. At first instance, one would expect countries with faster economic growth to produce faster earnings growth. However, several variables come in between GDP and EPS growth, to wit (1) profit margins; (2) foreign earnings; (3) inflation and (4) "dilution."

We will discuss (1) profit **margins** next. On (2) **foreign earnings**, most of the companies in the broad international indices that investors use operate across borders and thus partake not only in the growth of the country where they are headquartered, but also in their export markets, thus reducing the linkages with growth in their country of listing.

On (3) **inflation**, it is not immediately clear whether the strategic investor should consider growth differences in nominal or inflation-adjusted terms. At first, one would say nominal as earnings and returns are nominal. However, the global investor earns equity returns in their base currency. Theory tells us that currencies of countries with higher inflation will over time depreciate against those with lower inflation by the inflation rate difference, indicating that they should look at real growth differences.

On (4) **dilution**, today's investors only own today's companies and then for the most part only those listed on public exchanges. One can cover the latter limitation by also owning small caps<sup>4</sup> and private equity, but even that will not make you own your share of the full private sector. More important, **you do not own tomorrow's companies**. Economic growth does not just come from existing companies and people earning more over time. In a dynamic and competitive economy, it also comes from new businesses that come with new ideas, products and ways of doing things. As a current shareholder, you do not own these yet, and will have to "dilute" your current shareholdings over time to invest in new firms to stay fully invested in a particular economy. This dilution problem comes not just from equity issuance by new companies, but also from old companies, as well as the reverse, existing companies buying back their own shares, which make earnings per share (EPS growth faster than overall company earnings<sup>5</sup>).

**Fig 13: Number of listed firms in US, Europe, and World ex US**  
24m rolling average, Jul' 1990- Mar' 2021



Source: CRSP (Kenneth R. French), J.P. Morgan. World includes EM.

Fig 13 shows the number of listed large, mid-sized and small companies in the US, Europe, and DM ex US since 1990 covered in the CRSP data base. The number of listed companies in the US is clearly shrinking versus those in the rest of the world<sup>6</sup>. Together with other

<sup>4</sup> We found in our small-cap paper ([Small Caps: A Strategic Overweight](#), Feb 15, 2019) much smaller return differences across countries than on large caps making a stronger argument there to start one's strategic allocation with the world portfolio.

<sup>5</sup> See our latest issue on buybacks [Fallen Angel and Buybacks: Strategy Update 2020](#), Sep 28, 2020.

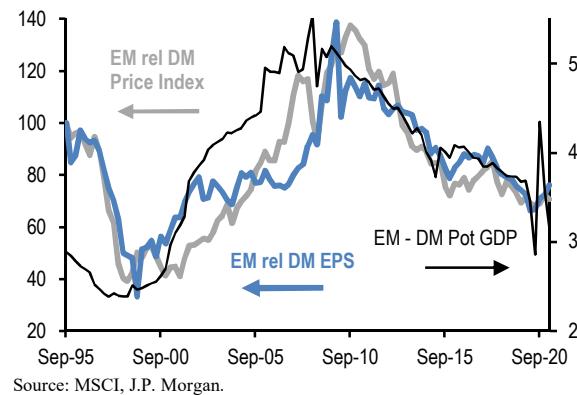
<sup>6</sup> In [The U.S. listing gap](#), Journal of Financial Economics, 2017, pp. 464-87, Dodge et al. state that the "largest contributor to the drop in listing is the fact that we have seen an extremely large number of mergers." They see the increased listing requirements from the 2002 Sarbanes-Oxley Act as a minor issue, but do see a contribution from the increased role of intangibles and R&D investments, which lower measured

evidence of the falling "birth rate" of US companies, and rising US business concentration (see below), this suggests that US economic growth is increasingly captured by incumbent companies and their shareholders rather than by new ones compared with the rest of the world, which is still seeing new gains in the number of listed companies.

Reviewing the **empirical evidence**, we find that when comparing **DM with EM** countries, higher real or nominal growth in EM by itself does not produce superior returns to DM. Instead, we find a strong low-frequency correlation between relative equity returns and earnings growth on one side, and *changes* (not levels) in the relative long-run (potential) real growth (Fig 14).

**Fig 14: US to EM equity index price and EPS ratios in USD and gap in potential GDP growth rates**

Quarterly, Ratios, %, Sep 1995- Mar 2021, quarterly.



Source: MSCI, J.P. Morgan.

Since 1995, EM economies grew 3.5% pa faster than DM in real terms and 4.8% pa in nominal \$ terms. But over this period, EM \$ EPS grew 1.5% pa *slower* than DM (Table 2, above). This is most likely due to EM earnings growth coming from non-listed companies and/or from new ones<sup>7</sup>.

The Fig 13 relationship with long-term EM/DM growth, assessed by our economists on the basis of trend demographics and productivity, shows it is **only accelerations in relative long-term growth that produce higher earnings growth in EM to DM**. That is, only growth accelerations are showing up in the earnings growth of existing listed companies, while the steady excess EM growth appears to come instead from

earnings, as making it harder for small companies to enter the listed exchanges.

<sup>7</sup> The overall EM current account balance over these years has been close to flat making differences in exposure to foreign earnings probably not the cause of different earnings growth.

new, or unlisted firms. In our March [issue](#), we cited the view by our economists that a post-pandemic world with accelerating climate change will lower EM trend productivity growth vs DM over the coming decade (Table 3). Together with equally slowing labor supply growth in both regions, this biases them to expect EM growth to slow vs DM growth and by implication that EM equities will continue to underperform vs DM.

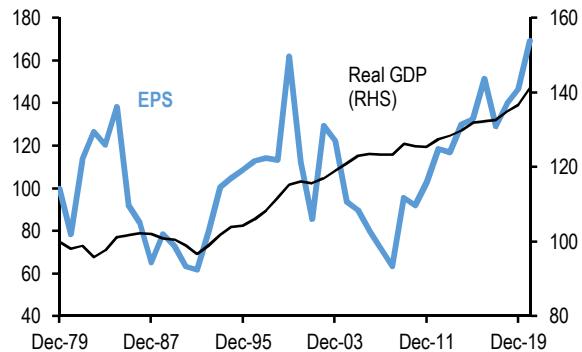
**Table 3: EM vs DM potential growth**

	2010s			2020s		
	Labor	Productivity	GDP	Labor	Productivity	GDP
EM	1.0	4.0	5.0	0.5	3.0	3.5
DM	0.5	1.0	1.5	0.0	1.5	1.5
EM-DM	0.5	3.0	3.5	0.5	1.5	2.0

Source: J.P. Morgan Economics.

Looking next at the **US versus the rest of DM**, we found that higher US growth did produce higher EPS growth over the past 40 years, but otherwise no meaningful relation on a particular 10-year period (Fig 15).

**Fig 15: US to rest of DM real GDP and nominal EPS growth**  
Ratios, 1980-2020, 1980=100 Ratios growth by difference in growth rates.



Source: MSCI, IMF, J.P. Morgan.

**Takeaway:** We have two problems in trying to use economic growth to project which country's equity market will perform better over the next decade. First is that the relation with economic growth is empirically weak as many other factors come in between the two over periods as long as 10 years. Second is that even then, our 1.5%, 1.3% and 0.8% long-term expected growth projections for the US, Euro area and Japan, respectively, would imply only very minor return differences by themselves. In the case of EM, our economists project the growth gap with DM to narrow by 1.5% pa on weaker productivity growth driven by EM difficulties to adjust to climate change and a post-

pandemic world, and DM benefiting more from AI and robotics. This makes for a **more meaningful long-term EM underperformance vs DM**.

## 2. Is US outperformance due to faster rising profit margins?

US profit margins have been steadily rising the past 10-20 years. In [Buybacks and the investor](#), Jul 18, 2019, we discussed that part of this was driven by a dramatic fall in **effective corporate tax rates, lower borrowing costs and globalization**. In that paper, we saw risk biased towards lower US profit margins in response to a retreat in globalization, and interest rate and effective tax rates more likely to rebound from all-time lows. Since then, the risk of higher inflation and thus borrowing costs as well international tax coordination **should make one raise the odds that US profit margins are set to come down, in our view**.

In [Business Concentration](#), Sep 30, 2020, we argued that higher US margins are also **related** to rising business concentration, although there is a lot of disagreement in the literature on which causes which. One view is that weaker enforcement of US **antitrust** laws and greater regulatory barriers to entry since the 1980s have led to an M&A boom, rising corporate power, depressed wages and greater profit margins from reduced competitiveness of markets.

A counter view is that rising concentration is the result of the emergence of **superstar** firms. Superstar firms have always been there, but David Autor et al., who launched the idea, believe that in the last two decades “technology or market conditions – or their interaction – have evolved to increasingly concentrate sales among firms with superior products or higher productivity, thereby enabling the most successful firms to control a larger market share<sup>8</sup>.” Irrespective of who is right on this debate, **both monopolization and superstar firms increase profit margins**.

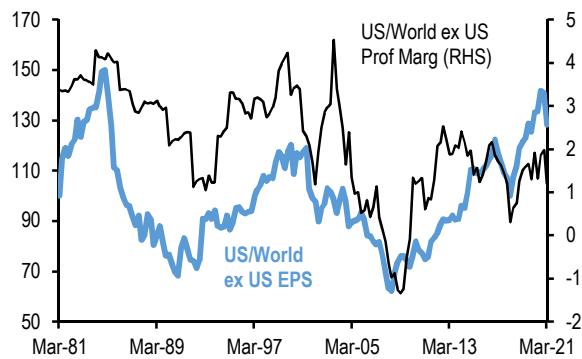
For our purposes, though, we need to look at *relative* margins. Borrowing costs and corporate taxation have been coming down all over the world, not just in the US. But the evidence in the literature cited in our [Business Concentration](#) paper shows that **concentration and price**

<sup>8</sup> See [The fall of the labor share and the rise of superstar firms](#), David Autor et al. A shorter version can be found in [Concentrating on the Fall of the Labor Share, David Autor et al., American Economic Review: Papers & Proceedings 2017, 107\(5\): 180–185](#).

### **markups have been rising more in the US than in the rest of the world.**

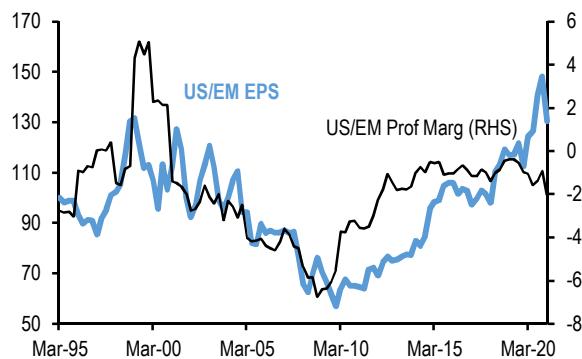
At issue for investors is not concentration in the overall economy, but what is happening to the companies in their global benchmarks. Figs 16-17, below, show the Refinitiv Datastream measures of US margins minus those in the rest of the world and against EM versus EPS ratios in USD. Margins are defined as after-tax earnings divided by revenues/sales. The relationship should be in local currency, but we do not have for the rest of the world to match these margin data. A comparison with MSCI local-currency data (not shown) confirms there is a decent relation between relative margins and earnings, though not over the past 8 years.

**Fig 16: US to rest of World Total Returns and Profit Margins**  
Ratios, Mar 1981- Mar 2021, Mar 1981=100, quarterly.



Source: Refinitiv Datastream, J.P. Morgan. World includes EM.

**Fig 17: US to EM Total Returns and Profit Margins**  
Ratios, Mar 1995- Mar 2021, Mar 1995=100, quarterly.

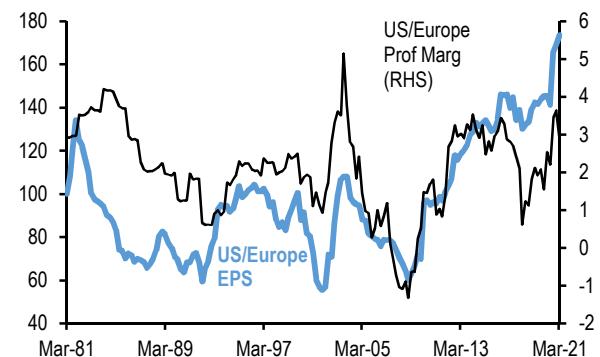


Source: Refinitiv Datastream, J.P. Morgan.

Fig 18 shows the relationship for US to Europe in local currency, instead of USD. We found no relationship for US to Japan. **Over the past 13 years of US outperformance, since 2007, US margins expanded by 4% points relative to Europe and EM, but not against Japan.**

The last three charts suggests **mean reversion** in relative profit margins but our tests **did not show them to have much statistical significance** or any great ability to forecast future margin gaps in a reliable manner.

**Fig 18: US to Europe Total Returns and Profit Margins**  
Ratios, Mar 1981- Mar 2021, Mar 1981=100



Source: MSCI, Refinitiv Datastream, J.P. Morgan.

**In short**, the empirical 1-on-1 relation between relative profit margins and returns has been quite decent, but not perfect quite likely due to other forces impacting on relative earnings growth. The recent widening of US margins against Europe and EM is quite plausibly related to the rising profitability of Tech companies, and the recent catch-up cut in US statutory corporate tax rates. Future margins movements is not easy as they lack clean mean reversion historically. That said, with the Biden administration in discussion within the G7/G20/OECD to impose a minimum tax rate on global corporates and European countries pushing to tax digital services by the location of the consumer (i.e., mostly on US Big Tech), one should probably assume that US profit margins are unlikely to gain from lower taxes relative to the rest of the world.

Overall then, **profit margins make us neutral to slightly negative on US equities vs the rest of the world over the coming decade.**

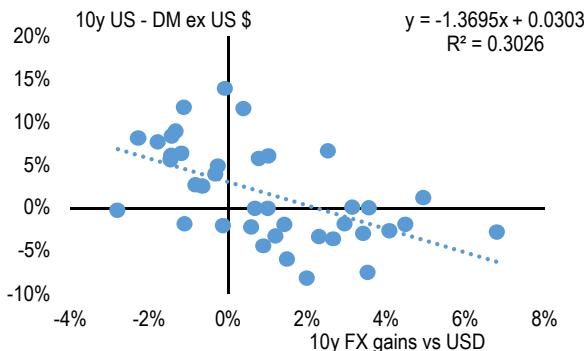
### **3. Is US outperformance due to the dollar?**

A potential third cause of recent US outperformance is the steady rise of the US dollar, which gained ~20% over the past 13 years on a trade-weighted basis (JBMNUSD on Bloomberg). In principle, a gain in a country's currency can either weaken its domestic equities, as its firms' foreign earnings are now worth less, or it can be the result of foreign inflows chasing a strong domestic equity market, thus correlating positively with it. It is thus an empirical question whose effect dominates.

Figs 19-20 shows the 10-year annual return differences between the US and other DM, in USD and in local currency against gains in the value of foreign currencies against USD over the same period. The latter is measured as non-US equity returns in USD minus the same in local currency. These are different from the traditional trade-weighted currency indices, which are by definition weighted by relative trade flows, and instead weight different currencies by their relative market caps.

**Fig 19: US returns minus rest of DM in USD versus FX gains vs USD**

%, annual, 1972-2020, 10-year averages. FX gains measured as MSCI World ex US in USD minus same in USD.

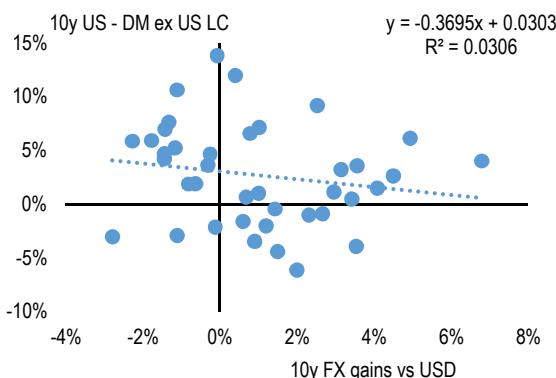


Source: MSCI, J.P. Morgan

Fig 19 shows that 10-year periods in which foreign currencies gained against the dollar correlated with US equities underperforming in common currency by modestly more than the FX change (1.37 times). However, in Fig 20, this extra local currency return from the currency appreciation is statistically not significantly from zero. We thus conclude that **currency gains translate about 1-to-1 into relative equity returns**.

**Fig 20: US returns minus rest of DM in local currency versus FX gains vs USD**

%, annual, 1972-2020, 10-year averages. FX gains measured as MSCI World ex US in USD minus same in local terms.



Source: MSCI, J.P. Morgan.

Over the period since 2007, when US equities outperformed the rest of the world by 7% pa, we find that only 0.9% was due to the rise in the dollar against other DM, and 1.2% against all countries, including EM (Table 4).

**Table 4: Returns in USD and local currency since end 2007**

%, Dec 2007- May 2021, FX gains vs USD.

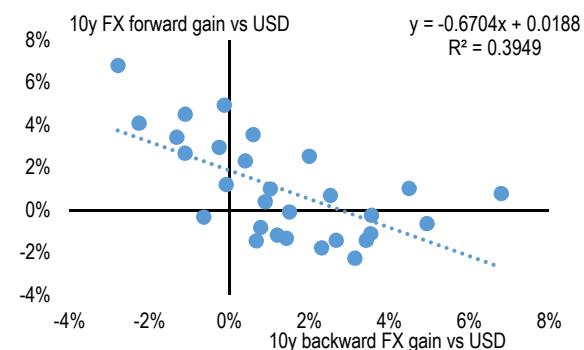
	US	Europe	JA	DM ex US	World ex US
USD	10.6	3.4	4.1	3.7	3.7
LC	10.6	4.8	3.9	4.5	4.8
FX gains	0.0	-1.4	0.2	-0.9	-1.2

Source: MSCI, J.P. Morgan. World includes EM

**How to judge the dollar over the coming 10 years?** It is a general presumption in economics that real currency values should mean revert over the long run as a high exchange rate should worsen the trade balance and thus eventually push the currency down. Using our market cap-weighted measure of FX gains vs the USD, we do indeed find that a past decade of FX gains vs the USD generally leads to losses over the next 10 years, and vice versa (Fig 21).

**Fig 21: Gains in non-US DM FX vs USD 10yr past vs 10yr future**

%, annual, 1972-2020, 10-year averages. FX gains measured as MSCI World ex US in USD minus same in local terms



Source: MSCI, J.P. Morgan.

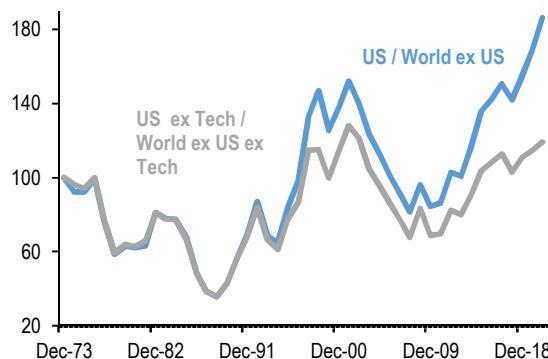
The beta of this regression shows that 2/3rds of FX gains vs the dollar in one decade is reversed the next decade. Given a 1.4% pa gain of the dollar vs the rest of DM over the past decade, equity cap weighted, this would imply a **1% depreciation of the dollar versus the rest of DM this coming decade**. This is almost exactly what our colleagues in J.P. Morgan AM are assuming in their annual [Long-term Capital Market Assumptions](#). **Dollar gains vs foreign currencies are thus a vote to expect non-US equities to outperform the US over the coming decade.**

#### 4. Is US outperformance due to Tech?

One much talked fourth driver of US equity market outperformance in the '90s and again in the post-GFC period is that both episodes were characterized by a global **Tech** industry that was steadily outperforming other sectors and that has a much higher weight in US indices: 27% vs 12% for non-US equities end last year. Fig 22 shows the total return ratios of US to non-US equities, with and without Tech. Tech clearly helped the US outperform during the big bull markets of the '90s and 2010s, but even without tech, US stocks outperformed. **During the past 13 years that the US beat the rest of the world by 7%, it still outperformed by 5% when excluding the Tech sector.**

**Fig 22: US Total Return Index over rest of world, with and without Tech**

Ratios, 1973 =100

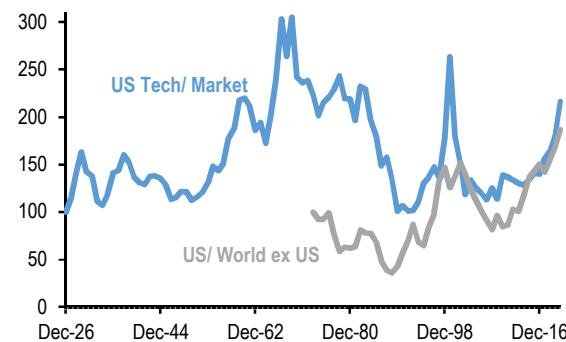


Source: Refinitiv Datastream, J.P. Morgan. World includes EM.

Fig 23 overlays US Tech excess return over the US market since 1926 on US return ratio over the rest of the world since 1973. The two are decently correlated showing that times when the **US Tech sector beats its own market, the overall US equity market is then also likely to beat the rest of the world.**

**Fig 23: Cumulative return ratios of US over rest of world and US Tech over US Market.**

Ratios, 1926 =100 for US Tech; 1973 = 100 for US/World ex tech, 1926- 2020.



Source:CRSP (Kenneth R. French), Refinitiv Datastream, J.P. Morgan. World includes EM

For the coming decade, a view on Tech is thus surely part of one's decision in where to position the US in one's strategic allocation. The temptation is to believe that Tech will remain all powerful in a post-pandemic world. However, history cautions against this automatic assumption. Fig 23 shows **clear mean reversion in US Tech excess returns over the long run, and until the past 10-year run-up, no superior long-run returns over other sectors.**

A reversion of the post GFC Tech bull market could come from valuation, or in our mind this time more likely from increased attention from **antitrust** authorities. We argued last year in [Business Concentration](#), Sep 30, that after 20 years of increased business concentration and market power, we are quite possibly at the start of political movement against mega companies, similar to the late 1800s that saw the birth of Antitrust. Such a movement would probably focus on Big Tech. Since we wrote this, we have seen increased antitrust action in the US, EU and China, ostensibly motivated by a perception that Big tech has too much power. And the US tech sector is underperforming YTD.

Overall, this analyst sees the dominance of Tech by itself as a **vote to expect US underperformance** over the coming decade.

**Do you need the rest of the world for risk diversification?**

An investor who does not want to speculate on the drivers of US relative performance we identified above may simply prefer the world market as recommended by *International CAPM*. It is a principle of modern finance that one's strategic portfolio should be max diversified as diversifiable risk is not paid for. Barring transactions costs – today at historical lows – diversification across countries and asset types is a “free” way to improve one's return to risk. Still, cross-country correlations have been rising over the past 2-3 decades<sup>9</sup> due to the globalization of global finance, reducing the degree to which one can actually reduce equity risk across countries.

Table 5, below, shows the historical volatilities of the US, non-US and world equity markets from the point of view of 5 different currencies in terms of both 1-year and 10-year annualized return volatility since 1972<sup>10</sup>. For 1-

<sup>9</sup> See our discussion in [De-globalization Update 2020](#), April 23, 2020.

<sup>10</sup> It could be argued we should use a more recent test period given the rise in correlations during the last 30 years of the

year risk, the global portfolio on average has the same risk as the US alone (the US is half of the world portfolio). The largest benefit comes to JPY-based investors where global 1-year risk is 2% point lower than the US alone. The long-term investor should focus more on long-term risk measures, which include any gains from time diversification (mean-reversion in annual returns), as discussed in our time diversification papers<sup>11</sup>. We have found that non-US equity returns mean revert somewhat better than US equity markets. We find that on a 10-year horizon, the world portfolio does provide some risk diversification versus investing only in the US, but the **benefit is small**, ranging from 1% point lower risk for a USD-based investor, to 1-3% lower for Europeans. Only JPY-based investors reduced risk a lot from investing globally rather than just in the US.

**Table 5: 1- and 10-year return vol for US, non-US and global equities by base currency**

%, 1973-2020, 10-year vol is standard deviation of 10-year compound returns multiplied by square root of 10 to make it comparable with 1-year vol. A market without time diversification nor momentum will have 10-year vol at the same level as 1-year vol. WD stands for World, incl. EM.

Currency	Period	US	World ex US	World
USD	1y	17	22	18
	10y	17	20	16
Yen	1y	22	20	20
	10y	17	13	11
GBP	1y	20	21	21
	10y	19	22	18
CHF	1y	23	23	22
	10y	20	19	17
Euro	1y	21	22	22
	10y	23	24	21

Source: Refinitiv Datastream, J.P. Morgan.

The lack of substantive gains from international diversification is quite likely because the US market is

Great Moderation of low inflation and low macro-economic volatility. This analyst does see a serious risk this environment is over as policy makers are steadily less focused on inflation stability and fiscal rectitude and that therefore cross-market correlations are due to return to lower historical norms. We thus prefer to look at a longer history than just the past 30 years.

<sup>11</sup> See [Bonds time diversify much better than you think](#), Feb 14; [The International 60/40 problem and US Hybrids](#), Sep 29, 2020; and [Can EM save 60 40](#), Dec 2, 2020

already very large and quite diversified itself, covering all global sectors and potential risk styles. It is also the most liquid in the market, with a huge primary issuance market, the greatest diversity of ETFs ([70% of global outstandings](#)) and the lowest transaction costs and management fees. And its equity market is complemented by the largest bond market in the world, with also the greatest liquidity and diversity of products.

**In short**, investors who do not have strong beliefs on what region will do better over the coming decade should in principle invest globally to gain max diversification, but will at the same time **not lose much by only investing in the US** as the US offers almost as much internal diversification opportunities as the world market.

## Conclusion

The US equity market has outperformed the rest of the world by 7% pa over the past 13 years. This has likely led to many, especially in the dollar world, to give up on international diversification that we all thought should be the starting point of a strategic allocation.

It is tempting to stay just in US equities. Non-US stocks remain highly correlated to the US market, pushing risk reduction through international diversification to negligible levels. The US market is already well diversified internally across sectors and styles and is more liquid and cheaper to trade and hold assets than the rest of the world. And the post-COVID-19 move to "everything online" will keep many focused on the Tech world that has been thriving in this environment.

That said, this analyst would advise to keep your strategic allocation in global equities and to only take short-term deviation rather than strategic ones. For one, the 13-year US bull run was probably not predictable. Our colleagues in JPM AM have been using the same fundamentals and signals that most investors rely on and, during the early years of this bull run, from 2008 to 2014, projected virtually the same returns on US as on other DM markets.

The momentum of the US market is very compelling, but needs to be challenged by evidence of **strong mean reversion in relative returns, the dollar, earnings growth and US Tech performance over 10-year holding periods that we have observed over the past 50 years**. At the end of any "bull run," it is always hard to imagine a reversal. We are not so worried about relative valuations, even as US multiples are at all-time highs versus the rest of the world as such relative valuations have had little value in signaling 10-year-out

relative returns. We are more worried about a return of Antitrust in the US that could penalize size, rightly or wrongly.

### Is there a case to strategically underweight the US?

By itself, the strong evidence of historical mean reversion in relative returns over the long run should imply that global investors, including USD-based ones, should hold less in US stocks than its current >50% share in global outstandings in the strategic benchmarks, depending on index. The US economy is only a quarter of world GDP, but we would not carry that argument too far as its companies operate globally. US macro policy is at the moment seemingly geared to boost its economy and equity market, but that is now and could easily create a more volatile macro environment in coming years that would bring its valuation down vs other countries.

We argued earlier this year in [Empirical models of long-term US equity returns](#) (Mar 1) that an average of 10-year-out forecasting signals indicate a best guess of a 4% pa return on SPX over the coming decade. That is a world in which Value should beat Growth. With the non-US equity markets at all-time low multiples versus the US, the rest of the world should include many more Value companies than the US, creating another argument to underweight the US strategically.

The US is now 58% of MSCI AC, EM is 13% (of which China 5%), and non-US DM is 29% (of this Europe 17%). An investor without any views on which country/region will do better is best off staying with the global portfolio based on outstandings. Investors who are biased towards our results of mean reverting long-term returns should start off strategically with a portfolio that has lower US weights. It is not too aggressive to start at 50%, putting the freed capital in other DM. With our concerns on long-term EM growth narrowing in on DM, we would keep low weights on EM, but focus on China that arguably is “everything that EM is not” as argued by us in our latest piece in [Short As to long-term Qs](#), Apr 19, 2021. To avoid misunderstandings, these recommendations are **target, average strategic allocations** around which tactical investors can take short-term deviations, as frequently recommended by our equity strategists.

## The Long-Term Strategist

### Health Care: A Strategic Sector OW

- **Health Care stocks have outperformed the market over the past 50 years and 90 years.**
- **They have beaten other equity sectors across major DM regions and EM with faster earnings growth, a much higher average ROE, and the lowest earnings volatility.**
- **US consumers are likely to continue to spend more on health care over coming decades, despite efforts to bend the cost curve.**
- **We see US biopharma in the midst of a significant innovation cycle.**
- **US drug pricing reform remains a key risk, but is to us more a headline than structural risk.**
- **The sector's low beta and volatility do not detract from its returns, as low-vol shares are known to perform well. The sector correlates well with the Quality style that has outperformed other styles and the market for a long time.**
- **Investors should thus consider having a Strategic OW of Health Care in US and non-US holdings. A 10%-point increase in its allocation should raise long-term portfolio returns by about 0.20%, and lower its volatility by the same.**

---

#### Long-term Strategy

##### **Jan Loeyς** <sup>AC</sup>

(1-212) 834-5874  
jan.loeyς@jpmorgan.com  
J.P. Morgan Securities LLC

##### **Shiny Kundu**

(91-22) 6157-3373  
shiny.kundu@jpmorgan.com  
J.P. Morgan India Private Limited

#### **US Pharmaceuticals — Major & Specialty**

##### **Chris Schott, CFA** <sup>AC</sup>

(1-212) 622-5676  
christopher.t.schott@jpmorgan.com  
J.P. Morgan Securities LLC

#### **US Economic and Policy Research**

##### **Jesse Edgerton**

(1-212) 834-9543  
jesse.edgerton@jpmorgan.com  
JPMorgan Chase Bank NA

---

In our last [issue](#), we argued that we can expect only very low returns over the next decade in the main bond and equity markets that investors have access to. With current high starting points on equity multiples and profit margins, the empirically observed mean reversion in each generated our expectation of **almost no capital gain on US large caps over the coming ten years**. That has led us to recommend focusing in higher-income assets in one's SAA.

In this issue, we focus on whether we can gain better long-term returns by selecting the "right" **sector**. Sectors are relatively under-researched in SAA, with much more attention paid to Styles, such as Value and Momentum, as it has been easier to make a case for excess returns in the latter. We find sector allocation appealing, as it requires less turnover than Styles, where stock membership can shift around quite a lot. A bank will remain in the Financials sector forever, but can easily shift in and out of Momentum and Value.

Sector allocation for most investors almost always means tactical Over- and Underweights against the widely used S&P, Russell, and MSCI indices. These benchmarks use market capitalization as the neutral weight for different sectors. This approach is consistent with CAPM and reduces the risk of being heavily invested in sectors with small outstandings

In this note, we investigate the case for making strategic, long-term sector allocations that diverge from market weights. We call these Strategic OWs and UWs. It comes to the conclusion that one sector – Health Care – stands out globally in terms of long-term outperformance, high earnings growth, low earnings volatility, and high ROE.

We first look at the long-term performance of different sectors, then look for plausible reasons why one sector, Health Care, had such great performance and why this could continue. We review potential threats to this view, both from the fundamental and the financial side. On the first, these include whether consumers will keep spending on health care, whether innovation can be maintained, and whether regulatory pressures will tighten. On the financial side, these include the potential for mean reversion in relative sector returns, the low beta nature of the index, whether it has the right Style exposure, and whether all the good news for the sector is not already in the price.

## Past sector performance

The longest time series of equity sector returns come from CRSP (Center of Research in Security Prices), which has total return indices across the extended US market (small, mid and large caps) starting in 1926. S&P has US sector returns from 1989, while Datastream reports for the US, World, EM and major regions since 1973. MSCI returns start only in 1994 and are thus not used here. Table 1 shows the sectors.

Figure 1- Figure 3 show CRSP total returns since 1926 across 10 US extended equity market sectors, cumulative on a log scale, cumulative as a ratio to the overall market, and as excess annual compounded returns versus the overall market.

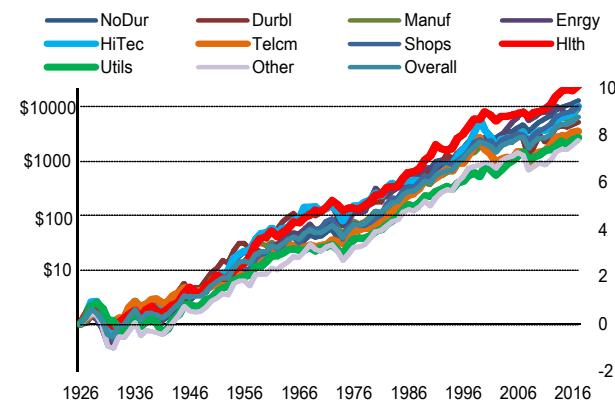
**Table 1: Datastream and Kenneth French Sector Abbreviations**

Datastream		Kenneth French	
Sector	Abbreviation	Sector	Abbreviation
Oil & Gas	EN	Consumer NonDurables	NoDur
Basic Materials	MT	Consumer Durables	Durbl
Industrials	IN	Manufacturing	Manuf
Consumer Goods	CG	Oil, Gas, and Coal Extraction and Products	Energy
Healthcare	HC	Business Equipment	HiTec
Consumer Services	CS	Telephone and Television Transmission	Telcm
Telecom	TC	Wholesale, Retail, and Some Services	Shops
Utilities	UN	Healthcare, Medical Equipment, and Drugs	Hlth
Financials	FN	Utilities	Utils
Technology	IT	Other	Other

Source: J.P. Morgan, CRSP, Kenneth French.

**Figure 1: Cumulative US sector returns since 1926**

Natural log of total-return sector indices and overall market total return  
1926 = 0

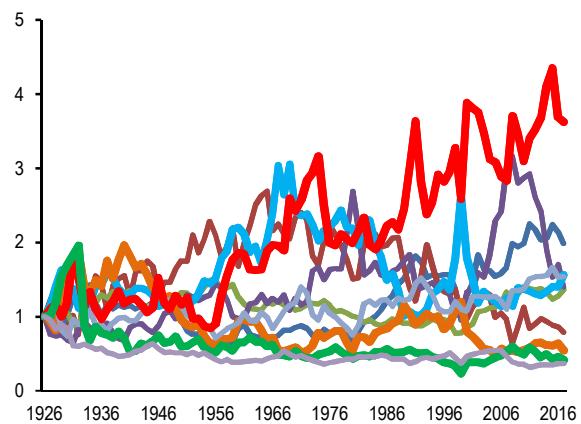


Source: J.P. Morgan, CRSP, Kenneth French. Last observation is Dec'17

From highest to lowest return, the sectors are Health-care, Non-durables, High-tech, Shops, Energy, Manufacturing, Durables, Telecoms, Utilities, and Other. The Other category includes Financials and has grown in importance over time to become 28% of the overall market currently.

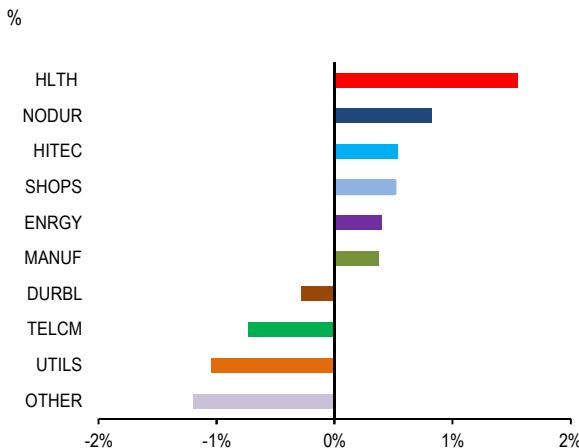
**Figure 2: Cumulative relative US sector returns since 1926**

Ratio of total-return sector indices over overall market total return  
1926 = 1, colors defined in Figure 1



Source: J.P. Morgan, CRSP, Kenneth French. Last observation is Dec'17

**Figure 3: Annually compounded US sector returns over market, since 1926**



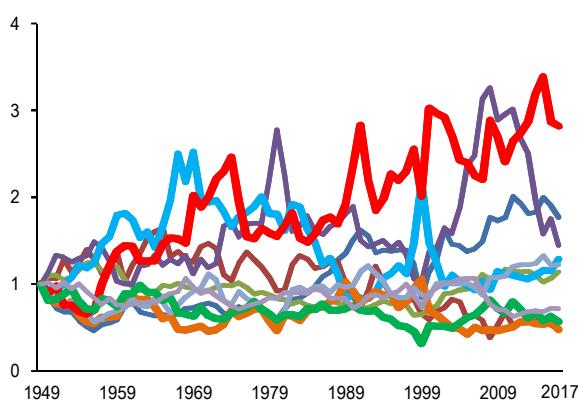
Source: J.P. Morgan, CRSP, Kenneth French. Last observation is Dec'17

Given the risk that pre-war returns come from a time that is no longer representative of the current economic regime, Figure 4- Figure 5 show the same total return ratios and excess returns since 1949. We get a similar pattern of sector returns as the full data set since 1926.

The Empirical Finance literature frequently analyzes CRSP data only from 1963, as that was the moment when the series incorporated AMEX data. Before that, they only used NYSE transactions<sup>1</sup>. Sector returns since 1963 show the same patterns as the two longer samples periods.

**Figure 4: Cumulative US relative sector returns since 1949**

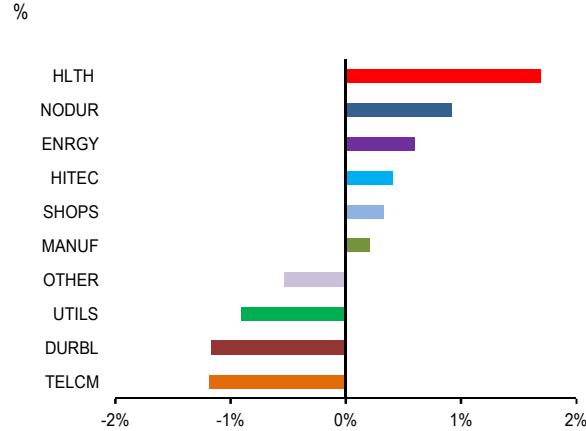
Ratio of total-return sector indices over overall market total return  
1949 = 1, colors defined in Figure 1



Source: J.P. Morgan., CRSP, Kenneth French, Last observation is Dec'17

<sup>1</sup> See Chapter 7: The CRSP Sample and Market Factor of Turan G. Bali, Robert F. Engle, Scott Murray. *Empirical Asset Pricing: The Cross Section of Stock Returns*, Apr 2016

**Figure 5: Annually compounded US sector returns over market, since 1949**

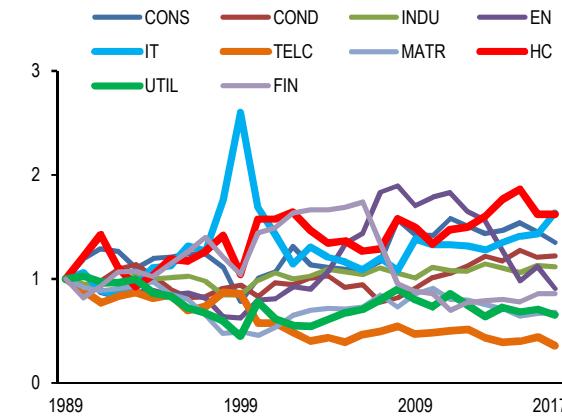


Source: J.P. Morgan., CRSP, Kenneth R. French, Last observation is Dec'17

Figure 6 to Figure 7 show the relative sector returns for the US large-cap S&P500, with the first level sector categories used by S&P. From highest to lowest returning sectors, these include IT, Health Care, Consumer Staples, Consumer Durables, Industrials, Energy, Financials, Materials, Utilities, and Telecoms.

**Figure 6: Cumulative US SPX relative sector returns**

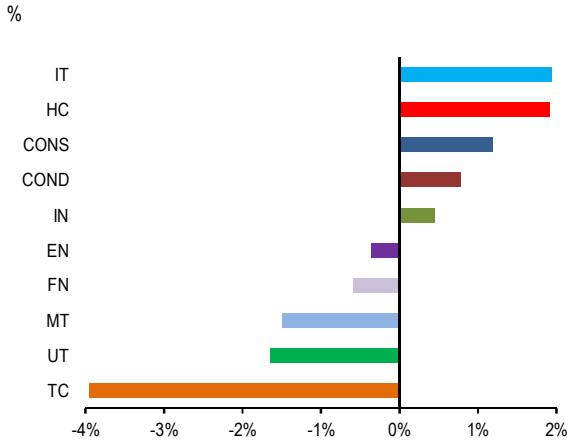
Ratio of total return sector indices over S&P 500 total return  
1989 = 1



Source: J.P. Morgan, S&P, Bloomberg. Last observation is Dec'17

The S&P data show us more familiar sector definitions, now including Financials, but again showing relative sector return rankings that are not that different from the 90-year CRSP results.

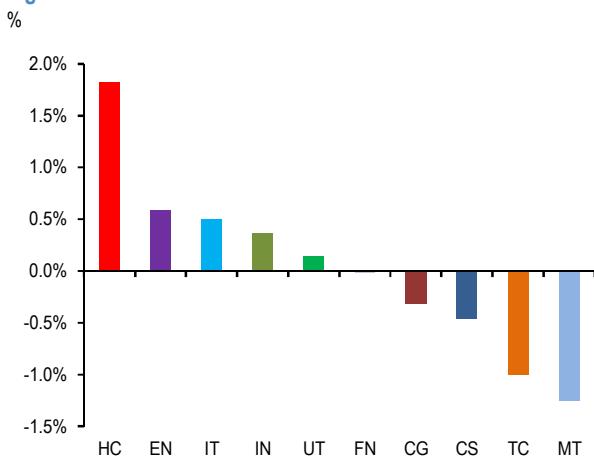
**Figure 7: Annually compounded US S&P500 sector returns over market, since 1989**



Source: J.P. Morgan, Bloomberg. Last observation is Dec'17.

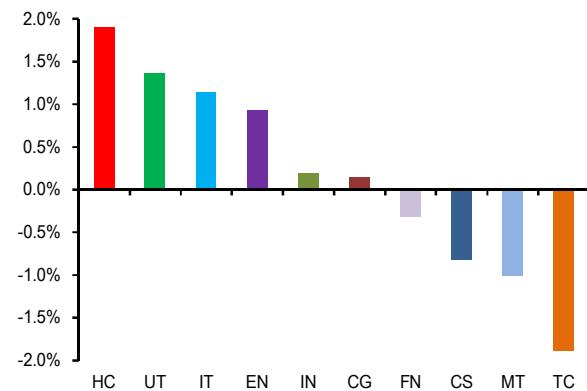
DataStream gives us relative sector return data going back to 1974. Figure 8- Figure 13 show sector excess total returns over market for the World, World ex US, US, Europe, EM and Japan. The results show that Health Care outperforms in every region and is thus not just a US phenomenon.

**Figure 8: World sector excess total returns over index**



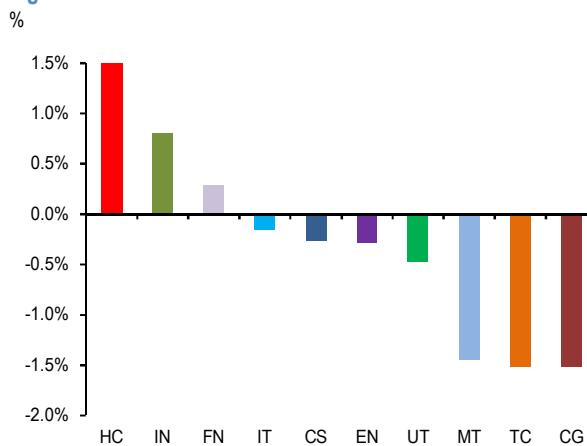
Source: J.P. Morgan, DataStream, Last observation is Q1 2018.

**Figure 9: World ex US sector excess total returns over index**



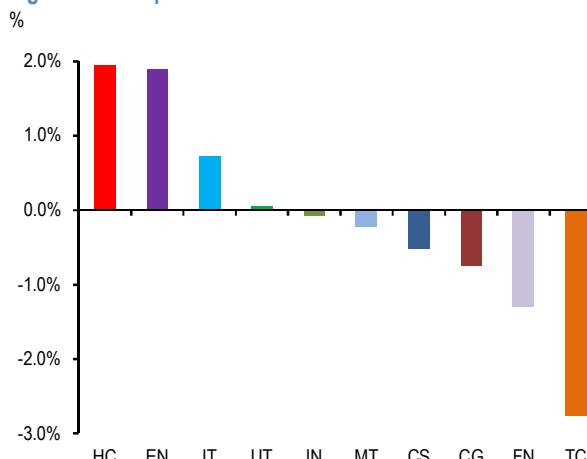
Source: J.P. Morgan, DataStream, Last observation is Q1 2018

**Figure 10: US sector excess total returns over index**



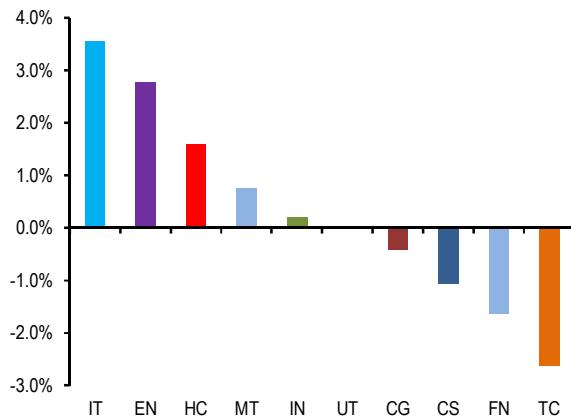
Source: J.P. Morgan, DataStream, Last observation is Q1 2018

**Figure 11: Europe sector excess total returns over index**



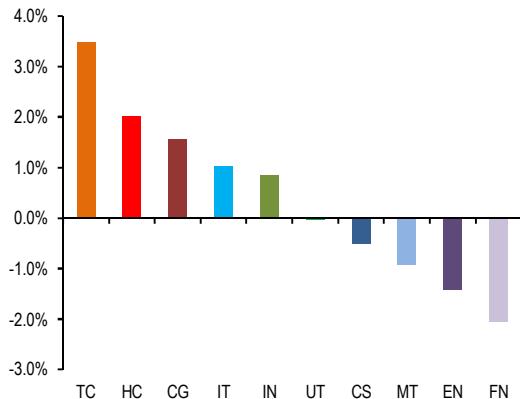
Source: J.P. Morgan, DataStream, Last observation is Q1 2018

**Figure 12: EM sector excess total returns over index**  
%



Source: J.P. Morgan, DataStream, Last observation is Q1 2018

**Figure 13: Japan sector excess total returns over index**  
%

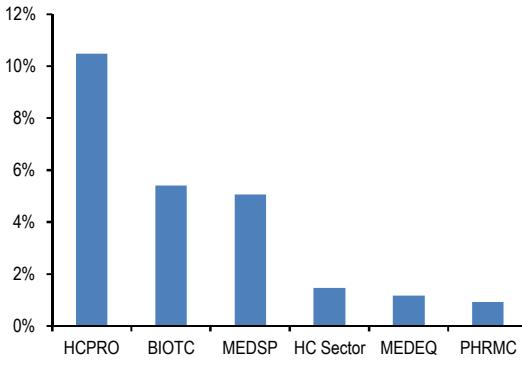


Source: J.P. Morgan, DataStream, Last observation is Q1 2018

## Health Care subsectors

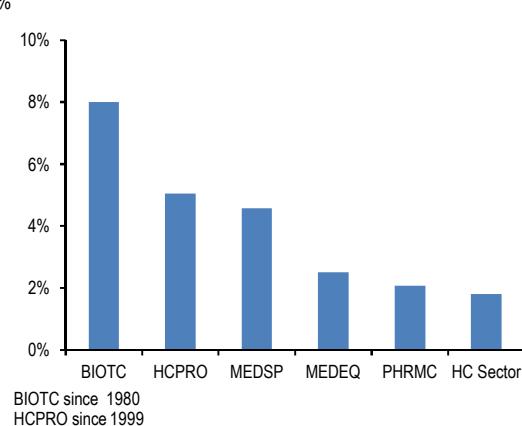
Companies in the DataStream Health Care sector can be divided up in five subsectors: Pharmaceuticals, Medical Equipment, Medical Supplies, Biotechnology, and Health care Providers. Each of these five has outperformed since 1973 (Biotech data only since 1983) in both the US and elsewhere (Figure 14–Figure 15). Pharmaceutical companies are by far the dominant sectors, making up 68% of the sector outside the US and 40% in the US. Health Care Providers and Biotech produced the largest outperformance, which was dramatic in size for such a long period.

**Figure 14: US sector excess total returns over index**  
%



Source: J.P. Morgan, DataStream, Last observation is Q1 2018

**Figure 15: World excluding US sector excess total returns over index**  
%



Source: J.P. Morgan, DataStream, Last observation is Q1 2018

## Why the strong Health Care sector performance?

Excess performance in any sector must by definition come from higher dividends, faster earnings growth, and/or greater multiple expansion. Table 2–Table 3 decompose the sector excess returns over index into these three components, all relative to the overall market, for DataStream World since 1973 and S&P500 since 1990, as per data availability.

**Multiple expansion** can be very important short term, and has played a significant role for certain sectors, but is generally mean reverting and can thus not be relied upon in the future. The tables show the sample period returns from multiple changes, but these results purely depend

on the starting and ending levels, are thus quite volatile, and we thus do not use them to extrapolate future excess returns.

**Table 2: Decomposition of World sector excess returns over market**

%, since 1974

Sector	Excess Total Returns	Excess Avg Div Yield	Excess EPS growth	Excess P/E change
HC	1.8%	-0.3%	2.2%	-0.1%
EN	0.6%	1.1%	-1.6%	1.0%
IT	0.5%	-1.1%	2.2%	-0.5%
IN	0.4%	-0.4%	0.4%	0.4%
UT	0.1%	2.2%	-2.2%	0.0%
FN	0.0%	0.0%	0.9%	-0.8%
CG	-0.3%	-0.3%	-0.5%	0.5%
CS	-0.5%	-0.8%	0.7%	-0.3%
TC	-1.0%	1.6%	-2.9%	0.3%
MT	-1.3%	0.0%	-1.0%	-0.2%

Source: J.P. Morgan, DataStream, P/E change = % change in PE ratio\*no. of yrs

**Table 3: Decomposition of US sector excess returns over market**

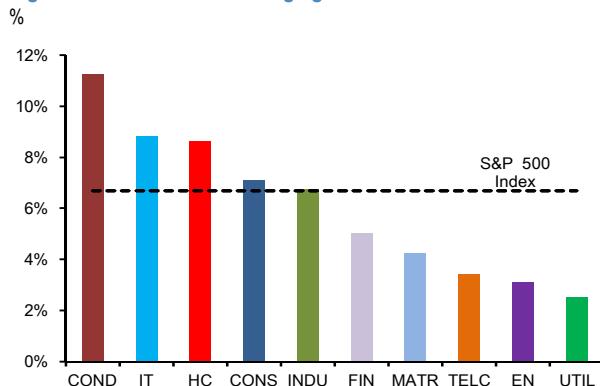
%, Since 1990

Sector	Excess Total Returns	Excess Avg Div Yield	Excess EPS growth	Excess P/E change
IT	1.8%	-1.1%	2.1%	0.5%
COND	1.2%	-0.6%	4.5%	-1.5%
HC	1.2%	-0.3%	2.4%	-0.9%
INDU	0.7%	0.0%	0.1%	0.5%
CONS	0.5%	0.3%	0.4%	-0.4%
FIN	0.2%	0.3%	-0.6%	0.4%
EN	-0.6%	0.6%	-3.6%	2.1%
MATR	-1.7%	0.3%	-2.5%	1.1%
UTIL	-1.8%	2.2%	-4.2%	0.0%
TELC	-3.6%	1.7%	-3.3%	-1.8%

Source: J.P. Morgan, S&P 500, Bloomberg, P/E change = % change in PE ratio\*no. of yrs

That leaves the **real source of long-term excess returns — faster earnings growth and dividend yields**. We find, in Figure 16 below, that three SPX sectors — Consumer Discretionary, Technology, and Health Care — had faster EPS growth than the overall index. This is best explained by recognizing that these sectors produce goods and services that economists consider “superior,” meaning that their income elasticity is higher than one. In other words, as incomes rise, consumers spend an increasing share of their income on them (see below under Threat #1: Will consumers keep coming?).

**Figure 16: S&P Sector Earnings growth 1989-2017**



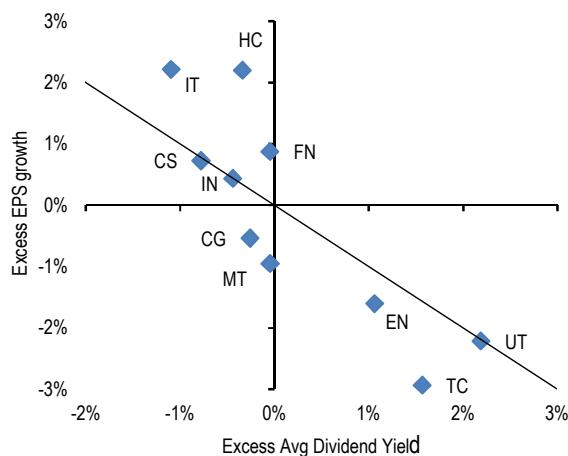
Source: J.P. Morgan, Bloomberg, Last observation is 2017

Faster growing companies generally do not pay out as much of their profit in dividends, and thus part of the earnings growth contribution to total return is offset by lower dividend payouts.

Figure 17 shows this by displaying the excess earnings growth of different DataStream World sectors on the y-axis against the excess dividend yield since 1989. Sectors along the downward sloping 45 degree line have their higher earnings growth offset by a lower dividend yield. The best performing sectors are the ones furthest from the line to the “North-East” side. This shows Health Care as the best sector, as its 2% higher earnings growth than market is only partly eaten into by a slightly lower dividend yield.

**Figure 17: Excess EPS growth and dividend yield per sector over market**

%, since 1974



Source: J.P. Morgan, DataStream, Last observation is Q1 2018

Related is the attractiveness of the Health Care sector in that it has had the second highest ROE among S&P500 sectors since 1989 (Table 4 and Figure 18) and the lowest volatility of earnings. This is not typical, as we find most of the time in economics and finance that faster growth is more volatile growth. Witness the low volatility of slow growing sectors Utilities and Consumer Staples against the higher volatility of faster growth sectors like Consumer discretionary and IT.

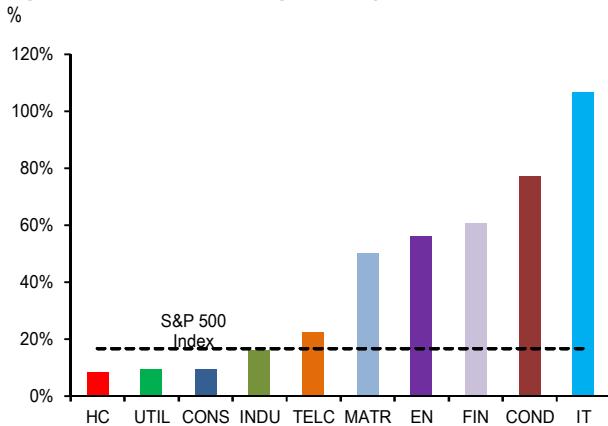
**Table 4: Return on equity by S&P500 sector**

%, average since 1989

Sector	Abbreviation	Avg ROE
Consumer Staples	CONS	25.30
Healthcare	HC	20.60
Industrials	INDU	15.30
Energy	EN	13.40
Information Technology	IT	13.30
Overall Index	S&P 500 Index	13.00
Consumer Discretionary	COND	11.70
Financials	FIN	11.20
Material	MATR	10.90
Telecommunication Services	TELC	10.70
Utilities	UTIL	9.30

Source: J.P. Morgan, S&P.

**Figure 18: S&P sector earnings volatility 1989-2017**



Source: J.P. Morgan, Bloomberg, Last observation is 2017

## Will Health Care perform in the future?

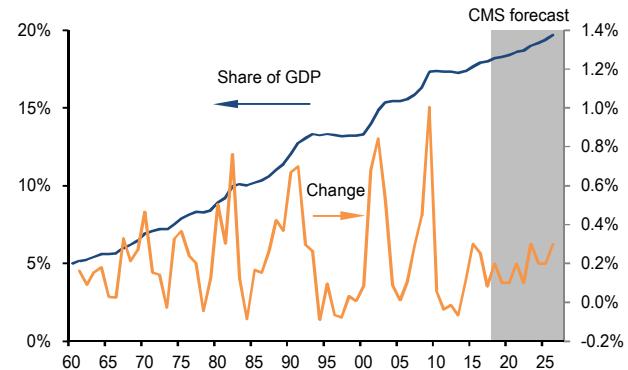
"Past performance is no guarantee of future results" is a warning that must be included in almost all financial offerings. And it is an important warning, irrespective of how long the outperformance has persisted. We will spend the rest of the paper looking at the main potential threats, both fundamental and financial that we can see to continued Health Care outperformance. The fundamental questions are 1) whether the consumer will continue to

spend higher and higher shares of their income on health care; 2) whether the industry, and in particular pharmaceutical companies, will be able to keep coming up with more new medicine; and 3) whether the industry can escape cost control efforts by governments that pay a lot of this care. The financial ones are 4) whether the normal mean reversion seen in more medium-term returns won't have its impact on this sector; 5) whether Health Care stocks will be bought by an investor more interested in Style investing; 6) whether this sector can continue to outperform despite evidence that it is really a low-beta sector; and finally 7) why all this is not yet in the price.

### Threat #1: Will consumers keep coming?

Health care spending has consumed **a rising share of US national income** over the last several decades. Indeed, Figure 19 shows that a comprehensive measure of US health care spending constructed by the Center for Medicare and Medicaid Services (CMS) rose from 5% of US GDP in 1960 to 18% in 2016, despite some deceleration in the years since the 2008-09 recession.

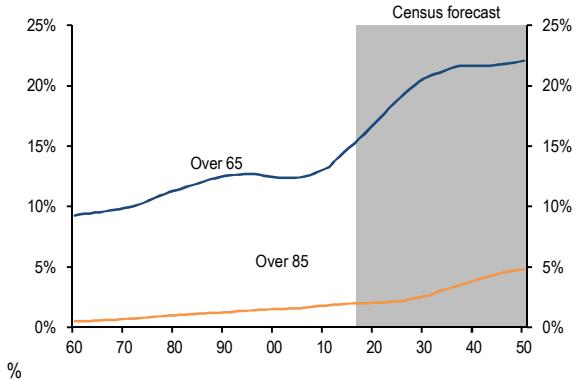
**Figure 19: National health expenditures as share of GDP %**



Source: J.P. Morgan, Center for Medicare and Medicaid Services

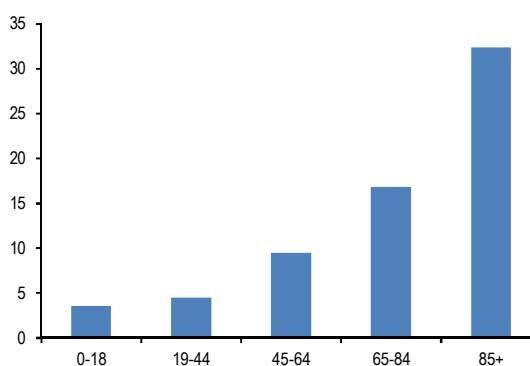
One factor that should continue to drive health care spending in the coming decades is the **aging** of the population. Figure 20 shows that the fractions of the population over age 65 and over age 85 are both projected to rise substantially in the coming decades, and Figure 21 shows that average health care spending per capita rises dramatically in these older age buckets. Simple calculations suggest that the aging of the population alone would tend to raise health care spending per capita by about 15% by the year 2050, enough to raise its share of GDP to 20.5% from about 18.0% today.

**Figure 20: Fraction of US population of a certain age**



Source: J.P. Morgan., Census Bureau

**Figure 21: Health Care spending per capita, by age**  
\$, 000s



Source: J.P. Morgan., Center for Medicare and Medicaid Services

But, in fact, the aging of the population played a relatively small role in driving the large increases in health care spending seen in Figure 19. Instead, those **increases were driven primarily by “excess cost growth,”** or growth in spending in excess of what can be explained by GDP growth and demographics. Thus, to forecast increases in health care spending going forward, we must also take a view on future excess cost growth.

There seems to be a near-consensus among health care researchers that excess cost growth in recent decades was driven largely by **increasing adoption of new medical technologies and procedures.** And, of course, in order for spending on these innovations to rise, there was also a willingness to pay for these innovations by the people writing the checks, including Medicare, Medicaid, private insurers, and consumers paying out of pocket.

There remains considerable debate, however, about the extent to which these ever-larger checks represent money

well spent. Some researchers have argued that diminishing marginal utility of consumption means that people should be willing to spend larger amounts of money on extending their life as they get richer.<sup>2</sup> In other words, they argue that the benefits of a third home or a second smartphone are small relative to another year of life, and they find that it would be optimal for the US to spend around 30% of GDP on health care by 2050.

Another set of researchers, however, emphasizes that the US spends much more money on health care than most other nations, even though we are not much healthier. And even within the US, spending on similar people with similar health problems varies dramatically in different parts of the country, despite producing little difference in mortality rates or other health outcomes. This research suggests that **as much as 30% of US health care spending is essentially wasted**, in that it produces no clear health benefits. As a result, there has been much focus in recent years on **“bending the cost curve”** by encouraging smarter spending decisions with programs like Accountable Care Organizations, high-deductible health insurance policies, and tighter reimbursement regimes from Medicare and Medicaid. The recent slowdown in spending growth in Figure 19 suggests that these efforts have met some success, though others argue that the slowdown is partly explained by the Great Recession lowering incomes and a lack of recent medical innovations to drive spending.<sup>3</sup>

So what do these competing arguments imply for future growth in health care spending? We tend to think there is some truth in both perspectives. Surely many medical innovations do have important benefits, while the utility of other forms of consumption likely diminishes as our incomes grow, justifying increased medical spending over time. Meanwhile, it could still be possible that some current spending is wasted, and there could be further benefits from bending the cost curve. But we are less convinced that policy changes will be very successful in producing these savings, as there will always be large constituencies resistant to such change. Indeed, many experts from CMS, the Congressional Budget Office, and academia continue to forecast excess cost growth of at least 1% per year, which would also be enough to drive health care’s share of GDP near 30% by 2050. For such a forecast to come true, however, we would likely need to

<sup>2</sup> Robert Hall and Chad Jones, “The Value of Life and the Rise in Health Spending,” *Quarterly Journal of Economics*, 2007.

<sup>3</sup> See, for example, Amitabh Chandra, Jonathan Holmes, and Jonathan Skinner, “Is this Time Different? The Slowdown in Health Care Spending,” NBER Working Paper 19700, 2013.

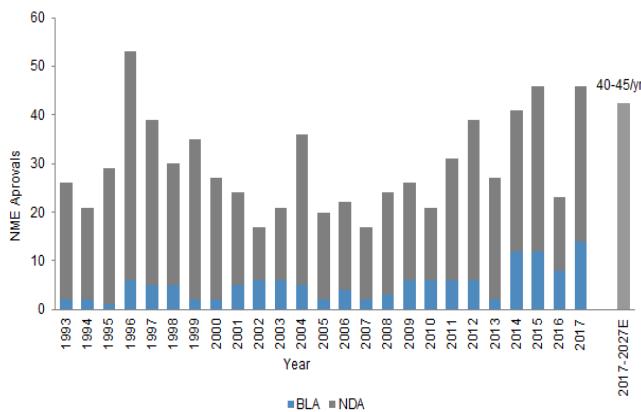
see a resurgence in medical innovations that drive further spending, which we turn to next.

### Threat #2: An end to innovation?

One major threat and concern frequently raised on the Health Care industry is whether it can maintain a strong innovation pace and avoid a slowdown in the discovery of new medical treatments. Below, our Pharma Equity analysts see no such slowdown.

**We see the biopharma industry in the midst of a significant innovation cycle.** Within biopharma industry, we are seeing an increase in the number of approvals for new molecular entities and an R&D investment focused on areas of unmet need such as oncology, immunology and orphan diseases. Further, the industry has seen a clear uptick in new product approvals, which are now averaging >40 per year, up from 20-25 per year for much of the past decade, and we expect this higher level of innovation will continue for the foreseeable future. Overall, we see this very healthy new product cycle driving acceleration in sector topline growth over the next decade, which we expect to average 3-5% annually.

Figure 22: FDA new drug approvals per year



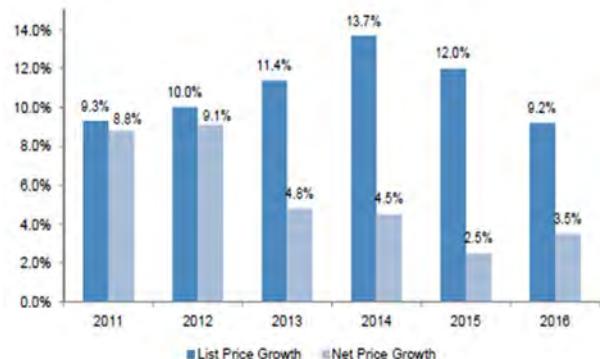
Source: FDA and J.P. Morgan., NME: New Molecular Entities, BLA: Biologic License Application, NDA: New Drug Application

**US FDA is working to expedite the approval of therapies targeting unmet need.** We see the newer, distributed specialty therapies as far better protected from price pressures and payer access restrictions relative to older products with an increased gov't/payer focus on value-based drug pricing that more fully incorporate the value of new treatments, including both system-wide Health Care and societal benefits through reduced primary care costs, increased quality of life, higher workforce participation, and increased productivity.

**Innovation is increasingly replacing price as a biopharma growth driver.** With public scrutiny on branded drug pricing peaking in 2015-2016 following several years of aggressive price increases and several high visible pricing controversies (eg, Valeant, Mylan's EpiPen controversies), we see the biopharma industry increasingly 'self-policing' on drug pricing as companies provide more disclosure on 'net' realized price increases, limit annual price over time (eg, companies' commitments to single-digit annual percentage increase), and avoid significant price resets on branded products. This should translate into US price growth slowing to the low-single digits over time.

At the same time, we see the newer, more innovative therapies as far better protected from price pressures and payer access restrictions relative to older products, which often have multiple competitive alternatives. We also highlight the increased use of innovative contracting and outcome based payment systems that could help increase access for new breakthrough treatments and justify future R&D investments.

Figure 23: Drug industry net pricing growth is slowing reflecting increased payer rebates



Source: IMS Health, May 2017.

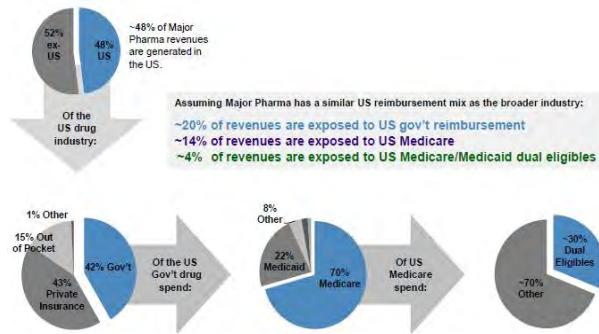
### Threat #3: US drug pricing reform remains a key controversy for the sector

The potential for drug price reform has represented an overhang on the biopharma space over the past several years, with investors questioning if the market can afford the range of innovative new medicines coming to market. We believe drug pricing reform represents more headline risk than structural risk for the sector and that meaningful drug price reform will be very difficult to enact given the currently fragmented payer system as well as the challenges introduced by limited access to novel medicines to patients (which we believe would be required to substantially reduce drug costs).

**Drug reimbursement channels for global biopharma companies remain highly fragmented.** While there is increased investor focus for large global biopharma companies, the drug reimbursement channel remains highly fragmented, with ~50% of Major Pharma revenues generated in the US, of which only ~40% is US government reimbursed, representing only ~20% exposure to US government players currently (eg, Medicare/Medicaid).

**On US gov't drug pricing, a wholesale shift in the current market structure appears unlikely.** We do not currently see any wholesale shift in the current health care market structure in the foreseeable future, while the most plausible Medicare/Medicaid reforms discussed appear manageable and legislative approval for even these changes remains highly uncertain, in our view. Near term, we watch for Trump/Republican comments on Medicare & Medicaid reform and its impact to the ~20% of the pharma groups from US gov't payers. While headline risks related to drug pricing remain, it is unclear how and if any changes to Medicare Part B or D would be implemented within the current Republican congress, while more expansive health care reform would prove more challenging, in our view.

**Figure 24: Biopharma industry US government payer exposure**



**Figure 25: Biopharma industry US government payer exposure**

- Probability of Implementation ↑
- **Pass Through Rebates / Increased Out of Pocket Copay Assistance** - this could include the industry covering a greater portion of the Part D donut hole as well as passing along increased drug rebates to patients
  - **Medicare Part B Reform** - More aggressively manage Part B drug coverage with formularies and drug negotiations where alternative therapies exist
  - **Medicare/Medicaid Dual Eligibles** - Legislating that patients who qualify for both Medicare and Medicaid should benefit from lower Medicaid pricing.
  - **Medicare Non-interference Clause** - Allowing CMS to negotiate for potentially better pricing than the Part D Plans. The CBO believes this would have a minimal effect without aggressive formulary narrowing.
  - **Medicare Formulary Negotiation / Narrowing** - The CMS would have significantly more power to negotiate lower drug prices if its moved to narrower formularies.
  - **Drug Importation** - This could bring prices to be more competitive with other nations, but would also introduce practical complexity and safety risks.
  - **"Medicare For All"/ Nationalized Healthcare** - A nationalized healthcare system would cover all US lives and give the government significantly more negotiating power, but would still require the government to make decisions over which drugs were covered.
- ↓ Probability of Implementation

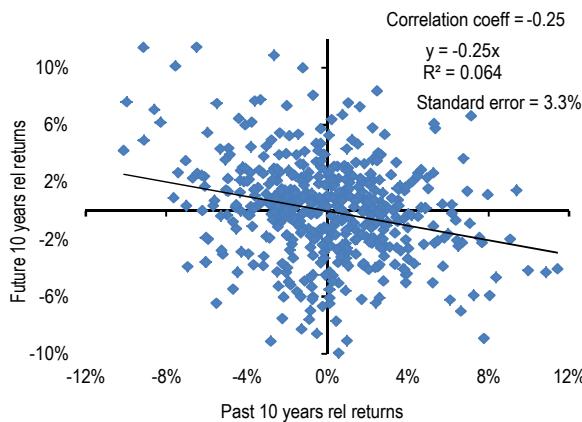
Source: J.P. Morgan estimates.

### Threat #4: Mean reversion?

One concern about whether Health Care can continue to outperform in the future is the general risk that any high-return sector will see new entrants into the sector eager to share in its high profits, or will see mean reversion in multiples when the excess came from multiple expansion. In the short term, we find that relative sector returns have tended to persist (see [Momentum in global equity sectors](#), Di Pietro and Ribeiro, May 2008), but that this reverses when we look over multi-year periods.

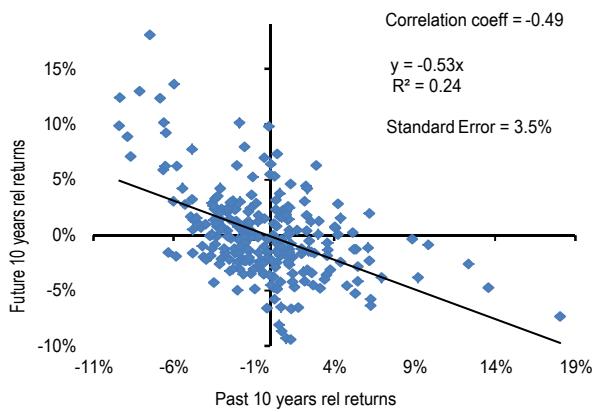
Figure 26 below shows a scatter of rolling 10-year sector excess returns over market versus those for the following 10 years, based on the US CRSP data since 1949. On average, a sector that outperformed its market by 1% over one decade underperformed by 0.25% the next decade, although the weak fit of the regression shows that there is plenty of volatility/uncertainty around this mean reversion. The same exercise for global equity sectors based on the DataStream data since 1973 showed sectors giving back about half (0.53%) of any past decade outperformance over the following decade (Figure 27).

**Figure 26: Mean reversion in 10year sector excess returns**  
 % rolling 10y returns, since 1949, all sectors



Source: J.P. Morgan, CRSP, Kenneth R. French, Last obs Dec 2017

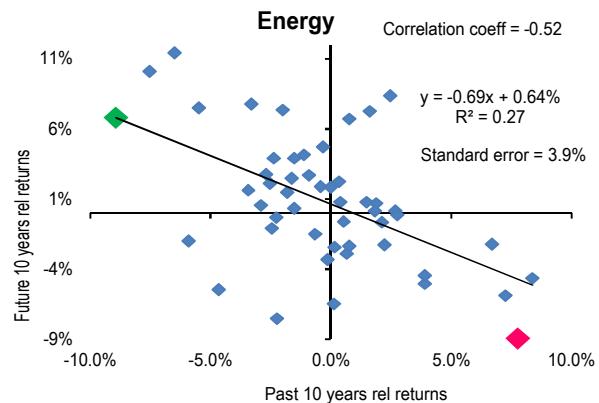
**Figure 27: Mean reversion World equity sector excess returns**  
 % rolling 10y returns, since 1973, all sectors



Source: J.P. Morgan, DataStream. Last observation is Jan18

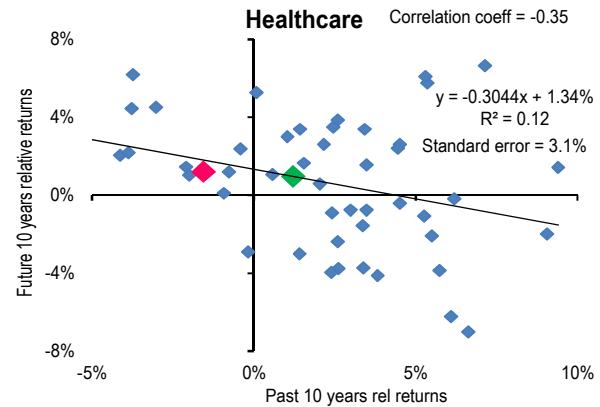
Long-term mean reversion in excess returns is not constant across sectors, although any differences may statistically not be that significant. In the case of Health Care, the mean reversion pace is close to average (at 30%, Figure 29), but is much faster in the case of Energy (69%, Figure 28).

**Figure 28: US Energy sector excess return mean reversion**  
 % rolling 10y returns, since 1949



Source: J.P. Morgan, CRSP, Kenneth French, Last observation is 2017, highlighted in pink while 10 year forecast highlighted in green

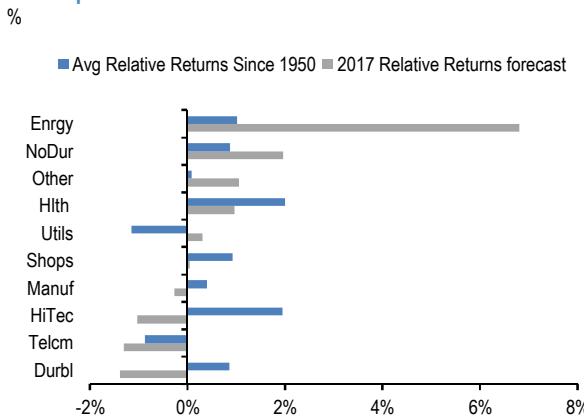
**Figure 29: US Health Care sector excess return mean reversion**  
 % rolling 10y returns, since 1949



Source: J.P. Morgan, CRSP, Kenneth French, Last observation is 2017, highlighted in pink while 10 year forecast highlighted in green

Applying these US sector return mean reversion betas simply to their past decade excess returns implies the highest excess return for Energy, as it underperformed by 8% this past decade on the dramatic fall in global oil prices (Figure 30 as well as forecast shown as a green diamond on regression line in Figure 20). Health Care actually also comes out with positive excess return over the next decade, despite outperformance this past decade, due to its positive intercept, which measures its long-term outperformance.

**Figure 30: Future 10-year excess returns implied by past 10-year and empirical mean reversion**



Source: J.P. Morgan., Kenneth French

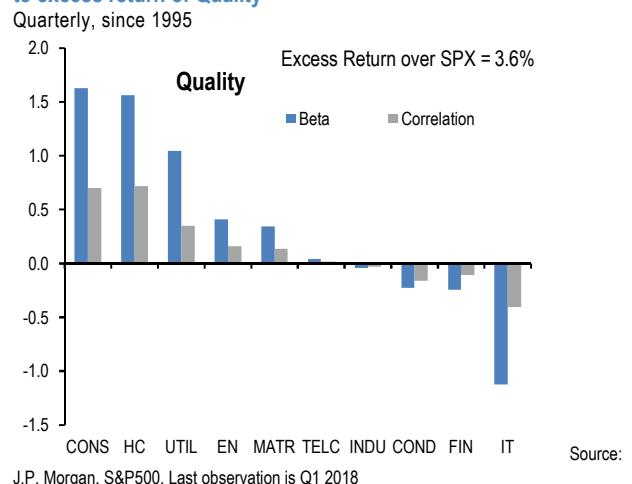
### Threat #5: The right style?

Most investors think about equity **Styles** when considering what types of stock could outperform over the longer run. The attention to Styles as opposed to Sectors comes because much of the Finance Literature has focused on this source of excess returns. We find that Health Care is actually highly correlated with the **Quality Style**, which many investors consider the best source of long-term excess returns across Styles. Figure 31- Figure 34 show, in the upper right corners, the excess return over market of four standard S&P500 Style indices – Quality, Momentum, Pure Value and Pure Growth. They have outperformed the overall SPX index by 3.6%, 1.4%, 2.6% and 2.4%, respectively, since 1994. The charts show both the correlation and beta between sector excess returns and Style excess returns. They show Health Care and Consumer Staples with the highest beta to Quality, which selects companies with high ROE and stable earnings. Table 4 and Figure 18 have shown this is indeed the case for the Health Care sector.

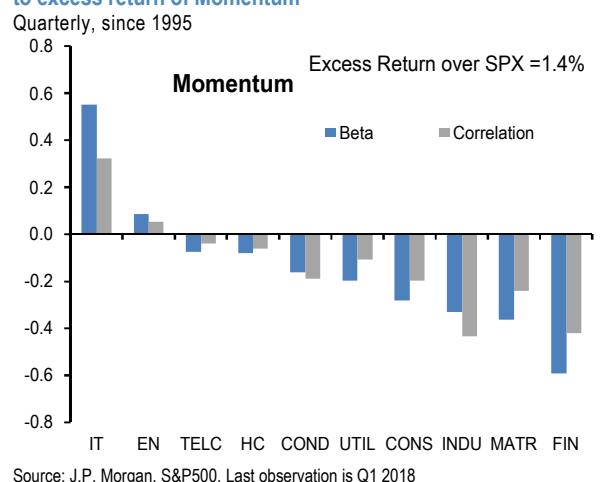
Health Care has a negative beta to Growth, which in our mind is misleading. Growth captures cyclical companies

and sectors that do well when economic growth accelerates, but reverse during a recession. As shown in Figure 16, Health Care has produced faster earnings growth than cyclical sectors such as Materials and Industrial, but its much lower earnings volatility means it maintained earnings growth during a recession.

**Figure 31: Correlation and beta of S&P500 sector excess returns to excess return of Quality**

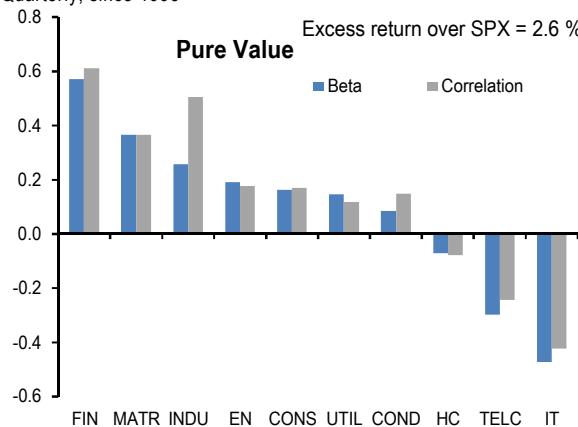


**Figure 32: Correlation and beta of S&P500 sector excess returns to excess return of Momentum**



**Figure 33: Correlation and beta of S&P500 sector excess returns to excess return of Pure Value**

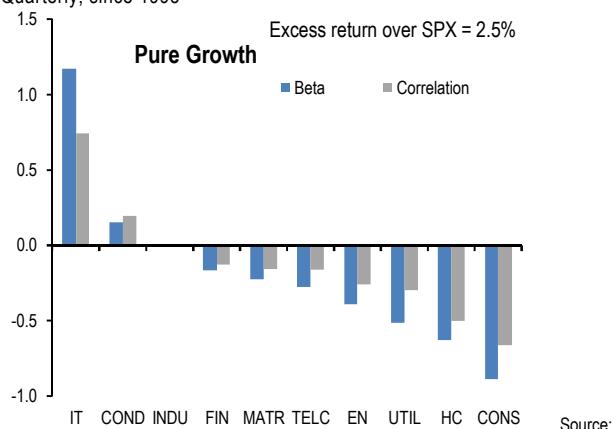
Quarterly, since 1995



Source: J.P. Morgan, S&P500, Last observation is Q1 2018

**Figure 34: Correlation and beta of S&P500 sector excess returns to excess return of Pure Growth**

Quarterly, since 1995



Source: J.P. Morgan, S&P500, Last observation is Q1 2018

### Threat #6: Can a low-beta sector really outperform over the long run?

There seems to be something wrong, or too much of a free lunch, that a sector with the most stable earnings and thus likely a low beta to the economy and the overall market would have higher returns. It goes against the grain of the broad market expectation that higher returns require taking more risk. Fig. 34 below makes this more glaring by displaying the estimated alphas and betas of the standard CAPM market line regression.

$$Rs - R_f = \alpha + \beta * (R_m - R_f)$$

Where

Rs = Sector return

Rm = Market index return

Rf = yield on risk free asset (3 month TBill)

According to CAPM, higher-returning securities, and thus also sectors, should have a higher beta to the overall market and alpha should be zero. In fact, we find in Figure 35 below that Health Care, a sector we know has outperformed over a long time, actually has a low beta and a significantly positive alpha. We do not object to either result, but the strong negative relation between alpha and beta likely means that there is something else going on. As broadly confirmed by the Empirical Finance literature, CAPM does not work well and is thus not a good theory to explain relative returns.<sup>4</sup> If CAPM and market betas do not explain relative returns, then sectors with low betas but not lower returns should in these regressions produce positive alphas, which is what we get here.

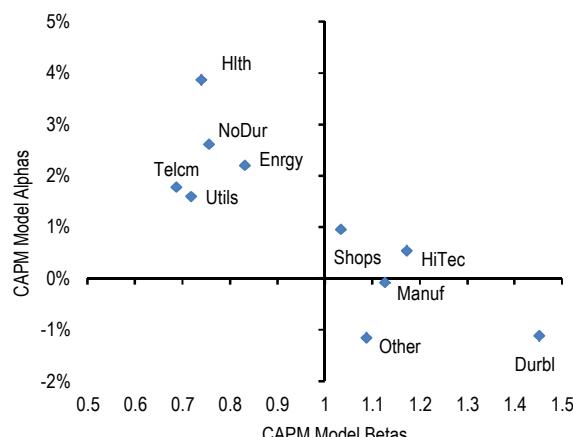
### Threat #7: What is known should be in the price

In Finance, it is generally assumed that what is known to everybody should be in the price and should not be a source of excess return over anything more than a short period of time, and surely not over a decade. How can it be the case then that the arguments we have offered in this paper, which are public information, did not prevent Healthcare from outperforming for almost a century? Our interpretation of this paradox is that almost all active money managers look at the short term, maybe as long as one year out, and that the steady, but not massive outperformance of Health Care is not that visible on a quarterly or annual basis. Its slow-burning, low-volatility, low-beta, and maybe “boring” nature also does not make it attractive to very aggressive investors who usually focus more on high-testosterone, high-beta stocks. This is also the broad explanation that the Finance Literature has offered for the failure of high-beta stocks to outperform, as active manager overprice them.

<sup>4</sup>See Chapter 8, Turan G. Bali, Robert F. Engle, Scott Murray. *Empirical Asset Pricing: The Cross Section of Stock Returns*, Apr 2016.

If *tactical* managers do not focus on this low-beta sector, why don't *strategic* investors structurally overweight the sector? Here, the only explanation we have is that most focus on allocating between the main standard indices that are for the most part outstandings based. Hiring an active manager, for example, is more cost-efficient when you use the same benchmark as everybody else. It is the point of this paper that we recommend holding a structural OW in Health Care, above what the standard indices hold.

**Figure 35: CAPM Alphas and Betas for each of the 10 US sectors**  
Alpha in %, since 1927



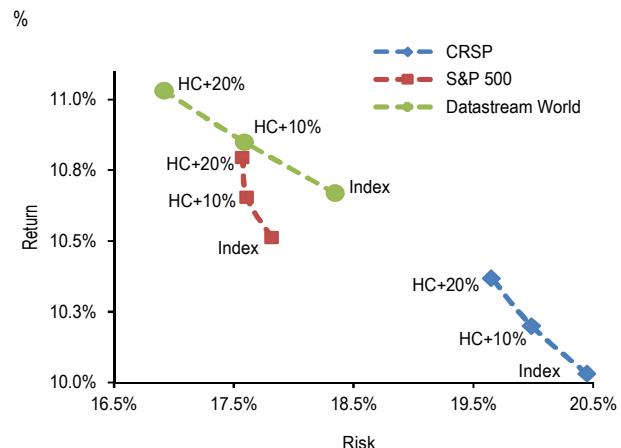
Source: J.P. Morgan, CRSP, Kenneth R. French, Federal Reserve

## How much?

How much can be gained by strategically OW-ing Health care? This query is usually addressed by plugging in past returns and risks into an optimizer that produces an efficient frontier of the allocations that generate the highest return for each level of portfolio volatility. When we do that, though, we obtain the predictable results in that portfolios on the efficient frontier will be invested in just a few sectors, and thus appears highly undiversified. Few investors will do that, as they rightly suspect that the past sample will not have seen all possible risks that could affect a security or sector.

We thus instead show for our three indices, CRSP since 1926, DataStream World since 1973 and S&P since 1989, what a 10- and 20-percentage-point higher allocation to Health Care spread against all other sectors would have done to portfolio return and volatility. Figure 36 shows that for each, portfolio returns would have risen about 0.2% and volatility fallen about the same. A 20-percentage-point rise, which is very significant, would have done twice as much.

**Figure 36: Portfolio risk and return impact of 10% and 20% points increases in Health Care structural OWs.**



Source: J.P. Morgan, CRSP, Kenneth French, Datastream, S&P

## Conclusion

In a future low-return world, investors should be more distinguishing in what sectors to invest strategically. Many have looked at Style investing across Value, Momentum and others, but little attention has been paid as to whether certain sectors offer better long-run returns. We have tried to make the case here for holding a Strategic Equity OW in the Health Care sector.

Our arguments are based on

- 1) long-term past excess returns on the sector, over the past 50, 70, and 90 years;
- 2) in both the US and other major regions, that
- 3) come from stronger earnings growth,
- 4) that is the most stable among sectors;
- 5) is only slightly eaten into by a lower dividends,
- 6) but that we think will continue, as demand will grow with income and aging;
- 7) that should be well supported by continued strong innovation pace; and
- 8) that is not overly threatened by renewed price regulation.



# Forecasting returns

## The Long-term Strategist

Very long-term return forecasts for US bonds and equities

- In the past, we have forecast returns over 10yr periods and have found that valuation signals generally perform reasonably well.
- Of course, many long-term investors have even longer investment horizons. In this note, we extend our forecasts for US bonds and equities to the 20yr horizon. We find again that valuations are the most important signal.
- The starting yield on a bond index generally provides a good estimate of the returns that can be expected over a period of almost twice the duration of the bond index. Thus, the starting yield on the US Aggregate Bond Index, with a duration of ~6 years, is a good forecast of its 10yr return.
- Forecasts of bond returns in the second decade of a 20-year period thus require forecasts of interest rates a decade from now, which we have previously developed using a framework based on 11 long-term structural drivers. This framework points to interest rates modestly higher than their current levels.
- Current yields and our long-term interest rate forecasts suggest to us a 20yr return of 4.7% pa on the US Aggregate Bond Index, consisting of 4.1% on USTs, 5.2% on high-grade corporates and 4.5% on MBS. While interest rates have moved above their pre-pandemic lows, these 20yr returns are at the low end of the historical distribution.
- From a relatively expensive entry point, expected equity returns in the first 10 years are reduced by mean reversion in valuations, while expected returns are roughly in line with the long-term historical average in the subsequent 10 years.
- We expect a 20yr return of 8.1% pa on US equities, which is towards the low end of the range of outcomes observed historically over this horizon. Still, this rate of return is decently higher than the 5.5% pa that we expect over the next decade, when valuations appear likely to revert somewhat.
- The Long-term Strategist will be on a summer break for three weeks and will return on August 23.

### Long-term Strategy

Alexander Wise <sup>AC</sup>

(1-212) 622-6205  
alexander.c.wise@jpmchase.com

Jan Loeys

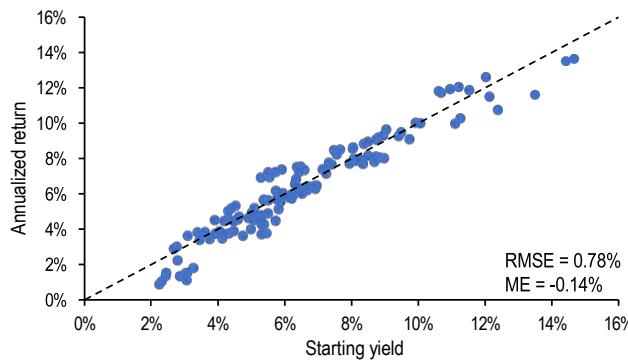
(1-917) 602-9440  
jan.loeys@jpmorgan.com  
J.P. Morgan Securities LLC

In the past, we have focused on the 10-year horizon when forecasting long-term returns and have found that a selection of valuation signals generally perform reasonably well. Of course, many long-term investors, such as pension funds and sovereign wealth funds, have even longer investment horizons. In this note, we formulate return expectations on US equities and fixed income over a 20-year horizon, and find that the same valuation signals still have predictive power.

## Bonds

As we have noted in the past, **the starting yield provides a good forecast of the return on a fixed income index over a period of almost twice the duration of that index**. This is not a ‘random’ empirical result, as we have [previously](#) discussed. Over this horizon, capital losses or gains from changes in interest rates are roughly offset by corresponding income gains or losses over time. Figure 1 shows the relatively tight relationship between starting yield and subsequent 10yr return on the US Aggregate Bond Index, which has a duration of ~6 years. In practice, this relationship between starting yield and subsequent 10yr return reduces the problem of forecasting 20yr returns to one of forecasting the level of interest rates in 10 years’ time. This should provide an indication of the expected 10y10y forward return, which can be combined with the current 10yr return expectation to produce a 20yr return forecast.

[Figure 1: US Aggregate Bond Index 10yr returns versus starting yield % pa, Q1/1982-Q2/2024, quarterly. 10yr rolling returns.](#)



Source: J.P. Morgan, Bloomberg Finance L.P.

We have previously constructed a **framework to forecast real interest rates in the long run based on a set of structural drivers**, which we have recently [updated](#). Applying this framework gives us a decade-ahead target of a 2.25% real yield on 10yr USTs. This framework can also be applied to other interest rates, which gives a target 2.5% real yield on the US Agg, consisting of 1.8% on USTs, 3.4% on high-grade corporates, and 3.1% on MBS. To these real yields, we add a long-term inflation expectation of 2.5% to produce nominal yield targets, consistent with our long-held view that higher

inflation volatility would bring slightly higher inflation on average because of the greater likelihood of inflation overshoots than undershoots.

While the starting yield provides a good forecast of the subsequent 10yr return, realized returns have historically been slightly lower than indicated by the starting yield in the case of corporate bonds and mortgages, where the starting yield has on average exceeded the realized 10yr return by 44bp and 68bp respectively. For the former, returns are slightly lower due to net downgrading of higher-grade corporates into sub-investment grade. For the latter, returns are lowered due to the negative convexity of mortgages. To account for this, we construct forecasts by subtracting the average historical forecast error from the actual or expected starting yield.

Table 1 reports the current starting nominal yield, the decade-ahead expected nominal yield, and the implied 20yr return forecast after adjustment based on historical forecast errors. **We expect a 20yr return of 4.7% pa on the US Agg, consisting of 4.1% on USTs, 5.2% on high-grade corporates and 4.5% on MBS.** This forecast 20yr return on the US Agg would be in the 16<sup>th</sup> percentile of the distribution of rolling 20yr returns since 1976, one standard deviation below the average.

[Table 1: Forecast 20yr fixed income returns](#)

% Current yield is as of 7/31/2024. Future yield is decade-ahead real yield forecast plus 2.5%. 20yr return is forecast return based on current and forecast future yields, adjusted for historical mean forecast error.

	Current yield	Future yield	20yr return
Aggregate	4.73	5.04	4.74
Treasuries	4.24	4.25	4.14
HG Corporates	5.30	5.88	5.15
MBS	4.89	5.56	4.54

Source: J.P. Morgan, Federal Reserve Bank of Philadelphia, Bloomberg Finance L.P.

Given current interest rates are now only modestly below our decade-ahead forecasts, our expected 10y10y forward returns on fixed income are quite close to our current 10yr return expectations.

## Equities

To forecast the 20yr return on the S&P500, we use a long-term forecasting model like the one we have previously used for 10yr returns.<sup>1</sup> **At the core of this regression model are a**

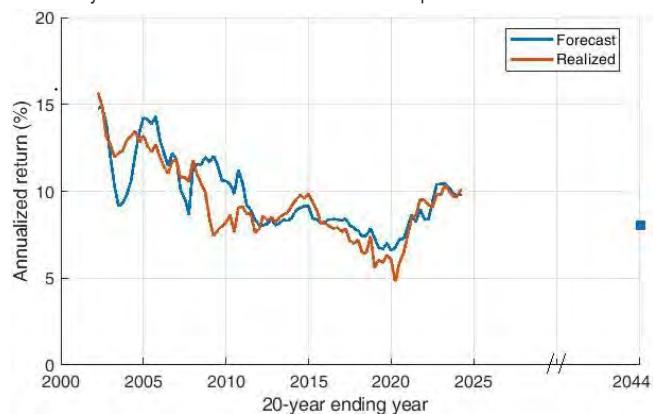
1. Relative to the previous [iteration](#) of the model, we have removed the interest rate signal, which does not materially affect model performance.

**set of valuation signals**, such as the standard PE multiple and the Shiller CAPE yield in excess of a real bond yield, and household allocations to equities, which reflect both the asset allocation decisions of households and valuations. Consistent with the research literature, we have found these to be the most effective signals of long-term returns.

We can recursively estimate this model to get an indication of past forecasting performance for 20yr returns. Forecasting each quarter from Q1/1982, the root-mean-square-error (RMSE) of the model over this period is 1.34%, suggesting the model performs reasonably well. Over this past period, roughly three-quarters of forecasts fell within one RMSE of the realized return.

Figure 2: Forecast and realized S&P500 20yr returns

% pa, Q1/1982-Q3/2024, quarterly. Values shown at the end of 20yr periods. Current forecast 20yr return as of 7/31/2024 shown as blue square.



Source: J.P. Morgan, Board of Governors of the Federal Reserve System, Bureau of Labor Statistics, Bureau of Economic Analysis, Robert Shiller, Refinitiv, S&P, Bloomberg Finance L.P.

Looking ahead, we forecast an **8.1% pa return on the S&P500 over the coming 20 years**. This forecast return would be in the 23<sup>rd</sup> percentile of the distribution of rolling 20yr returns since 1960, 0.8 standard deviations below the average. This forecast is **towards the lower end of the historical spectrum of 20yr returns due to the current expensive entry point**, with the PE multiple currently around 24, well above the long-term average of 17 since 1960, but not yet at the extremes observed in the late 1990s and early 2000s.

Comparing the full history of 10yr and 20yr model forecasts reveals that, when market valuations deviate meaningfully from their long-term historical average, returns in the next decade are likely to be reduced by mean reversion of valuations, producing lower returns from high valuations, and vice versa, while returns in the decade after that are expected to be roughly in line with the long-term historical average.

Currently, **the 20yr return forecast of 8.1% pa is decently higher than return forecast of 5.5% pa over the next decade**, when valuations appear likely to revert somewhat. Taking as given the 10yr forecast return of 5.5% pa, the 20yr forecast return of 8.1% pa implies a 10y10y forward expected return of 10.8% pa. This is roughly in line with the long-term average rate of return of ~10.4% pa since 1960. Thus, the 20yr return forecast implies a period of below-average returns in the coming decade, followed by returns that are in line with the long-term historical average in the following decade.



## The Long-term Strategist

Forecasting long-term US equity returns with a neural network

- We construct a neural network model based on fundamentals to forecast 10-year out returns on the S&P500.
- The model makes no assumptions about the future and is based solely upon currently observable fundamentals. This produces more objective forecasts and allows us to estimate the risk around forecasts based on historical model out-of-sample performance.
- Fundamentals include different measures of the internal rate of return on the index, macroeconomic factors, and lagged returns. Macroeconomic factors include household asset allocations, real yields, and recent economic growth.
- The model exhibits strong predictive power over 10-year returns, with relatively small forecasting errors and approximately zero statistical bias, implying the predictions were neither too optimistic nor too pessimistic on average.
- The model forecasts an SPX return of 8.0% pa in the coming 10 years. This forecast comes with a one-sigma risk of ~1.5%, implying a 2/3 probability of a return between 6.5% and 9.5% pa. This risk measure is based on the out-of-sample forecast errors of our model and is, thus, not to be confused with within-sample errors.
- This conditional risk around the 10-year compound return is much lower than what would be implied by the annual return volatility of 17.4%, and the historic volatility of 10-year returns.
- Based on the current 4.8% yield on the US Aggregate Bond market, which is the best estimate for its 10-year return, equities are very likely to outperform bonds in the coming decade from today's entry point, producing comparable returns even with a two-sigma underperformance of equities relative to our forecast.
- Jointly, these equity and bond return forecasts imply a decade-ahead return of 6.7% pa on a 60-40 strategic allocation in US equities and bonds. This forecast comes with a one-sigma risk of ~1%, implying around a 2/3 probability of a return between 5.7% and 7.7% pa.

### Long-term Strategy

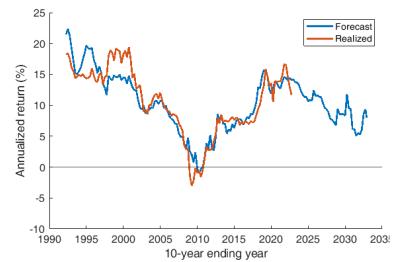
**Alexander Wise** AC

(1-212) 622-6205  
alexander.c.wise@jpmchase.com

**Jan Loeys**  
(1-917) 602-9440  
jan.loeys@jpmorgan.com  
J.P. Morgan Securities LLC

**Figure 1: Forecast and realized returns on the SPX over 10-year periods**

% pa, quarterly, Q1/1982-Q4/2022 (QTD as of 11/11/2022). Realized and forecast values shown at end of each 10-year period.



Source: J.P. Morgan, Federal Reserve Bank of Philadelphia, Board of Governors of the Federal Reserve System, Bureau of Labor Statistics, Bureau of Economic Analysis, Robert Shiller, Refinitiv, Bloomberg Finance L.P.

In this paper, we construct a neural network model to forecast 10-year out returns on the S&P500. This model, which does not make assumptions about future fundamentals, is based solely upon currently observable fundamentals. Such an approach is more objective and also allows one to assess the risk around forecasts based on the historical out-of-sample performance of the model, which is not possible with any model based on assumptions about future fundamentals. Furthermore, as we have recently shown, there is considerable uncertainty around long-run forecasts of fundamentals, such as [economic growth](#) or [corporate profits](#), in addition to uncertainty about the relationship between returns and those fundamentals.

The neural network model exhibits strong predictive power over future returns, with relatively small forecasting errors and approximately zero bias, implying the predictions were neither too optimistic nor too pessimistic on average. Based on recent model performance, there is ~1.5% one-sigma risk around the projected return of 8.0% pa over the coming decade.

## Signals of future returns

The forecasting model uses a set of signals consisting of a selection of measures of internal rate of return (IRR) on the index, macroeconomic factors, and lagged returns. While several included IRR measures are closely related, it was previously observed that univariate econometric models using different signals produce materially different forecasts of long-term future returns, indicating these signals convey different information and are not perfect substitutes.<sup>1</sup> Using all signals jointly substantially improves the predictive power of our neural network model.

## Household equity allocation share

The share of total household financial assets held in equities is used as one signal, with data sourced from the US Financial Accounts. Empirical evidence suggests that the household equity share exhibits predictive power over future equity returns, with higher shares associated with lower future returns.<sup>2</sup> Household equity shares simultaneously reflect valuations and household positioning.

<sup>1</sup> Jan Loeys and Alexander Wise, [The Long-term Strategist: US Equity, Bond and USD long-term returns after the repricing](#), February 16, 2022.

<sup>2</sup> David Yang and Fan Zhang, [The Household Equity Share and Expected Market Returns](#) (2016) Working Paper.

## Price-to-earnings ratio

The price-to-earnings ratio is the most commonly used equity valuation measure. In this paper, the deviation of the PE ratio from the mean in the preceding 30 years is used as one signal. Using the deviation from a recent mean accommodates structural trends in multiples. Between 1921 and 1990, the average SPX multiple was 13.9, compared to a post-1990 average multiple of 19.1.

## Excess CAPE yield

Another signal is the earnings yield based on a cyclically adjusted price-to-earnings (CAPE) ratio minus real yields on 10yr US Treasuries, as proposed by Shiller, Black and Jivraj (2020).<sup>3</sup> This measure accommodates the argument that the return on equities depends both upon the IRR, but also upon the yield differential relative to bonds as the primary alternative. Data for this measure are sourced from Robert Shiller.<sup>4</sup> As above for the PE ratio, the measure is calculated as the deviation from the mean in the preceding 30 years.

## Nominal earnings yield

The nominal earnings yield is constructed as the earnings yield based on the PE multiple plus the average rate of inflation in the preceding 10 years. This measure accounts for the likelihood that nominal equity returns will be higher in periods of higher inflation, all else being equal.

## Multiple and earnings reversion

Simple projections of future long-term equity returns can be constructed by assuming that PE multiples revert to the mean in the preceding 30 years,<sup>5</sup> earnings approach the level implied by the exponential trend over the last 30 years, and the dividend yield is equal to the average yield in the preceding 10 years. The implied return under these assumptions is included as a signal in the model.

## Buyback-adjusted dividend yield

Boudoukh, et al. (2007) documented that the predictive power of the dividend yield has diminished over time,

<sup>3</sup> Robert Shiller, Laurence Black and Farouk Jivraj, [CAPE and the COVID-19 Pandemic Effect](#) (2020) Working Paper.

<sup>4</sup> Robert Shiller, [US Stock Markets 1871-Present and CAPE Ratio](#).

<sup>5</sup> For several reasons, an assumption of mean reversion for the purposes of constructing this signal does not render the PE mean deviation signal redundant. Most fundamentally, a non-zero deviation from the mean does not necessarily imply that the multiple will revert to that mean over a 10-year horizon. For example, it is possible that the multiple empirically tends to overshoot the mean, as we have previously documented for real exchange rates over this horizon.

coinciding with the substantial growth in distributions through share repurchases since the 1980s.<sup>6</sup> Reflecting this shift, they observed that a total payout yield, constructed using both dividends and buybacks, exhibits better predictive power. In this paper, a measure of total payout yield is constructed using data on net dividends and net equity issuance sourced from the US Financial Accounts. Since the 1980s, the latter measure has been persistently negative and large, reflecting the growth in buybacks. Dividing net dividends minus net equity issuance by market capitalization from the same source gives a measure of payout yields.<sup>7</sup>

### Changes in real yields

Changes in real yields on 10yr US Treasuries in the preceding 10 years are used as a predictor.<sup>8</sup> In principle, declining real yields ought to be associated with multiple expansion. In the US, the correlation between real yields on 10yr US Treasuries and SPX multiples after 1952 was approximately -0.3. To smooth over noise in real yields, the real yield at any point in time is measured as the average real yield in the preceding 12 months. Predictive performance was superior when including recent changes in real yields, rather than the level of real yields.

### Recent economic growth

Lagged real economic growth terms are included as signals in the model.<sup>9</sup> As a general proposition, the state of the economy ought to bear upon equity returns. Conventionally, higher rates of contemporaneous growth ought to be associated with higher equity returns. However, the growth terms used as signals in the paper are backward-looking, since our model is based solely on currently observable fundamentals. Thus, it is conceivable that slow or negative growth in preceding years, for example, may be associated with higher future equity returns as the economy recovers from a downturn, as occurred post-GFC.

<sup>6</sup> Jacob Boudoukh, Roni Michaely, Matthew Richardson, Michael Roberts, [On the Importance of Measuring Payout Yield: Implications for Empirical Asset Pricing](#) (2007) 62(2) *Journal of Finance* 877-915.

<sup>7</sup> Net dividends and net equity issuance are sourced from Table F.103 of the US Financial Accounts. Market capitalization is from Table L.103 of the same source.

<sup>8</sup> Real yields are constructed back to 1952 by backcasting 10-year inflation expectations from the *Survey of Professional Forecasters* using an adaptive expectations model based on inflation in the past 2 and 10 years. For details, see Nikolaos Panigirtzoglou and Jan Loeys, [A Fair Value Model for US Bonds, Credit and Equities](#), June 30, 2005.

<sup>9</sup> Economic growth in the preceding year and 5 years are included as predictors.

### Recent returns

Lagged SPX returns are also included in the model as predictors.<sup>10</sup> As for growth, the effects of these terms are ambiguous *a priori*. On one hand, very recent high returns may be a positive signal for future returns due to momentum. On the other hand, recent high returns may indicate that an equity boom is maturing and that the prospect of a future downturn is growing. Empirically, we find that higher recent returns tend to be a positive signal.

### Neural network model

Generally speaking, a regression is a process of finding a statistical relationship between inputs and an output. The most commonly used form of regression is the linear regression, which involves the estimation of a linear mapping from inputs to output that minimizes the sum of squared differences between the model outputs and the observed values. Specifying that the relationship between inputs and output is linear is a restrictive assumption. [Neural networks](#) are more flexible regressions that have exhibited predictive power in financial time series applications. Various [universal approximation theorems](#) establish that there exist neural networks which can represent a very wide range of functions.

Neural networks consist of a collection of connected neurons, often arranged in layers. Each neuron combines a set of inputs into a weighted sum, plus a bias term. In the first layer of neurons, these inputs are the predictor variables. This sum is passed through an activation function, which typically introduces non-linearity. For example, one widely used activation function, the rectified linear unit, simply returns the weighted sum if it is positive, and zero otherwise. In a multi-layered network, the output of a neuron is passed forward as a signal to be used in the same way as an input by neurons in the next layer. Neurons in the final layer pass signals forward for use in the calculation of the model output as a weighted sum, plus a bias term. Training a neural network entails iteratively updating weights and biases in the network in a way that reduces a cost function, typically the mean square error of the model. In short, training a neural network amounts to adjusting the way in which inputs are combined in a manner that is calculated to improve the fit of the model to the estimation data.

<sup>10</sup> Total returns in the preceding year, 5 years and 10 years are included as predictors.

## Forecasts

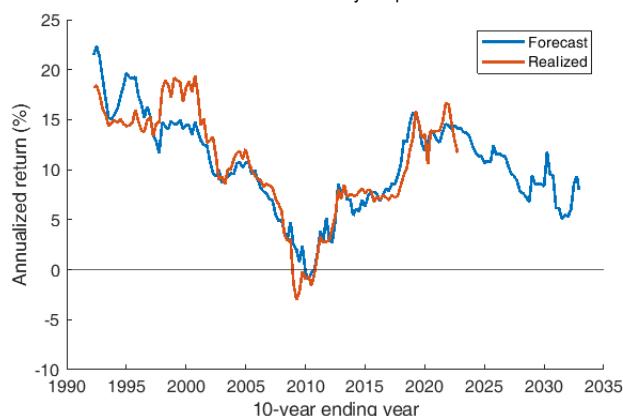
To assess the performance of the model, we assess the **out-of-sample forecasting performance**. This entails estimating the model at various points in time, using only the data available to a hypothetical forecaster at that point of time, and comparing the forecasts generated by the model with the realizations that are now known to us.<sup>11</sup> Two metrics are used to assess the predictive power of the model: the root mean square error (RMSE) and the mean error (ME).

The panel of data used in this paper begins in Q1/1952, with observations at a quarterly frequency.<sup>12</sup> To ensure that we have sufficient data to estimate the model, we begin forecasting out-of-sample 30 years later in Q1/1982, giving us approximately 40 years of returns to assess model performance.

Figure 1 plots forecast annualized returns in 10-year periods alongside realized rates of return. Forecast 10-year equity returns have closely tracked realized returns, with the largest divergences associated with the dot-com bubble in the 1990s. Over the full evaluation period, the **RMSE is ~2.2%, while the mean error is ~0.05%**, implying that the model is neither too optimistic nor too pessimistic on average.

**Figure 1: Forecast and realized returns on the SPX over 10-year periods**

% pa, quarterly, Q1/1982-Q4/2022 (QTD as of 11/11/2022). Realized and forecast values shown at end of each 10-year period.



Source: J.P. Morgan, Federal Reserve Bank of Philadelphia, Board of Governors of the Federal Reserve System, Bureau of Labor Statistics, Bureau of Economic Analysis, Robert Shiller, Refinitiv, Bloomberg Finance L.P.

<sup>11</sup> In the appendix, we precisely specify the set of information taken to be known at each point in time.

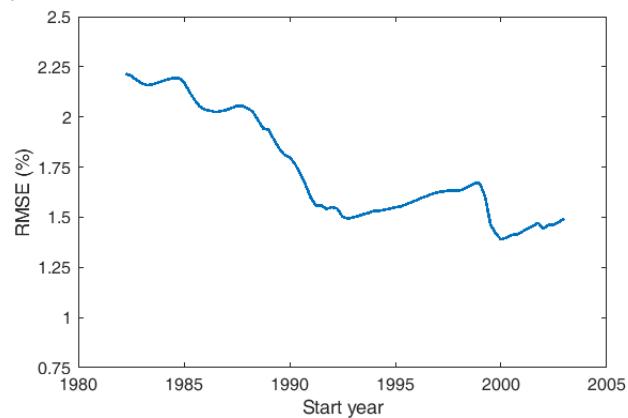
<sup>12</sup> Thus, the first observation in the sample is the 10-year return between Q1/1952 and Q1/1962.

**The model performance improves over time as the estimation sample grows.** Figure 2 depicts how the RMSE changes when evaluating the model on more recent performance. If one evaluates the model on performance since 1992 instead of 1982, the RMSE falls to ~1.5%. If one evaluates the model on performance since 2002, the RMSE falls further to ~1.4%. We start the evaluation period no later than 2002 to ensure there are a sufficient number of observations to evaluate model performance. Regardless of the period of time used to evaluate model performance, **conditional risk around the model forecast is substantially lower than the risk implied by the unconditional volatility of 10-year returns** since 1982 of 5.4%.

Since forecast performance improves meaningfully over time as more data become available, the forward-looking risk to the forecast from the present date – when a large estimation sample is available – is likely lower than suggested by model performance since 1982. Thus, we use a one-sigma risk of 1.5% in this paper, since the RMSE has stabilized around this level since the 1990s.

**Figure 2: RMSE of the neural network model based on performance since a specified date**

%, quarterly, Q1/1982-Q3/2022. RMSEs shown at the date since which performance is assessed.



Source: J.P. Morgan, Federal Reserve Bank of Philadelphia, Board of Governors of the Federal Reserve System, Bureau of Labor Statistics, Bureau of Economic Analysis, Robert Shiller, Refinitiv, Bloomberg Finance L.P.

The model projects a **10-year SPX return of 8.0% pa** from November 11, 2022, with the SPX at approximately 4000. Assuming normal distribution of forecast errors – which cannot statistically be rejected in Lilliefors or Jarque-Bera normality tests at any standard level of significance – a one-sigma risk of 1.5% implies a **~2/3 probability of a return between 6.5% and 9.5% pa, and a ~95% likelihood of a return between 5.0% and 11.0% pa.**

At an 8.0% pa rate of return, \$100 invested now will grow to \$216 in 10 years if held passively with dividends constantly reinvested. At the lower rate of return of 6.5% pa, the corresponding figure is \$188, while the corresponding figure is \$245 at the higher rate of 9.5% pa.

It is worthwhile emphasizing that the entry point is a crucial determinant of the expected long-term future returns. However, this entry point is fluctuating meaningfully even on a daily basis. As a rule of thumb, one can make adjustments on a one-to-one basis in order to mark-to-market this projection. For example, if the SPX rose 5% from 4000 to 4200 within a quarter, this rule of thumb would entail marking down the annualized rate of return projected over the next 10 years by 0.5% pa – over 10 years, this would cumulate to approximately 5%. Estimation of the model with different initial SPX prices suggests this is a reasonable rule of thumb.

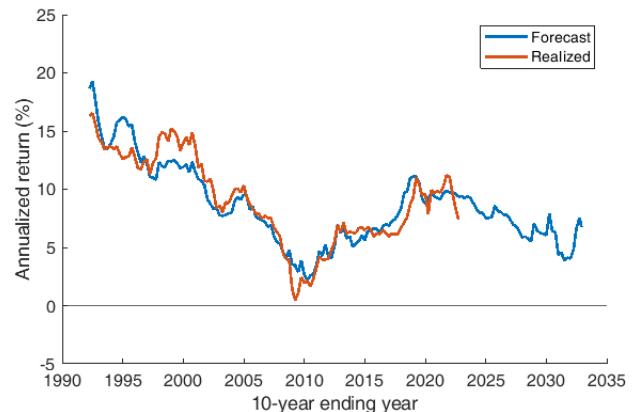
As we have [previously noted](#), the current yield on a duration-weighted aggregate bond index is a good forecast of returns over the decade ahead, with a one-sigma risk of slightly below 1%. Using the current yield of 4.8% on the US Aggregate Bond Index, our forecast implies that **equities are very likely to outperform bonds**, producing comparable returns even with a two-sigma underperformance of equities relative to our forecast.

Using these equity and bond forecasts, it is possible to forecast the returns on a **60-40 strategic allocation** to US equities and bonds.<sup>13</sup> Our forecasts for equities and bonds imply a **return of 6.7% pa on a 60-40 strategic allocation**. The historical out-of-sample performance of forecasts of 60-40 returns based on the bond and equity forecasts is plotted in Figure 3. Since 1982, the RMSE is ~1.4%, while the mean error is ~0.05%.

If one evaluates the 60-40 forecasts on more recent performance since 1992, the RMSE falls to ~1%, as depicted in Figure 4. Since the RMSE has oscillated

around this level since the 1990s, we use a **one-sigma risk of 1% around forward-looking 60-40 return forecasts** in this paper. This risk implies a **~2/3 probability of a return between 5.7% and 7.7% pa, and a ~95% likelihood of a return between 4.7% and 8.7% pa**.

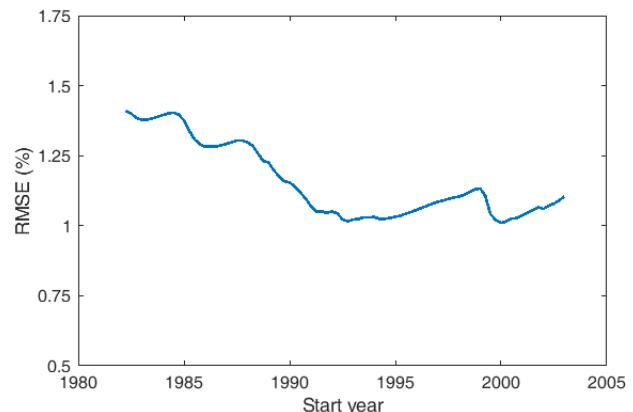
**Figure 3: Forecast and realized returns on 60-40 strategic allocation to US equities and bonds over 10-year periods**  
 % pa, quarterly, Q1/1982-Q4/2022 (QTD as of 11/11/2022). Realized and forecast values shown at end of each 10-year period.



Source: J.P. Morgan, Federal Reserve Bank of Philadelphia, Board of Governors of the Federal Reserve System, Bureau of Labor Statistics, Bureau of Economic Analysis, Robert Shiller, Refinitiv, Bloomberg Finance L.P.

**Figure 4: RMSE of 60-40 return forecasts based on performance since a specified date**

%, quarterly, Q1/1982-Q3/2022. RMSEs shown at the date since which performance is assessed.



Source: J.P. Morgan, Federal Reserve Bank of Philadelphia, Board of Governors of the Federal Reserve System, Bureau of Labor Statistics, Bureau of Economic Analysis, Robert Shiller, Refinitiv, Bloomberg Finance L.P.

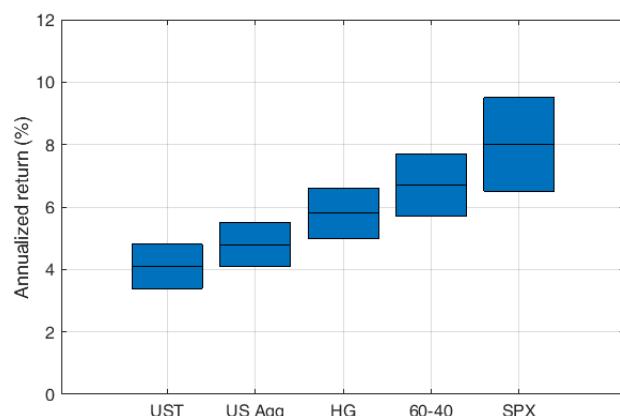
Figure 5 summarizes the return projections and two-thirds confidence intervals based on model performance for US Treasuries, the US Agg, US High Grade, the 60-40 allocation discussed above, and the S&P500. Assuming a multivariate normal distribution of forecast

<sup>13</sup> As noted in [earlier work](#), the current yield of a *duration-weighted* bond index is a good forecast of the return over the coming decade. J.P. Morgan's Global Aggregate Bond Index (GABI) is duration-weighted, with the US Agg yield available from Q1/1987. Between Q1/1982 and Q1/1987, the yield is constructed by adding the Bloomberg US Agg yield and the yield difference between the JPM US Agg and the Bloomberg US Agg in Q1/1987. This procedure is used to calculate a measure of the duration-weighted yield before Q1/1987 since the latter is not duration-weighted.

errors, Monte Carlo simulations indicate that there is an **~86% probability that the S&P500 will produce superior returns to US High Grade corporate bonds over the coming decade**, based on the covariance structure of forecast errors for SPX and US High Grade returns since 1992.

**Figure 5: Forecast returns and two-thirds confidence intervals for SPX, 60-40, US High Grade, the US Agg, and USTs**

% pa. Lines at the midpoint of intervals indicate forecast returns.  
 Surrounding intervals are two-thirds confidence intervals based on model RMSEs.



Source: J.P. Morgan, Federal Reserve Bank of Philadelphia, Board of Governors of the Federal Reserve System, Bureau of Labor Statistics, Bureau of Economic Analysis, Robert Shiller, Refinitiv, Bloomberg Finance L.P.

## Conclusion

We construct a neural network model to forecast 10-year returns on the S&P500. The model is based solely upon currently observable fundamentals, producing more objective forecasts, and allowing us to estimate the risk around those forecasts based on historical model performance. We forecast a return of 8.0% pa in the coming 10 years. Based on model performance, this forecast comes with a one-sigma risk of ~1.5%, implying around a 2/3 probability of a return between 6.5% and 9.5% pa. Combining this equity return forecast with our bond return forecast implies a decade-ahead return of 6.7% pa on a 60-40 strategic allocation in US equities and bonds. Based on historical performance, this forecast comes with a one-sigma risk of ~1%, implying around a 2/3 probability of a return between 5.7% and 7.7% pa.

## Data appendix

In this appendix, we specify exactly what information is known to a hypothetical forecaster at any point in time, to ensure that the historical performance of the model is an appropriate measure of risk around our current forecasts. Put differently, the circumstances in which historical forecasts were made ought to be as close as

possible to those in which we are presently forecasting. This is non-trivial due to different data reporting lags for different variables. While this is notionally non-trivial, these decisions have very small effects upon the actual forecasts. In any case, they are detailed for completeness.

Historical forecasts were made at the end of each quarter. Several measures in this paper, such as the PE multiple, are contemporaneously available at the time of the forecasting. Our focus in this section is upon those measures for which this is not the case.

Household equity shares are based on data in the US Financial Accounts, which are published with a lag. At the end of any given quarter, the most recent available data are from the preceding quarter. However, it is possible to reasonably impute the household equity share at any point in time using the preceding share, along with equity returns and changes in yields since that preceding observation.<sup>14</sup> Since we use this imputation model to nowcast the household equity share when forecasting from today, our historical out-of-sample forecasting makes use of the contemporaneous shares.

Economic growth data are reported with a lag in the national accounts. In this paper, measures of prior economic growth are calculated up to and including the preceding quarter. Also note that, since the National Income and Product Accounts only provide *quarterly* real GDP coverage from 1947, we set real GDP in Q4/1946 – which we require to estimate the model from Q1/1952 – equal to the 1946 annual figure.

Since there is also a reporting lag for inflation, measures of prior inflation are calculated up to and including the preceding quarter, as for economic growth. Note that the excess CAPE yield measure also makes use of a measure of inflation, but there is no reporting lag because Robert Shiller – from whom these data are sourced – already imputes current period inflation.

Like household equity shares, the buyback-adjusted dividend yield is based on data from the US Financial Accounts, which are reported with a one-quarter lag. Accordingly, net dividends and net equity issuance are calculated by taking the average over the 4 preceding quarters.<sup>15</sup> However, it is possible to reasonably impute

<sup>14</sup> The R<sup>2</sup> of a model which regresses changes in household equity shares on SPX returns and changes in 10yr UST yields is approximately 0.90.

<sup>15</sup> Since we are forecasting the decade-ahead return in the middle of the fourth quarter in this paper, the most recent net dividend and net issuance data available from the US Financial



## The Long-Term Strategist

### Long-Term FX Forecasts

- We present two approaches to making long-term FX forecasts, one based on mean reversion of real exchange rates and one that combines this mean reversion with forward FX rates.
- Our models exhibit predictive power for *long-term* (greater than 5-year) exchange rate changes for a large set of currencies. Forecasts were more accurate for longer horizons and were most accurate at the 10-year horizon. Our models have the advantage over models that link FX rates to economic fundamentals such as growth, productivity, current accounts and terms of trade, as the latter require one to forecast these drivers, which is not straightforward at these long horizons.
- At the 10-year horizon, our real FX mean reversion model exhibited average forecasting errors ~40% lower than forecasts based only on forward exchange rates, and ~25% lower than forecasts of no change.
- We forecast that the majority of DM and EM currencies considered – including yen, euro and pound – will appreciate relative to the USD over the next 10 years. Including carry, this implies a 47% return (~3.9% pa) on shorting the USD and being long an equal-weighted portfolio of 17 DM and EM currencies, which we forecast will appreciate versus the USD over the next decade, with risk of 11.3%. This implies the investment strategy is likely to be profitable. Annualized risk is ~3.6%, yielding a Sharpe ratio of 1.1. Approximately half of this return is due to carry, while the other half is due to FX appreciation.
- Several currencies, including the NZ dollar, are forecast to depreciate relative to the USD over the next 10 years, while a number of currencies, including the Australian dollar and the Swiss franc, are approximately at their long-term forecast value relative to the USD.
- Note that our *strategic long-term* forecasts may be different from the *tactical* or shorter-term forecasts of our FX research colleagues.
- [Video.](#)

---

#### Long-term Strategy

Alexander Wise AC

(1-212) 622-6205  
alexander.c.wise@jpmchase.com

Jan Loeys  
(1-917) 602-9440  
jan.loeys@jpmorgan.com  
J.P. Morgan Securities LLC

---

Both long-term investors and multinationals that invest across borders need to make assumptions about the performance of currencies over their investment horizon. In this paper, we present a very simple but useful method to forecast FX rates 5-10 years out, without having to judge the many economic and other variables that will affect currency values over the short and more medium terms. It is based on the well-known observation that real exchange rates mean revert over time. We use this observation, on its own and in combination with forwards rates, to project how a large set of currencies will change in value versus the USD, providing us both forecasts for levels and risk of FX rates 10 years out.

Many models grounded in fundamental economic theory have been developed with a view to forecasting the movement of exchange rates. For example, the literature has considered the predictive power of interest rate differentials, inflation differentials, money or output differentials, productivity differentials, and portfolio balance, amongst others. However, a model with broad predictive power at different horizons and across a large set of countries in different periods of time has proved elusive.<sup>1</sup> As famously indicated by Meese and Rogoff (1983), many predictive models even perform poorly when the predictions are based upon actual realized future explanatory variables, which would in fact have been unknown to a forecaster at the time of prediction.<sup>2</sup>

One class of models that has historically exhibited predictive power over medium to long horizons is based on the **real exchange rate**, which may be defined as the price of a foreign basket of goods in terms of a basket of home goods:

$$RER = \frac{NER \times P}{P^*}$$

where *NER* is the value (price) of the foreign currency in units of the home currency (i.e., the nominal exchange rate), *P* is the price level in the foreign country, and *P\** is the price level in the home country.

Eichenbaum, Johannsen and Rebelo (2021) (hereafter ‘EJR’) evaluated an RER-based model that incorporates recent econometric advancements, and found that the model had **strong predictive power over horizons of three years or longer**.<sup>3</sup> In this paper, we use this methodology to predict the long-term performance of a large set of currencies from 2021 using an RER mean reversion model. Finally, we construct an extended model that also incorporates forward rates (hereafter the ‘mean reversion plus forwards model’), which may be appropriate for a larger set of countries, particularly in EM. Incidentally, forecasts from this extended model are similar to forecasts from an RER mean reversion model, which incorporates recent inflation in a country in excess of that in the US, as one would expect if forward rates price in expected inflation differences.

<sup>1</sup> For a review of the exchange rate modelling literature, see Rossi, [Exchange Rate Predictability](#) (2013) 51(4) *Journal of Economic Literature* 1063-1119.

<sup>2</sup> Meese and Rogoff, [Empirical Exchange Rate Models of the Seventies](#) (1983) 14 *Journal of International Economics* 3-24.

<sup>3</sup> Eichenbaum, Johannsen and Rebelo, [Monetary Policy and the Predictability of Nominal Exchange Rates](#) (2021) 88(1) *The Review of Economic Studies* 192-228.

The theory of purchasing power parity (PPP) is at the foundation of both models. When PPP holds, the amount of home currency used to purchase a basket of goods domestically could alternatively be converted into another currency and used to purchase the same basket of goods in the other country. Thus, the purchasing power of a currency is equal in different markets. If the prices of these baskets in a common currency are unequal, the law of one price implies that consumers should seek to buy the goods in the cheaper market, thereby demanding the currency of that market and causing an appreciation of that currency which restores the prices to parity in a common currency. Under the strictest interpretation of the PPP theory, the RER is constant. In practice, it is observed that the RER tends to mean revert in the long run after a shock (see, for example, EJR, 2021).<sup>4</sup> We also present strong evidence to this effect in the appendix. We will leverage this mean reverting property in forecasting nominal exchange rates.

By definition, mean reversion of the RER after a shock can happen in two ways: (1) adjustment of the NER, or (2) adjustment of the relative price level. As argued by EJR (2021), if central banks adopt an inflation target, there is a constraint on the adjustment of the relative price levels. Therefore, most adjustment must occur through the NER. Consequently, **the RER is an effective leading signal of changes in the NER in countries with an inflation-targeting central bank**.

Therefore, our first sample consists of countries around the world that have adopted inflation targets. We include in our sample countries that have adopted a formal inflation target according to Ilzetzki, Reinhart and Rogoff (2017) for the period in which those regimes were in place.<sup>5</sup> In addition, we also include Japan and Switzerland in our sample, even though they are not identified as countries with a formal inflation target, because both countries have maintained low and stable inflation rates for an extended period of time. This sample consists of 21 currencies issued by: Australia, Brazil, Canada, Chile, Colombia, the euro area, Indonesia, Israel, Japan, Mexico, New Zealand, Norway, Peru, Philippines, South Africa, South Korea, Sweden, Switzerland, Thailand, Turkey, and the United Kingdom. The fact that some of these countries, such as Brazil and Turkey, have recently performed poorly in maintaining

<sup>4</sup> It has been argued that a number of factors may give rise to a trending RER, such as the canonical Balassa-Samuelson effect, or demographic changes.

<sup>5</sup> Ilzetzki, Reinhart and Rogoff, [Exchange Arrangements Entering the 21<sup>st</sup> Century: Which Anchor Will Hold](#) (2017) NBER Working Paper #23134.

low and stable inflation will be noted when evaluating the predictions of the model, and will motivate our extension of the RER mean reversion model.

In our extended model, we augment the RER mean reversion model by including the appreciation or depreciation implied by forward exchange rates as an explanatory variable. For countries in which high inflation and interest rates are forecast, forward rates will price in a depreciation in accordance with covered interest parity. This augmented specification still leverages the mean reverting property of the RER, but accounts for the fact that relative price levels may be an important margin of RER adjustment, particularly in many EM countries in the context of the ongoing global economic recovery. For this extended model, we will relax the requirement that countries included in the sample are identified as inflation-targeting. We extend our sample to include the euro and the currencies of all non-Eurozone DM and EM countries in the MSCI ACWI Index, with the exception of those that peg their exchange rates to the USD.<sup>6</sup> We also omit Denmark, since the Danish krone is kept in a narrow band relative to the euro, in accordance with the European Exchange Rate Mechanism system. Since there is no need to restrict our analysis to inflation-targeting countries in this extended model, we include 32 countries in this analysis.

In our analysis, we consider the exchange rate of the currencies of these countries against the US dollar. While we do not consider the entire matrix of bilateral exchange rates between these countries, predictions of exchange rates with respect to the US dollar will implicitly generate predictions of exchange rates between two non-US countries by the principle of triangular currency arbitrage.<sup>7</sup> For example, in this paper, we forecast appreciations of similar magnitudes for the euro and the pound relative to the US dollar, implying a relatively stable euro-pound exchange rate. However, to generate predictions of exchange rates among non-US

<sup>6</sup> Hong Kong, Kuwait, Qatar, Saudi Arabia and the UAE are dropped for this reason. The currency of the constituent countries of the Eurozone, such as France and Italy, is taken to be the European Currency Unit (ECU) prior to the introduction of the euro, rather than the preceding national currencies. There is no appropriate CPI data for a sufficiently long span for Argentina.

<sup>7</sup> Triangular arbitrage occurs when it is possible to make a risk-free profit by trading one currency for a second currency, the second currency for a third currency, and the third currency for the first currency. Arbitrage implies that this profit will be driven to zero. Therefore, one is able to construct the exchange rate between currencies A and B when given the exchange rates between currencies A and C, and B and C.

countries, we recommend estimating the model for the country of interest to allow a direct assessment of the magnitude of risk around any forecasts and the out-of-sample predictive ability of the model.

Our 5-10 year forecasts are complementary to the shorter-term forecasts of our FX Strategy colleagues, who recently presented their tactical forecasts in their 2022 outlook,<sup>8</sup> and who regularly update a fair value model of exchange rates 3-4 years out, which is based on real effective exchange rates adjusted with economic fundamentals as shorter-term determinants, such as the terms of trade, productivity growth, international investment income balance, and government debt.<sup>9</sup>

## Data

For our mean reversion model for inflation-targeters, we require nominal exchange rate data for the years in which countries maintained inflation targets according to Ilzetzki, Reinhart and Rogoff (2017), or in which inflation was low and stable in our assessment in the cases of Japan and Switzerland.<sup>10</sup> For our extended model, we require these data from Q1/1990. Nominal exchange rates for each currency relative to the US dollar are sourced at a quarterly frequency through to Q3/2021 from the IMF International Financial Statistics (IFS) database.<sup>11</sup> Note that European exchange rate data prior to the introduction of the euro in 1999, which are sourced from Bloomberg, are based on the European Currency Unit (ECU). We also require consumer price indices at a

<sup>8</sup> See the [Global FX Outlook](#) by Daniel Hui et al. (November 23, 2021) or the most recent [Key Currency Views](#) publication by Meera Chandan et al. (October 8, 2021).

<sup>9</sup> For recent forecasts, see [Long-term fair value estimates](#) by Meera Chandan (July 9, 2021). For a detailed statement of the methodology, see [A refresh of J.P. Morgan's long-term fair value model](#) by Meera Chandan (November 24, 2015).

<sup>10</sup> The start dates for each country are as follows: Australia, Q3/1993; Brazil, Q2/1999; Canada, Q2/1991; Chile, Q3/1999; Colombia, Q4/1999; Germany/Europe, Q4/1982; Indonesia, Q3/2005; Israel, Q2/1997; Japan, Q1/1993; Mexico, Q4/2001; New Zealand, Q1/1990; Norway, Q1/2001; Peru, Q1/2002; Philippines, Q1/2002; South Africa, Q1/2000; South Korea, Q2/1998; Sweden, Q1/1996; Switzerland, Q1/1994; Thailand, Q2/2000; Turkey, Q1/2006; UK, Q4/1992. Start dates for Australia, Canada, Germany/Europe, New Zealand, Sweden and the UK are based on EJR (2021).

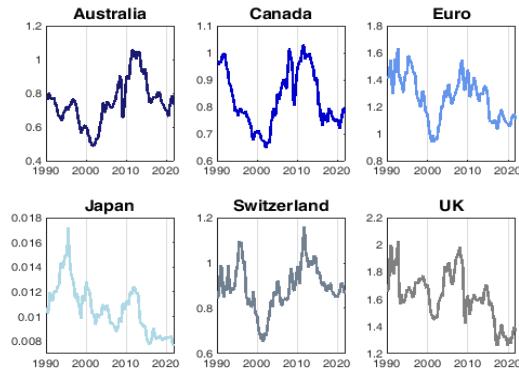
<sup>11</sup> Nominal exchange rates are reported as the average across the quarter. The average spot rate in Q3/2021 for Peru is missing in the IMF data, so was filled using the average spot rate for that period from Bloomberg.

quarterly frequency over the same period.<sup>12</sup> These data are also sourced from the IFS database.<sup>13</sup>

Using these data, we can construct the RER for each country in our analysis.

Figure 1 plots the RER for a selection of countries over thirty years from 1990 to 2021. Note, however, that this window begins before the low-inflation or inflation-targeting period under study for Australia, Canada, Japan, Switzerland and the UK, which is the period in which we require RER mean reversion. It could be argued that, over this time span or some part thereof, the RER was not mean reverting in Japan and the UK. Below, we find that the model has predictive power for both countries. Nonetheless, extra caution will be exercised in evaluating our forecasts for the yen and the pound. It would also be possible to estimate the model over a restricted time window in which the RER was more plausibly stationary in Japan and the UK – this avenue is not fully explored in this paper, given the robustness of the predictability results, but we refer in passing to how this would likely change our forecasts.

**Figure 1: Real exchange rate of six currencies relative to the USD**  
 Q1/1990-Q3/2021, quarterly data.



Sources: J.P. Morgan, IMF, OECD, Bloomberg Finance L.P.

<sup>12</sup> For Europe, we use the German CPI, which provides more extensive coverage. This approach is rationalized on the basis that Germany is an ‘anchor’ of the European Monetary System, and was at the center of the original European Exchange Rate Mechanism (ERM) before the introduction of the Euro. We consider inflation-targeting to begin in Germany/Europe at the same time for this reason.

<sup>13</sup> Missing CPI observations for Brazil, Indonesia and Japan for Q3/2021 were based on changes in the CPI reported by the OECD. Missing CPI observations for Peru and Philippines for Q2/2021 and Q3/2021 were based on changes in the CPI reported by Trading Economics. Missing CPI observations for Taiwan were sourced from the Taiwan National Statistics Bureau.

In order to estimate our augmented model, we also require forward exchange rates at a quarterly frequency. We will also evaluate the forecasts of our models by reference to forward exchange rates as one forecasting benchmark that our models outperform. These data are sourced at a quarterly frequency from J.P. Morgan’s DataQuery.<sup>14</sup>

## Analysis

Following EJR (2021), we construct our forecasting rule in the first mean reversion model for changes in the NER over a horizon  $h$  as follows:

$$\log\left(\frac{NER_{i,t+h}}{NER_{i,t}}\right) = \beta_h(\log(RER_{i,t}) - \mu_{i,t}) + \epsilon_{i,t,t+h}$$

where  $NER_{i,t+h}$  is the NER for country  $i$  at time  $t + h$ ,  $\mu_{i,t}$  is the mean of  $\log(RER_{i,t})$  in country  $i$  from the date at which inflation targeting started in that country through to time  $t$ , and  $\epsilon_{i,t,t+h}$  is the error term.  $\beta_h$  is the slope coefficient from a panel regression of this form with cross-country pooling of observations.<sup>15</sup> Pooling is based on the observation in Mark and Sul (2011) that pooling may generate more accurate forecasts when “there is not much heterogeneity in the model parameters.”<sup>16</sup> Regressing changes in the NER on levels of the RER yields similar coefficients in the sample of countries examined in this paper, suggesting that there is not much such heterogeneity and that pooling may be econometrically appropriate.

In these regressions, we find that  $\beta_h$  tends to increase over longer horizons up to 10 years. For horizons of 5 years and longer, the estimated coefficients are greater than 1, implying overshooting of the mean, as is commonly observed in asset prices with mean reverting tendencies.

Next, we conduct an out-of-sample forecasting exercise based on EJR (2021) to assess the predictive power of the RER mean reversion model at different horizons. Out-of-sample forecasting at each point in time is based only on information that was available at the

<sup>14</sup> For data availability reasons, these forward rates are calculated as the average forward rate on the last business day of the quarter.

<sup>15</sup> That is, all observations from different countries are pooled into a single regression. There is no separate  $\beta_h$  coefficient for each country.

<sup>16</sup> Mark and Sul, [When Are Pooled Panel-Data Regression Forecasts of Exchange Rates More Accurate than the Time-Series Regression Forecasts?](#) (2011).

time of making the forecast, and thus represents a true test of the forecasting power of the model.<sup>17</sup> This out-of-sample forecasting entails running the specified regression each quarter, yielding a different  $\beta_h$  as more data become available each quarter.<sup>18</sup> This  $\beta_h$  is used each quarter to generate forecasts from that date according to the forecasting rule that are then compared with the relevant realized change.

As in EJR (2021), a country is included in the regression sample once it has been targeting inflation for three years, to allow us to estimate  $\mu_{i,t}$  over a sufficiently large sample for each country.<sup>19</sup> We begin out-of-sample forecasting in Q1/1993 for countries eligible for inclusion in the regression sample by that time (Germany/Europe and New Zealand) and start forecasting for each country thereafter once it has been in the sample for three years. We continue this out-of-sample forecasting for as long as data permit comparison between the forecast and the realization. For example, for New Zealand, which begins targeting inflation in Q1/1990, the first forecast is made in Q1/1993, the last 5-year forecast is made in Q3/2016, and the last 10-year forecast is made in Q3/2011.<sup>20</sup> Note that for countries that begin to target inflation late, such as Turkey in Q1/2006, there are a relatively small number of 10-year forecasts for which a realization is available.

How good is our model? Here, we look at two metrics: root mean squared error of the out-of-sample forecasts; and the share of forecasts that were of the correct sign.

With the full sequences of out-of-sample forecasts and realizations for each country, it is possible to estimate the root mean square error (RMSE) of the forecasting rule for each country  $i$  over each horizon  $h$  – a measure of the typical deviation of the forecast from the realization:

<sup>17</sup> This is in contrast to an in-sample assessment in which the model is fitted using all available data and predictions are made retrospectively and then compared with observed realizations. In-sample forecasting often yields more accurate predictions, but is based on information not known to the forecaster at the time of making the forecast, and hence is not an appropriate test of forecasting potential.

<sup>18</sup> When constructing the regression sample each quarter,  $\log(RER_{i,t}) - \mu_{i,t}$  for each observation is calculated using the most recent  $\mu_{i,t}$ .

<sup>19</sup> We specifically measure the mean over the period in which a country was inflation-targeting in case there is a structural break in the evolution of the RER once that monetary policy is adopted.

<sup>20</sup> The relevant exchange rate change with which to compare these last forecasts is realized in Q3/2021, the last quarter of data in our sample.

$$RMSE_{i,h} = \left[ \frac{1}{N_{i,h}} \sum_t \left( f_{i,t+h} - \log\left(\frac{NER_{i,t+h}}{NER_{i,t}}\right) \right)^2 \right]^{\frac{1}{2}}$$

where  $N_{i,h}$  is the number of forecasts of horizon  $h$  for country  $i$ , and  $f_{i,t+h}$  is the forecast of  $\log(NER_{i,t+h}/NER_{i,t})$ . Rossi (2013) and EJR (2021), amongst others, argue that the **random walk** – under which the forecast of an exchange rate at any horizon is the current value – is the most challenging forecasting benchmark. We will calculate the RMSE of a random walk forecast to compare with the RMSE of the forecasting model. Since economic theory tells us that **forward exchange rates** should reflect the market's forecast of exchange rates in the future, we also evaluate the RMSE of forecasts based on forward exchange rates.

As in EJR (2021), it is also possible to calculate a pooled RMSE for a forecasting model over horizon  $h$ , which measures the typical deviation of the forecast from the realization across all countries jointly:

$$PRMSE_h = \left[ \frac{1}{N_h} \sum_i \sum_t \left( f_{i,t+h} - \log\left(\frac{NER_{i,t+h}}{NER_{i,t}}\right) \right)^2 \right]^{\frac{1}{2}}$$

where  $N_h$  is the number of forecasts of horizon  $h$ , summed across all countries jointly.

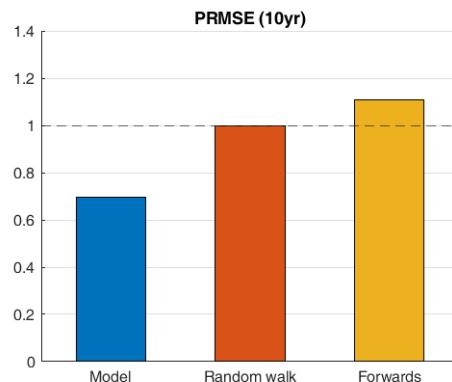
In Figure 2, we plot the 10-year horizon PRMSEs of the forecasting model, of a random walk forecast, and the forecasts based on forward rates, after normalizing such that the PRMSE of the random walk is 1. These numbers are calculated using the common sample of time periods for which we have a model forecast, a random walk forecast, and a forward rate forecast.<sup>21</sup> Forecast errors from our forecasting model are approximately 37% lower than errors for forecasts based on forward exchange rates, while random walk forecast errors are about 10% lower than those forecasts based on forward exchange rates.

If we compare the 10-year horizon PRMSEs of the forecast model and a random walk using the full sample of forecasts (*not depicted*) – without dropping a relatively small number of observations for which there are missing forward rates – forecast errors of our model are approximately 22% lower than for random walk

<sup>21</sup> Relative to the forecasting model, there is a relatively small number of missing forward exchange rate observations. There are no 10-year forward exchange rates for Turkey in these DataQuery data.

forecasts. Taken together, these results indicate that **the model surpasses our two forecasting benchmarks on aggregate over the 10-year horizon.**

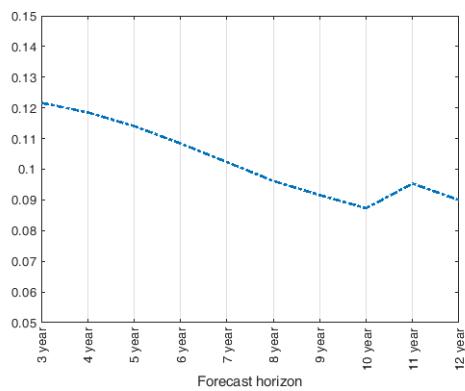
**Figure 2: PRMSEs of 10-year forecasts relative to that of a random walk forecast (random walk normalized to 1)**  
 Q1/1993-Q3/2021, quarterly data.



Sources: J.P. Morgan, IMF, OECD, Bloomberg Finance L.P., Trading Economics.

On aggregate, our mean reversion model outperforms a random walk for horizons of 5 years and longer. The performance of the model improves monotonically as the forecast horizon increases from 5 years to 10 years, and decreases thereafter. **In terms of model performance, the optimal forecast horizon is 10 years.** The PRMSE of the forecast model annualized by dividing by the square root of time is depicted in Figure 3, showing a declining annualized error through to the 10-year horizon. It is also worthwhile noting that the RMSE of the 10-year forecast is less than the RMSE of the 5-year forecast for 13 of 21 currencies, indicating that **the majority of currencies time diversify.**

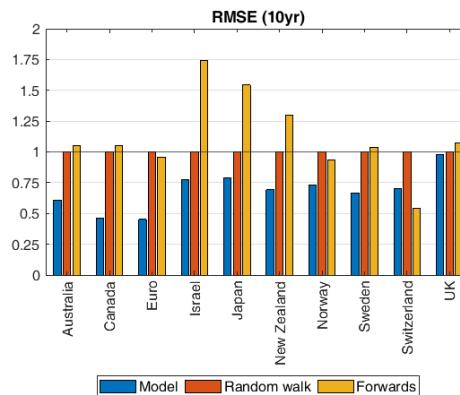
**Figure 3: PRMSEs of model forecasts annualized by dividing by the square root of time**  
 Q1/1993-Q3/2021, quarterly data.



Sources: J.P. Morgan, IMF, OECD, Bloomberg Finance L.P., Trading Economics.

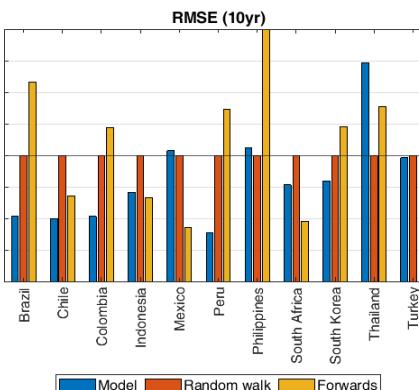
Beneath the aggregate outperformance, there is **heterogeneity in the performance of the forecasting model for each individual country.** In Figure 4, we plot the 10-year horizon RMSEs for each DM country in the inflation-targeting sample after normalizing such that the RMSE of the random walk is 1 in each country.<sup>22</sup> The RMSE of the model is lower than the RMSE of a random walk for all DM countries, and is lower than the RMSE of forecasts based on forward rates for all of these countries, except Switzerland. This margin of model outperformance is relatively large for all DM countries, other than the UK.

**Figure 4: RMSEs of 10-year forecasts relative to that of a random walk forecast for each DM country (random walk normalized to 1)**  
 Q1/1993-Q3/2021, quarterly data.



Sources: J.P. Morgan, IMF, OECD, Bloomberg Finance L.P., Trading Economics.

**Figure 5: RMSEs of 10-year forecasts relative to that of a random walk forecast for each EM country (random walk normalized to 1)**  
 Q2/2001-Q3/2021, quarterly data.



Sources: J.P. Morgan, IMF, OECD, Bloomberg Finance L.P., Trading Economics.

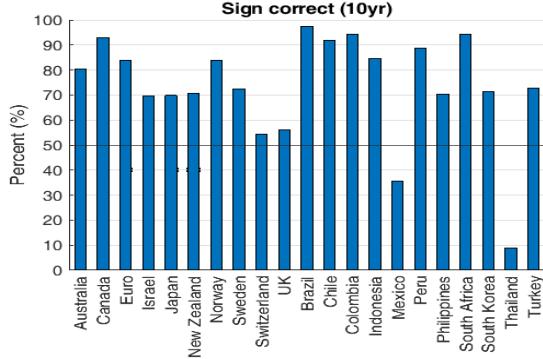
<sup>22</sup> As for Figure 2, this is for the common sample for which we have model forecasts, random walk forecasts, and forward rate forecasts.

In Figure 5, we plot the corresponding RMSEs for each EM country in the inflation-targeting sample.<sup>23</sup> Here, the model outperforms a random walk in all EM countries, except Mexico, the Philippines, and Thailand. The model outperforms forecasts based on forward exchange rates in the majority of EM countries. Relative to DM countries, the average performance of the model in EM countries is slightly lower. This is one motivation for constructing an extended model of exchange rates later in this paper. The margin of model outperformance in EM is larger in this extended model.

PRMSEs and RMSEs are one way to assess the relative success of our forecasting model. Another way to assess the success of our forecasting model is to calculate the percent of forecasts for which our prediction of an appreciation or a depreciation was correct. As argued by Melvin, Prins and Shand (2013), exchange rate forecasting models that simply generate relative likelihoods of appreciation or depreciation can be of great use to an investment manager.<sup>24</sup> In Figure 6, we plot the share of 10-year forecasts of the same sign as the realization in each country in our inflation-targeting sample. This share is greater than 50% in 19 of the 21 countries considered, indicating that **the model is effective at predicting whether there will be a long-term appreciation or depreciation of a currency**. Overall, the share of forecasts of the correct sign in the whole sample was about 74%.

**Figure 6: Percent of 10-year forecasts of the correct sign in each country**

%, Q1/1993-Q3/2011, quarterly data.



Sources: J.P. Morgan, IMF, OECD, Bloomberg Finance L.P., Trading Economics.

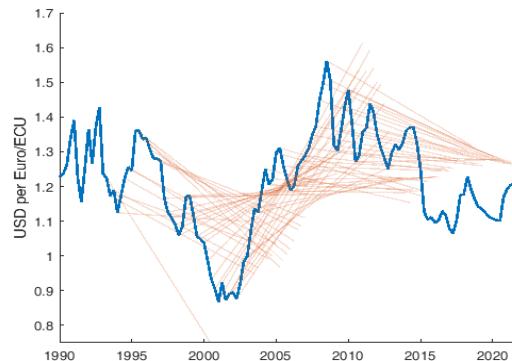
<sup>23</sup> Since there are no 10-year forward rates for Turkey in the DataQuery database, the reported RMSEs for Turkey are based on the full sample for which we have model forecasts.

<sup>24</sup> Melvin, Prins and Shand, [Forecasting Exchange Rates: An Investor Perspective](#) (2013) Center for Economic Studies and the Ifo Institute, Working paper #4238.

We present a third measure of success in the appendix, which indicates that the model may be one useful tool in the formulation of expectations about the size of appreciations or depreciations of a currency relative to the historical record – even when the RMSE of the forecasting model is high.

To make these measures of forecast outperformance concrete, in Figure 7, we plot the path of the Euro/ECU-USD exchange rate from Q1/1990 to Q3/2021 alongside our contemporaneous 10-year exchange rate forecasts at each point in time, depicted in red.<sup>25</sup> The model's outperformance of a random walk for the Euro/ECU is around the cross-country average for the model. Over the full forecasting period – even near the beginning in 1993 when the model was estimated with a very small sample – the evolution of the exchange rate generally reflected the forecasts. From the 1990s to the early 2000s, the model predicted a large Euro/ECU depreciation. The model also predicted the subsequent very substantial appreciation of the euro, the plateau around 2010, and the more moderate depreciation in the 2010s.

**Figure 7: Evolution of the Euro/ECU-USD exchange rate with contemporaneous out-of-sample 10-year forecasts**  
 Q1/1990-Q3/2021, quarterly data.



Sources: J.P. Morgan, IMF, OECD, Bloomberg Finance L.P.

Based on the theoretical foundations of the model, **high or very volatile inflation in a country (relative to others) in the future is a substantial risk to the accuracy of the forecasts from this mean reversion model**. This is a particular risk at the moment as there remains substantial uncertainty about how countries – particularly EM countries – will manage the ongoing global inflationary episode, and persistent risks to

<sup>25</sup> For the Euro/ECU, the model outperformed a random walk in the full sample of forecasts by approximately 30%, and outperformed forward rates in the restricted sample for which forwards are available by approximately 53%.

growth.<sup>26</sup> For example, inflation in Brazil is rapidly increasing, in both absolute and relative terms.<sup>27</sup> A sustained inflationary spike would tend to shift expectations substantially towards depreciation relative to our forecasts from the RER mean reversion model.

For this reason, we also estimate an extended forecasting model that includes the appreciation or depreciation priced into forward exchange rates as an explanatory variable:

$$\log\left(\frac{NER_{i,t+h}}{NER_{i,t}}\right) = \beta_h^1 (\log(RER_{i,t}) - \mu_{i,t}) + \beta_h^2 \log\left(\frac{FWD_{i,t+h}}{NER_{i,t}}\right) + \epsilon_{i,t,t+h}$$

where  $FWD_{i,t+h}$  is the forward exchange rate for time  $t+h$  as of time  $t$ . By contrast to the original mean reversion model, we simply calculate the mean RER in each country since Q1/1990, since there is no longer any *a priori* need to restrict our analysis to the years in which each country is targeting inflation. Since the first 10-year forward exchange rates in the DataQuery data are reported in Q3/1993, and we require these data and associated exchange rate realizations to estimate our extended model, our first 10-year exchange rate forecast is from Q3/2003.

It is worth noting that the exchange rate forecasts for higher-inflation EM countries generated by this extended model are broadly comparable to forecasts from a model that controls for recent inflation in a country in excess of the rate of inflation in the US.<sup>28</sup> This suggests that forward rates price in inflation differences, as one would expect, alleviating concerns about the effect of inflation differences on our forecasts. We prefer the extended specification with forward rates since the historical performance is comparable, but the forward rates may better capture forward-looking inflation expectations

<sup>26</sup> For example, see our colleagues' emerging markets outlook for 2022: [Emerging Markets Outlook and Strategy for 2022](#) by Oganes et al. (November 23, 2021).

<sup>27</sup> See, e.g., [Balance of risks deteriorates and BCB should step up the pace of tightening](#) by Fernandez et al. (October 21, 2021).

<sup>28</sup> This alternative specification is estimated on the original sample, and controls for excess inflation over the three years prior to making a forecast. For DM countries, the forecasts were comparable to those from the first RER mean reversion model, but the historical forecasting performance of the inflation-control model was poorer. For EM countries, forecasts and the historical performance of the model were comparable to the extended model with forward rates.

than historical inflation, especially around the inflationary episode induced by the pandemic.

Based on PRMSE, the *aggregate* performance of this extended model relative to our forecasting benchmarks is slightly stronger than the performance of the original RER mean reversion model.<sup>29</sup> However, this varies on a country-by-country basis. By RMSEs, the performance of this extended model is somewhat worse for most DM countries, but somewhat better for a number of EM countries, as one may have anticipated based on theoretical priors. Moreover, the extended model provides forecasts that outperform the forecasting benchmarks for a larger set of countries, which were not identified as inflation-targeting above. For brevity, performance metrics for this extended model are reported in the appendix.

## Forecasts for the next 10 years

In Table 1, we present the 10-year forecast change from Q3/2021 in the value of all currencies that meet at least one of two criteria: (1) outperformance of the random walk or forward rates benchmarks by RMSE in at least one model, or (2) correct prediction of appreciation or depreciation more than 50% of the time in at least one model. We also present the forecast prices of one USD in each currency, and the 10-year forward price as of Q3/2021.<sup>30</sup> Since the forecasting performance of the model is critical, **we recommend considering the forecast exchange rate changes presented in Table 1 in light of the model performance metrics** for each country presented above and in the appendix. **Confidence intervals for these predictions are presented in the appendix.**

For each country that is in both samples, we present the forecast of the model that is most appropriate in our judgment, in light of the relative performance of the mean reversion and mean reversion plus forwards models, and future inflationary risks. *Relative to EM countries*, inflationary risks are relatively slight in DM countries, so the arguments for relying upon the extended model are relatively weak, especially given the strong

<sup>29</sup> On aggregate, the baseline model outperformed a random walk by ~22%, while the extended model outperformed a random walk by ~27% (over a shorter time period).

<sup>30</sup> We omit Turkey, even though it meets both criteria over the 10-year horizon, because the fit of the baseline model is poor. The Turkish lira has persistently depreciated rapidly over the entire period of study, while the baseline model predicted small appreciations or depreciations. Turkey has no 10-year forward exchange rate data in DataQuery, so there are no historical forecasts for the extended model.

**Table 1: 10-year exchange rate forecasts from Q3/2021**

Forecasts from average level in Q3/2021. Positive changes represent appreciations of the identified currency. \*\* indicates forwards are constructed using 10-year government bond yields and covered interest rate parity. See footnote 33 for more details about the South African rand forecast.

Currency	10yr change	Model	Forecast price of 1 USD	Forward price of 1 USD
Australian dollar	1.3%	RER mean reversion	1.34 AUD	1.36 AUD**
Canadian dollar	9.1%	RER mean reversion	1.16 CAD	1.29 CAD
Euro	20.9%	RER mean reversion	0.70 EUR	0.73 EUR
Israeli new shekel	-10.8%	RER mean reversion	3.62 ILS	3.14 ILS**
Japanese yen	63.3%	RER mean reversion	67.40 JPY	92.76 JPY
Norwegian krone	40.4%	RER mean reversion	6.25 NOK	8.88 NOK
NZ dollar	-10.4%	RER mean reversion	1.59 NZD	1.57 NZD
Singapore dollar	3.6%	MR plus forwards	1.30 SGP	1.31 SGP
Swedish krona	41.2%	RER mean reversion	6.12 SEK	8.08 SEK
Swiss franc	4.0%	RER mean reversion	0.88 CHF	0.78 CHF
UK pound	27.6%	RER mean reversion	0.57 GBP	0.69 GBP
Brazilian real	39.4%	MR plus forwards	3.75 BRL	11.05 BRL
Chilean peso	27.5%	RER mean reversion	605.84 CLP	1005.56 CLP
Colombian peso	23.0%	MR plus forwards	3129.85 COP	6537.86 COP
Egyptian pound	-19.0%	MR plus forwards	19.32 EGP	19.47 EGP
Hungarian forint	-1.3%	MR plus forwards	303.97 HUF	359.04 HUF**
Indian rupee	-27.5%	MR plus forwards	102.22 INR	114.42 INR
Indonesian rupiah	-1.5%	MR plus forwards	14614.41 IDR	21671.27 IDR
Mexican peso	12.0%	MR plus forwards	17.86 MXN	35.21 MXN
Peruvian sol	14.8%	MR plus forwards	3.53 PEN	6.21 PEN
Philippine peso	-15.8%	MR plus forwards	59.49 PHP	66.00 PHP
Polish zloty	0.1%	MR plus forwards	3.87 PLN	4.14 PLN**
Russian ruble	-11.7%	MR plus forwards	83.21 RUB	128.70 RUB**
South African rand	24.0%	RER mean reversion	11.79 ZAR	31.54 ZAR**
South Korean won	15.9%	MR plus forwards	998.90 KRW	1121.31 KRW

Sources: J.P. Morgan, IMF, OECD, Bloomberg Finance L.P., Trading Economics

forecasting record of the baseline RER mean reversion model. Therefore, the presented forecasts for DM countries in Table 1 are from the baseline model, with the exception of the Singapore dollar, which is included only in the extended model.

For EM countries in both samples, we present the forecasts for each country from the model with a lower country-specific RMSE over the common historical period in which we have forecasts from both the mean reversion and extended models, with the exception of Brazil, Indonesia, and Peru. In these countries, the RER mean reversion model very slightly outperforms the

extended model historically by RMSE, but we present the forecast from the extended model due to the substantial inflationary risks that exist in our judgment. For most countries in which at least one of the two criteria is satisfied by both models, the predictions of the model are comparable, with the exception of Brazil, Colombia, Indonesia, and Peru. For each of these countries, the forecast appreciation is materially smaller in the extended model – both forecasts are presented in the footnote below.<sup>31</sup> For these countries, one could

<sup>31</sup> For Brazil, the mean-reversion and extended forecasts are 66.2% and 39.4% appreciation, respectively. For Colombia, the

interpret the lower extended model forecasts as representing the downside risk posed by high-inflation scenarios.

While we present the 10-year exchange rate forecasts here, the forecasts from the baseline RER mean reversion model between 5 and more than 10 years are qualitatively the same – but quantitatively different – since that forecasting rule always predicts an appreciation when the RER in a country is below its mean in the inflation-targeting era, and a depreciation when the RER is above its mean.<sup>32</sup> This is typically true, but is not true as a matter of generality, in the extended model, since it includes forward exchange rates as an additional regressor.

Broadly, we **forecast that the majority of both DM and EM currencies considered will appreciate against the US dollar over the 10 years after Q3/2021**, with a few exceptions. In DM, the models indicate that the Canadian dollar, the Euro, the Japanese yen, the Swedish krona, the Norwegian krone, and the UK pound are undervalued relative to their long-term forecast value relative to the US dollar. The models indicate that the Australian dollar and the Swiss franc are approximately at a long-term forecast value, while the NZ dollar and the Israeli new shekel are slightly overvalued relative to their long-term forecast value.

In EM, the models indicate that the majority of countries – the Brazilian real, the Chilean peso, the Colombian peso, the Mexican peso, the Peruvian sol, the South African rand,<sup>33</sup> and the South Korean won – are cheap relative to their long-run forecast values. According to the models, the Egyptian pound, the Indian rupee, the Philippine peso, and the Russian ruble are overvalued relative to their long-run forecast values.

As alluded to earlier in relation to Japan and the UK, the possible existence of RER trends may undermine the accuracy of the model forecasts. This fact notwithstanding, we found that the RER mean reversion

---

forecasts are 52.4% and 23.0% appreciation, respectively. For Indonesia, the forecasts are 18.1% appreciation and 1.54% depreciation, respectively. For Peru, the forecasts are 33.1% and 14.8% appreciation, respectively.

<sup>32</sup> In general, the size of the forecast appreciation or depreciation is smaller over shorter horizons.

<sup>33</sup> South Africa is one country in which the performance of the extended model with forward rates is materially worse than an extended model controlling for inflation. The extended model controlling for inflation forecasts a 0.1% depreciation. This estimate should be interpreted as reflecting the downside risk due to inflation relative to the RER mean reversion model.

model outperformed both a random walk and forward rates by RMSE, and correctly predicted the sign of exchange rate changes more than 50% of the time at a 10-year horizon in both countries. However, the margin of outperformance was relatively small for the pound, so those forecasts should be interpreted with a greater degree of caution. If the look-back period over which we averaged the RER in Japan were shortened to exclude the volatile RER before the 2000s – to construct a period over which the RER was more plausibly stationary – the forecast appreciation would likely be smaller at about 45% over 10 years, implying an exchange rate of approximately 75 JPY per USD.

Now, we consider the return and risk of a strategy of being short the US dollar and long the 17 currencies that we forecast will appreciate for the 10 years from Q3/2021 as presented in Table 1. This exercise looks past shorter-term volatility. To obtain a measure of risk of being short the USD, we construct forecast 10-year returns on an equal-weighted portfolio of currencies from Q1/2000 using country-level forecasts from our models.<sup>34</sup> We compare these forecasts with the realized 10-year returns of an equal-weighted portfolio of currencies. The RMSE of these portfolio forecasts is constructed according to the formula specified above. After adding average carry, as measured by the average of yields on a 10-year government bond in each country in excess of US yield, we forecast the 10-year expected return for this strategy would be 47%, with a 10-year risk of 11.3% as measured by RMSE. With a normal distribution of forecast errors, this would imply the likelihood of profitability of this strategy is in excess of 95%. On an annualized basis, adjusting 10-year-out risk by the square root of time rule, this implies an annual return of ~3.9%pa, with annualized risk of ~3.6%, yielding a Sharpe ratio of 1.1. Approximately half of this return is due to carry, while the other half is due to FX appreciation.

## Conclusion

In this paper, we forecast the long-term performance of a large set of currencies looking forward from Q3/2021. Our results suggest that the RER is one important signal for investors when making long-term country allocations. In general, we find that our models outperform the random walk model and forward rates over horizons longer than 5 years for a relatively large number of countries. We find that the accuracy of our forecasts

---

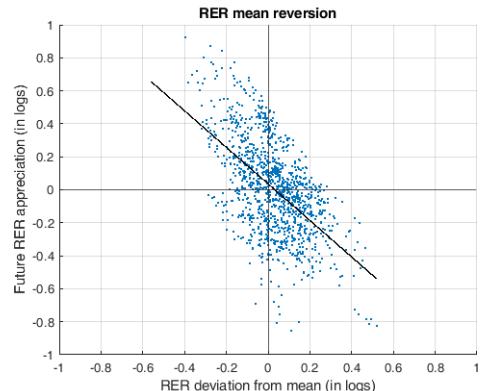
<sup>34</sup> We include in this equal-weighted portfolio those currencies for which we have a model forecast as of each quarter. Most DM countries are included as of Q1/2000, and most EM countries are included as of Q4/2003.

tends to increase over longer horizons. We forecast that the currencies of a majority of DM and EM countries considered will appreciate relative to the US dollar over the long-term looking forward from Q3/2021, with a few exceptions.

### Appendix – RER mean reversion

In Figure 8, we plot RER deviations from the mean in a country therebefore against future appreciations of the RER for our first sample of countries with an inflation target. We find, as conjectured, that the RER tends to appreciate in the future when it is below its historical mean, and to depreciate in the future when it is above its historical mean. The corresponding figure for our sample for the extended model is comparable.

**Figure 8: Future appreciation of the RER against current RER deviation from its mean therebefore in a country**  
 Q1/1993-Q3/2021, quarterly data.



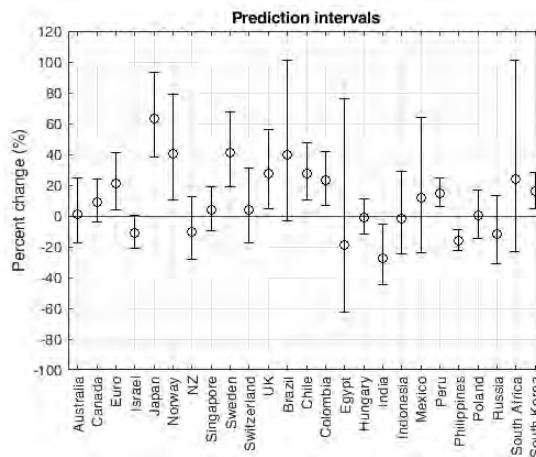
Sources: J.P. Morgan, IMF, OECD, Bloomberg Finance L.P., Trading Economics.

### Appendix – Exchange rate prediction intervals

In Figure 9, we present confidence intervals for the predicted exchange rate changes in Table 1. We plot confidence intervals calculated as plus or minus 1 times the RMSE for each country. In the plot, the round marker indicates our forecast of the exchange rate change over the next 10 years. The bars above and below the round marker indicate the confidence interval. The intervals are close to, but not exactly, symmetric about each point estimate because the model is estimated in natural log ratios, but the results here are presented in percentage changes for interpretability.

**Figure 9: Confidence intervals for 10-year exchange rate forecasts from Q3/2021**

Forecasts from average level in Q3/2021. Positive changes represent appreciations of the identified currency.



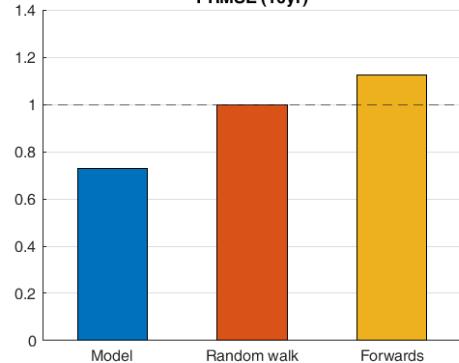
Sources: J.P. Morgan, IMF, OECD, Bloomberg Finance L.P., Trading Economics.

### Appendix – Model performance metrics for the extended mean reversion plus forwards model

PRMSEs and RMSEs are presented over the common sample for which we have model forecasts and forward rates forecasts. On aggregate, forecasting errors in the extended model are ~27% lower than a random walk, and ~35% lower than the forward rates.

**Figure 10: Extended model – PRMSEs of 10-year forecasts relative to that of a random walk forecast (random walk normalized to 1)**  
 Q3/2003-Q3/2011, quarterly data.

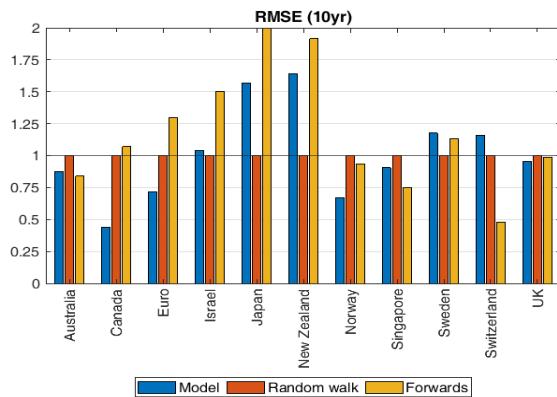
PRMSE (10yr)



Sources: J.P. Morgan, IMF, OECD, Bloomberg Finance L.P., Trading Economics.

**Figure 11: Extended model – RMSEs of 10-year forecasts relative to that of a random walk forecast for each DM country (random walk normalized to 1)**

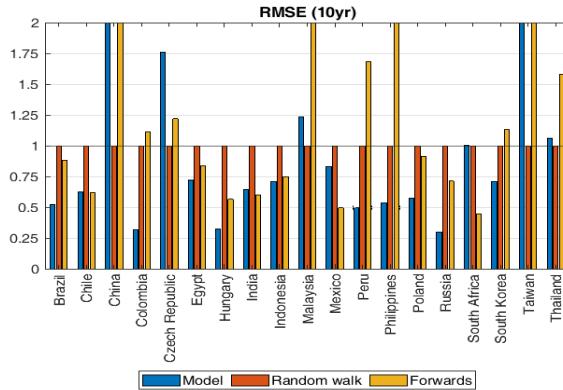
Q3/2003-Q3/2011, quarterly data.



Sources: J.P. Morgan, IMF, OECD, Bloomberg Finance L.P., Trading Economics.

**Figure 12: Extended model – RMSEs of 10-year forecasts relative to that of a random walk forecast for each EM country (random walk normalized to 1)**

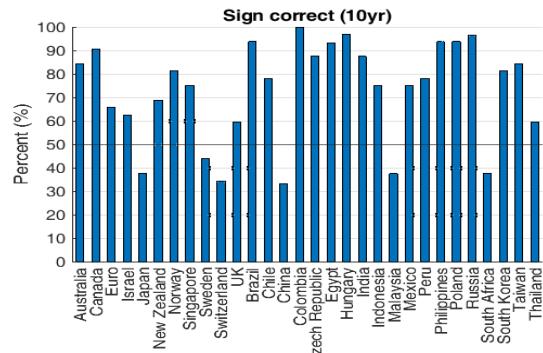
Q3/2003-Q3/2011, quarterly data.



Sources: J.P. Morgan, IMF, OECD, Bloomberg Finance L.P., Trading Economics.

**Figure 13: Extended model – Percent of 10-year forecasts of the correct sign in each country**

%, Q3/2003-Q3/2011, quarterly data.



Sources: J.P. Morgan, IMF, OECD, Bloomberg Finance L.P., Trading Economics.

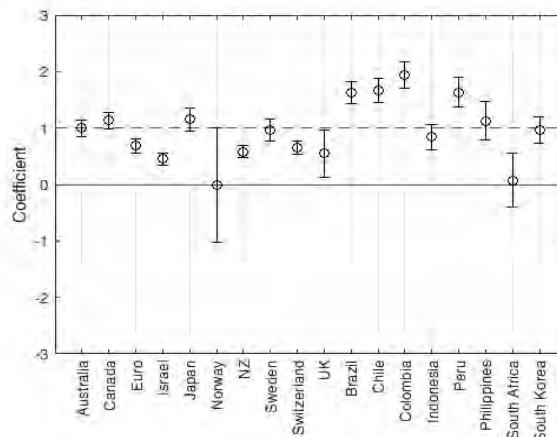
## Appendix – Third assessment of model performance

Another way of assessing the forecasts of the models, beyond RMSE or whether forecast changes were of the correct sign, is whether larger forecast appreciations or depreciations tended to coincide with larger realized appreciations or depreciations. In Figures 14 and 15, we present estimates of the slope coefficient when we regress forecast changes of the NER on realized changes and a constant for the 10-year baseline and extended forecast models respectively. The round marker is the point estimate, while the band around that round marker indicates the 95% confidence interval for the coefficient.

With a perfect forecasting model, the slope coefficient would be 1, indicating that a one percentage point increase in the forecast appreciation or depreciation relative to the past coincided with a one percentage point increase in the realized appreciation or depreciation relative to the past. A positive coefficient indicates that larger forecast appreciations or depreciations tend to coincide with larger realized appreciations or depreciations. The coefficients are clustered around 1 for the vast majority of countries. This suggests that the models may be *one* useful tool in the formulation of expectations over whether appreciations or depreciations of a currency will be small or large relative to the historical experience in a country, even if the RMSE of the model is relatively high in that country.

**Figure 14: Slope coefficients with 95% confidence intervals for a regression of 10-year forecast NER changes on 10-year realized NER changes**

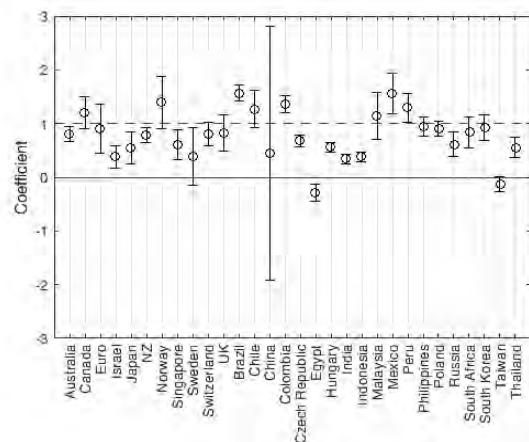
Q1/1993-Q3/2021, quarterly data. Dashed line corresponds to a coefficient of 1.



Sources: J.P. Morgan, IMF, OECD, Bloomberg Finance L.P., Trading Economics.

**Figure 15: Extended model – Slope coefficients with 95%  
confidence intervals for a regression of 10-year forecast NER  
changes on 10-year realized NER changes**

Q1/2003-Q3/2021, quarterly data. Dashed line corresponds to a coefficient of 1.



Sources: J.P. Morgan, IMF, OECD, Bloomberg Finance L.P., Trading Economics.

A close-up photograph of a hot air balloon's envelope. The fabric is divided into panels of various colors: yellow, green, red, and blue. The basket is visible on the right side, made of dark material with some equipment inside. The background is a clear blue sky.

# Interest rates



## The Long-term Strategist

Real yields along the US curve: Long-term forecasts

- We previously argued that longer-term structural forces are set to push real bond yields higher in the US in coming years, giving early-2030s targets of a 2.5% real yield on 10yr US Treasuries, and a 3.0% real yield on the US Aggregate Bond Index.
- We extend this analysis to project real yields along the full US yield curve into the early-2030s.
- Looking at 10-year moving averages to neutralize the impact of the business cycle, the short end of the real curve, up to the 3-year, steadily flattened from 1981 to the GFC, and stayed relatively flat afterwards, plausibly as the market over time lowered its expectations of any quick rate hikes after each successive recession.
- The shape of the longer end of the real curve, beyond the 3-year, in contrast, was relatively stable until the GFC, despite steady falls in real rates, as lower term premia offset the steepening impact of expectations that short real rates would eventually move back up to a more normal 2-3% range. After the GFC, this part of the real curve initially steepened in anticipation of eventual normalization, but then flattened again on growing fears the economy was headed towards secular stagnation, with short rates near or below zero for the foreseeable future.
- Using the same framework balancing the diverse long-term forces bearing on real yields that we used to project a 2.5% real 10yr UST yield in the early 2030s, we derive projections for the rest of the curve as follows: a 1.1% real Federal Funds Rate, a real yield of 0.8% on 3mo UST, 1.0% on 6mo, 1.3% on 1yr, 1.5% on 2yr, 1.7% on 3yr, 2.0% on 5yr, and 3.0% on 30yr.
- Thus, we see a future 3mo-to-3yr curve that is somewhat steeper on average than in the 2000s and 2010s, but flatter than the 1980s and 1990s. In contrast, the 3yr-to-30yr curve should be flatter than the 2000s and 2010s, but steeper than the 1980s and 1990s.
- Nominal yield forecasts can be constructed by adding a measure of future expected inflation to these real yield projections. As previously argued, we regard a scenario of 3% long-term inflation expectations as more likely than a scenario of 2% long-term inflation expectations.
- Assuming linear convergence to our projections over a 10-year horizon, the short end of the curve, focused on the 2yr, should produce higher returns than the longer end of the curve, with the long bond producing the lowest returns. Thus, strategic investors should on average approach their duration management from the short/underweight side.

### Long-term Strategy

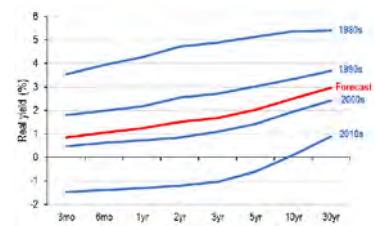
**Alexander Wise** AC

(1-212) 622-6205  
alexander.c.wise@jpmchase.com

**Jan Loeys**  
(1-917) 602-9440  
jan.loeys@jpmorgan.com  
J.P. Morgan Securities LLC

### Forecast real yield curve and average real yield curves in decades since 1980

% Real yield curves constructed as the average across 10yr periods. Real yield forecasts are based on the weighting framework previously constructed.



Source: J.P. Morgan, Federal Reserve Bank of Philadelphia, Board of Governors of the Federal Reserve System, Bloomberg Finance L.P.

In early 2022, we [argued](#) that a number of **structural forces were likely to push real bond yields in the US higher over the coming decade**, partially reversing the persistent decline observed since the 1980s. The framework constructed in that paper suggests that, by the early-2030s, real yields in the US will revert to average levels last observed in the early-2000s. We projected a **2.5% real yield on 10-year US Treasuries**, and a 3.0% real yield on the US Aggregate Bond Index. In this note, **we extend this analysis to project real yields along the full US curve in the early-2030s.**

The **structural forces we anticipate putting upward pressure on real yields** include the rising number of older people moving naturally into a dissaving state; rising capital spending to adapt to climate change and mitigate its impact; rising government debt ratios; partial deglobalization and de-dollarization reducing the demand for dollar assets; and higher macro volatility raising term premia. In our view, these forces are likely to dominate the effects of slower economic growth, which is increasingly concentrated in relatively low investment sectors like healthcare.

Our analysis is based on the economic premise that interest rates are ultimately determined by the supply and demand for capital in an economy – savings and investment.<sup>1</sup> The **forces driving this balance should affect not only the 10-year yield, but interest rates along the full maturity curve**, though the impact may not be the same for all maturities. Economic theory provides that longer-term interest rates should equal expectations of future short rates plus a term premium to compensate for the extra price risk relative to cash, plus any liquidity premia and “preferred habitat” effects. The latter effects tend to come from pension funds, for whom 20-30yr bonds are a good way to hedge long-term liabilities. On average, yield curves tend to be upward-sloping, but at times are downward-sloping beyond 10 years when pension fund duration demand is strong.

## Dynamics of the yield curve

Real bond yields can be observed in the US Treasury inflation-linked bond market (**TIPS**). However, these securities have only been issued since the late-1990s,

<sup>1</sup> Principal Component Analysis conducted by Rachel and Summers validates this emphasis on structural drivers of real yields operating through savings and investment, with a lesser role for explanations based on liquidity and risk. See Lukasz Rachel and Lawrence Summers, [On Secular Stagnation in the Industrialized World](#) (2019) *Brookings Institution Working Paper*. Note that Lawrence Summers [recently indicated](#) that he believes that the era of ‘secular stagnation’ is now over.

giving time series which are too short for our purposes.<sup>2</sup> Thus, we construct real yield estimates across the yield curve by subtracting expected inflation – at horizons which match the security in question – from nominal yields.

As in our previous analysis, 1- and 10-year **inflation expectations** since 1981 are sourced from the Federal Reserve Bank of Philadelphia.<sup>3</sup> In order to construct measures of expected inflation at other time horizons, we make two related observations. Firstly, 1- and 10-year inflation expectations from this source are very similar, even in the 1980s. Further, “*Blue Chip*” consensus long-term inflation expectations 1-5 years into the future and 5-10 years are almost invariably comparable. This suggests that it is reasonable to simply use the geometric average of expected inflation for all horizons between 1 and 10 years. For maturities shorter than 1 year, we use expected inflation in the next year. For maturities longer than 10 years, we use expected inflation in the next 10 years.

As we are focused on the long term, we take **averages of real yields across 10-year periods**. This allows us to look through the impact of the business cycle and to instead focus on more long-term structural changes.

Note that our forecasts of real short-term interest rates are **not forecasts for the “neutral rate of interest”,  $r^*$** , which is the subject of research by our colleagues in Economics Research.<sup>4</sup> Notionally,  $r^*$  is the real interest rate consistent with full employment and stable inflation, though estimation of this rate is difficult to the point of being non-credible.<sup>5</sup> Even over extended periods of time, the economy can deviate persistently from “neutral”. For example, since 1980, unemployment was greater than the Congressional Budget Office’s estimated non-cyclical rate of unemployment around 65% of the time, including most of the 1980s and 2010s, with an average difference of around 1 percentage point.

<sup>2</sup> For more on the TIPS market, see [An introduction to TIPS and US CPI derivatives: 2020 Update](#), Phoebe White, August 26, 2020.

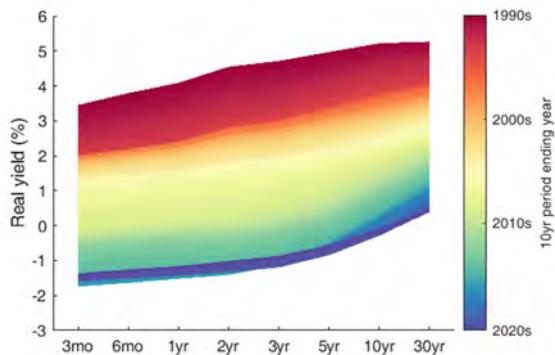
<sup>3</sup> Inflation expectations each quarter are based on either the Survey of Professional Forecasters, the Livingston Survey, or the Blue Chip Economic Indicators – depending on availability. Where there are no 10-year ahead inflation expectations data for a quarter, the value is interpolated. Future expected inflation is taken to be the same for each month within a quarter.

<sup>4</sup> See [When you wish upon  \$r^\*\$](#) , Bruce Kasman, February 15, 2023, and [The US real economy: Same as it ever was](#), Michael Feroli, April 13, 2022.

<sup>5</sup> See [Dark Sky: On the ill-fated search for R-star](#), Joseph Lupton and Dan Weitzfeld, March 8, 2023.

As a starting point, we document the evolution of the real yield curve over the last 40 years. Figure 1 plots our estimates of US real yields from 3 months to 30 years in rolling 10-year periods from 1981 to 2023. The darkest red yield curve corresponds to the average real yield curve between 9/1981 and 9/1991, while the darkest blue curve corresponds to the average real yield curve between 1/2013 and 1/2023. Looking through the business cycle, it is apparent that **the shape of the yield curve has changed non-trivially** as yields have fallen over time.

**Figure 1: Average real yield curves in rolling 10-year periods**  
 %, monthly, 9/1981-1/2023. Real yield curves constructed as the average across 10yr periods. Each color corresponds to the average real yield curve in a 10-year period ending in the specified year.



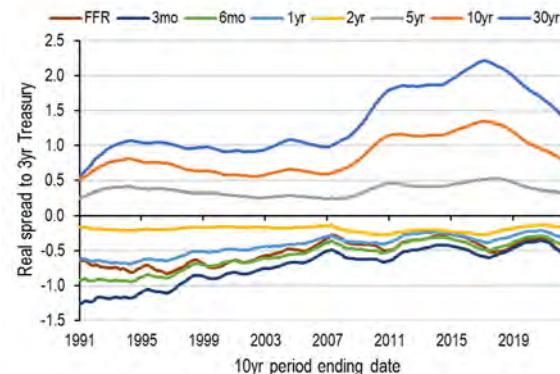
Source: J.P. Morgan, Federal Reserve Bank of Philadelphia, Board of Governors of the Federal Reserve System, Brewer and Harrower (2023), Bloomberg Finance L.P.

These same dynamics of the yield curve are also depicted in Figure 2, which plots the real spread of various maturities of Treasuries relative to the 3yr UST in rolling 10-year periods from 1981 to 2023. Several stylized facts emerge from these figures. First, **the slope of the yield curve from 3yr to 30yr maturities was relatively stable until the GFC**, evidenced by the relatively stable spreads of longer maturities over 3yr real yields in Figure 2. After the GFC, these spreads stayed wider for longer, before a reversal of the steepening later in the 2010s. Second, **the real yield curve flattened prior to the GFC at maturities less than 3 years**, depicted as a compression of spreads in Figure 2. In the aftermath of the GFC, these spreads were relatively stable at levels which are low in the historical context.

Economic theory links interest rates of different maturities through the **Expectations Hypothesis**. This provides that longer rates should equal expectations of short rates over the longer maturity plus a term premium to compensate investors for the higher price risk on longer-duration bonds.

**Figure 2: Average real spreads relative to 3yr USTs in rolling 10-year periods**

%, monthly, 9/1981-1/2023. Real yield curves constructed as the average across 10yr periods. Year indicates the 10yr period ending date. FFR denotes the Effective Fed Funds Rate.



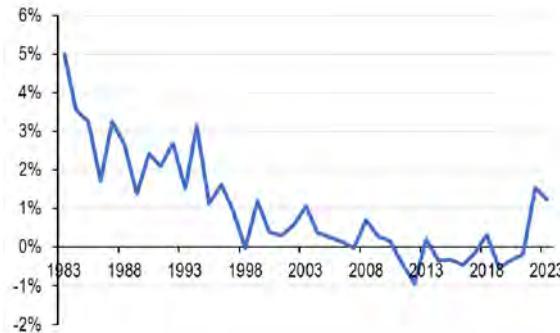
Source: J.P. Morgan, Federal Reserve Bank of Philadelphia, Board of Governors of the Federal Reserve System, Bloomberg Finance L.P.

We have written in recent years on both changing term premia and interest rate expectations. Our previous analysis showed that **the term premium has declined steadily over time** since the 1980s, until an increase in 2022 to a level last seen in 1996 (see [Where are we in Regime Change? Macro volatility, deglobalization, and secular rise in yields](#), Loeys and Wise, Nov 8, 2022).

This is shown in Figure 3, which estimates the term premium as the yield gap between the 5y5y forward UST yield and the *Blue Chip* consensus forecasts of the 3mo UST bill rate 5 to 10 years into the future.

**Figure 3: US term premia**

%, annual, 1983-2023. Term premium is measured as the yield gap between the 5-year, 5-year forward UST yield and *Blue Chip* consensus forecasts of 3mo bill rate 5 to 10 years in the future.



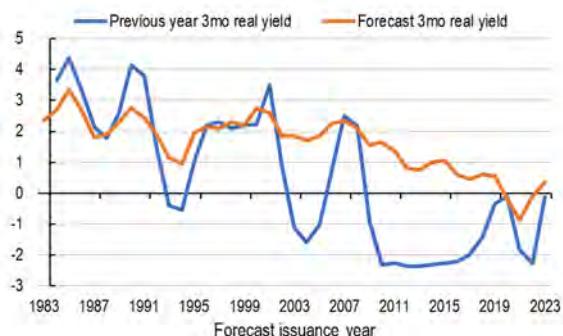
Source: J.P. Morgan, Board of Governors of the Federal Reserve System, Wolters Kluwer/Haver Analytics, Bloomberg Finance L.P.

Additionally, expectations of future real yields have shifted over time, as we previously discussed in [How good are long-term forecasts?](#), Wise and Loeys, June 14, 2022. Figure 4 plots *Blue Chip* consensus long-term

forecasts of 3mo T-Bill real rates in the year the forecasts were made, and, for comparison, the average 3mo T-Bill real rate observed in the year prior. Until the GFC, the consensus of economists, and probably also the market, was that real UST rates would eventually move back to the 2-3% range, even as policy rates were increasingly below these levels. **After the GFC, the consensus abandoned this view and steadily lowered expectations about where real short rates would settle in the long run.**

**Figure 4: Long-term forecasts of 3mo T-Bill real rates against real rates in the year prior to forecast issuance**

%, annual, 1983-2023. Realized real rates are calculated as the annual average 3mo T-Bill rate in the prior year minus *Blue Chip* consensus long-term inflation expectations. Forecast real rates are based on consensus long-term forecasts, and are plotted in the year of forecast issuance.



Source: J.P. Morgan, Board of Governors of the Federal Reserve System, Wolters Kluwer/Haver Analytics.

In short, **several stylized facts about the dynamics of the US real yield curve beyond the business cycle** emerge from the last four figures:

1. The short end of the real yield curve, up to 3 years, trend flattened until the GFC, and stayed quite flat thereafter.
2. The shape of the longer end of the real yield curve, beyond 3 years, was quite stable until the GFC, steepened for several years, and then largely flattened again.
3. The term premium has fallen over time, to particularly low levels in the aftermath of the GFC, before rising again in 2022 to a level last seen in the 1990s.
4. Pre-GFC, investors continually expected that short real rates would eventually go back to 2-3%. Post-GFC, they progressively assumed that short rates would stay low for longer.

These **stylized facts can be combined into the following narrative**. Prior to the GFC, the slope of the real yield curve beyond 3 years was relatively stable. This can be attributed to two offsetting forces. The decline in the term premium was a force for a *flatter* real yield curve at longer maturities. But an expectation that short real rates would eventually rise again to 2-3%, despite the steady fall in spot rates, was a *steepening* force which offset the impact of lower term premia, thus keeping the curve beyond 3 years relatively stable.

Post-GFC, it was perceived that real policy rates would be held “low-for-long”, but that real yields would normalize into the more distant future, leading to a relatively flat curve up to 3 years, but a steepening beyond 3 years. Over time, there was a growing fear that short rates would stay low for a longer period – beyond 3 years – as investors began to accept the **Secular Stagnation** hypothesis, thus flattening the curve at the longer end. This was accentuated by the coincident decline in the term premium to historically low levels.

## Forecasts of the yield curve

Our starting point to project the full US real yield curve into the next decade is our [forecast](#) that real 10-year UST yields will average 2.5% in the early-2030s. This forecast was based on an equal weighting of 11 structural forces identified by the literature as having driven real bond yields in recent decades.

Our framework, summarized in Table 1, is based on our projections for the evolution of these 11 structural forces over the next decade. This approach constructs real yield forecasts for the early-2030s as weighted averages, where each weight is multiplied by the average real yield from the preceding decade in which the effect of the factor was comparable. For example, the weight on demographics is multiplied by the average real yield from the 1980s, while the weight on inequality is multiplied by the average real yield from the 2010s. For those factors which are a force for real yields to be higher or lower than in any preceding decade – climate investment, sector composition, and fiscal debt – we use yields moderately above the highest, or below the lowest, average yields in any other decade. Note that this framework has since been updated to reflect evidence that changes in global economic growth are unlikely to further depress real yields relative to the 2010s ([Long-term forecasts: Update January 2023](#), Wise and Loeys, January 6, 2023).

**Table 1: Level of real interest rates in the early-2030s relative to averages in other decades due to each factor**

'Higher' indicates that the factor is a force for real yields to be higher in the early-2030s than on average in the specified decade. 'Lower' indicates that the factor is a force for real yields to be lower. 'Comparable' indicates that the factor is a force for real yields to be comparable.

	1980s	1990s	2000s	2010s
<i>Fiscal debt</i>	Higher	Higher	Higher	Higher
<i>Climate investment</i>	Higher	Higher	Higher	Higher
<i>Demographics</i>	Comparable	Higher	Higher	Higher
<i>Macro volatility</i>	Comparable	Higher	Higher	Higher
<i>Deglobalization</i>	Lower	Comparable	Higher	Higher
<i>Corporate profits</i>	Lower	Lower	Comparable	Higher
<i>Financial repression</i>	Lower	Lower	Lower	Comparable
<i>Economic growth</i>	Lower	Lower	Lower	Comparable
<i>Inequality</i>	Lower	Lower	Lower	Comparable
<i>EM reserves</i>	Lower	Lower	Lower	Comparable
<i>Sector composition</i>	Lower	Lower	Lower	Lower

Source: J.P. Morgan.

An **alternative method** to project the full curve based on our anchor forecast of a 2.5% real yield on 10-year USTs would be to simply take the average curve spread for each maturity versus the 10-year in the period between 1981 and the GFC. Later years are not used since they were, in our view, influenced by the "low-for-long" views we do not expect to prevail in the coming decade. Results from this alternative approach were **very similar to those from our structural approach**.

Projections for real yields are reported in Table 2. For comparison, Figure 5 plots the projected real yield curve by the early-2030s along with the average real yield curve in each decade since the 1980s. Broadly speaking, we are projecting that **real yields will revert to around the levels last seen in the early-2000s**. The **shorter end** of the real yield curve, up to 3 years, is expected to be steeper than on average in the 2000s and 2010s, but flatter than in the 1980s and 1990s. In contrast, the **longer end** of the real yield curve, beyond 3 years, is expected to be flatter than on average in the 2000s and 2010s, but steeper than in the 1980s and 1990s.

**Table 2: Projected real US yields in the early-2030s**

%. Projections are for real yields on average across the cycle.

	Forecast real rates and yields
<i>Fed Funds Rate</i>	1.1%
<i>3-month</i>	0.9%
<i>6-month</i>	1.1%
<i>1-year</i>	1.2%
<i>2-year</i>	1.5%
<i>3-year</i>	1.7%
<i>5-year</i>	2.0%
<i>10-year</i>	2.5%
<i>30-year</i>	3.0%

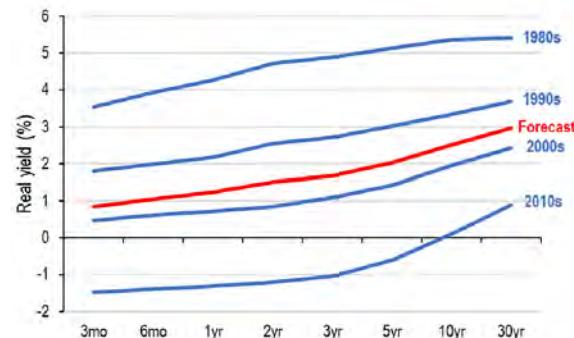
Source: J.P. Morgan, Federal Reserve Bank of Philadelphia, Board of Governors of the Federal Reserve System, Bloomberg Finance L.P.

**Nominal yield forecasts** can be constructed by adding a measure of future inflation expectations. If expected inflation 10 years out reverts to the 2% inflation target, these forecasts imply a 3.1% Fed Funds Rate by the early-2030s. If, as we consider more likely, there is a

structural trend towards higher average inflation in the order of 3%, these projections would imply a 4.1% Fed Funds Rate.

#### Figure 5: Forecast real yield curve and average real yield curves in decades since 1980

%. Real yield curves constructed as the average across 10yr periods. Real yield forecasts are based on the weighting framework [previously constructed](#).



Source: J.P. Morgan, Federal Reserve Bank of Philadelphia, Board of Governors of the Federal Reserve System, Bloomberg Finance L.P.

#### Investment implications

Investors can use our forecasts as **gravitational inputs into tactical decisions on how to position along the curve**, both outright and duration-weighted, along both the real TIPS curve and the nominal curve. The implications are not necessarily what we would advise today as near-term tactical duration and curve positions will be driven foremost by the near-term outlook for the economy, monetary and fiscal policy, as well as technical conditions. Our current recommendations are in our [US Fixed Income Markets Weekly](#), Jay Barry and Srinivas Ramaswamy.

Figure 6 plots our forecast **nominal UST curve 10 years out under two alternative expected inflation scenarios**: 2% and 3%. At 3% inflation prevailing 10 years from now, the nominal UST curve will be higher and steeper than today's forwards for 2033. At 2% expected inflation, it will be lower, but also steeper.

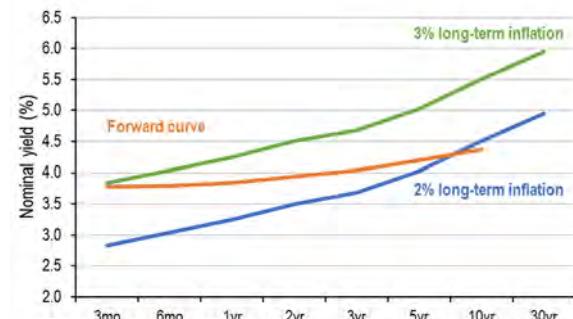
Figure 7 presents the **expected decade-ahead returns on different maturities**, rolled over each year into a new par bond of the same maturity, assuming linear progression from today's curve to the forecasts in 10 years' time. Investments in 3-, 6- and 12-month bills are rolled over at maturity.

The rank order of returns across maturities is similar under both long-term inflation scenarios. **Under both scenarios, the highest returns are predicted at the 2yr**

**maturity, while the lowest returns are predicted at the 30yr maturity**, where capital losses weigh heavily on total returns. The drop-off in returns at longer durations is particularly acute under the higher inflation expectations scenario which we regard as more likely. Broadly similar results are obtained if the progress from current yields to our projections is either frontloaded or backloaded relative to the linear baseline. Thus, our projections motivate **shorter-duration positioning for strategic investors**, particularly given the elevated risk of slightly higher average inflation expectations in the future. Duration-weighted, our forecasts imply steepening relative to current forwards over the coming decade. We do not see any clear implications with respect to barbells.

#### Figure 6: Forecast nominal yield curve under two long-term inflation expectations scenarios against 10-year forward curve

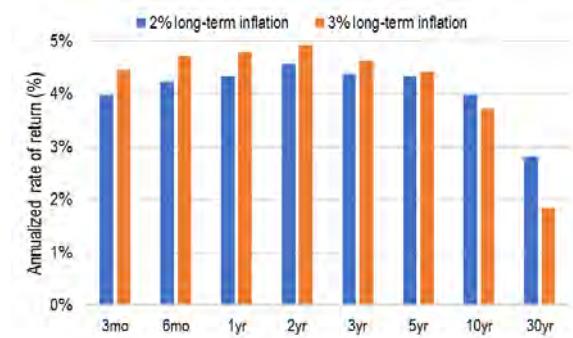
%. Real yield forecasts are based on the weighting framework [previously constructed](#). Forward rates as of 3/8/2023.



Source: J.P. Morgan, Federal Reserve Bank of Philadelphia, Board of Governors of the Federal Reserve System, Bloomberg Finance L.P.

#### Figure 7: Expected return 10 years out on different maturities under two long-term inflation scenarios

% pa. Notes and bonds with a maturity longer than a year are sold each year, with the proceeds reinvested in a newly-issued note or bond of the specified maturity. Bills are rolled over at maturity. Notes and bonds are issued at par. Assumes linear progression of nominal yields from current levels (as of 3/8/2023) to projected levels over the course of 10 years.



Source: J.P. Morgan, Federal Reserve Bank of Philadelphia, Board of Governors of the Federal Reserve System, Bloomberg Finance L.P.



## The Long-term Strategist

### Real bond yields in DM: Long-term projections

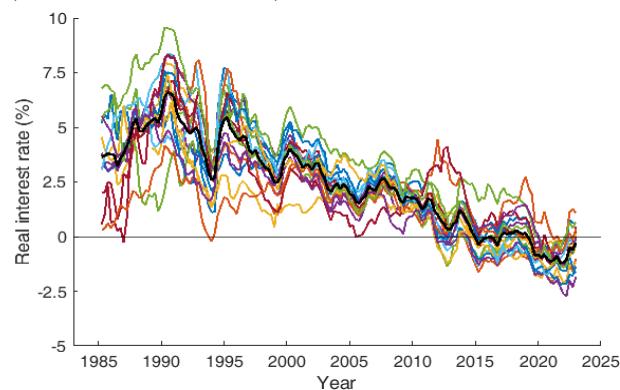
- We previously argued that several structural drivers of real yields are likely to push real bond yields higher in the US, giving early-2030s targets of a 2.5% real yield on 10yr US Treasuries, and a 3.0% real yield on the US Aggregate Bond Index.
- The structural forces driving higher real yields are fundamentally global in nature. Thus, it is a natural presumption that any marked long-term move higher in US real yields would be mirrored in other financially integrated DM economies.
- We construct decade-ahead 10yr government bond real yield forecasts for a set of 19 DM economies by forecasting long-term real spreads to the US.
- These spread forecasts are based on presently observable fundamentals that govern global yield differences in financially integrated economies, including current account balances, differences in economic growth rates, differences in fiscal debt accumulation, and demographic changes in the form of growing longevity and rising old-age dependency shares.
- Since the US current account has trended towards larger deficits, the rate of US fiscal debt accumulation is relatively high, economic growth in the US is likely to exceed most other DM economies, US life expectancy is lagging, and the old-age dependency rate gap between the US and DM ex-US is narrowing, real yields are likely to be higher in the US than most other DM countries.
- In a decade, we forecast 10yr government bond real yields of 1.4% in Germany, 2.3% in France, 1.8% in the UK, 1.8% in Japan, and 2.1% in the broader Euro area. Due to the nature of the forces driving real yields, there is considerable uncertainty around these projections.
- For around half of the countries considered, including Italy and the UK, our real yield projections are roughly in line with those implied by 10y10y forward rates. For the other countries considered, including Germany, Japan and the US, our projected real yields are materially higher than priced into markets.
- For markets where we project yields will rise well above current forwards, a bond manager should thus play the market from the short-duration side until the bond yield approaches our projected level.
- Comparing our long-term projections of real yields in this paper with our previously published long-term forecasts for growth suggests there is a distinct possibility that the post-GFC era in which real growth exceeded real interest rates will come to an end. If this were to occur, concerns about DM government debt sustainability would intensify in many countries.
- Taking into account forecast yield-growth gaps and differences in current market pricing of yields, the results imply a strategic overweight on the bond markets of Australia, Austria, Belgium, Norway, and the UK, against Japan and Sweden.

In early 2022, we [argued](#) that a number of structural forces were likely to push real bond yields in the US higher over the coming decade, partially reversing the persistent decline observed since the 1980s. The framework constructed in that paper suggested that, by the early 2030s, real yields in the US would revert to levels last observed in the pre-GFC 2000s. On average across the cycle, we projected a 2.5% real yield on 10-year US Treasuries, and a 3.0% real yield on the US Aggregate Bond Index. In this note, we extend this analysis to project real government bond yields in other DM economies by the early 2030s.

To summarize, our view that real yields in the US are likely to increase over the coming decade was grounded in the judgment that the majority of structural forces that have depressed real yields since the 1980s are likely to either moderate or reverse in the future. Amongst others, accelerating global increases in old-age dependency shares should put downward pressure on savings relative to investment, meeting climate objectives will demand substantial increases in investment, fiscal debt will reach historical highs, partial deglobalization or de-dollarization are plausible, and higher macro volatility is likely. In our view, these forces are likely to dominate the effects of slower economic growth, which is increasingly concentrated in relatively low investment sectors like healthcare.

#### [Figure 1: Real yields on 10-year government bonds for 19 DM economies](#)

%, quarterly, Q1/1985-Q4/2022. Black line depicts the mean real yield. Real yields are nominal yields minus inflation in the preceding five years (see footnote 2 for more details).



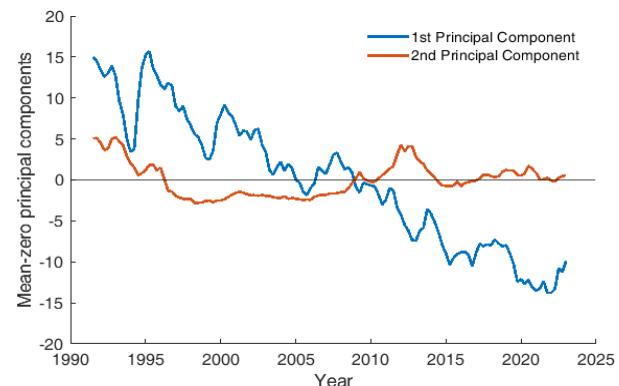
Source: J.P. Morgan, IMF, OECD.

Broadly speaking, the framework previously constructed balances various structural forces affecting global supply and demand for capital – savings and investment, respectively. If these are the primary structural drivers of real yields, **real yields in financially integrated economies ought to “co-move” closely over time**. This

co-movement is clear in Figure 1, which presents real yields on 10-year government bonds issued by a set of 19 DM economies<sup>1</sup> since 1985.<sup>2</sup> Since we do not have inflation-linked real bond yields in all countries for extended periods of time, *ex ante* real yields are constructed by subtracting a measure of long-term inflation expectations from the nominal yield.<sup>3</sup>

[Figure 2: Principal components of real yields on 10-year government bonds for 19 DM economies](#)

Quarterly, Q2/1991-Q4/2022.



Source: J.P. Morgan, IMF, OECD.

One can conduct Principal Component Analysis (PCA) to quantitatively assess the importance of the common trend decline in real yields relative to idiosyncratic country-level structural forces which drive government bond spreads, such as default risk.<sup>4</sup> Analyzing data since 1991 – when real yields for all included countries are available in our data – the first principal component, which captures the global trend, accounts for approximately 88% of the total variance. This validates our view that **the most important structural drivers of real yields have been, and should remain, the global**

<sup>1</sup> Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, Netherlands, New Zealand, Norway, Spain, Sweden, Switzerland, the UK, the US, and the Euro area. Nominal yields data are sourced from the OECD.

<sup>2</sup> Since long-term inflation expectations data are not generally available in all economies, inflation in the preceding five years is used as a measure of long-term inflation expectations, motivated by our [previous observation](#) that *Blue Chip* consensus forecasts for decade-ahead inflation in the US very closely resemble inflation in the preceding five years.

<sup>3</sup> The inflation risk premium accruing to non-inflation-linked bonds arguably approximately offsets the illiquidity premium accruing to inflation-linked bonds.

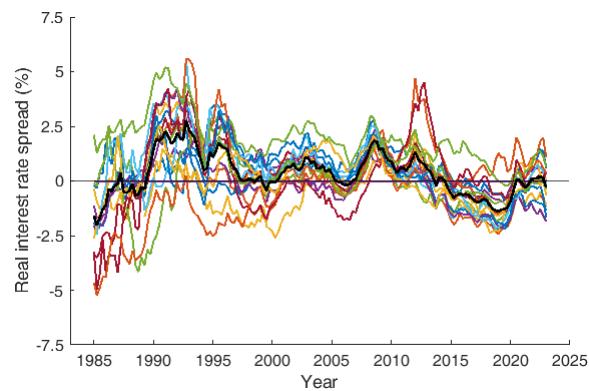
<sup>4</sup> For an application of this approach, see Lukasz Rachel and Lawrence Summers, [On Secular Stagnation in the Industrialized World](#) (2019) *Brookings Institution Working Paper*. Note that Lawrence Summers [recently indicated](#) that he believes that the era of ‘secular stagnation’ is now over.

**factors previously considered.** Thus, it is a natural presumption that any marked long-term move higher in US real yields would be mirrored in other DM economies.

In light of this evidence, our approach in this paper will be to construct long-term real yield forecasts for other economies by **forecasting future real government bond spreads relative to US Treasuries using idiosyncratic country-level data.** It is natural to focus on spreads to the US given it accounts for more than half of the broad global bond market, and since US monetary policy drives the global financial cycle.<sup>5</sup> Figure 3 presents the evolution of real government bond spreads for the same DM economies since 1985. While there is cyclical variation, there has been a slight downward trend in average real spreads since the 1990s. Thus, using more simple approaches to forecasting real spreads – such as simply using the historical spread over some period of time – may be misguided.

**Figure 3: Real spreads on 10-year government bonds for 19 DM economies relative to 10-year US Treasuries**

%, quarterly, Q1/1985-Q4/2022. Black line depicts the mean real spread.



Source: J.P. Morgan, IMF, OECD.

## Determinants of real spreads

### Current real spread

Several factors may affect the evolution of real spreads over time. Conditional on the other predictor variables, the inclusion of the current real spread as a predictor may capture other determinants of real spreads that are immeasurable or otherwise unknown. In the regressions below, the average real spread over the last four quarters in a country is incorporated as a predictor of future real spreads.

<sup>5</sup> Silvia Miranda-Agrrippino, Hélène Rey, [US Monetary Policy and the Global Financial Cycle](#) (2020) 87(6) *Review of Economic Studies* 2754-2776.

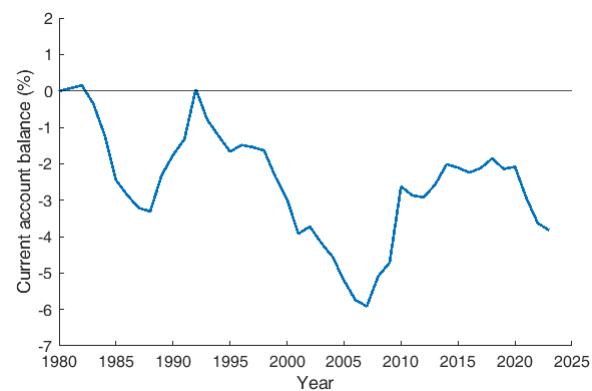
### Current account balance

It has been documented that there is an empirical relationship between current account balances and interest rate differentials. Boileau and Normandin (2008) find that current account balance is negatively correlated with current and future interest differentials, implying that increases in current account surpluses are associated with lower relative interest rates in the future, all else being equal.<sup>6</sup>

The logic behind this relationship is that a country's current account balance equals its national savings minus investment. A country with higher domestic investment than savings – equal to its current account deficit – will need to attract funding from countries with savings surpluses by offering a higher real yield to compensate for the extra risk that the savings surplus country incurs lending to the deficit country – consisting primarily of FX risk among DM countries. Thus, current account deficit countries will generally have higher real bond yields than those with current account surpluses, all else being equal.

**Figure 4: US current account balance as a share of US GDP**

%, annual, 1980-2022. World Bank data are used until 2021. IMF data are used in 2022.



Source: J.P. Morgan, IMF, World Bank.

As shown in Figure 4, the US current account deficit has grown since 1980, albeit with considerable cyclical variation. In the regression models specified below, the current account balance of a country relative to the current account balance of the US is used as a predictor of real spreads 10 years hence.

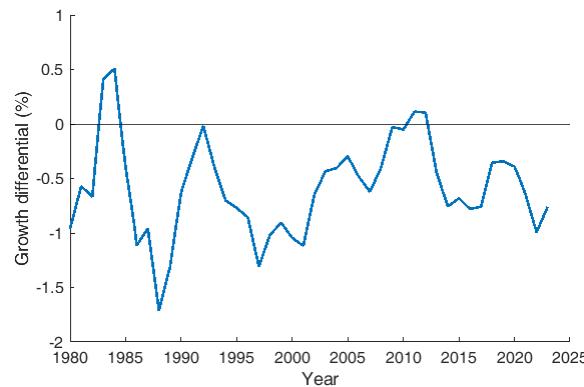
<sup>6</sup> Martin Boileau and Michel Normandin, [Dynamics of the current account and interest differentials](#) (2008) 74(1) *Journal of International Economics* 35-52.

## Growth differentials

The rate of economic growth has also commonly been cited as a determinant of real interest rates.<sup>7</sup> Proponents of this view argue that higher economic growth is associated with higher natural real rates of interest. Figure 5 plots the average growth rate in DM ex-US minus the US growth rate in the preceding five years. Since the 1980s, growth in the US has typically exceeded growth in DM ex-US. In the regression models below, the rate of economic growth in a country in excess of US growth in the preceding five years is included as a predictor of decade-ahead real spreads.<sup>8</sup>

**Figure 5: DM ex-US economic growth minus US growth in the preceding 5 years**

%, quarterly, 1980-2022. World Bank data are used until 2021. IMF data are used in 2022. DM growth is an unweighted average across economies considered. Quarterly data are interpolated from annual data.



Source: J.P. Morgan, IMF, World Bank.

## Government debt

Real yields on government bonds also reflect perceptions of the risk of sovereign default. Many factors may affect the risk of default, though this risk is regarded as being higher at elevated debt-to-GDP ratios, all else being equal. While the risk of default is generally seen to be low or remote for DM countries with monetary policy set at a national level, default risks for some countries were seen as non-trivial during the Eurozone debt crisis.

Figure 6 plots the average debt-to-GDP ratio in DM ex-US minus the debt-to-GDP ratio in the US. Until the

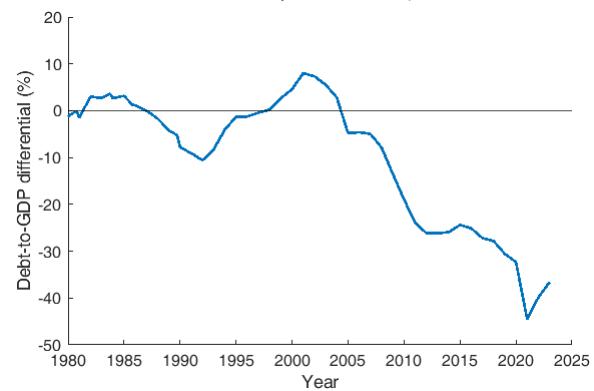
<sup>7</sup> See, e.g., Kathryn Holston, Thomas Laubach and John Williams, [Measuring the natural rate of interest: International trends and determinants](#) (2017) 108(S1) *Journal of International Economics* S59-S75.

<sup>8</sup> We focus on presently observable growth differences, rather than our projections of future long-term growth differences, given the level of risk around forecasts of differences in long-term growth. For more details, see [Long-run economic growth forecasts](#), Alexander Wise and Jan Loeys, October 10, 2022.

2000s, debt-to-GDP in the US was broadly in line with the DM ex-US average, though there was substantial cross-country heterogeneity. Since the 2000s, public debt has grown at a faster-than-average rate in the US. In the regression analysis below, growth of debt-to-GDP in a country relative to growth in debt-to-GDP in the US in the preceding five years is used as a predictor of real spreads 10 years later. Empirically, this measure is more closely related to future real spreads than differences in levels of indebtedness. In any case, the latter is implicitly controlled for using the current real spread.

**Figure 6: DM ex-US public debt-to-GDP minus US debt-to-GDP**

%, quarterly, 1980-2022. DM debt is an unweighted average across economies considered. Quarterly data are interpolated from annual data.



Source: J.P. Morgan, IMF.

## Demographics

In [previous analysis](#) on the effects of demographic change on real yields, we found that increases in longevity were likely to lower real yields, while increases in old-age dependency shares were likely to raise real yields. This occurs because increases in longevity are associated with increases in savings relative to investment as individuals anticipate longer retirements. By contrast, increases in old-age dependency shares are associated with decreases in savings relative to investment as retirees consume with little to no income, running down their savings. It follows that demographic change may also affect real interest rate spreads.

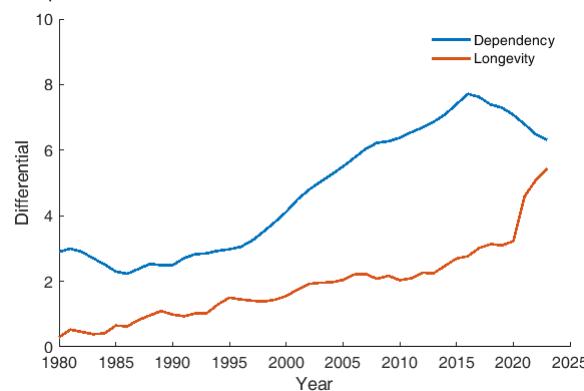
Figure 7 plots longevity and old-age dependency rates in DM ex-US minus longevity and old-age dependency rates in the US.<sup>9</sup> Life expectancy in the US at age 15 has fallen further behind the DM ex-US average since 1980. Dependency rates in DM ex-US tended to increase at a faster rate than in the US between 1980 and 2016, though

<sup>9</sup> Dependency rates and longevity in 2022 are extrapolated from the 2017-2021 trend.

they have increased at a slower rate since 2016. In the regression models specified below, life expectancy at age 15 relative to the US, and the old-age dependency share relative to the US are included as predictors of future real spreads.<sup>10</sup>

**Figure 7: DM ex-US dependency rates and longevity minus US dependency rate and longevity**

% (dependency) and years (longevity), quarterly, 1980-2022. Longevity is life expectancy at age 15. Dependency is old-age population as a share of middle-age population. DM dependency and longevity are unweighted averages across economies considered. Quarterly data are interpolated from annual data.



Source: J.P. Morgan, UN.

### Real exchange rate

There is some mixed empirical evidence that real exchange rates are associated with real interest rate differentials.<sup>11</sup> This link is implied by the combination of the theory of uncovered interest rate parity and a form of purchasing power parity. In theory, real yields ought to be higher in countries in which the real exchange rate is expected to depreciate due to mean reversion. Univariate analysis here suggests that there is a relationship between deviations of the real exchange rate from the historical mean and real interest rate differentials 10 years later. However, the inclusion of this variable did not materially improve the fit of the model conditional on the other covariates. Thus, in the interest of parsimony, these variables are omitted from the final forecasting models, but are detailed here for the sake of completeness.<sup>12</sup>

<sup>10</sup> The old-age dependency share is calculated as the population aged 65 or older divided by the population aged 20 to 64.

<sup>11</sup> Marianne Baxter, [Real exchange rates and real interest differentials: Have we missed the business-cycle relationship?](#) (1994) 33(1) *Journal of Monetary Economics* 5-37.

<sup>12</sup> Parsimony is not the pursuit of simple models for the sake of simplicity itself. Simpler models often make more accurate out-of-sample predictions by reducing overfitting.

### Forecasts of real spreads

Following our approach to [forecasting long-term economic growth](#), forecasts of real spreads in 10 years will be constructed by averaging forecasts generated by a linear regression model with country fixed effects, and a Gaussian process regression.<sup>13</sup> As previously established, averaging the forecasts produced by these models can improve predictive accuracy. These forecasting models are based on presently observable fundamentals, not assumptions about the evolution of fundamentals into the future. Due to data constraints, it is not feasible to robustly define measures of risk based on the out-of-sample forecasting performance of these models over an extended period of time.<sup>14</sup> However, pseudo out-of-sample forecasting over a very short period of time suggests that both models comfortably outperform a random walk benchmark, under which the best forecast of future real spreads is the current real spread – either with four-quarter smoothing or without.<sup>15</sup> The combined model outperforms a random walk by a larger margin.<sup>16</sup> This outperformance is not surprising given the apparent non-stationarity of real spreads in many countries since the 1990s, as alluded to above.

As discussed in [previous analysis](#), only the linear regression model yields interpretable coefficients which characterize the marginal effects of the predictor variables. The results from the linear regression are presented in Table 1. The estimates are broadly consistent with our theoretical priors and previous research. **Larger current account surpluses are**

<sup>13</sup> We forecast the average real spread in a country in the four-quarter period ending 10 years into the future. The average is taken across four quarters to smooth across high-frequency volatility in real yields.

<sup>14</sup> Since we require all predictor variables to include a country in the estimation sample in any given period, one would need to start forecasting out-of-sample at a relatively late date, leaving too short a forecasting history to robustly assess model performance and forecast risk. For example, if one started out-of-sample forecasting in 2005, the first forecast would be for real spreads in 2015. Additionally, in our view, the estimation sample in 2005 would be sufficiently small that model performance from that date may be unrepresentative of model performance looking forward from 2023.

<sup>15</sup> We refer to the out-of-sample forecasting in this instance as “pseudo out-of-sample” since some variables – such as public debt growth – are constructed at a quarterly frequency by linearly interpolating the annual data. Since the end-of-year data are not known mid-year, one could not interpolate data when looking forward in the middle of any given year.

<sup>16</sup> Based on performance forecasting real yields since 2005, the RMSE of the combined model is approximately 50% lower than the RMSE of a random walk benchmark.

**associated with lower future real spreads. Faster public debt growth and faster economic growth are both associated with higher future real spreads. Higher longevity relative to the US is associated with lower future real spreads, while higher old-age dependency relative to the US is associated with higher future real spreads.** The latter two effects are consistent with our previously published analysis on the effect of demographics on real yield levels (see [A demographic reversal to start pushing real interest rates up](#), Alexander Wise and Jan Loeys, March 2, 2022).

**Table 1: Linear regression estimates**

p-values reported in brackets. \*\*\* denotes significance at 1% level. \*\* denotes significance at 5% level. \* denotes significance at 10% level.

	Real spreads in 10 years
Current spread	-0.1999*** (0.000)
Current account differential	-0.0895*** (0.000)
Debt growth differential	0.0261*** (0.000)
Growth differential	0.1417*** (0.000)
Dependency differential	0.0325** (0.013)
Longevity differential	-0.3672*** (0.000)
Country fixed effects	Yes
R <sup>2</sup>	0.38

Source: J.P. Morgan, IMF, OECD, World Bank, UN.

Based on these estimated effects, there is reason to expect that **real yields in the US will exceed real yields in most other DM countries a decade from now**. As presented earlier in this paper, the US current account has trended towards larger deficits since the 1980s. Economic growth in the US is higher than in the majority of DM economies, and we forecast that this will persist over the coming decade, though the gap is likely to narrow (see [Long-run economic growth forecasts](#), Alexander Wise and Jan Loeys, October 10, 2022). US public debt has grown faster than the DM ex-US average since around 2000, and the US-DM gap in longevity has persistently grown since the 1980s. Based on our estimates, all of these forces point to higher real yields in the US.

**Table 2: Real yield projections for 10yr government bonds in a decade**

Real spreads are real yields on 10yr government bonds minus the real yield on 10yr UST. Euro area is the average across 19 economies.

	Real spread in 10 years	10yr real yield in 10 years
Australia	-0.68%	1.82%
Austria	-1.23%	1.27%
Belgium	-0.83%	1.67%
Canada	-0.18%	2.32%
Denmark	-1.19%	1.31%
Finland	-0.47%	2.03%
France	-0.24%	2.26%
Germany	-1.12%	1.38%
Italy	-0.12%	2.38%
Japan	-0.73%	1.77%
Netherlands	-0.74%	1.76%
New Zealand	0.38%	2.88%
Norway	-1.00%	1.50%
Spain	-0.75%	1.75%
Sweden	-0.43%	2.07%
Switzerland	-0.85%	1.65%
UK	-0.69%	1.81%
US	0.00%	2.50%
Euro area	-0.43%	2.07%

Source: J.P. Morgan, IMF, OECD, World Bank, UN.

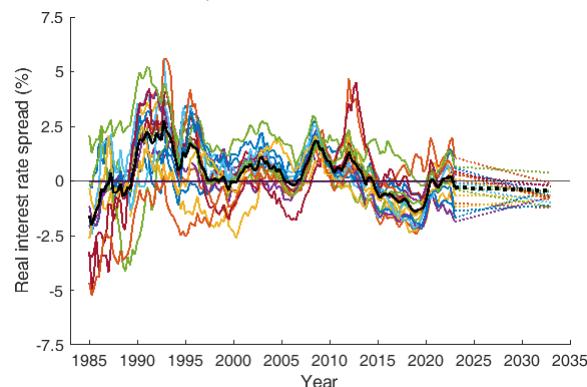
Long-term forecasts for real spreads and, consequently, real yields on 10yr government bonds in a decade are reported in Table 2.<sup>17</sup> To smooth over higher-frequency variation in quarterly input data, the reported forecasts are the average forecasts in the eight-quarter period ending Q4/2022. As hypothesized, real yields are

<sup>17</sup> The Euro area interest rate is the average across 19 economies sourced from the OECD. To construct measures of the current account balance, public debt, growth, dependency and longevity, the GDP-weighted average is taken across France, Germany, Italy, Netherlands, and Spain. These countries account for in excess of 80% of Euro area GDP. Euro area inflation is constructed using German CPI data before Q1/1996.

forecast to be higher in the US than in most other DM economies. In a decade, we project 10yr real government bond yields of 1.4% in Germany, 2.3% in France, 1.8% in the UK, 2.1% in the Euro area, and 1.8% in Japan. In the set of countries considered in our analysis, **real yields are only expected to materially exceed US levels in New Zealand**. As depicted in Figure 8, our forecasts imply a degree of convergence in real yields. However, as evidenced by the European debt crisis in the aftermath of the GFC, financial crises bring elevated spread dispersion.

**Figure 8: History and forecasts for real spreads on 10-year government bonds for 19 DM economies relative to 10-year US Treasuries**

%, quarterly, Q1/1985-Q4/2022. Black line depicts the mean real spread. Dashed lines indicate spread forecasts.



Source: J.P. Morgan, IMF, OECD.

There is **considerable unquantifiable risk around these projections**. Firstly, there is risk around the initial projection of a 2.5% real yield on 10yr US Treasuries. Since this projection was based on subjective judgment about future trends in the structural drivers of real yields, it is not possible to assess out-of-sample forecasting performance, which could be used to construct a measure of risk. Out-of-sample forecasting would yield a measure of risk conditional upon our forecasts, which is, in our judgment, a more appropriate measure of risk than implied by the historical volatility real yields (see [Long-vs short-term risk](#), Jan Loeys and Alexander Wise, February 1, 2023). Secondly, there is risk around the spread projections constructed in this paper. For data reasons discussed above, it is not feasible to robustly evaluate the out-of-sample performance of the spread forecasting model over an extended period of time, though out-of-sample performance over a short period of time suggests comfortable outperformance of the random walk benchmark. Thus, one should be mindful of the considerable uncertainty around these long-term real yield projections.

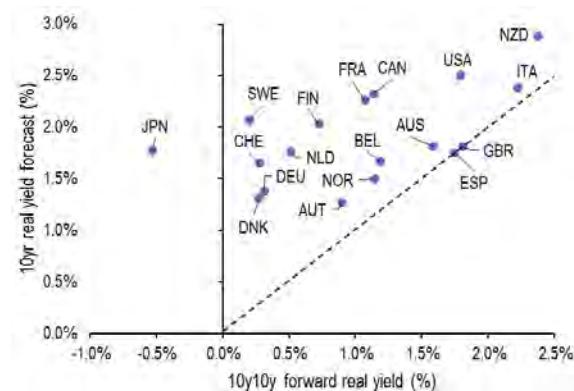
Shifts in sentiments about credit-worthiness are one noteworthy risk to our forecasts for real spreads. These shifts can occur quickly, with substantial effects on real spreads and the capacity to actualize sovereign debt crises. While risk factors are known, and indeed included in our models, there is no way to reliably predict the timing of sentiment shifts, especially at a 10-year horizon. If such a shift were to occur, spreads for any affected country could be substantially higher than projected. Indeed, as we discuss in greater depth below, our real yield projections raise the prospect that debt crises may be more likely in the future.

## Investment implications

**In general, these real yield projections are higher than presently priced into markets.** Figure 9 plots these real yield projections against 10y10y forward real yields constructed by subtracting a country's inflation target from the 10y10y forward nominal yield implied by 10yr and 20yr yields. 20yr yields are constructed by linearly interpolating 10yr and 30yr yields, to adjust for an illiquidity premium accruing to 20yr bonds.<sup>18</sup> Inflation targets are used to measure long-term inflation expectations a decade from now in the absence of other data.

**Figure 9: 10yr government bond real yield projections versus 10y10y forward real yield**

%. 10y10y forward real yield is the implied nominal 10y10y forward rate minus inflation target. Implied forward rates are calculated using a 10yr yield and a 20yr yield adjusted for an illiquidity premium. Dashed line is the 45-degree line.



Source: J.P. Morgan, IMF, OECD, World Bank, UN, Bloomberg Finance L.P.

Our real yield projections are within 50bp of the implied 10y10y forward real yields for Australia, Austria, Belgium, Italy, Norway, Spain, and the UK. Our real

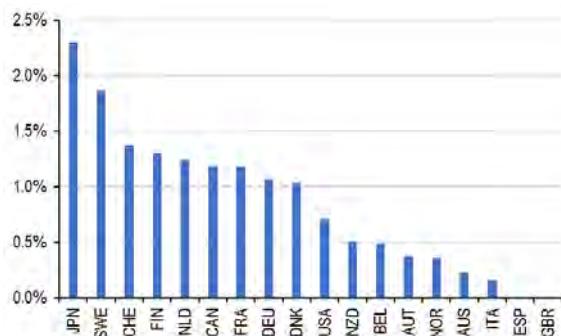
<sup>18</sup> In the absence of 30yr bond yields, 20yr yields for Norway and Sweden are based on the current yields on bonds maturing in approximately 20 years.

yield projections are materially higher than priced by the market for Canada, Denmark, Finland, France, Germany, Japan, Netherlands, New Zealand, Sweden, Switzerland, and the US. Note, however, that the implied 10y10y forward real yield for Japan assumes a 2% inflation rate. While this is the declared inflation target, inflation has persistently undershot this level, averaging 1.0% pa since the target was adopted in 2013, even after the recent marked increase in inflation. Thus, it is plausible that the forward yield prices in a lower rate of inflation than the declared target, implying a higher market-implied real yield than reported below. Similar dynamics may also be at play in Switzerland.<sup>19</sup>

**Rising bond yields depress bond prices and thus returns.** However, for the long-term investor, it remains the case that, ~10 years out, any initial capital losses on a bond portfolio of 5–6 year duration due to rising bond yields will afterwards be offset by higher coupons on newly issued bonds entering the portfolio.<sup>20</sup> The starting yield will govern the full-period return. That said, the investor will experience first capital losses and then only over time see higher coupon income. For markets where we project yields to rise well above current forwards, a **bond manager should thus keep duration under 6 years, and play the market from the short-duration side until the bond yield approaches our projected level.** Figure 10 presents the difference between projected real yields and 10y10y real yields in descending order.

**Figure 10: 10yr government bond real yield projections minus 10y10y forward real yield**

%. 10y10y forward real yield is the implied nominal 10y10y forward rate minus inflation target. Implied forward rates are calculated using a 10yr yield and a 20yr yield adjusted for an illiquidity premium.



Source: J.P. Morgan, IMF, OECD, World Bank, UN, Bloomberg Finance L.P.

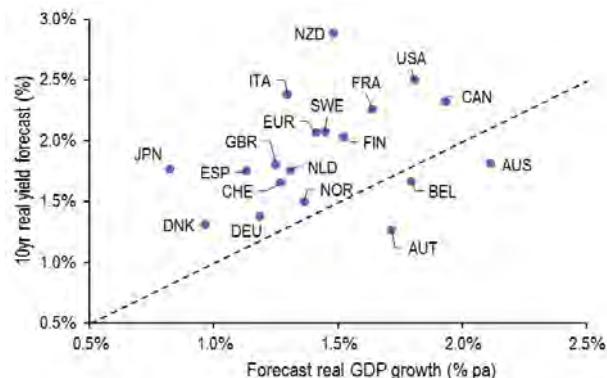
<sup>19</sup> A notional target of 1% inflation is assumed for Switzerland.

<sup>20</sup> See, e.g., discussion in [Long-term forecasts: Update January 2023](#), Alexander Wise and Jan Loeys, January 6, 2023.

These real yield projections also bear upon the question of debt sustainability. It has been argued that **debt sustainability concerns are moderated when the real interest rate ( $r$ ) is below the real economic growth rate ( $g$ ), as has been the case for many countries since the GFC.**<sup>21</sup> In these circumstances, there exist non-zero primary budget deficits which are consistent with debt-to-GDP declining over time. The magnitude of these feasible deficits is governed by the difference between  $g$  and  $r$ . Comparing our long-term projections of real yields in this paper with our previously published long-term forecasts for growth suggests there is a distinct possibility that this era is coming to an end.<sup>22</sup>

**Figure 11: Forecast real GDP growth in the decade ahead versus 10yr government bond real yield projections**

%. Real GDP growth is the forecast annual rate of growth over the coming decade from our [recent paper](#). Dashed line is the 45-degree line.



Source: J.P. Morgan, IMF, OECD, World Bank, UN, Feenstra et al. (2015), Ha et al. (2022).

Figure 11 plots our long-term projections for 10yr real yields against our forecasts for growth over the coming decade, while Figure 12 plots the difference between projected real yields and growth forecasts in descending order. Of the economies considered, the rate of economic growth is expected to be greater than the decade-ahead 10yr real yield only in Australia, Austria, and Belgium. The largest growth shortfalls are forecast in New Zealand, Italy, and Japan. It is important to emphasize, however, that there is substantial uncertainty around long-term growth forecasts, in addition to the previously discussed uncertainty around the real yield forecasts. Our long-term growth forecasting model, which outperforms

<sup>21</sup> See, e.g., Olivier Blanchard, [Public Debt and Low Interest Rates](#) (2019) 109(4) *American Economic Review* 1197-1229.

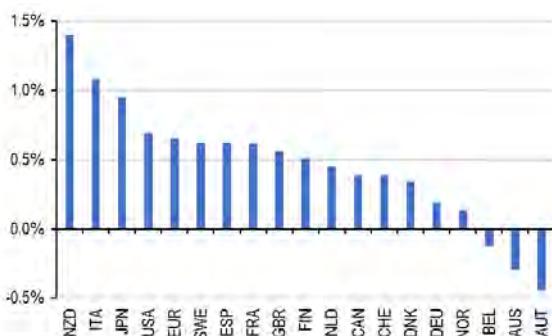
<sup>22</sup> This is a simplified comparison of  $r$  and  $g$  since the maturity structure of outstanding debt varies across countries. The average maturity of outstanding debt in J.P. Morgan's Government Bond Index (GBI) typically lies in a range of 7 to 12 years.

other benchmarks, still comes with a RMSE of 1.0% around long-term annualized growth rates in DM.

Given we have projected modest growth slowdowns for most countries over the coming decade on the basis of deteriorating fundamentals, circumstances are slightly more favorable when comparing projected real interest rates with realized growth since 2000. In that case, realized growth exceeds our real interest rate projections in Australia, Austria, Denmark, New Zealand, Spain and Switzerland – with only marginal differences in each of those countries excepting Australia. In any case, it is clear that **our projections call into question the presumption that growth rates will exceed real interest rates indefinitely in most countries.**

**Figure 12: 10yr government bond real yield projections minus 10yr growth forecast**

%. Real GDP growth is the forecast annual rate of growth over the coming decade from our [recent paper](#).



Source: J.P. Morgan, IMF, OECD, World Bank, UN, Feenstra et al. (2015), Ha et al. (2022).

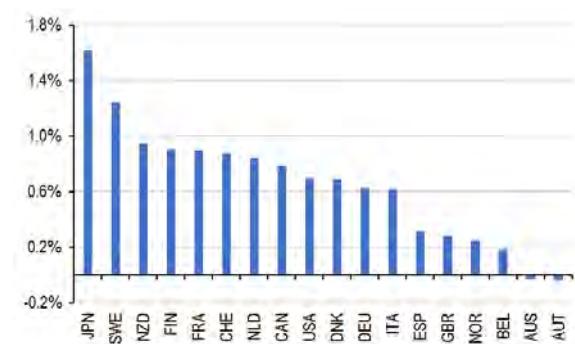
While the difference between real growth rates and real interest rates is an important factor bearing on debt sustainability,  **$g > r$  is neither a sufficient nor a necessary condition for sustainability**. A country could conceivably maintain such a large primary deficit that debt-to-GDP increases over time, even if the real growth rate exceeds the real interest rate. Conversely, a country could maintain a sufficiently large primary surplus to reduce debt-to-GDP, even if the real interest rate is greater than the rate of growth. Furthermore, vulnerability to debt crises will be low for countries with comparatively small debt-to-GDP burdens, regardless of the yield-growth differential. In any case, real interest rates materially higher than real growth rates are a risk factor.

**Bond managers can also use our forecasts to position on one market versus another.** Based on our discussion above, two key dimensions to this question are the deviation of forecast real yields from yields presently

priced into the market, and the vulnerability to debt crises through the lens of yield-growth gaps. One way to combine these two factors is simply to average these two gaps. These averages are reported in descending order in Figure 13. It implies **strategically overweighting the bond markets of Australia, Austria, Belgium, Norway, and the UK, against Japan and Sweden.**

**Figure 13: Averages of yield forecast minus 10y10y forward government yields, and forecast yield minus forecast growth (from Figures 10 and 12)**

%.



Source: J.P. Morgan, IMF, OECD, World Bank, UN, Bloomberg Finance L.P., Feenstra et al. (2015), Ha et al. (2022).

## Conclusion

We previously [argued](#) that several structural drivers of real yields are likely to push real bond yields higher in the US, giving early-2030s targets of a 2.5% real yield on 10yr US Treasuries, and a 3.0% real yield on the US Aggregate Bond Index. We construct decade-ahead 10yr government bond real yield forecasts for a set of 19 DM economies by forecasting long-term real spreads relative to the US using presently observable fundamentals. We find that real yields are likely to be higher in the US than most other DM countries. In a decade, we forecast 10yr government bond real yields of 1.4% in Germany, 2.3% in France, 1.8% in the UK, 1.8% in Japan, and 2.1% in the broader Euro area. Due to the nature of the forces driving real yields, there is considerable uncertainty around these projections.

For around half of the countries considered, including Italy and the UK, our real yield projections are roughly in line those implied by 10y10y forward rates. For the other countries considered, including Germany, Japan and the US, our projected real yields are materially higher than priced into markets. Comparing our long-term projections of real yields in this paper with our previously published [long-term forecasts for growth](#) suggests there is a distinct possibility that the post-GFC era in which rates of economic growth exceeded real

Alexander Wise  
(1-212) 622-6205  
alexander.c.wise@jpmchase.com

Jan Loeys  
(1-917) 602-9440  
jan.loeys@jpmorgan.com

**Global Long-term Strategy**  
The Long-term Strategist  
21 February 2023

**J.P.Morgan**

interest rates will come to an end. If this were to occur, concerns about DM government debt sustainability would intensify.

These projections have several implications for an investor. For markets where we project yields to rise well above current forwards, a bond manager should play the market from the short duration side until the bond yield approaches our projected level. Differences in forecast yields and market-priced yields and exposure to forecast yield-growth gaps motivates a strategic overweight on the bond markets of Australia, Austria, Belgium, Norway, and the UK, against Japan and Sweden.

## The Long-term Strategist

Long-term forces point to higher US bond yields

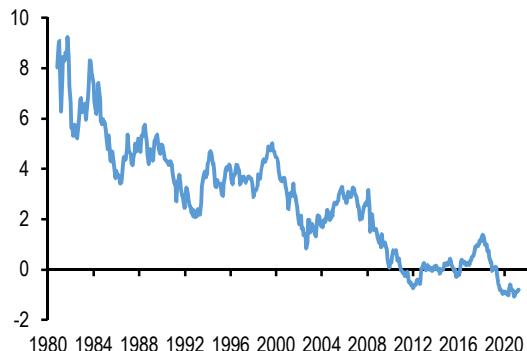


- Since the 1980s, most long-term forces have applied downward pressure on US real bond yields. Demographic changes caused a global savings glut; growth slowed in most countries and was concentrated in low investment sectors; income and wealth inequality grew; countries accumulated vast reserves; there was substantial globalization; corporate profits and savings surged; macro volatility was restrained; and financial repression intensified.
- Over the next 10 years, a number of forces will likely begin to put upward pressure on real bond yields. A demographic reversal should reduce savings; climate objectives will demand substantial increases in investment; fiscal debt will reach historic highs; corporate profit margins and savings are likely to partially revert; geopolitical risks and tensions will probably drive partial deglobalization; and higher macro volatility is probable.
- Some forces historically reducing real yields are likely to plateau. Income and wealth inequality have stabilized, with a decent chance of partial reversion. International reserve accumulation has slowed substantially, with the possibility of partial de-dollarization. Financial repression has likely stabilized.
- Two forces should continue applying downward pressure on real yields. Trend growth is likely to continue decelerating, and low investment sectors like health care and education should continue to grow as a share of economies.
- Upward pressures on real yields should outweigh downward pressures into the future. US real yields 10 years out should be higher than on average in the 2010s, comparable to real yields in the pre-GFC 2000s, but lower than on average in the 1990s. This implies a ~3% real yield on the US Agg and a ~2.5% real yield on 10yr US Treasuries.
- If expected inflation reverts to a 2% long-term average, this gives a ~5% nominal yield on the US Agg and a ~4.5% nominal yield on 10yr US Treasuries. However, we have argued that there is a strong risk that we have entered a new regime with higher macro vol and on average higher inflation. We could easily see long-term expected inflation staying at ~3%, implying long-term targets for a nominal US Agg yield of ~6% and a nominal 10yr US Treasury yield of ~5.5%.

Many economic theories have been advanced to account for the persistent decline of real interest rates in the US, and the world more generally, since the 1980s. Whether real yields will remain at current depressed levels into the future is a matter of great debate. In this paper, we construct long-term forecasts for US real interest rates some 10 years out by assessing 11 long-term forces that, in our view, will influence US real interest rates into the future. Then, taking a view of average long-term expected inflation, we construct long-term forecasts of US nominal interest rates.

While the decline in real yields since the 1980s has been observed around the world, our primary focus in this paper is on US bond yields since the US market makes up more than half the world bond market by capitalization and thus likely reflects global forces. In Figure 1, we plot the real yield on the Bloomberg US Aggregate Bond Index since the 1980s.<sup>1</sup> There has been a steady and persistent decline from an average level of ~6% in the 1980s to the current negative levels.

**Figure 1: Real yield on the US Aggregate Bond Index**  
 %, 7/1981-12/2021, monthly data, see footnote 1 for calculation.



Sources: J.P. Morgan, Federal Reserve Bank of Philadelphia, Bloomberg Finance L.P.

Broadly speaking, many theories rationalizing the decline of real yields fundamentally relate to the **balance between savings and investment** in an economy, where savings reflect the supply of available funds,<sup>2</sup> and investment reflects the demand for those funds. Increases in the propensity to save, depicted as an outward shift in the saving schedule, tend to decrease real interest rates, while increases in the propensity to invest, depicted as an outward shift in the investment schedule, tend to increase real interest rates.

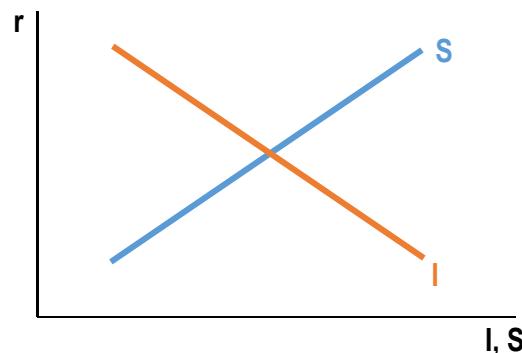
Several accounts for the decline in real interest rates do not relate directly to the balance between savings and investment. For example, one body of research emphasizes the substantial **growth in demand for safe**

<sup>1</sup> The real yield is constructed by subtracting 10-year ahead expected inflation from the nominal yield. Inflation expectations each quarter are from either the Survey of Professional Forecasters, the Livingston Survey, or the Blue Chip Economic Indicators – depending on availability. All data are sourced from the Philadelphia Fed. Where there are no 10-year ahead inflation expectations data for a quarter, the value is interpolated. Expected inflation is taken to be the same for each month within a quarter.

<sup>2</sup> Aggregate saving is the sum of private saving, which reflects private spending decisions, and public saving, which reflects the budget surplus or deficit.

**and liquid assets**, such as US Treasuries. As demand shifts towards these assets, the real yields on these assets should fall.

**Figure 2: Interest rate determination**

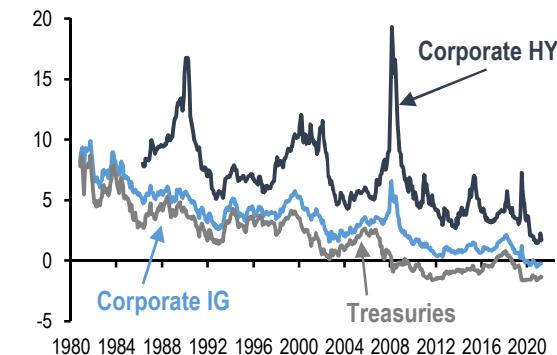


Sources: J.P. Morgan.

Conceptually, theories with effects mediated by the balance between aggregate savings and investment ought to have common implications for the yields of all interest-bearing assets, whereas theories based on the demand for safe or liquid assets ought to bear more directly upon spreads and the yields of particular assets.

**Figure 3: Real yields on the Bloomberg US Treasury, Corporate IG, and Corporate HY bond indices**

%, 7/1981-12/2021, monthly data, see footnote 1 for calculation.



Sources: J.P. Morgan, Federal Reserve Bank of Philadelphia, Bloomberg Finance L.P.

Figure 3 plots the real yields on the Bloomberg US Treasury Index, the Bloomberg US Corporate Bond Index, and the Bloomberg US Corporate High Yield Bond Index. While spreads have fluctuated around economic crises, real interest rates have persistently trended down since the 1980s in each asset class. This suggests a **predominant role for factors which affect the balance between savings and investment**. Since the 2000s, there appears to have been a slight widening in spreads, suggesting a **secondary role for the growth in demand for safe or liquid assets** like US Treasuries.

**Table 1: Average real yields on 10yr US Treasuries and the Bloomberg US Agg, Treasury, Corporate IG, and Corporate HY bond indices in each decade**

%, 7/1981-12/2019, monthly data, see footnote 1 for calculation.  
 Corporate HY from 1/1987.

	US Agg	US Treasuries	US 10yr Treasury	US Corporate IG	US Corporate HY
1980s	5.75%	5.13%	5.42%	6.63%	9.50%
1990s	3.66%	3.06%	3.34%	4.17%	8.08%
2000s	2.57%	1.48%	1.93%	3.41%	8.08%
2010s	0.22%	-0.63%	0.10%	1.12%	4.41%

Sources: J.P. Morgan, Federal Reserve Bank of Philadelphia, Bloomberg Finance L.P.

## A cycle-neutral forecast

Short term, the business cycle is arguably the most important driver of movements in interest rates. As argued in a recent issue, a long-term forecast should be seen some 10 years out as an average, neutral, or equilibrium level across the business cycle. Hence, in our effort to derive long-term forecasts of interest rates, we will not consider shorter-term business cycle conditions or counter-cyclical monetary or fiscal policy.

## 1 – Demographics

We recently assessed the impact of demographics on interest rate dynamics in our paper, [A demographic reversal to start pushing real interest rates up](#) (March 2, 2022). The findings are summarized here, but further details are available in that paper. There, a large panel of data – with coverage of nearly 200 countries for varying periods of time between 1960 and 2020 – was used to assess the effect of demographic changes on savings and investment, and consequently upon real interest rates.

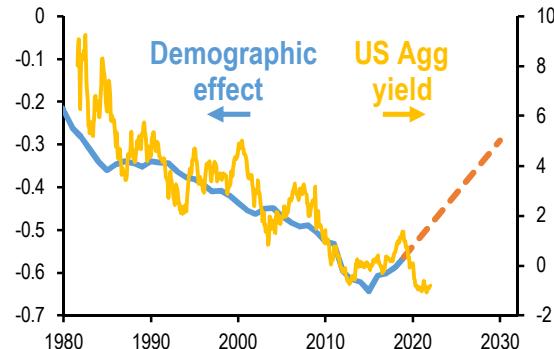
Our results indicated that **increases in the old-age share of populations tended to decrease both savings and investment, with a proportionally larger effect upon savings**. The empirical relationship between the old age share and savings accords with the life-cycle theory of savings, whereby individuals save in their working years and run down their savings in retirement. The effect upon investment is consistent with old-age population growth driving a shift in economic activity from investment towards consumption, in the form of health care services amongst others. This downward pressure on desired savings relative to investment tends to increase real interest rates.

We also found that **increases in life expectancy were associated with increases in both savings and**

**investment, with a proportionally larger effect upon savings.** As individuals anticipate greater longevity, they ought to save more for their retirement, conditional upon relatively stable retirement ages, for which there is empirical evidence. Increased longevity should also tend to increase investment insofar as it is associated with greater population and demand growth. This upward pressure on desired savings relative to investment tends to decrease real interest rates.

Finally, we found that increases in the fertility rate were associated with increases in both savings and investment. Since the effect of fertility on savings and investment were comparable, changes in fertility rates over time were not consequential for the balance between desired savings and investment, and thus not of first-order significance when considering real interest rates.

**Figure 4: Estimated effects of demographic changes in G20 countries since 1960 and the real US Agg yield since 1980**  
 %, nominal yield minus 10-year expected inflation (see fn 1).



Sources: J.P. Morgan, UN Population Division, World Bank, Federal Reserve Bank of Philadelphia, Bloomberg Finance L.P.

Having documented the empirical relationships between demographic variables and the balance between desired savings and investment, we assessed the historical effect of demographic changes on real interest rates, and the anticipated future effect of demographic changes through to 2030. To do so, we conducted counterfactual analysis in which we assessed how much higher or lower desired savings or investment would have been at each point in time in each country if demographic characteristics were fixed at their 1960 levels. Weighting these differences by GDP, demographic changes in G20 countries tended to increase desired savings relative to investment through to 2015, since demographic changes were largely characterized by the growth in life expectancies over this period. This downward pressure on real interest rates coincided with a decline in real yields, as shown for the US Agg in Figure 4.

Looking forward to 2030, it is likely there will be a reversal as demographic changes are increasingly characterized by increases in old-age population shares, and decelerating growth in life expectancies. This forecast reversal is depicted as a dashed red line in Figure 4. By 2030, estimates suggest that the effect of demographic changes on the balance between desired private savings and investment would revert to a level last observed in the 1980s.

Moreover, we argue that while the effect of demographic changes on government savings has likely been muted thus far, upward pressure on real interest rates in the future will likely be exacerbated by the deterioration of public finances as net fiscal outlays rise with ageing populations. The role of public debt is discussed in more depth below.

**In conclusion, empirical evidence indicates that demographics will be a force for higher interest rates in 2030 than at any point since the 1980s.**

## 2 – Climate investment

**In order to achieve objectives to reduce the carbon intensity of economies, substantial investment will be necessary** – over and above current investment levels. While there is considerable uncertainty as to the willingness of governments to make public investments, substantial growth in private investment is inevitable. This will entail the replacement of an obsolete and stranded capital stock, such as fossil fuel powered vehicles, and the upgrading of the existing capital stock – for example, by retrofitting existing buildings to meet more stringent efficiency standards. It will also entail large incremental investments in new industries, such as carbon capture and storage, and in the expansion of existing industries, such as lithium, cobalt and nickel mining.

The International Energy Agency (IEA) estimates that capital investment – in energy alone – under a 2050 net zero emissions plan would increase from 2.5% of global GDP to 4.5% of global GDP by 2030.<sup>3</sup> This accords with International Monetary Fund (IMF) estimates that an incremental increase of investment by between 0.5% and 4.5% of cumulative GDP is required over the next decade, with most estimates in the vicinity of 2%.<sup>4</sup> Pisani-Ferry (2021) argues that current forecasts indicate

<sup>3</sup> International Energy Agency, [Net Zero by 2050: A Roadmap for the Global Energy Sector](#) (2021).

<sup>4</sup> International Monetary Fund, [Reaching Net Zero Emissions](#) (2021).

that the public and private investment required to meet climate objectives will likely rise to a level of macroeconomic significance by 2030, noting that a 2 percentage point increase in the investment-to-GDP ratio globally would more than reverse the decline from 25.7% in the 1980s to 24.3% in the 2010s.<sup>5</sup>

Moreover, to the extent that governments incur expenses in the mitigation or management of the effects of climate change, meeting this challenge will create additional strain on government budgets, leading to a reduction in public saving on the margin. The resultant effect on real interest rates, which is mediated by fiscal expenditure and public debt, will be discussed in greater depth below.

All considered, climate investment is a force for future real interest rates to be higher relative to any previous period, *ceteris paribus*.

## 3 – Sectoral composition of economies

As a country grows, there is a transition in the share of economic output derived from high investment sectors, such as agriculture, to low investment sectors, such as health care. To assess this change in the structural composition in the US, we consider the ratio of value added produced by high and low investment sectors, based on National Income and Product Accounts (NIPA) data. The investment intensity of 20 broad sectors in the North American Industry Classification System (NAICS) is calculated as investment in private fixed assets<sup>6</sup> in a sector in 2019 divided by value added from that sector. Sectors with below median investment intensity by this definition are classified as low investment sectors, and sectors with above median investment intensity are classified as high investment sectors.<sup>7</sup>

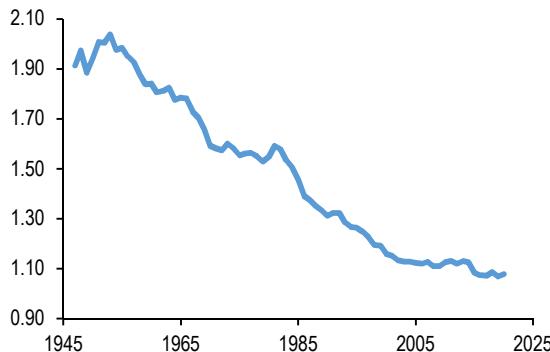
<sup>5</sup> Jean Pisani-Ferry, [Climate policy is macroeconomic policy, and the implications will be significant](#) (2021) Peterson Institute for International Economics, Policy Brief 21-20.

<sup>6</sup> According to NIPA: “Fixed assets consist of structures, equipment, and intellectual property products that are used in the production of goods and services. Private fixed investment encompasses the creation of new productive assets, the improvement of existing assets, and the replacement of worn out or obsolete assets.”

<sup>7</sup> Low investment intensity sectors: wholesale trade, construction, accommodation and food services, other services, except government, health and social assistance, administrative and waste management services, retail trade, management of companies and enterprises, professional, scientific, and technical services, and educational services. High investment intensity sectors: finance and insurance, transportation and warehousing, arts, entertainment, and recreation, durable goods, nondurable goods, real estate and rental and leasing,

Figure 5 plots the ratio of value added produced by high investment intensity sectors relative to the value added produced by low investment intensity sectors from the inception of NIPA data to 2020. Over this period, there was a marked decline in the relative share of value added produced by sectors of the economy with high investment intensity, though the rate of decline moderated substantially after 2000. Taking as given sectoral investment intensity in 2019, this compositional transition would imply approximately a 1.5 percentage point reduction in investment as a share of GDP between 1980 and 2020, though all of this change was realized by 2000, with no subsequent effect.

**Figure 5: Ratio of value added produced by high investment sectors relative to low investment sectors in the US**  
1947-2020, annual data.



Sources: J.P. Morgan, US Bureau of Economic Analysis.

If this sectoral transition continued, this would be one force for declining investment rates in developed countries, although the magnitude of these declines is likely to be small, based on recent historical evidence. However, changes in sectoral composition are likely to be a large factor reducing investment intensity in many middle-income developing countries, including China, with shrinking agriculture and, in time, manufacturing sectors (as a share of total economic activity). Based on the US experience of declining agriculture and manufacturing shares since 1947 as a benchmark, this will probably eventually reduce investment as a share of GDP in these emerging markets by around 2 percentage points, all else being equal, though the change realized by 2030 is very likely to be somewhat smaller.

**On the margin, this would tend to decrease the investment intensity of the global economy, thereby putting downward pressure on real interest rates in**

information, agriculture, forestry, fishing, and hunting, utilities, and mining.

**2030 relative to any previous period.** However, the strength of this effect at a global level is likely moderated by the fact that the largest changes in investment intensity due to compositional change have likely already occurred in most DM countries, which account for the majority of global economic activity. These countries have, to a large extent, already transitioned out of agriculture and manufacturing.

#### 4 – Economic growth

Two core mechanisms by which economic growth may affect real interest rates are emphasized in the literature.<sup>8</sup> Firstly, faster growth ought to increase the return on investment and capital expenditure.<sup>9</sup> Secondly, faster growth ought to raise consumption and reduce saving as individuals anticipate higher future income. Both mechanisms ought to lead to a **positive correlation between economic growth and real interest rates**.

Over a longer horizon, **it is likely that the trend rate of economic growth will slow in both developed and emerging economies**. Firstly, a substantial share of the decline in trend economic growth is attributable to economic structural change. The transition from high productivity growth in agriculture and manufacturing towards low productivity growth in services is a robust empirical regularity – this is Baumol's 'cost disease'. This will likely weigh particularly on growth in middle income emerging economies, such as China.

Moreover, as argued by Duernecker et al. (2021), there is also typically a transition of economic activity within services away from relatively high labor productivity growth service sectors, such as telecommunications and transportation, towards relatively low labor productivity growth services, such as health care and education.<sup>10</sup>

The consequences of these transitions are clear in US real GDP per capita growth, which has trended down over time, as depicted in Figure 6. However, Duernecker et al. (2021) argue that most of the productivity reducing effects of these transitions have now been realized in the US, so these will not tend to substantially reduce US

<sup>8</sup> Sylvain Leduc and Glenn Rudebusch, [Does Slower Growth Imply Lower Interest Rates?](#) (2014) *Federal Reserve Bank of San Francisco Economic Letter* 2014-33.

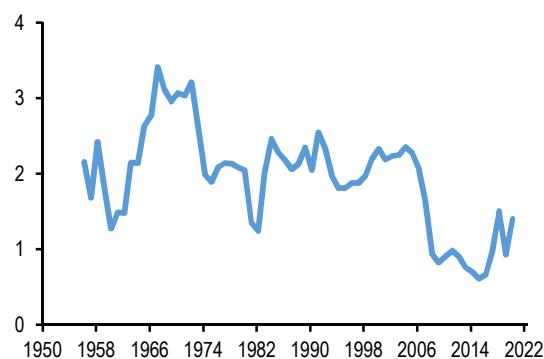
<sup>9</sup> There is a bi-directional causal relationship between investment and economic growth, since increases in investment should themselves accelerate economic growth due to capital accumulation.

<sup>10</sup> Georg Duernecker, Berthold Herrendorf and Akos Valentinyi, [Structural Change within the Services Sector and the Future of Cost Disease](#) (2021) *Working Paper*.

trend growth further into the future. The deceleration of trend growth due to these transitions will likely continue in less developed economies with larger agriculture and manufacturing sectors.

**Figure 6: Annualized US real GDP per capita growth rate over the preceding ten years**

1947-2021, annual data.



Sources: J.P. Morgan, US Bureau of Economic Analysis.

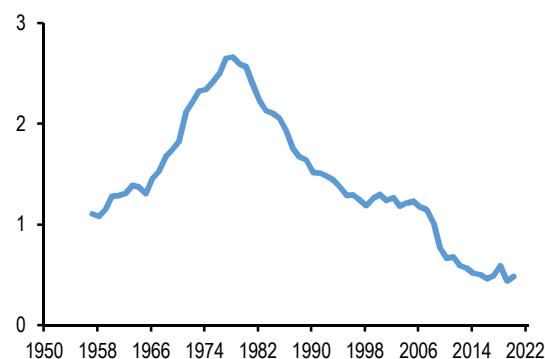
Some counter that digitalization and technological advances have the capacity to drive an acceleration in economic growth into the future. Such ‘accelerationist’ arguments are not new. The trend rate of economic growth in the US continued to decline in spite of the widespread adoption of computers and information technologies, which was heralded as the ‘third industrial revolution’. Proponents of this accelerationist view argue that the apparent non-materialization of these changes in productivity data reflects measurement error. For example, one would underestimate productivity growth in the IT sector if the decline in information technology quality-adjusted prices were underestimated. However, productivity improvements from the adoption of information technologies by businesses ought to be reflected in their measured productivity, as argued by Nordhaus (2021).<sup>11</sup> For our purposes here, we note that the majority of recent economic research weighs against the accelerationist view.<sup>12</sup>

As discussed above, demographic changes will also likely weigh on economic growth ex-Africa. For example, the rate of growth of the labor force in the US, plotted in Figure 7, has trended down consistently since the 1970s, after the maturation of labor force growth due

to increased female labor force participation and the ‘Baby Boomer’ generation entering the workforce. Since our demographic analysis above countenanced demographic effects on savings and investment which were mediated by their effects upon economic growth, we do not focus on the effect of demographics on economic growth here to avoid ‘double counting’.

**Figure 7: Annualized US labor force growth rate over the preceding ten years**

1948-2021, annual data.



Sources: J.P. Morgan, US Bureau of Labor Statistics.

**In sum, structural trends will likely lead to slower trend economic growth in the future in both developed and emerging economies**, though the effect will likely be moderated in highly-developed economies with the attenuation of the productivity-reducing effect of changes in sectoral composition. **All else being equal, this would likely tend to reduce real interest rates.**

## 5 – Income and wealth inequality

It is argued that **changes in income and wealth inequality should affect the rate of saving** in a country because individuals with different income and levels of wealth have different saving propensities.<sup>13</sup> Thus, changes in the distribution of income or wealth over time may affect real interest rates.

Empirical research suggests that the marginal propensity to save is positively correlated with income and household wealth, so increases in inequality should increase national savings. Auclert and Rognlie (2020) estimate that approximately 70bp of the observed decline in real interest rates in the US since the 1980s can be

<sup>11</sup> William Nordhaus, [Are We Approaching an Economic Singularity? Information Technology and the Future of Economic Growth](#) (2021) 13(1) *American Economic Journal: Macroeconomics* 299-332.

<sup>12</sup> See also Robert Gordon, [Secular Stagnation: A Supply-Side View](#) (2015) 105(5) *American Economic Review* 54-59.

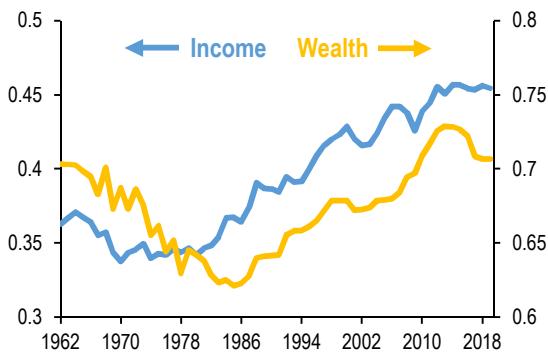
<sup>13</sup> See, e.g., Tullio Jappelli and Luigi Pistaferri, [The Consumption Response to Income Changes](#) (2010) 2(1) *Annual Review of Economics* 479-506; and Tullio Jappelli and Luigi Pistaferri, [Fiscal Policy and MPC Heterogeneity](#) (2014) 6(4) *American Economic Journal: Macroeconomics* 107-136.

accounted for by rising income inequality in the US over that time.<sup>14</sup>

Figure 8 plots the shares of income earned and wealth held by the top 10% over time in the US based on survey and tax microdata aggregated by the World Inequality Database.<sup>15</sup> In the US, **the share of income and wealth accruing to the top 10% increased considerably since the 1980s**, though this growth attenuated towards the end of the 2010s.<sup>16</sup> These trends are qualitatively consistent with those observed in the same database in other developed markets, such as Germany and Japan. Though data are more limited, this also appears consistent with inequality dynamics in China, where the share of income earned by the top 10% increased from 27.8% in 1978 to 43.1% in 2011, before decreasing slightly. With a policy realignment towards the Common Prosperity framework in China, it is likely that these changes will be persistent.

**Figure 8: Share of US income earned and wealth held by the top 10%**

1962-2019, annual data.



Sources: J.P. Morgan, World Inequality Database.

Typically income and wealth distribution data are reported with a lag. Thus, most databases do not provide systematic coverage of developments over the course of the pandemic, which may have materially altered the trajectory of inequality. To assess the effect of the pandemic on these trends, we use a novel database constructed by Blanchet et al. (2022), which provides high-frequency, ‘real-time’ US microdata.<sup>17</sup> These data indicate that the share of disposable income (income plus

<sup>14</sup> Adrien Auclert and Matthew Rognlie, [Inequality and Aggregate Demand](#) (2020).

<sup>15</sup> [World Inequality Database](#) (2022).

<sup>16</sup> These trends in income shares are consistent with the rising Gini index in the US from the inception of World Bank estimates in 1991 to present.

<sup>17</sup> Thomas Blanchet, Emmanuel Saez and Gabriel Zucman, [Real-Time Inequality](#) (2022).

transfers minus taxes) earned by the top 10% increased marginally from 39.9% in February 2020 to 40.1% in December 2021, with two sharp, temporary reductions associated with stimulus payments. Wealth held by the top 10% increased marginally from 71.2% in Q1/2020 to 71.7% in Q4/2021, coinciding with the run-up in asset prices. In these data, income inequality has been stable since 2012 by these measures, while wealth inequality has decreased slightly over that time. Thus, these data indicate that **the pandemic has not materially altered the long-term trajectory of income or wealth inequality in the US**.

Looking forward, **we anticipate the stabilization in income and wealth inequality will persist, with the possibility of a partial reversal**. It has been argued that part of the historical increase in income inequality in the US can be accounted for by the decline in manufacturing employment.<sup>18</sup> However, according to the Bureau of Labor Statistics, manufacturing employment as a share of total employment has remained relatively stable at approximately 9% since the end of 2009, after a nearly 70-year decline. Moreover, the increased political salience of income and wealth inequality will likely contribute to more restrained growth in wage-polarizing globalization – as evidenced by the US-China trade war, and the US abandonment of the Trans-Pacific Partnership (TPP) and the Transatlantic Trade and Investment Partnership (TTIP) – and growing opposition to regressive tax and transfer reform, or indeed growing support for progressive tax reform, such as wealth taxes. Further, as discussed below, potential growth in labor bargaining power should in principle directly support labor income across the income distribution and compress corporate profit margins, with an indirect effect on asset prices and thereby on wealth inequality.

Thus, under our view of the future of income and wealth inequality, **it is likely that the depressing effect of growing inequality on real interest rates since the 1980s has fully matured, with the possibility of a partial reversal by 2030**.

## 6 – Reserve accumulation and sovereign wealth funds

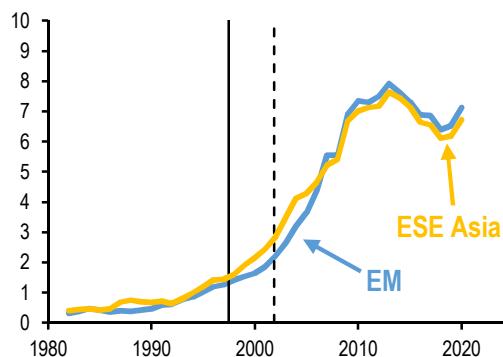
There has been **substantial growth in international holdings of reserves since the 1990s**, particularly in EM countries and East and Southeast Asia. Figure 9 plots international reserves (excluding gold) held by eight

<sup>18</sup> Natalija Novta and Evgenia Pugacheva, [Manufacturing Jobs and Inequality: Why is the U.S. Experience Different?](#) (2019) IMF Working Paper 19/191.

countries in East and Southeast Asia<sup>19</sup> and in a selection of large EM economies<sup>20</sup> as a share of world GDP since the 1980s. The solid black line indicates the Asian Financial Crisis, which severely affected these East and Southeast Asian economies, with the exception of China and Japan. Holdings of international reserves increased appreciably in these countries in the aftermath of this crisis, likely due to revised risk perceptions. The dashed black line indicates China's accession to the World Trade Organization (WTO) in 2001, after which China's trade surpluses and reserve accumulation burgeoned. These accumulated reserves are heavily invested in government-issued securities, putting downward pressure on real interest rates, particularly on US Treasuries.<sup>21</sup>

**Figure 9: Reserve accumulation in EM and East and Southeast Asia (ESE Asia) as a share of world GDP**

%, 1982-2020, annual data. Solid black line indicates Asian Financial Crisis. Dashed black line indicates China WTO accession.



Sources: J.P. Morgan, World Bank, IMF.

In the set of large EM economies, reserves peaked at approximately \$6.1 trillion (7.9% of world GDP) in 2013, before declining to \$6.0 trillion (7.1% of world GDP) in 2020. There was a modest increase in reserve holdings with the onset of the pandemic. To the extent that the accumulation of reserves reflects revised risk perceptions after financial and debt crises, **the decline in reserve holdings as a share of world GDP very likely reflects a judgment that sufficiently large buffers have been accumulated**. This judgment is likely supported by the fact that EM countries have largely

<sup>19</sup> China, Indonesia, Japan, Malaysia, the Philippines, South Korea, Thailand and Vietnam.

<sup>20</sup> Argentina, Brazil, China, India, Indonesia, Korea, Malaysia, Mexico, the Philippines, Russia, South Africa, Thailand, Turkey and Vietnam.

<sup>21</sup> Olivier Blanchard, Davide Furceri and Andrea Pescatori, A prolonged period of low real interest rates? in Coen Tulings and Richard Baldwin (eds), [Secular Stagnation: Facts, Causes and Cures](#) (2014).

withstood a period of great volatility during the pandemic without widespread currency or debt crises.

Moreover, as noted by our colleagues in US Fixed Income research ([Things ain't like they used to be](#), October 22, 2018), the share of reserves held in US dollars has trended down since 2000. According to the IMF COFER database, **the US dollar share of allocated reserves steadily declined from 71% in 2000 to 59% in 2020**. Relatedly, as argued by Ilzetzki et al. (2019), "an emergence of the renminbi as a major reserve currency could have important implications for the value of the dollar and advanced country interest rates".<sup>22</sup> Longer term, the same forces that underpinned the dominance of the US dollar as the world's reserve currency – economic gravity and centrality in global commerce – should support the role of renminbi as a major reserve currency. To the extent that this occurs, the depressing effect of reserve accumulation on US interest rates would attenuate.

On a related note, a number of countries – primarily oil and gas producers – have accumulated substantial assets in sovereign wealth funds. For example, assets held by the Norwegian Government Pension Fund increased from approximately \$23 billion in 1998 to approximately \$1.4 trillion in 2021.<sup>23</sup> Jointly, assets held by the sovereign wealth funds of Norway, Kuwait, Saudi Arabia, the UAE, and Qatar alone are estimated to be in the order of \$5 trillion (~6% of world GDP) in 2021.<sup>24</sup> Since these sovereign wealth funds are largely funded by fossil fuel revenues, contributions will likely continue to grow in proportion to fossil fuel consumption.

Thus, we assess that **asset accumulation in sovereign wealth funds will probably continue for the foreseeable future, but that other precautionary reserve accumulation will decrease as a share of world GDP. Moreover, there is a reasonable likelihood that the share of reserves held in US dollars will continue to trend downward. On balance, it is likely that the effect upon real yields through to 2030 will be approximately neutral relative to recent history, though any meaningful diminution of the US dollar as the predominant reserve currency would skew the effect towards higher US yields.**

<sup>22</sup> Ethan Ilzetzki, Carmen Reinhart and Kenneth Rogoff, [Exchange Arrangements Entering the Twenty-First Century: Which Anchor Will Hold?](#) (2019) 134(2) *Quarterly Journal of Economics* 599-646, p. 642.

<sup>23</sup> [Norges Bank Investment Management](#) (2022).

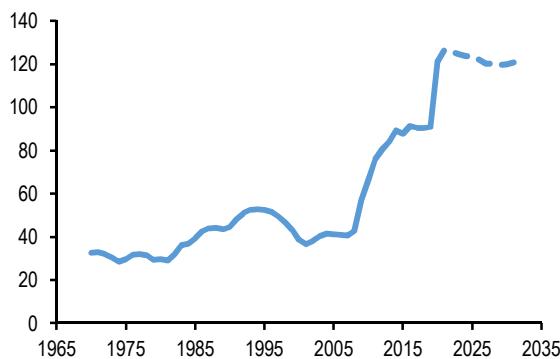
<sup>24</sup> [Sovereign Wealth Fund Institute](#) (2022).

## 7 – Fiscal debt and deficits

Laubach (2009) estimates that a 1 percentage point increase in federal debt as a share of GDP is associated with a 3 to 4 basis point increase in interest rates in the US.<sup>25</sup> More broadly, these are consistent with estimates by Kinoshita (2006) of the effects of government debt accumulation using a panel of data from 19 OECD countries.<sup>26</sup> Taking these estimates as given, it is possible to estimate the historical and forecast effect of debt accumulation in the US on interest rates. To do so, historical and forecast data on US federal debt held by the public and the Federal Reserve as a share of GDP are sourced from the Congressional Budget Office's July 2021 Budget and Economic Outlook,<sup>27</sup> and the Federal Reserve Bank of St. Louis.

**Figure 10: Historical and forecast US federal debt held by the public and the Federal Reserve as a share of GDP**

%, 1970-2031, annual data and estimates. Dashed line indicates CBO forecasts.



Sources: J.P. Morgan, Congressional Budget Office, Federal Reserve Bank of St. Louis.

Figure 10 depicts the historical share of federal debt held by the public and the Federal Reserve (the measures reported by the CBO) from 1970 to 2020, and the forecasts through to 2031. With the exception of a brief period in the 1990s, debt as a share of GDP has historically trended upwards in the US over this time span. From 1980 to 2020, the share increased by ~75 percentage points, with the most substantial increases during the GFC and the pandemic. Taking literature estimates as given, this implies that federal debt accumulation raised US interest rates over a

<sup>25</sup> Thomas Laubach, [New Evidence on the Interest Rate Effects of Budget Deficits and Debt](#) (2009) 7(4) *Journal of the European Economic Association* 858-885.

<sup>26</sup> Noriaki Kinoshita, [Government Debt and Long-Term Interest Rates](#) (2006) *IMF Working Paper WP/06/63*.

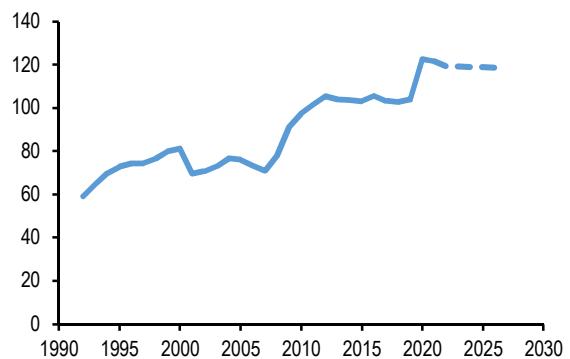
<sup>27</sup> Congressional Budget Office, [An Update to the Budget and Economic Outlook: 2021 to 2031](#) (2021).

counterfactual constant debt-to-GDP scenario by 225bp to 300bp over that time. According to the CBO, the federal debt-to-GDP share is forecast to stabilize around 120% in the 2020s.

Since there is a degree of global capital market integration, the accumulation of fiscal debt in other countries will tend to absorb savings, putting further upward pressure on US interest rates. Since the 1980s, there has been an accumulation of fiscal debt around the world. Figure 11 depicts historical and forecast general government debt<sup>28</sup> as a share of GDP for advanced economies from the IMF Fiscal Monitor database. The accumulation of debt in advanced economies broadly reflects that observed in the US. As in the US, limited growth in debt-to-GDP shares is forecast over the IMF forecast horizon through to 2026.

**Figure 11: Historical and forecast general government debt in advanced economies as a share of GDP**

%, 1992-2026, annual data and estimates. Dashed line indicates IMF forecasts.



Sources: J.P. Morgan, IMF.

An important caveat to the argument that rising debt will put upward pressure on rates is that real yields have persistently declined while debt as a share of GDP has increased substantially since the 1980s. This has been taken by some as evidence that putative ‘crowding out’ effects are in fact negligible. However, Rachel and Summers (2019) argue that, **while the growth in advanced economy debt has exerted upward pressure on real interest rates, that effect has been dominated by forces which have exerted downward pressure since the 1980s**, such as long-term growth declines, growing inequality, and demographic changes, which we

<sup>28</sup> General government debt is distinct from federal debt in the US context, since it includes all government units, including state and local governments.

also discuss in this paper.<sup>29</sup> This view accords with the analysis in this paper, which indicates that most forces served to reduce real yields between the 1980s and the 2010s.

While there is a possibility of endogenous rises in debt aversion due to rising interest costs and post-pandemic economic normalization, **it is very likely that debt will remain at historic post-WWII highs by 2030** with upside risk, especially due to increasing acceptance of the view that fiscal borrowing is justifiable when the rate of economic growth exceeds the interest rate,<sup>30</sup> and a growing view that putative increases in interest rates associated with increases in public debt have not materialized.

**In conclusion, given the growth in public debt in recent years, the accumulation of debt is a force for US interest rates to be higher by 2030 than in any preceding decade through to the 2010s, even if debt stabilizes as a share of GDP from this point forward.**

## 8 – Corporate profits

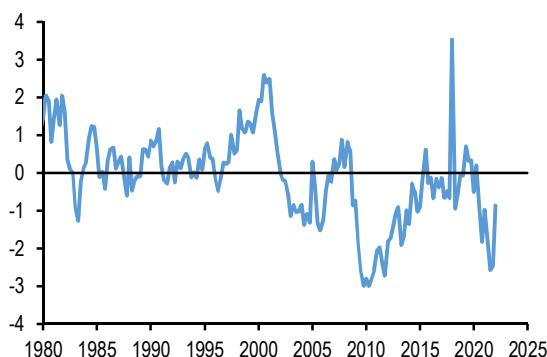
**When profits grow, corporates have greater ability to internally fund capital expenditure, without recourse to financial markets for external funding, thereby reducing the demand for loanable funds.** Figure 12 plots non-financial corporate capital expenditures minus gross savings as a share of GDP – a measure of the ‘financing gap’ – using data sourced from the US Financial Accounts.<sup>31</sup> While there is cyclical variation, there has been a downward trend in this financing gap since around 2000, denoting a rise in US corporate savings relative to capital expenditures. Similar trends are also observed using free cash flow data in the Euro area and Japan.

This trend since 2000 in the US coincides with a period in which there was significant growth in corporate profits. Figure 13 plots corporate profits after tax from

NIPA as a share of GDP.<sup>32</sup> The same figure also depicts the effective tax rate on an inverse axis, calculated as US corporate tax receipts divided by corporate profits before tax. Since the 1980s, there has been substantial growth in corporate profits as a share of US GDP – especially since 2000 – from a low of ~4% in 1986 to a historic high of ~12% in 2021. Over this time, the effective corporate tax rate decreased from ~26% to 9%. The strong negative correlation between these variables indicates that **declining effective corporate tax rates** were an important contributor to the growth in US corporate profits since the 1980s.

**Figure 12: Capital expenditures of non-financial corporates minus gross savings (less net capital transferred) as a share of GDP in the US**

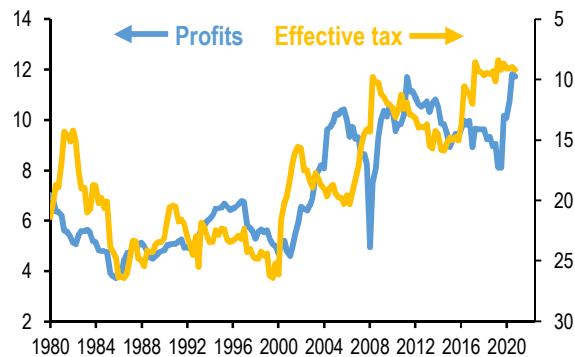
%, Q1/1980-Q4/2021, quarterly data.



Sources: J.P. Morgan, Board of Governors of the Federal Reserve System, US Bureau of Economic Analysis.

**Figure 13: US corporate profits after tax as a share of GDP and the effective US corporate tax rate (inverted axis)**

%, Q1/1980-Q3/2021, quarterly data.



Sources: J.P. Morgan, US Bureau of Economic Analysis.

<sup>29</sup> Lukasz Rachel and Lawrence Summers, [On Secular Stagnation in the Industrialized World](#) (2019) Brookings Working Paper.

<sup>30</sup> See, e.g., Jason Furman and Lawrence Summers, [A Reconsideration of Fiscal Policy in the Era of Low Interest Rates](#) (2020) Brookings Working Paper.

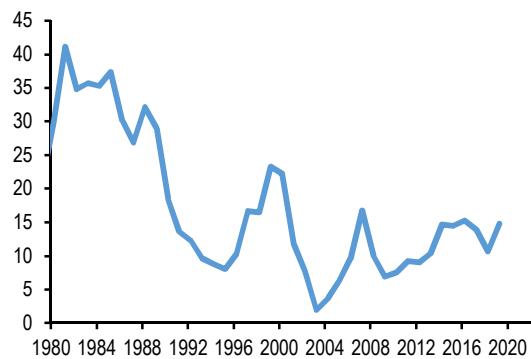
<sup>31</sup> [Financial Accounts of the United States – Z.1](#) (2022). Data are from Table F.103. We construct the measure of the ‘financing gap’ as capital expenditures (line 10) minus gross savings less net capital transfers paid (line 8).

<sup>32</sup> Our measure of profits is corporate profits after tax without inventory valuation adjustment and capital consumption adjustment.

Figure 14 shows US corporate net interest payments as a share of before tax profit. Since the 1980s, **corporate net interest payments have decreased as a share of profits**, reflecting the coincident decline in interest rates over this time. This suggests that the secular decline in interest rates was another factor supporting the growth in US corporate profits since the 1980s. Thus, the growth in corporate profits and savings due to reduced borrowing costs has an amplifying effect upon changes in interest rates. That is, as interest rates decline, this contributes to the growth of corporate profits and savings, which supports declining interest rates, and *vice versa*.

**Figure 14: US corporate net interest payments as a share of before tax profits**

%, 1980-2020, annual data.



Sources: J.P. Morgan, US Bureau of Economic Analysis.

In [Deglobalization](#) (April 5, 2019), we also argued that the **globalization has historically supported the growth of US corporate profits**, consistent with other economic research. One counter-argument is that globalization raises competitive pressures on businesses. However, empirical analysis by De Loecker et al. (2016) indicates that firms tend to raise price markups over cost after trade liberalization.<sup>33</sup> Moreover, globalization increases the capacity for corporates to engage in tax arbitrage.

Furthermore, we argued in [Business concentration](#) (September 30, 2020) that the **growth in business concentration supported growth in profits and margins**, through the use of monopoly power in output markets and monopsony power in labor markets.<sup>34</sup> In the

<sup>33</sup> Jan De Loecker, Pinelopi Goldberg, Amit Khandelwal, Nina Pavcnik, [Prices, Markups, and Trade Reform](#) (2016) 84(2) *Econometrica* 445-510.

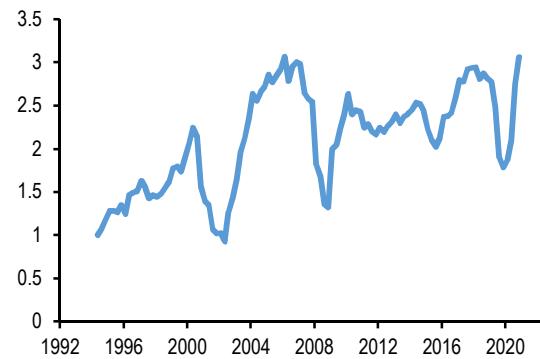
<sup>34</sup> See also, Jan De Loecker, Jan Eeckhout and Gabriel Unger, [The Rise of Market Power and the Macroeconomic Implications](#) (2020) 135(2) *Quarterly Journal of Economics* 561-644.

US, one account for this growth in concentration is rising corporate power in light of weaker antitrust enforcement, growth in the volume of mergers and acquisitions, and growth in regulatory barriers to entry. Kroen et al. (2021) also recently argued that record low interest rates have contributed to this growth in business concentration, since lower rates are disproportionately beneficial for large corporates.<sup>35</sup>

Beyond the US, Chen et al. (2017) provide evidence that the corporate saving rate at a global level has increased considerably since 1980.<sup>36</sup> Figure 15 plots an index of global corporate profits to global GDP from 1995 to present. This index is constructed by dividing a GDP-weighted index of global corporate profits by an index of world GDP sourced from the IMF.<sup>37</sup> Global corporate profits data are aggregated by our colleagues from the Economic Research team using MSCI data on listed company earnings.<sup>38</sup> **The growth in global corporate profits reflects that observed in the US.** As in the US, this likely at least partially reflects global corporate tax reductions. Between 2000 and 2021, the average statutory corporate tax rate in OECD countries decreased from 30.4% to 21.5%.

**Figure 15: Global corporate profit to GDP index (1995 = 1)**

%, Q1/1995-Q3/2021, quarterly data.



Sources: J.P. Morgan, IMF, MSCI, Bloomberg Finance L.P.

<sup>35</sup> Thomas Kroen, Ernest Liu, Atif Mian and Amir Sufi, [Falling Rates and Rising Superstars](#) (2021) *NBER Working Paper* #29368.

<sup>36</sup> Peter Chen, Loukas Karabarbounis and Brent Neiman, [The Global Rise of Corporate Saving](#) (2017) *NBER Working Paper* #23133.

<sup>37</sup> The world GDP index is constructed using world GDP in current US dollars from the IMF. Since those data are available at an annual frequency, world GDP is taken to be the same in each quarter of the same year.

<sup>38</sup> See Joseph Lupton and Bruce Kasman, [Profit stall threatens global expansion](#) (June 21, 2016).

Looking forward, it is **unlikely that corporate tax cuts will support further corporate profit growth** given the current historically low effective rates, especially in light of the recent multilateral agreement on a 15% global minimum corporate tax rate.

Moreover, further growth in global integration is unlikely given geopolitical tensions, the maturation of growth due to prior integration initiatives like the creation of the Eurozone, growing trade skepticism, the apparent US abandonment of the TPP and the TTIP, stalled multilateral initiatives such as the WTO Doha Round, and the shifting composition of global economic activity towards less-traded services. In fact, there is a material risk that **a retreat in globalization could put downward pressure on corporate profit margins** if corporates are compelled to reconstitute supply chains.

In relation to business concentration, we believe there is downside risk on profit margins with growing political impetus for **stronger antitrust enforcement**. Any reversion of interest rates to higher levels would also tend to put downward pressure on corporate profits and margins directly through the resultant increase in borrowing costs and indirectly through the reduction in business concentration.

As we argued in our recent note, [Inflation, markets and the end of the Great Moderation](#) (September 17, 2021), there are signs that the US has entered a new policy paradigm which affords more weight to an employment maximization objective, at the expense of the price stability objective. If greater weight were placed on employment maximization, this would likely increase the **bargaining power of labor**, a key determinant of profit margins. It is worth noting, however, that recent labor tightness has coincided with increasing wages, but even larger increases in prices.

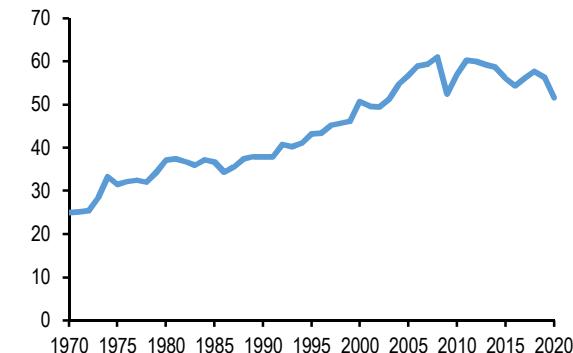
**In sum, we believe most evidence suggests there is a risk that corporate profits will partially revert from current historically high levels. This would tend to reduce the capacity of corporates to internally fund capital expenditure without recourse to financial markets. In turn, this should put upward pressure on real interest rates relative to recent history.** However, it is unlikely that corporate profits will decrease to record lows observed in the 1980s, when effective corporate taxes were substantially higher than present levels.

## 9 – Deglobalization

We have written in the past about the risks of [deglobalization](#).<sup>39</sup> Two dimensions of deglobalization merit discussion here. Firstly, any **retrenchment in global goods trade would necessitate a degree of duplication of supply chains, with a corresponding need for additional fixed investment** in new productive capacity, raising the demand for capital. Figure 16 plots global trade as a share of world GDP sourced from the World Bank. The persistent growth in world trade plateaued from the mid-2000s, likely due to a maturation of global trade liberalization initiatives, as discussed above. While trade volumes as a share of GDP in the latter half of the 2010s were modestly lower than highs recorded in the late-2000s and early-2010s, the decline in trade volumes reported in 2020 is not necessarily indicative of a stronger downward trend, given the shock to economic activity posed by the pandemic. By all preliminary indications, global trade recovered with the re-opening of economies in 2021.

**Figure 16: Global trade (exports plus imports) as a share of world GDP**

%, 1970-2020, annual data.



Sources: J.P. Morgan, World Bank.

As alluded to above, there is a risk of trade fragmentation or regionalization due to re-emergent geopolitical tensions in recent years, and the rise of US-China 'strategic competition'. Thus, when considering the future of trade, risks are materially skewed to the downside.

Secondly, any **disintegration of global capital and financial markets would likely reduce the accessible pool of excess savings from a US perspective**. Habib and Venditti (2019) document that total global capital flows as a share of GDP increased substantially from 1990 to 2008, before subsequently reverting to levels

<sup>39</sup> See also [Deglobalization](#) (April 5, 2019).

observed in the late-1990s.<sup>40</sup> The same geopolitical risk factors raised in relation to the global goods trade are also applicable when considering financial flows. Thus, when considering the future of international capital flows, risks are again skewed to the downside.

**Importantly, even the perception of geopolitical risk should exert downward pressure on global integration**, even if there is in fact no realization of these risks. With any upward revision in risk perceptions, corporates and investors with cross-border interests would likely reduce exposure as a risk mitigation strategy, thereby affecting cross-border capital flows or global supply chain construction. There is little doubt that geopolitical risk perceptions have risen in recent years, so this will likely serve to constrain globalization.

Broadly considered, the evidence suggests that there has been a modest reversal of global integration at least to levels last observed in the 2000s. While it is difficult to analytically forecast the future of global integration, **the substantial skew of geopolitical risks to the downside and rising risk perceptions suggest there is a reasonable likelihood that global trade and financial integration will revert further than observed thus far, conceivably to the lower levels of integration observed in the 1990s. Through the two mechanisms discussed above, this would tend to put upward pressure on real yields in the US.**

## 10 – Increasing macro volatility

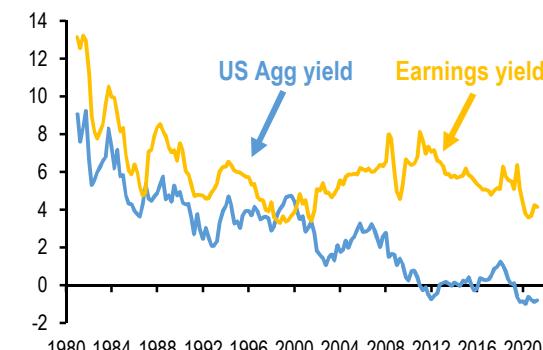
As discussed above, we recently argued that there is considerable risk that the period of low inflation and macro volatility since the mid-1980s – known as the Great Moderation – will come to an end, due to the adoption of new macroeconomic policies.<sup>41</sup> The adoption of these new policies is motivated by the perceived failures of Great Moderation policies to deliver high growth and reduce inequality. This has the potential to usher in a **new period of higher and more volatile inflation**. Since macro volatility is not easily diversified, this should raise term premia and the inflation risk premium accruing to bonds.<sup>42</sup> *Ceteris paribus*, this is a

force for higher real interest rates relative to the Great Moderation era since the mid-1980s.

## 11 – Financial repression

The analysis above focused upon determinants of the supply and demand for capital, and consequently upon the overall level of interest rates. Strictly speaking, however, the supply and demand for capital ought to govern the cap-weighted internal rate of return on the full set of financial instruments used to attract capital – equities and fixed income. Figure 17 plots the real US Agg yield and SPX earning yield (reverse trailing multiple). During the 1980s, both yields fell. From the 1990s on, real bond yields continued to fall, but equity yields did not follow and simply fluctuated around a stable mean.

Figure 17: Real yield on the US Aggregate Bond Index and the earnings yield (reverse trailing multiple) on the S&P500 %, Q3/1981-Q4/2021, quarterly data.



Sources: J.P. Morgan, Thomson Reuters, Bloomberg Finance L.P.

The divergence between these yields suggests end investors changed their “preferences” towards fixed income and away from equities. Some of this came from the growth in international holdings of reserves, where monetary authorities took over part of the management of a country’s excess savings. As discussed above, these reserves are primarily held in safe and liquid assets, such as US Treasuries, pushing down the yields on these assets relative to equities and to other fixed income assets.<sup>43</sup>

Another force has been ‘financial repression’. Financial repression typically refers to policies and regulations that force or incentivize end investors to focus their holdings

<sup>40</sup> Maurizio Michael Habib and Fabrizio Venditti, [The global capital flows cycle: structural drivers and transmission channels](#) (2019) ECB Working Paper #2280.

<sup>41</sup> [Inflation, markets and the end of the Great Moderation](#) (September 17, 2021).

<sup>42</sup> Jan Loeys and Nikolaos Panigirtzoglou found that inflation volatility was one of four key factors that historically explained long-term real yields in their [Fair Value Model for US Bonds, Credit and Equities](#) (June 30, 2005).

<sup>43</sup> Thus, the growth in international reserves also accounts for the widening of fixed income spreads over Treasuries from the 2000s on.

on certain advantaged asset classes.<sup>44</sup> Two dimensions of financial repression are particularly relevant. The first is policies or regulations that increase demand for fixed income relative to equities, thereby depressing returns on bonds relative to equities. The second is policies or regulations that increase demand for a subset of fixed income assets, such as liquid US Treasuries, relative to other fixed income assets, depressing relative returns on that subset.

There has been a proliferation of such policies and regulations in recent years, particularly post-GFC. For example, global implementation of the Basel Accords has raised regulatory capital requirements, compelling banks to hold more safe and liquid assets, such as US Treasuries. In the US, similar provisions were implemented under the Dodd-Frank Act. The strong demand created by these regulations served to depress yields on these assets.

Other financial institutions, such as pension funds and insurance companies, have faced comparable requirements or incentives to reallocate assets from riskier equities towards fixed income, typically in the form of risk-based capital/surplus requirements. For example, many defined-benefit pension plans thus moved towards 'immunizing' by constructing a bond-only portfolio which provides income flows that fully match the anticipated stream of pension liabilities. This reallocation of demand from equities to fixed income is one force for increasing yields on equities and decreasing yields on fixed income. This upward pressure on equity yields offsets forces with depressing effects on the yields of all assets – which were discussed at length above – with the consequence that equity yields did not continue to fall. There were no such offsetting effects for fixed income, which attracted stronger demand.

Regulatory frameworks of this kind, such as Basel III and the Dodd-Frank Act, are the product of structural reforms enacted in response to lessons learned from financial crises, and thus are almost certain to remain in place for the foreseeable future. While the Dodd-Frank Act is the subject of political debate, repeal or amendment is unlikely where doing so would be inconsistent with the provisions of the Basel Accords. While there is a possibility of enactment of more stringent regulation, such as Basel IV, it should be noted that proposed changes appear modest relative to reforms thus far, and remain in the consultation phase.

<sup>44</sup> Here, we do not consider quantitative easing to be a form of 'financial repression' but rather a short-term monetary policy tool used for counter-cyclical purposes.

**Thus, it is very likely that strong institutional demand for fixed income assets, and US Treasuries in particular, will persist for the foreseeable future. Given policies and regulations driving this demand were strengthened in response to the GFC, this would likely be neutral for real yields relative to the 2010s, but would tend to decrease yields relative to the pre-GFC period.**

## Putting the pieces together

With the exception of climate investment and fiscal debt accumulation, our analysis suggests that the forces discussed above applied growing downward pressure on real yields from the 1980s through to the 2010s. Taken together, it is therefore no surprise that real yields fell monotonically over this period.

Looking forward, quantitative forecasts for real yields in 2030 are constructed in a relativistic manner by comparing each point in time to preceding points in time to identify the bounds within which future real yields should lie.<sup>45</sup>

Specifically, we compare the effect of each force in 2030 to its average effect in each preceding decade since the 1980s, based on our analysis of each factor above. The results of this comparison exercise are reported in Table 2. The entry in each cell specifies how real yields in 2030 will compare to average real yields in a decade due to the identified factor, in our judgment. For example, 'Higher' in the 2010s-demographics cell indicates that demographic changes are a force for real yields to be higher in 2030 than they were on average in the 2010s. 'Comparable' in the 1980s-demographics cell reflects the view outlined above that, by 2030, the effect of demographic changes will revert to that observed in the 1980s.

Forming a quantitative forecast for real yields requires one to construct weights to be applied to each factor. Below, we present two parsimonious approaches. The first approach applies equal weights to each factor. The second approach classifies each factor into a high- or low-importance class, with double weight given to factors judged to be of greatest importance based on analysis above: demographics, climate investment, economic growth, reserve accumulation, fiscal debt, deglobalization, and financial repression.

<sup>45</sup> An approach of this kind is taken in Edward Gamber, [The Historical Decline in Real Interest Rates and Its Implications for CBO's Projections](#) (2020) Congressional Budget Office Working Paper #2020-09, which uses 1995-2004 as a historical benchmark.

**Table 2: Level of real interest rates in 2030 relative to averages in other decades due to each factor**

'Higher' indicates that the factor is a force for real yields to be higher in 2030 than on average in the specified decade. 'Lower' indicates that the factor is a force for real yields to be lower. 'Comparable' indicates that the factor is a force for real yields to be steady.

	1980s	1990s	2000s	2010s
<i>Demographics</i>	Comparable	Higher	Higher	Higher
<i>Climate investment</i>	Higher	Higher	Higher	Higher
<i>Sector composition</i>	Lower	Lower	Lower	Lower
<i>Economic growth</i>	Lower	Lower	Lower	Lower
<i>Inequality</i>	Lower	Lower	Lower	Comparable
<i>EM reserves</i>	Lower	Lower	Lower	Comparable
<i>Fiscal debt</i>	Higher	Higher	Higher	Higher
<i>Corporate profits</i>	Lower	Lower	Comparable	Higher
<i>Deglobalization</i>	Lower	Comparable	Higher	Higher
<i>Macro volatility</i>	Comparable	Higher	Higher	Higher
<i>Financial repression</i>	Lower	Lower	Lower	Comparable
<b>Overall</b>	<b>Lower</b>	<b>Lower</b>	<b>Comparable</b>	<b>Higher</b>

Sources: J.P. Morgan.

Real yield forecasts for 2030 are constructed as weighted averages, where each factor weight is multiplied by the average real yield from the preceding decade in which the effect of the factor was comparable. For example, the weight on demographics is multiplied by the average real yield from the 1980s, while the weight on inequality is multiplied by the average real yield from the 2010s. For those factors which are a force for real yields to be higher or lower than in any preceding decade – climate investment, sector composition, economic growth, and fiscal debt – we use yields moderately above the highest, or below the lowest, average yields in any other decade. The yields used in the calculation of the weighted averages are reported in Table 3.

The weighted average estimates of real yields in 2030 on 10yr US Treasuries and four US bond indices are reported in Table 4. The duration-weighted adjusted

version of the US Agg in the second row simply adds 35bp to yields on the US Agg in the first row, since Bloomberg reports a value-weighted yield, while yields on our own J.P. Morgan US Aggregate Index (which is duration-weighted) are in the order of 30-40bp higher. We discussed this rule of thumb in a [recent issue](#).

**We estimate that real yields will be higher than observed on average in the 2010s, comparable to real yields in the pre-GFC 2000s, but lower than observed on average in the 1990s.** The estimated yields are comparable under the equal and non-equal weighting schemes.

On one hand, it is likely that global GDP growth will be slower in the coming decade and concentrated in sectors with lower investment intensity relative to the 2010s. On the other hand, demographic changes, fiscal debt accumulation, climate investment, a moderation of

Alexander Wise  
(1-212) 622-6205  
alexander.c.wise@jpmchase.com

Jan Loeys  
(1-917) 602-9440  
jan.loeyns@jpmorgan.com

corporate profits, deglobalization, and growing macro volatility should put upward pressure on real yields relative to the 2010s. It is likely that reserve accumulation, inequality and financial repression have stabilized, and will thus be neutral for US rates with respect to the 2010s.

**Table 3: Real yields used for weighted average calculations**  
%, 7/1981-12/2019, monthly data, see footnote 1 for calculation.

	US Agg	US Treasuries	US 10yr Treasury	US Corporate IG	US Corporate HY
<i>Higher</i>	6.00%	5.50%	5.75%	7.00%	10.00%
1980s	5.75%	5.13%	5.42%	6.63%	9.50%
1990s	3.66%	3.06%	3.34%	4.17%	8.08%
2000s	2.57%	1.48%	1.93%	3.41%	8.08%
2010s	0.22%	-0.63%	0.10%	1.12%	4.41%
<i>Lower</i>	0.00%	-1.00%	-0.25%	0.75%	4.00%

Sources: J.P. Morgan, Federal Reserve Bank of Philadelphia, Bloomberg Finance L.P.

**Table 4: Forecasts for real yields on 10yr Treasuries and various US bond indices in 2030**

%, US Agg (duration weighted) adds 35bp to US Agg real yields, see text for details.

	Equal weight	Non-equal weight
US Agg	2.8%	2.9%
US Agg (Duration wgt)	3.1%	3.3%
US Treasuries	2.0%	2.2%
US 10yr Treasury	2.5%	2.7%
US Corporate IG	3.6%	3.8%
US Corporate HY	6.9%	7.0%

Sources: J.P. Morgan, Federal Reserve Bank of Philadelphia, Bloomberg Finance L.P.

## From real to nominal yields

Ultimately, investors want to formulate a view on where nominal bond yields will go. Above we developed a forecast for real yields. We thus “simply” have to add a forecast of average long-term expected inflation some 10 years from now. This is not as straightforward as it may at first appear.

As discussed by our Chief Economist, inflation is ultimately a policy choice ([Keep it simple: Inflation is a policy choice](#), Bruce Kasman, May 13, 2021). The

**Global Long-term Strategy**  
The Long-term Strategist  
04 April 2022

**J.P.Morgan**

Federal Reserve has not officially changed its **dual-mandate** objectives of achieving medium-term price stability and maximum employment, so this creates no basis for using anything else than ~2% as long-term expected US inflation. However, with only one policy instrument – its balance sheet – the Fed thus has to decide how much weight to put on each objective, as they cannot always be achieved simultaneously. Over recent decades, economists have generally argued that the central banks have no impact on long-term real variables and only set inflation. This has led many to increase the weight on their inflation objective.

In an issue last year on [Inflation, markets and the end of the Great Moderation](#) (September 17, 2021), we argued that there is an increasingly prevalent view in the US that the strong focus on achieving price stability has prevented policy from quickly reversing recession-induced damage to employment and growth, with long-term adverse economic consequences.

**Thus, we see a decent chance that the implicit weight on employment has risen versus that on price stability**, even though no formal such declaration has been made. If so, then we should be using a higher 10-year out US breakeven inflation rate than the 2% average level since the first TIPS issuance in 1997. There is no analytical way to put a basis-point precise number on this, but there is a good case to be made that it should be near 3%. Until 2014 – after which US and global inflation steadily surprised on the downside – the US 5-year, 5-year forward breakeven inflation rate averaged 2.5%. If we are right that the underlying inflation regime has changed, then it is probably safe to assume that long-term US inflation expected is due to eventually average 3% if not higher. For our purposes here, it thus seems relatively conservative to simply add 3% to our real yield target to produce a long-term target for nominal US bond yields, giving us 5.9% on the US Agg and 5.7% on the 10-year US Treasury.

## Conclusion

Since the 1980s, real interest rates have persistently declined in the US due to the combined effects of various forces. Looking forward, a number of forces will likely apply upward pressure on real yields. A demographic reversal should reduce savings, climate objectives will demand substantial increases in investment, fiscal debt will reach historic highs, corporate profit margins and savings are likely to partially revert, geopolitical risks and tensions will probably drive partial deglobalization, and higher macro volatility is probable. These upward pressures should outweigh downward pressures. US real

yields 10 years out should be higher than on average in the 2010s, comparable to real yields in the pre-GFC 2000s, but lower than on average in the 1990s. This implies a ~3% real yield on the US Agg and a ~2.5% real yield on 10yr US Treasuries.

If expected inflation reverts to a 2% long-term average, this gives a nominal yield of ~5% on the US Agg and a ~4.5% nominal yield on 10yr US Treasuries. However, we have argued that there is a distinct possibility that long-term expected inflation will eventually settle at 3% if not higher, giving higher nominal yields.



## The Long-term Strategist

A demographic reversal to start pushing real interest rates up

- Demographic changes are widely regarded as a principal driver of real interest rate declines across the world since the 1980s.
- Real interest rates are a function of the supply and demand for capital—saving and investment, respectively. Demographics affect both.
- In a panel study with nearly 200 countries from 1960 to 2020, we found that increases in life expectancy by themselves raised both private savings and investment, with a larger effect on private savings, while increases in the old-age share of the population lowered private savings and investment, with again a larger effect on private savings.
- Hence, “living longer” lowers real interest rates while “more old people” raises real rates.
- Decreases in fertility rates decreased private savings and investment to a comparable degree.
- Between 1960 and the mid 2010s, the effect of rising life expectancies dominated, raising private savings propensities by more than investment, thereby putting downward pressure on real interest rates.
- There was a “demographic reversal” in 2015, when the effect of rising old-age shares began to dominate, reducing private savings propensities by more than investment, thereby putting upward pressure on real interest rates.
- While the effect of demographic changes on government savings has likely been muted thus far, upward pressure on real interest rates in the future will likely be exacerbated by the deterioration of public finances as net fiscal outlays rise with aging populations.
- The estimated negative effect of demographic changes on real interest rates peaked in 2015. By 2030, the effect of demographics on real interest rates will likely revert to a level last observed in the 1980s.
- This is one factor indicating an increase in real interest rates over the next decade.

Many economic theories have been advanced to account for the persistent decline of real interest rates in the US, and the world more generally, since the 1980s. One theory for this decline is based on demographic trends. In this paper, we assess the historical and future effect of demographic changes on global real interest rates over the longer term. While other factors are also consequential in interest rate determination, demographic changes are nearly ubiquitously regarded as the principal driver of interest rate dynamics since the 1980s and hence are our focus in this paper.

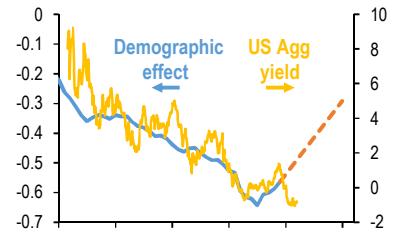
### Long-term Strategy

**Alexander Wise** AC

(1-212) 622-6205  
alexander.c.wise@jpmchase.com

**Jan Loeys**  
(1-917) 602-9440  
jan.loeys@jpmorgan.com  
J.P. Morgan Securities LLC

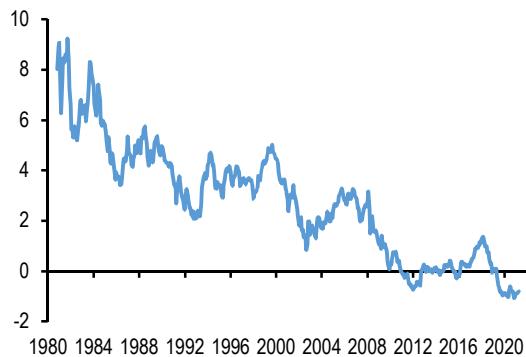
Estimated effects of demographic changes in G20 countries since 1960 and the real US Agg yield since 1980 %pt, nominal yield minus 10-year expected inflation (see fn 1).



Sources: J.P. Morgan, UN Population Division, World Bank, Federal Reserve Bank of Philadelphia, Bloomberg Finance L.P.

In Figure 1, we plot the real yield on the Bloomberg US Aggregate Bond Index since the 1980s.<sup>1</sup> There has been a steady and persistent decline from an average level of ~6% in the 1980s to the current negative levels. We use US bond yields here since the US market makes up more than half the world bond market by capitalization and thus likely reflects global forces.

**Figure 1: Real yield on the US Aggregate Bond Index**  
 %, 7/1981-12/2021, monthly data, see footnote for calculation.



Sources: J.P. Morgan, Federal Reserve Bank of Philadelphia, Bloomberg Finance L.P.

Broadly speaking, **economic theory tells us that real interest rates are ultimately determined by the balance between savings and investment in an economy**, where savings reflect the supply of available funds, and investment the demand for those funds. An argument that demographic trends can account for the historical decline in real interest rates typically emphasizes that changes in population structure have changed the propensity to save and invest.

National saving can be decomposed into private and public saving components:

$$\text{Saving} = \underbrace{(Y - T + TR - C)}_{\text{Private saving}} + \underbrace{(T - TR - G)}_{\text{Public saving}}$$

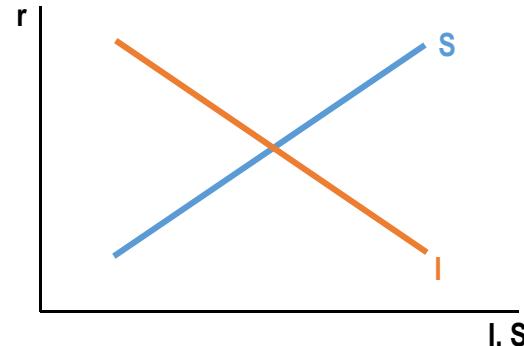
where  $Y$  is production or income,  $T$  is taxes,  $TR$  is transfers, and  $G$  is government expenditure. In words, private saving is equal to income plus net transfers (transfers minus taxes) minus consumption, while public saving is the government budget surplus (or deficit). In

<sup>1</sup> The real yield is constructed by subtracting 10-year ahead expected inflation from the nominal yield. Inflation expectations each quarter are from either the Survey of Professional Forecasters, the Livingston Survey, or the Blue Chip Economic Indicators, depending on availability. All data are sourced from the Philadelphia Fed. Where there are no 10-year ahead inflation expectations data for a quarter, the value is interpolated. Expected inflation is taken to be the same for each month within a quarter.

this paper, we discuss the effect of demographic changes on both private and public savings.

Since there is a degree of global capital mobility, especially among DM countries, interest rates in a globally integrated country are a function not only of domestic savings and investment propensities but also of savings and investment propensities in other partially or wholly financially integrated countries. National savings and investment rates need not be equal in any given country but will be equal at a global level. In our analysis, we will consider demographic changes in the world more broadly.

**Figure 2: Interest rate determination**



Sources: J.P. Morgan.

## **Demographic theory of private savings and investment**

The mechanisms by which demographics affect real interest rates are a matter of great debate. In this paper, we consider three dimensions of demographics: (1) the size of the population over age 65 relative to the population aged 15-64, (2) conditional life expectancy at age 15, and (3) the total fertility rate.<sup>2</sup> Note that conditional life expectancy at age 15 is measured in terms of expected years of life left.

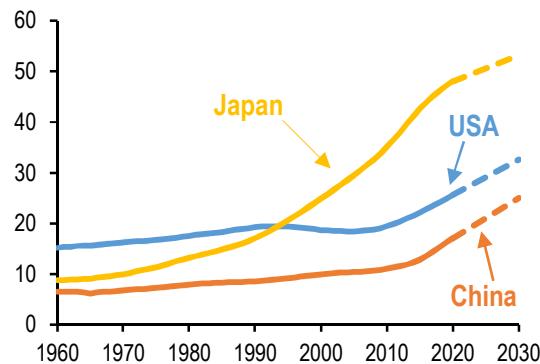
In Figures 3 to 5, we plot the evolution of these demographic measures since 1960, and the forecasts of these measures by 2030, in three large economies of interest: the US, China, and Japan. The old-age population as a share of the middle-age population has steadily increased in Japan since 1960 but only trended upward materially in the 2010s in the US and China. Conditional life expectancy at age 15 has trended up in each of the three countries since 1960, but the rate of increase has moderated in recent years. In China, there

<sup>2</sup> Jointly, these variables are key determinants of population growth, excepting immigration.

were substantial declines in the fertility rate from 1960 to 1990, but relative stability thereafter. In the US and Japan, fertility rates have remained reasonably stable for an extended period of time.

**Figure 3: Old-age population as a percent of middle-age population**

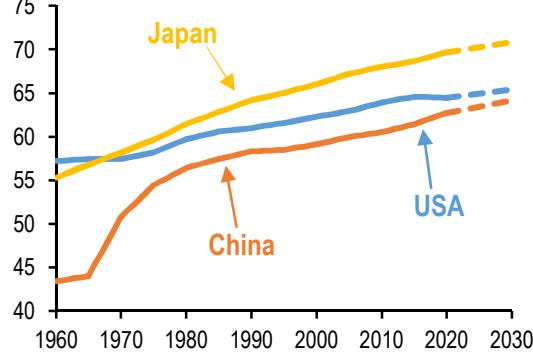
%, 1960-2020, annual data. Dashed lines are forecasts.



Sources: J.P. Morgan, UN Population Division.

**Figure 4: Conditional life expectancy (years left) at age 15**

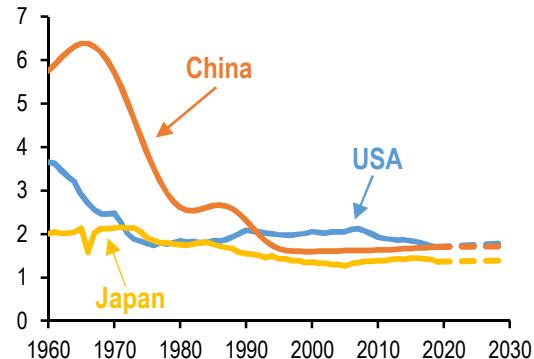
1960-2020, annual data. Dashed lines are forecasts.



Sources: J.P. Morgan, UN Population Division.

It is argued that aging populations reduce savings because there are fewer workers in the high-saving phase of their lifetimes. According to the life-cycle hypothesis, there is a non-linear relationship between saving and age. As one moves from childhood to adulthood, income and saving typically increase, while they tend to decrease after retirement. This would imply a negative relationship between savings and the size of the population over age 65 relative to the population aged 15-64.

**Figure 5: Fertility rate (children per woman)**  
 1960-2020, annual data. Dashed lines are forecasts.



Sources: J.P. Morgan, UN Population Division, World Bank.

On the other hand, aging populations may put upward pressure on savings as individuals anticipate greater longevity beyond retirement. In the US, for example, the average effective age of retirement has remained relatively steady over time, decreasing slightly from 68.4 years in 1970 to 67.9 years in 2018, while life expectancy increased from 67.1 years to 76.2 years. This implies that an increase in longevity ought to increase savings.

The theoretical effect of changes in fertility rates on savings is more ambiguous. On the one hand, a high fertility rate will tend increase the share of the population younger than 15, an age below which no or low saving is expected under the life-cycle hypothesis. But higher fertility will also subsequently lead to larger cohorts entering the labor force. Further, it is both conceivable that individuals may save more in anticipation of having children, or save less out of an expectation that their children will support them in their retirement.

As it relates to investment, it is argued that aging populations shift economic activity from investment toward consumption, in the form of healthcare services among others. On the other hand, greater longevity and higher fertility (and consequently population growth) may induce investment to meet anticipated growing needs, for example by raising investment in infrastructure.

## Empirical evidence

Since there are competing theories about how demographic changes ought to affect savings and investment, we assess the relationship between these variables in cross-country data. To do so, we begin by

constructing an **unbalanced panel of data that includes 217 countries or subnational entities<sup>3</sup> between 1960 and 2020, giving us approximately 5,500 country-year observations.** We source gross savings data from the World Bank, which correspond to private saving as defined above.<sup>4</sup> We separately consider the effects of demographics on public saving below. We also source investment, GDP, and fertility data from the World Bank.<sup>5</sup> Population and life expectancy data are sourced from the UN Population Division.<sup>6</sup>

Using these data, we construct three demographic variables of interest. First, we consider the population over the age of 65 divided by the population between 15 and 64. For brevity, this will be referred to as the “**old-age share**” subsequently in this paper. According to the lifecycle theory of savings, individuals older than 65 ought to be dissaving on average, reducing national private savings, while working-age individuals ought to be saving. In alternative specifications, we also consider the share of the population over 65 and the share of the population below 15 or over 65—the “dependency rate.” Estimated coefficients in the alternative econometric specifications were qualitatively the same as those presented below.

Second, we consider **life expectancy** upon reaching the age of 15.<sup>7</sup> When an individual confronts the question of how much to save, they should give consideration to: (1) the likelihood that they will reach retirement age and (2) how long they expect to live after retirement. As the likelihood of reaching retirement age or expected post-retirement longevity increase, an individual should save more to fund their anticipated retirement. We prefer this variable over life expectancy at birth, which has

<sup>3</sup> For example, Puerto Rico is listed as a separate entity in World Bank data, even though it is an unincorporated territory of the US.

<sup>4</sup> Specifically, we use the “gross savings (% of GDP)” variable, which is equal to gross national income plus net transfers minus total consumption. This definition conforms with System of National Accounts (SNA) standards for national accounts data.

<sup>5</sup> Total investment is measured as “gross fixed capital formation and changes in inventories and acquisitions less disposals of valuables.” Like savings, this definition conforms with System of National Accounts (SNA) standards.

<sup>6</sup> Forecasts of future fertility rates in 2030 are also sourced from the UN Population Division.

<sup>7</sup> The UN Population Division specifies conditional life expectancy in five-year bands, such as 1960-1965. We take the reported number to be the conditional life expectancy in the last specified year of the band and linearly interpolate conditional life expectancies in the other years.

historically increased substantially due to reductions in childhood mortality. These changes in childhood mortality are likely not of first-order significance to an individual in the labor force who is considering how much to save for retirement. In any case, as above, the estimated coefficient on life expectancy at birth is qualitatively the same as the coefficient on life expectancy at age 15 in alternative econometric specifications.

Third, we consider the **fertility rate**, which is measured as the number of children that would be born to a woman if she lived to the end of childbearing age based on age-specific fertility rates recorded in a country in a given year.

Having constructed these explanatory variables of interest, we run the following regression:

$$y_{it} = \beta_0 + \beta_1 OldShare_{it} + \beta_2 LifeExp_{it} + \beta_3 Fert_{it} \\ + \beta_4 \ln(GDP\ per\ capita)_{it} \\ + \beta_5 \ln(GDP\ per\ capita)_{it}^2 + \lambda_t + \delta_i \\ + \epsilon_{it}$$

where  $y_{it}$  is the savings rate or investment rate as a percent of GDP in country  $i$  in year  $t$ ,  $OldShare_{it}$  is the population over 65 as a share of the population between 15 and 64 in percentage points in country  $i$  in year  $t$ ,  $LifeExp_{it}$  is life expectancy at age 15 in country  $i$  in year  $t$ ,  $Fert_{it}$  is the fertility rate in country  $i$  in year  $t$ ,  $\ln(GDP\ per\ capita)_{it}$  is the natural log of GDP per capita in current US dollars in country  $i$  in year  $t$ ,  $\lambda_t$  are year fixed effects,  $\delta_i$  are country fixed effects, and  $\epsilon_{it}$  is the error term.

In our preferred econometric specification, we control for the level of development through the two GDP per capita variables since there are well-documented non-linear relationships between the level of development and the rate of saving or investment in a country.<sup>8</sup> Since the level of development is correlated with the old-age share, and longevity and fertility in particular, omitting the level of development may lead one to estimate the effects of these demographic variables with statistical bias.

While the correlations between longevity, fertility, and GDP per capita are moderately high, statistical tests for multicollinearity—which may lead to imprecise estimates—based on variance inflation factors (VIF) suggest this is unlikely to be problematic in our

<sup>8</sup> See, e.g., Manuel Garcia-Santana, Josep Pijoan-Mas and Lucciano Villaorta, [Investment Demand and Structural Change](#) (2021) 89(6) *Econometrica* 2751-2785.

econometric specification. Moreover, coefficient standard errors are not large in our estimates, and our estimates do not exhibit great sensitivity to small specification changes, both of which would indicate a multicollinearity problem.

In our preferred specification, we also include both **country and year fixed effects**. Country fixed effects control for unobserved country-level determinants of savings or investment rates that are constant over time. For example, it has been argued that there are strong cultural and structural economic reasons for persistently high savings rates in China.<sup>9</sup> Year fixed effects control for unobserved determinants of savings or investment rates that are common across countries in a period of time. For example, one might anticipate that the Global Financial Crisis was a shock to savings and investment in most countries. If these controls were omitted, we might conflate the effects of demographic changes with those of other global secular forces. In alternative specifications, we omitted these fixed effects and found that estimated coefficients of interest were qualitatively similar to those presented below.

We also considered specifications that allow for a **non-linear relationship** between savings and life expectancy, since one may tend to increase savings particularly in response to increases in life expectancy above the age of 65. We found that these estimates were both broadly comparable with the estimates presented here and consistent with our theoretical priors. Since the results were comparable, in this paper we present the more parsimonious specification outlined above.

Our estimates are also consistent with other papers that explore the effects of adding additional controls, such as Li et al. (2006).<sup>10</sup> These papers typically use narrower and shorter panels of data and do not find large changes in estimates of the effects of variables of interest after adding controls. For the reasons enunciated above in the justification of our econometric specification, we prefer the specification adopted in this paper and regard the addition of further controls as potentially over-controlling or as giving rise to multicollinearity concerns. With respect to over-controlling, for example, controlling for the rate of economic growth would

preclude effects of demographic changes upon savings or investment that are mediated through their effect upon growth rates. We consider any such effects to fundamentally have been caused by demographic changes. In any case, coefficient estimates are qualitatively similar when including growth as a control.

**Table 1: Estimated coefficients from a regression of the private savings rate and investment rate on our variables of interest**

\*\*\* indicates statistical significance at the 1% level of significance.

\*\* indicates statistical significance at the 5% level of significance.

\* indicates statistical at the 10% level of significance. p-values are reported in brackets beneath coefficient estimates.

	Savings rate (% of GDP)	Investment rate (% of GDP)
<i>Old age share</i>	-0.2758** (0.011)	-0.1887** 0.038
<i>Life expectancy at 15</i>	0.7154*** (0.000)	0.5837*** (0.000)
<i>Fertility</i>	0.6519 (0.101)	0.7582** (0.036)
<i>log(GDP per capita)</i>	10.4789*** (0.000)	6.5321*** (0.000)
<i>log(GDP per capita)<sup>2</sup></i>	-0.5065*** (0.000)	-0.5596*** (0.000)
<i>Country fixed effects</i>	Yes	Yes
<i>Year fixed effects</i>	Yes	Yes

Sources: J.P. Morgan, UN Population Division, World Bank.

In Table 1, we present the estimated coefficients on our variables of interest for savings and investment. In the savings rate regressions, **the coefficients are qualitatively consistent with our theoretical priors outlined above**. An increase in the ratio of the old- to working-age population tends to reduce private savings. Specifically, a one percentage point increase in the old-age population as a share of the working-age population is associated with a 0.28 percentage point decrease in the savings rate. A one year increase in conditional life expectancy aged 15 is associated with a 0.72 percentage point increase in the private savings rate. Finally, an increase in fertility of one child per woman is associated with a 0.65 percentage point increase in private savings. Coefficients on all variables of interest are statistically significant, with the exception of fertility, which is on the threshold of statistical significance.

We had weaker theoretical priors regarding the effect of these demographic variables on investment. In the data, we observe that increases in life expectancy and fertility are associated with increases in investment, while increases in the ratio of the old- to working-age population are associated with decreases in investment. For investment, coefficients on all variables of interest are statistically significant.

<sup>9</sup> See, e.g., Shang-Jin Wei and Xiaobo Zhang, [The Competitive Saving Motive: Evidence from Rising Sex Ratios and Savings Rates in China](#) (2011) 119(3) *Journal of Political Economy* 511-564.

<sup>10</sup> Hongbin Li, Jie Zhang and Junsen Zhang, [Effects of longevity and dependency rates on saving and growth: Evidence from a panel of cross countries](#) (2006).

## Effects of demographic changes

When one considers the effects of these demographic changes on real interest rates, **it is the relative effect of these demographic variables on savings and investment that is of interest.** Increases in the old-age share of the population have substantial negative effects on savings relative to investment. Increases in life expectancy have large positive effects on savings relative to investment. While the estimated coefficient on fertility is slightly larger for investment than for savings, this difference is not statistically significant and is largely inconsequential when considering the balance of savings and investment through time in a country given there is relatively limited variation in fertility in the data relative to that in old-age shares and life expectancies at 15 (as is evident in Figures 3 to 5). For this reason, we will focus our discussion below on the latter two variables.

If demographic changes are primarily characterized by large increases in life expectancy, but relatively small increases in the old-age population share relative to the working age population, our model indicates that demographic changes cause savings to grow faster than investment, putting downward pressure on real interest rates. If demographic changes are primarily characterized by large increases in the old-age share of populations, our model indicates that demographic changes cause savings to decline faster than investment, putting upward pressure on real interest rates.

As evident in Figures 3-4 above, **between 1960 and the 2010s, there were relatively large increases in life expectancy in most countries but relatively slight increases in the old-age share of populations.** Between 1960 and 2010, the global average life expectancy at age 15 rose from 49.7 years to 57.5, while the average old-age share rose from 8.3% to 11.8%. *Prima facie*, this suggests that **demographics likely had a net depressing effect on real interest rates before the 2010s.**

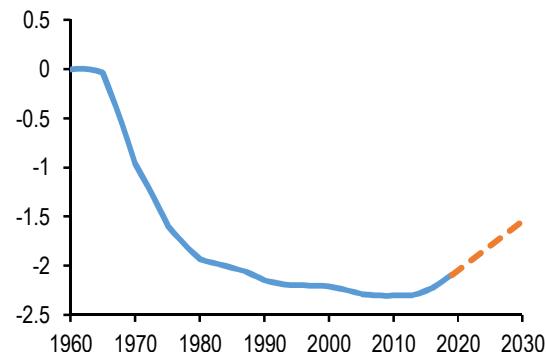
It is often conjectured that demographic forces gave rise to the **East and Southeast Asian “savings glut”** that putatively reduced global real interest rates in the 1990s and 2000s.<sup>11</sup> To assess this hypothesis, we examine changes in the demographic structure of emerging East and Southeast Asian countries from 1960 and calculate an implied causal effect of those changes on savings and investment rates based on our model’s coefficients.

<sup>11</sup> See Bernanke, [The Global Saving Glut and the U.S. Current Account Deficit](#) (2005).

In Figure 6, we plot the implied effect of demographics on the difference between investment and savings as a share of GDP in China. As a practical matter, we calculate the change in the old-age population share, life expectancy at age 15, and the fertility rate from 1960 to each subsequent point in time. Multiplying these changes by the estimated coefficients gives an estimated effect of demographic changes on savings and investment rates at each point in time *relative to 1960 levels*. We then plot the estimated changes in investment rates in excess of changes in savings rates. When the line is decreasing, this implies that savings are growing faster (or shrinking slower) than investment due to demographic changes. When the line is increasing, this implies that investment is growing faster (or shrinking slower) than savings.

Our results indicate, for example, that the investment rate minus the savings rate in China was 2.2 percentage points lower in 2000 than it would have been if the demographics of China were unchanged from 1960. Put differently, *ceteris paribus*, **demographic changes from 1960 to 2010 in China caused the savings rate to increase by more than the investment rate—this is the emergence of a savings glut.** Based on our estimates, this savings glut emerged due to rapid growth in conditional life expectancy but relatively slight growth in the old-age population share over this time.<sup>12</sup> This pattern is reflected in other emerging East and Southeast Asian economies, such as South Korea.

**Figure 6: Changes in investment minus savings as a share of GDP (at each point in time relative to 1960) in China due to demographic changes**  
%pt, 1960-2030, estimates.



Sources: J.P. Morgan, UN Population Division, World Bank.

<sup>12</sup> It is worthwhile noting that the growth in savings induced by growing life expectancy in China was likely so large due to the absence of an effective pension system for an extended time.

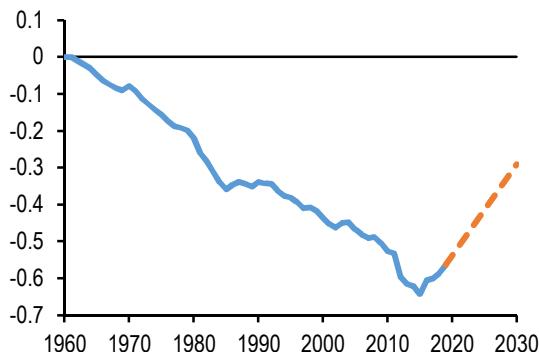
Using UN Population Division medium-variant<sup>13</sup> forecasts of conditional life expectancy, the old-age population share and fertility in China for 2030, we can project the future effect of demographic changes in China on savings and investment. This is shown as the dashed orange line in Figure 6. **Looking forward to 2030, relatively large increases in the old-age population share are forecast, while there is a projected deceleration in the rate of life expectancy growth.** Based on our estimates, this implies a “demographic reversal”<sup>14</sup> in which demographic changes cause savings to shrink relative to investment in China. All else equal, this should raise global real interest rates.

The chart does not immediately imply that China’s demographic impact on the global savings glut by 2030 moves back to its level in the 1970s as China has raised its share of world GDP by more than a factor of 5 since the 1970s. Hence, we need to consider the GDP-weighted effect of demographic changes in G20 countries on the balance between desired investment and savings. As above, we consider how much higher or lower desired savings and investment rates would have been in each country at each point in time compared to a counterfactual scenario under which demographic characteristics were unchanged since 1960. Then, we multiply these investment and savings rate differences in each country by GDP to ascertain the effect of demographics on desired savings and investment in that country in US dollars. Analogous to above for China, we subtract the effect upon savings from the effect upon investment. After summing across countries, we plot the aggregate amount relative to world GDP in Figure 7.

Note that our methodology estimates how much higher or lower desired savings and investment in the world were *at any given interest rate*. In graphical terms, these demographic-induced changes correspond to shifts of the savings and investment schedules in Figure 2. Globally, real interest rates adjust to equilibrate global savings and investment after these shifts. For example, if global desired savings *at any given level of interest* increased, while desired investment did not, real interest rates would fall. We are not estimating that demographic

changes lead savings and investment to be unequal at a global level, which is impossible.

**Figure 7: Changes in investment minus savings as a share of world GDP (at each point in time relative to 1960) due to demographic changes in G20 economies**  
 %pt, 1960-2030, estimates.



Sources: J.P. Morgan, UN Population Division, World Bank.

The estimated line in Figure 7 being below zero means demographic changes in G20 countries since 1960 tended to increase GDP-weighted desired savings of these countries relative to investment. This is one force depressing real interest rates. When considered relative to the size of the world economy, this effect grew to the mid 2010s. By 2015, we estimate that demographic changes in G20 countries since 1960 tended to raise desired savings at any given level of interest by \$483bn more than investment, all else being equal.

To project the effect of demographics upon the balance between savings and investment through to 2030, we use projections from the UN Population Division, and extrapolate GDP growth in each country to 2030 based on IMF projections to 2026 in their World Economic Outlook (October 2021). The projected effect of demographics is plotted as a dashed orange line in Figures 7 and 8. We estimate that **there was a “demographic reversal” in the mid 2010s, after which the depressing effect of demographics on real interest rates reversed. By 2030, we estimate that the depressing effect of demographics will have reverted to 1980s levels.**

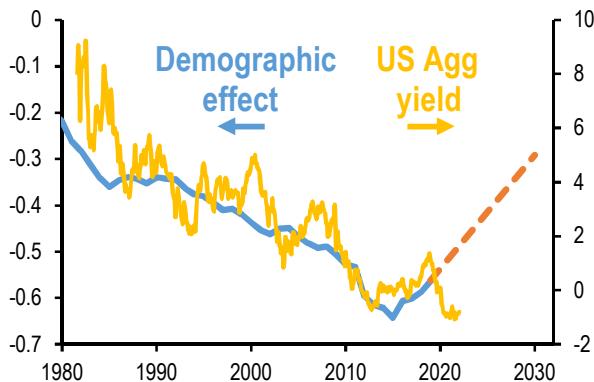
In Figure 8, we plot the same estimated effects of demographic changes alongside the real yield on the US Agg since the 1980s. **As the depressing effect of demographic changes strengthened, the real yield on the US Agg decreased.** Note that demographics are only one force determining real interest rates, so our projections do not imply that real interest rates will return to 1980s levels but rather that the depressing

<sup>13</sup> “Medium-variant” forecasts are in the middle of the forecast range of a variable.

<sup>14</sup> We have borrowed the term “reversal” from Charles Goodhart and Manoj Pradhan’s *The Great Demographic Reversal: Ageing Societies, Waning Inequality and an Inflation Revival* (2020). See also our webinar with the authors in [Inflation coming back?](#) March 10, 2021.

impact of demographics upon real interest rates will revert to levels observed in the 1980s.

**Figure 8: Estimated effects of demographic changes in G20 countries since 1960 and the real US Agg yield since 1980**  
 %pt, nominal yield minus 10-year expected inflation (see fn 1).



Sources: J.P. Morgan, UN Population Division, World Bank, Federal Reserve Bank of Philadelphia, Bloomberg Finance L.P.

## Public saving

To this point, we have characterized the dynamics of investment and private savings during demographic transitions. As indicated at the beginning of the paper, public savings—measured as the budget surplus—are the second key component of national savings.

Theoretically, holding policy settings constant, it would be natural to expect that increases in longevity and in the old-age share of the population would tend to increase fiscal outlays on pension entitlements and government-funded or subsidized healthcare. Moreover, one would not anticipate much growth in tax receipts due to greater longevity given effective retirement ages have generally proven relatively stable over time, as alluded to earlier.

The theoretical effect of fertility on public savings is somewhat more ambiguous. Reductions in fertility may tend to reduce fiscal outlays on education and childcare services but simultaneously reduce the size of future cohorts entering the workforce and paying income taxes.

With a view to quantifying effects of demographic changes on public finances, we constructed an unbalanced panel of data for 88 countries from 1960 to 2020, with general government debt as a share of GDP sourced from the IMF. Data for all other variables were the same as used in the analysis presented earlier in this paper.

Using this panel of data, we estimated the same econometric specification from our preceding analysis of private savings and investment with two different dependent variables: general government debt as a share of GDP and annual changes in general government debt as a share of GDP. Overall, we found that there were **no simultaneously robust and statistically significant relationships between demographic variables and government debt and deficits**.

One interpretation of this result is simply that there is no robust relationship between these demographic variables. In our view, the more plausible interpretation of this result is that there is substantial policy endogeneity, whereby policy settings respond to realized and anticipated changes—such as in population structure—convoluting the “pure effect” of demographic changes upon public finances. For example, countries may embark upon pension reform, or seek to broaden the tax base in anticipation of growing cohorts of retirees, which would strain public finances in the absence of policy reform.

Thus, in order to formulate an expectation about the future effect of demographic changes on public saving, one must project the future path of policy. There is, of course, great uncertainty in any such endeavor. In our view, the **risks are skewed towards higher debt and deficits in the future due to demographic changes**.<sup>15</sup>

First, recent history has demonstrated that there is growing policy inertia in many countries. We believe that the most likely outcome is that this will persist, creating great difficulties in enacting meaningful policy reform in the future, especially with aging political constituencies with strong vested interests in the preservation of entitlement programs. In such a case—as is made clear in baseline Congressional Budget Office (CBO) forecasts that presume no change in the current policy stance—there would likely be substantial growth in net fiscal outlays induced by demographic changes.

Thus, while there may historically have been relatively limited effects of demographic changes on the state of public finances, we anticipate that this will become a growing force into the future. Combined with the projected negative effects of demographic changes on private savings in the future, **this would serve to increase the upward pressure on real interest rates**

<sup>15</sup> This view is similar to that expressed by Charles Goodhart and Manoj Pradhan in their *The Great Demographic Reversal: Aging Societies, Waning Inequality and an Inflation Revival* (2020).

**looking forward to 2030**, over and above our projections above.

One argument against this view is that there may be a form of Ricardian equivalence, whereby individuals adjust their private savings decisions with regard to the state of public finances in anticipation that they will need to carry the burden of public debt in the future. However, the balance of economic research finds weak empirical evidence for Ricardian equivalence,<sup>16</sup> so this argument is not compelling in our view.

### Case study: Japan

It has been argued that the persistent low real interest rate environment in Japan is the consequence of demographic changes. Since population aging in Japan accelerated earlier than in most other countries, it is further argued that other countries with aging populations will also follow this path toward lower real interest rates in the future, very unlike the above projections of our model. However, Japan is part of an integrated global capital market, with near-free capital mobility between DM economies and a degree of capital mobility between EM countries such as China. Since the 1990s, both savings and investment have declined as a share of GDP in Japan, as predicted by our demographic model. However, as we have argued above, demographic changes in the world led to the emergence of a global savings glut over this time, which would invariably put downward pressure on Japanese interest rates. Therefore, we believe the low real interest rate environment in Japan can be explained by declining domestic propensities to save and invest with the simultaneous emergence of a global savings glut. Under this view, **the change in real interest rates with an aging population in Japan—but not simultaneously in the rest of the world—is not indicative of the future effect of aging populations at a GDP-weighted global level.**

### Conclusion

Many economic theories have been advanced to account for the persistent decline of real interest rates across the globe since the 1980s. Many of these focus on the impact of demographic trends. In this paper, we use a panel of data with nearly 200 countries from 1960 to 2020 that shows us that increases in life expectancy by themselves raised both private savings and investment, with a larger effect on private savings, while increases in the old-age

share of the population lowered private savings and investment, with again a larger effect on private savings.

Between 1960 and the mid 2010s, the effect of rising life expectancies dominated, raising private savings propensities by more than investment, thereby putting downward pressure on real interest rates. But from 2015, we see a “demographic reversal,” with the effect of rising old-age shares beginning to dominate, reducing private savings propensities by more than investment, thereby putting upward pressure on real interest rates. While the effect of demographic changes on government savings has likely been muted thus far, upward pressure on real interest rates in the future will in our mind likely be exacerbated by the deterioration of public finances as net fiscal outlays rise with aging populations. In our model, the estimated negative effect of demographic changes on real interest rates peaked in 2015. By 2030, the effect of demographics on real interest rates will likely revert to a level last observed in the 1980s. This is one factor indicating an increase in real interest rates over the next decade.

<sup>16</sup> See, e.g., James Poterba and Lawrence Summers, [Finite lifetimes and the effects of budget deficits on national savings](#) (1987) 20(2) *Journal of Monetary Economics* 369-391.



# Long-term macro

## The Long-term Strategist

### Deregulation, long-term growth and markets

- There is growing focus on deregulation as a policy tool to raise long-term economic growth, including in the US, UK and EU. We explore the effect of regulation on long-term growth and markets.
- Less restrictive regulation on businesses and in credit markets typically raises long-term growth. Less restrictive labor market regulation probably raises growth, but the effect is smaller. Part of the growth effect is likely as it raises investment.
- Within DM, regulation is less restrictive in the Anglosphere ex-UK. The UK is on par with most of continental Europe, with more restrictive regulation. EM are generally even more restrictive.
- We estimate that more restrictive regulation reduces long-term growth in the five largest EU economies by 0.8%-points relative to the US, 0.3%-points in Japan, and 2.4%-points in China.
- Less restrictive regulation supports long-term equity returns as it raises long-term growth and likely reduces constraints and compliance costs for corporates.
- We remain comfortable with our strategic overweight on Anglosphere ex-US equities given the UK is on par with Europe on regulation, while the other countries are among the least restrictive in DM.
- Within EM, regulation is least restrictive in the Middle East, Asia ex-China and Europe. It is more restrictive in Africa, Latin America and China. This supports our strategic allocation to EM ex-China.
- Financials and Technology are subject to heavy regulation. Much of the current deregulation focus appears to be on banks and AI. Credit market deregulation improves long-term returns on Financials relative to the market, while business deregulation improves long-term relative returns on Technology.
- Deregulation raises investment in the long-term, meaning more demand for capital if countries are successful in reducing regulation. This, combined with the positive effect on growth, gives us a bit more confidence in our view that real interest rates have moved durably above post-GFC lows.
- However, history shows that reducing regulation is difficult, even for governments with a strong focus on deregulation. Still, the incentives are strong with many countries suffering from very weak demographics. The strategic investor should thus closely monitor actual progress.

#### Long-term Strategy

Alexander Wise <sup>AC</sup>  
(1-212) 622-6205  
alexander.c.wise@jpmchase.com  
**Jan Loeys**  
(1-917) 602-9440  
jan.loeys@jpmorgan.com  
J.P. Morgan Securities LLC

There is a growing focus on deregulation as a policy tool to raise long-term economic growth. Many countries, including the US, the UK, and members of the EU, have recently declared their intention to pursue deregulation as part of stated pro-growth agendas. It is a central tenet of *economic liberalism* that reducing constraints on private economic agents should improve efficiency and growth, at least assuming it does not give rise to market failures. In practice, it is unclear how much regulatory burden matters for **long-term growth and markets**. In this note, we explore these relationships and the implications for a long-term investor.

## Measuring regulation

As one part of their *Economic Freedom of the World* index, the Fraser Institute constructs a measure of “the extent to which regulations that restrict entry into markets and interfere with the freedom to voluntary exchange reduce economic freedom”.<sup>1</sup> The measure of regulation is broken down into four sub-components: credit market regulation, labor market regulation, business regulation, and freedom to compete.

In the overall economic freedom index, of which regulation is one of five components, higher scores indicate “how closely the institutions and policies of a country correspond with the classical liberal ideal of a limited government, where the government protects people and property rights from aggressors but otherwise allows them to make their own economic choices”.<sup>2</sup> Deregulation should thus be reflected in an increase in the regulation index.

## Regulation and long-term growth

To explore the relationship between regulatory burden and long-term growth, we construct a panel of data covering 38 countries from 1970 to 2022.<sup>3</sup> Using these data, we estimate the relationship between the regulatory burden and the rate of **real GDP growth** and **real GDP per capita growth** in 10-year periods. The former regression is specified as follows:

$$Growth_{it} = \beta_0 + \beta_1 Reg_{it} + \beta_2 \ln(PC_{it}) + \alpha_i + \gamma_t + \epsilon_{it}$$

where  $Growth_{it}$  is the rate of real GDP growth in country  $i$  in 10-year period starting in year  $t$ ,  $Reg_{it}$  is the average regulation measure in that country over that period of time,  $PC_{it}$  is the log of the level of GDP per capita in that country at the

start of that period,  $\alpha_i$  are country fixed effects, and  $\gamma_t$  are time period fixed effects.<sup>4</sup> Our second regression has growth in real GDP per capita over 10 years as the dependent variable, instead of the growth in real GDP. This outcome is closer to a measure of productivity, which regulation is arguably more likely to affect than outright growth, which contains a demographic element that is probably unrelated to regulation.

We control for GDP per capita as its omission should downwardly bias estimates of the effect of more liberal regulation if more developed countries typically have more liberal regulation, as they do, given more developed countries generally grow more slowly than their less-developed peers for reasons unrelated to regulation. Not including this control might lead one to infer that more liberal regulation has a negative effect on long-term growth, even if there were in fact a positive effect.

Table 1: Effect of regulatory burden on long-term growth and per capita growth

Based on a regression with rolling 10-year observations. Standard errors clustered at the country level and reported in brackets.

	Growth	Per capita growth
Regulation	0.274 (0.384)	0.425 (0.416)
ln(GDP per capita)	-2.044 (1.037)	-1.905 (1.086)
Constant	20.221 (9.326)	16.862 (9.696)
Country FE	Yes	Yes
Time FE	Yes	Yes

Source: J.P. Morgan, World Bank, Fraser Institute, Gwartney, Lawson and Murphy (2024).

Table 1 reports the results of these two regressions. For both the GDP growth and GDP per capita growth outcomes, the effect of regulation is imprecisely estimated, meaning there is only **suggestive evidence of a positive effect of more liberal regulation on long-term growth**. The evidence for an effect on per capita growth, as hypothesized, is slightly stronger. One reason overall regulation liberalism may not be strongly associated with long-term growth is that different forms of regulation may have different effects. To explore this further, we estimate the same regressions as reported in the table above, but this time including three of the sub-measures for credit market regulation, labor market regulation, and business regulation. We omit the fourth sub-measure, freedom of competition, as data coverage only starts in 2000 and thus does not allow us to be sufficiently confident in the results.

1. James Gwartney, Robert Lawson and Ryan Murphy, [Economic Freedom of the World: 2024 Annual Report](#) (2024) *Fraser Institute*, page 2.

2. Ibid, page 10.

3. Economic freedom observations are every five years between 1970 and 2000, and annual thereafter.

4. World Bank, [GDP per capita \(constant 2015 US dollars\)](#).

The correlation between these measures is reasonably low, meaning that there is little reason to be concerned that we will not be able to discriminate between the effects of each type of regulation.

The results from these regressions are reported in Table 2. The estimated effects of each form of regulation are quite different, which likely accounts for the lack of any clear effect in the aggregate measure. For both measures of growth, there is reasonably strong evidence that **more liberal credit market and business regulation comes with higher long-term growth**. The evidence for an effect of **labor market regulation is somewhat weaker**, with only suggestive evidence that it is associated with faster growth, whether outright or in per capita terms.

Table 2: Effect of types of regulatory burden on long-term growth and per capita growth

Based on a regression with rolling 10-year observations. Standard errors clustered at the country level and reported in brackets.

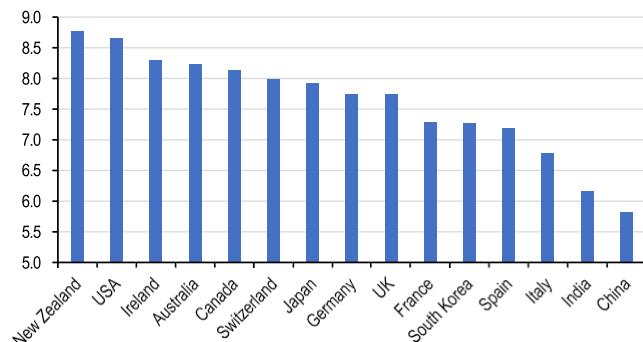
	Growth	Per capita growth
Credit market	0.365 (0.177)	0.439 (0.172)
Labor market	0.122 (0.195)	0.061 (0.195)
Business	0.421 (0.196)	0.601 (0.167)
ln (GDP per capita)	-2.511 (0.777)	-2.523 (0.774)
Constant	20.880 (7.463)	18.296 (7.431)
Country FE	Yes	Yes
Time FE	Yes	Yes

Source: J.P. Morgan, World Bank, Fraser Institute, Gwartney, Lawson and Murphy (2024).

One way of making sense of the magnitude of these estimates is to calculate **cross-country differences in long-term growth** that can be attributed to differences in regulation. As a first examination, Figure 1 shows the overall regulation measure for a set of countries in 2022. While most developed countries receive a reasonably high score, there is still quite a bit of variation. At the high end are primarily countries from the **Anglosphere**, New Zealand, the US, Ireland, Australia and Canada, though the UK is more moderate. Countries in the **EU** generally have less liberal regulation, and, predictably, regulation is much less liberal in most developing countries, such as **India** and **China**.

Figure 1: Overall regulation measure in selected countries

2022. Scores are on a 0-10 scale, with higher scores indicating more liberal regulation.



Source: J.P. Morgan, Fraser Institute, Gwartney, Lawson and Murphy (2024).

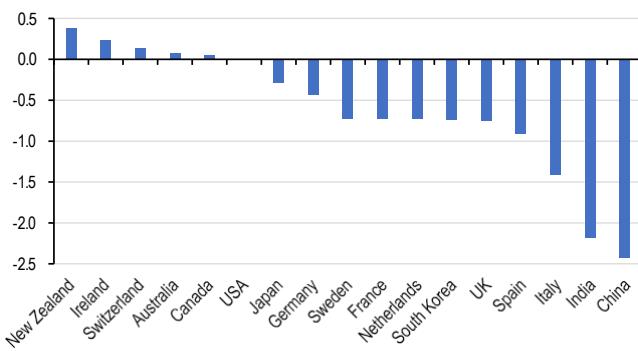
Using our econometric results reported in the left column of Table 2, Figure 2 shows the long-term growth difference implied by regulation differences relative to the US as of 2022. Again, we find the regulatory environment in the **Anglosphere ex-UK** to be quite favorable. By our estimates, differences in regulation in New Zealand, Ireland, Australia and Canada imply long-term growth that is between 0.05 and 0.4 percentage points higher than the **US**, which is itself in quite a favorable position relative to the rest of the world. Within the Anglosphere, the regulatory environment in the **UK** appears less favorable, reducing long-term growth relative to the US by an estimated 0.7 percentage points. Similarly, we estimate that the less favorable regulatory environments in **Japan, Germany and France** reduce their long-term growth relative to the US by 0.3, 0.4 and 0.7 percentage points respectively, while even less favorable environments again in **Spain** and **Italy** reduce long-term growth by an estimated 0.9 and 1.4 percentage points respectively. The GDP-weighted difference for the EA5 (Germany, France, Italy, Spain, Netherlands) is estimated to be 0.8%-points. For less-developed countries, the differences are even larger, rising to an estimated 2.4 percentage points in the case of **China**.

Our analysis above has considered the **level** of regulation, as opposed to **changes** in regulation. Running the same regression with changes shows no clear effects on growth. In part, this is likely as it is **hard to deliver regulatory reform**, as we discuss in greater detail below, meaning changes in regulation are generally quite modest. To that point, we find that the standard deviation of the regulation index across countries (on average across years) is larger than the standard deviation of the regulation index across time (on average across countries). This suggests that cross-country variation is more important than time series variation in our regressions above. With relatively few instances in which the regulation measure changed substantially in a country over a 10-year period, our estimation depends heavily on small changes that could be

more noise than signal. Additionally, it is possible that the growth effects of regulatory changes are seen with a lag, rather than contemporaneously. Finally, there is no guarantee that any regulatory change came in the earlier years of any 10-year period, obscuring any growth effect when looking at average growth over 10 years. All told, this leads us to expect that the results in *levels* will be more representative of the effects of regulation. These results still inform us about the likely effects of any changes, but in a more robust manner.

Figure 2: Long-term growth differences relative to the US implied by regulation

% points, 2022. Based on credit market regulation, labor market regulation, and business regulation measures. Long-term growth differences implied by regulation are calculated relative to the US.



Source: J.P. Morgan, World Bank, Fraser Institute, Gwartney, Lawson and Murphy (2024).

## Regulation and equity markets

In light of our [previous result](#) that **higher long-term growth has historically been associated with higher long-term equity returns within DM**, but not EM, we have a prior that more liberal regulation should be associated with higher long-term equity returns, at least among larger DM equity markets that are broadly representative of their overall economies.<sup>5</sup>

Over and above this growth mechanism, more liberal regulation could **support long-term equity returns by providing a more favorable business environment**, with reduced costs of regulatory compliance and fewer constraints on corporate growth. In our view, this is likely to be the case regardless of the size or economic representativeness of a country's equity market, as we hypothesized would be the case for economic growth. Thus, we are comfortable with regressing long-term equity returns on measures of regulation using the full sample – without restricting our analysis to only large DM markets.

5. We hypothesize that the relationship between long-term growth and equity returns would be weaker in countries with smaller equity markets, which may be dominated by a small number of companies that may not be representative of the overall economy.

Table 3 presents the results of a regression of the kind estimated above, with two changes. Firstly, the outcome of interest is 10-year USD equity returns. Secondly, we drop the control for GDP per capita as we are less concerned about omitted variable bias when the outcome of interest is equity returns, rather than economic growth. We find a **clear positive effect of more liberal business regulation on long-term returns** but no evidence of any effect of more liberal credit or labor market regulation. The relationship between equity returns and business regulations is consistent with our *ex ante* intuition.

Table 3: Effect of types of regulatory burden on long-term equity returns

Based on a regression with rolling 10-year observations. Standard errors clustered at the country level and reported in brackets. Returns on MSCI country indices in USD terms.

	Equity returns
Credit market	-0.134 (0.969)
Labor market	0.484 (0.993)
Business	6.925 (1.540)
Constant	-36.048 (11.815)
Country FE	Yes
Time FE	Yes

Source: J.P. Morgan, MSCI, Refinitiv/Datastream, Fraser Institute, Gwartney, Lawson and Murphy (2024).

We believe that the lack of any observed effect of more liberal credit market regulation on equity returns, in spite of an effect on economic growth, is related to our observation that there is no relationship between long-term growth and equities returns in EM, and our hypothesis that the equity-growth relationship is likely to be strongest in relatively large equity markets, as the sample here includes both EM countries and many smaller equity markets.<sup>6</sup> The lack of any effect of more liberal labor market regulation on equity returns is consistent with these observations, in addition to the weakness of its effect on growth.

We also hypothesize that regulation will be relevant for the **long-term performance of individual sectors**. In our view,

6. Running this analysis on the nine largest DM equity markets – which were the focus of our study on economic growth – yields coefficients that mirror those reported in our analysis of the effects of regulation on long-term growth in Table 2. This result is consistent with our hypothesis.

the clearest arguments for an effect of regulation are the **financials** and **technology** sectors. The financial sector is heavily regulated due to its systemic importance to economies and has been subjected to substantial regulatory change over time, particularly after the GFC. The technology sector also appears particularly susceptible to regulation as it is regularly in flux and can have transformative effects on economies and societies, as during the internet and ICT boom, and as will surely be the case in the future due to AI. In the past couple of years, there has been widespread discussion of the need to regulate AI.

We hypothesize that credit market regulation would be most consequential for the financial sector, while business regulation would be most consequential for technology. As reported in Table 4, which shows the effect of regulation on long-term excess returns, this is precisely what we find. The largest and most significant effects are a **positive effect of more liberal credit market regulation on long-term excess returns on financials**, and a **positive effect of more liberal business regulation on long-term excess returns on technology**.

There is only suggestive evidence of a negative effect of more liberal business regulation on excess returns on financials, and of a negative effect of more liberal credit market regulation on the excess returns on technology. The possible smaller *negative* effects arguably also make sense in light of the mirroring *positive* effects on financials and technology given positive effects on one sector negatively affect excess returns on the other sectors, and financials and technology are typically amongst the largest sectors in many equity markets.

Table 4: Effect of types of regulatory burden on long-term sector excess returns

Based on a regression with rolling 10-year observations. Standard errors clustered at the country level and reported in brackets. Based on regression with the 10 largest DM markets and 6 of the largest EM markets by capitalization. Uses Datastream equity indices.

	Financials	Technology
Credit market	2.088 (0.559)	-4.613 (2.702)
Labor market	0.693 (0.531)	-0.101 (1.605)
Business	-1.432 (1.369)	7.759 (4.068)
Constant	-7.385 (15.151)	-2.082 (49.720)
Country FE	Yes	Yes
Time FE	Yes	Yes

Source: J.P. Morgan, Refinitiv/Datastream, Fraser Institute, Gwartney, Lawson and Murphy (2024).

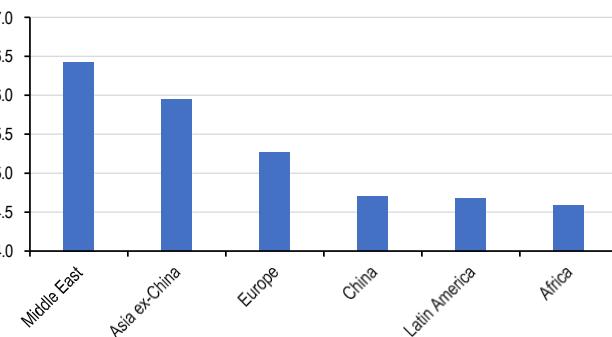
## Long-term investment implications

Long-term investment implicationsWhen it comes to **long-term country selection** in equities, we see the key findings of our analysis to be the following. First, a favorable regulatory environment for businesses is generally a positive long-term signal. Second, among the larger DM equity markets, more favorable credit and labor market regulations are also a positive signal as they tend to raise long-term growth, and higher long-term growth comes with higher long-term equity returns [in these countries](#). Among the largest DM equity markets by capitalization share in MSCI World, the **broad regulatory environment appears most favorable in the Anglosphere ex-UK** – the USA, Canada, Australia and Ireland – and **Switzerland**, and **less favorable in much of continental Europe, the UK and Japan**. Given our estimates suggest the overall regulatory environment in the UK is roughly on par with much of continental Europe, we remain comfortable with our overweight on Anglosphere ex-US equities when viewed through the lens of regulation in light of the more favorable regulatory environment in the other Anglosphere countries.

In **EM**, we restrict our focus only to the regulatory environment for business, informed by our results above and noting that there is no relationship between long-term growth and equity returns in EM (which would lead us to give more weight to credit and labor market regulation). Figure 3 reports the average business regulation score in each region among countries in the MSCI EM index. Generally, **business regulation is most favorable in the Middle East and then Asia ex-China and EM Europe, while it is least favorable in Africa, Latin America and China**. This is one signal to inform strategic allocations within EM equities, which is helpful given our analysis suggests both [valuations](#) and long-term [growth](#) are ineffective, at least at the individual country level.

Figure 3: Business regulation measure in EM regions

2022. Scores are on a 0-10 scale, with higher scores indicating more liberal regulation. Average across countries in MSCI EM index. Turkey included in Europe.



Source: J.P. Morgan, Fraser Institute, Gwartney, Lawson and Murphy (2024).

To this point, our focus has been on the current regulatory environment in these countries. However, governments in many countries have stated that they intend to reduce regulation – including the US, the UK, and countries in the EU. As we noted above, though, cross-country differences in the regulatory environment have proven to be large relative to the magnitude of changes due to reform. If we look at the period of time (1980-1990) roughly corresponding to the Reagan and Thatcher governments, we see only a very slight increase in the regulation score in the US, and a modest increase in the UK that reverted by about two-thirds by 2010.<sup>7</sup> The historic experience of slight-to-modest cutbacks in regulatory pressures during the Reagan and Thatcher governments tells us that there can be a lot of resistance by entrenched interests and bureaucracies to any meaningful deregulation. Thus, the historic record tells us that any new government intending to reduce red tape and regulatory costs will have to work extremely hard for sustained periods to meaningfully boost long-term economic growth, though it is not impossible. However, if most countries pursue deregulation, achieving that goal may not change cross-country differences much. Still, our results suggest it is worth monitoring progress – outright and in relative terms – made by countries in their deregulation agendas.

On the question of **long-term sector choice**, in our view, the clearest implications are for **financials** and **technology**. Our analysis above suggests more liberal regulation should benefit both. For financials, there is ongoing discussion about scaling back proposed Basel III banking regulations and capital requirements, which should benefit performance. Progress towards a capital market union in the EU could also support the sector there. For technology, some countries like the US and the UK have discussed the need for a permissive regulatory environment to allow the development of AI. Other countries still appear to be primarily focused on further regulation of the sector, suggesting cross-country divergences in the sector are probable. Still, in light of our observation that working-age populations are shrinking in many developed countries, it seems plausible that there will eventually be broader pressure to liberalize regulation on the sector as a way of delivering the growth needed to minimize strains on pension systems and government budgets more generally.

Finally, if deregulation efforts were successful in raising long-term growth, that would **moderate or plausibly reverse the**

downward pressure on real interest rates that we expected to come from slower economic growth, though this is only one factor in our broader framework. Further, a more permissive regulatory environment could support the **demand for capital** needed to finance investments that are encouraged by deregulation. Indeed, regressing gross capital formation as a share of GDP on credit market, labor market and business regulation, country fixed effects and year fixed effects (not shown) suggests there is a positive effect of more liberal regulation on investment, primarily due to more liberal business regulation. These forces, and the current policy bias towards deregulation, give us marginally more confidence in our long-held view that interest rates have structurally moved above their post-GFC lows.

7. The increase in regulation score in the UK was equal to about 0.7 times the standard deviation of scores across countries in our sample in 1980. The increase was driven primarily by credit market deregulation, while the business regulation component did not increase.

## The Long-term Strategist

### Strategic concerns on US government debt

- US fiscal conditions have been unsustainable for a sustained period.
- Debt sustainability is classically defined as a stable debt-to-GDP ratio.
- US federal debt has close to tripled relative to the economy over the past 20 years, and on current legislation debt to GDP is due to rise at least ~20%-points over the next 10 years and 70%-points over the next 30 years to 166%, according to CBO's long-term projections in March.
- US exceptionalism of strong relative growth, super strong equity markets, a strong currency, superior demographics, superior immigration, a strong military, strong global alliances, leading technologies, and a resilient political system has allowed the US Treasury to grow its debt in the hands of the public more than six-fold over the past 20 years without an increase in the interest rate it pays.
- For the next 30 years, CBO projects no change in interest rates and only a slight drop in productivity growth despite a 70%-point rise in US debt-to-GDP as it sees the impact on rates of higher debt offset by other secular forces putting downward pressure on bond yields, including a projected surge in domestic and foreign savings. We are not convinced as we see no such future surge in global savings to absorb this debt without a significant rise in interest rates, and instead we expect global aging to reduce savings rates.
- Without a near-term reversal in these supportive conditions for US Treasury debt, Congress is under little pressure to try and stabilize its debt burden.
- A future debt crisis is in our mind unlikely to come from a mere rise in debt-to-GDP and more likely from any major political, economic, or military setbacks that severely damage investor confidence in the economy, which is the ultimate backstop to federal debt, even as no such setbacks are on our horizon.
- There is a strong economic case, though, that with the US government increasingly being called upon to counteract each new threat to the economy – major or minor – it makes sense to retain extra fiscal space/reserves to be used for the many rainy days, from recessions, pandemics, extreme weather, or crises, that are surely ahead of us.

#### Long-term Strategy

**Jan Loeys** <sup>AC</sup>

(1-917) 602-9440

jan.loeys@jpmorgan.com

**Alexander Wise**

(1-212) 622-6205

alexander.c.wise@jpmchase.com

J.P. Morgan Securities LLC

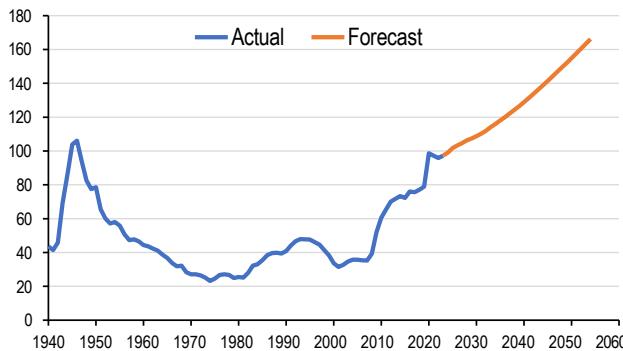
In this note, we aim to address a dozen of the many concerns you have raised with us about the long-term impact of large US federal government budget deficits.

## 1. How bad is the US fiscal situation?

The US federal government is running a large deficit at 6.3% of GDP over the just-ended 2023-24 fiscal year, with an economy at full capacity. This large a deficit was in the postwar period only exceeded during the GFC and Covid and exceeds even those seen in pre-GFC recessions. It is doubly “surprising” for an economy operating at full capacity. It is double its average over the past 60 years. Over the past 20 years, US federal debt held by the public, domestic and foreign, rose from 35% of GDP to 96% today.

Figure 1: US federal debt as a share of GDP

%, 1940-2054, annual. Federal debt in hands of the public. Actual up to the present, followed by [CBO Long-term budget projections](#), March 2024.



Source: J.P. Morgan, Congressional Budget Office.

The US Congressional Budget Office's (CBO) [Long-Term Budget Outlook](#) projects that under current law, including the sun-setting of the 2017 tax cuts, federal debt in the hands of the public will rise to 116%<sup>1</sup> of GDP 10 years from now and 166% in 30 years (Figure 1). It projects the deficit will average 6.7% over the next 30 years. These are not purely unconditional forecasts, but based on current legislation, as per Congressional mandate, and thus do not include any judgments on future actions by Congress that could either raise or lower these projections. Congress simply wants to be

1. In an August [update](#) CBO raised its 10-year out projection of debt/GDP to 122% as it had to include the impact of “emergency supplemental appropriations that provided \$95 billion for aid to Ukraine, Israel, and countries in the Indo-Pacific region. By law, that funding continues in future years in CBO’s projections (with adjustments for inflation).” This is because CBO needs to always extend current spending and tax legislation even if there is reason to believe this spending will end in the not-too-distant future. We will keep using the March 10- and 30- year outlook in this note.

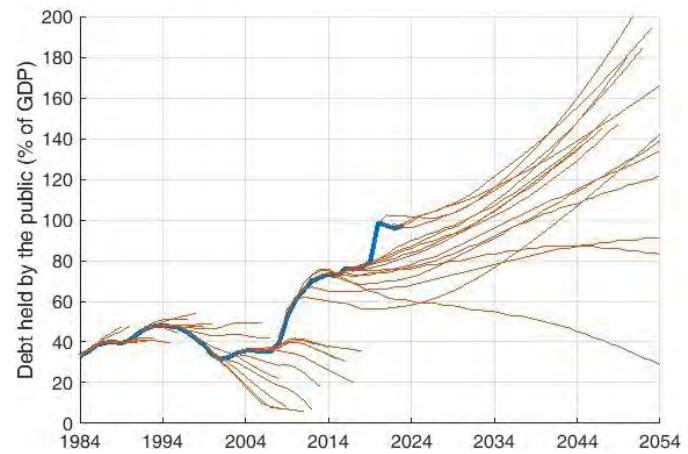
informed about the implications of current laws as an input into their deliberations on how possibly to change future federal government spending and taxation laws.

## 2. How good are long-term debt forecasts?

Overall, not very good, with accuracy worsening quickly the further out in time one goes. Figure 2 shows CBO projections for US federal government debt over GDP over the past 40 years and how this ratio actually changed over time. Much of these projection errors are because CBO is not asked to try and forecast future spending or tax changes by Congress but only to extrapolate the implications of current law.

Figure 2: US federal debt as a share of GDP, actual and CBO projections

%, 1984-2054, annual. Based on [historical forecast data](#) provided by CBO. Before 2007, we have only data for CBO forecasts of debt outstanding in hands of the public and thus divided these by realized GDP. Red lines are forecasts from each point in time.



Source: J.P. Morgan, Congressional Budget Office.

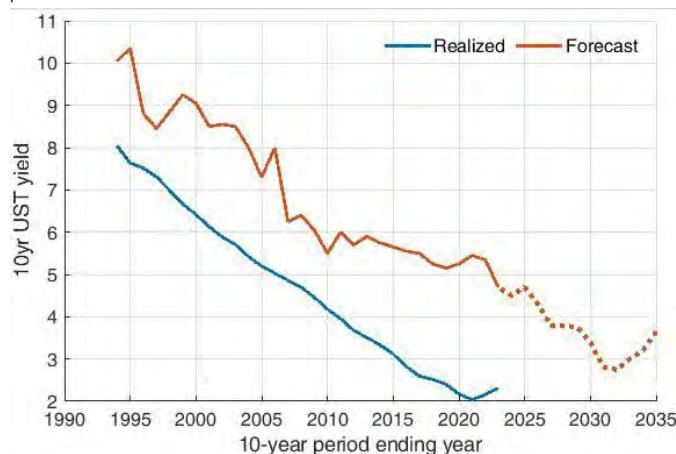
Other sources of projection errors for debt/GDP ratios are due to the economy, inflation, or interest rates in the future deviating from the assumptions CBO makes to project future revenues and spending by the government. We have found that the consensus of long-term economic forecasters, which is generally not that different from those of CBO, has systematically over-predicted inflation and interest rates 10 years (Figure 3) out over the past 45 years and has forecast real growth with large errors in both directions.<sup>2</sup> Long-term forecasts for nominal GDP growth 10 years out (Figure 4) were almost always too high (except for the decades ending 2007-08, and the last 10 years, the last largely due to high inflation), with an average over-forecast of 1.1%-points.

2. See [How good are long-term forecasts?](#), June 14, 2022.

Over-predicting nominal growth by itself makes tax revenue projections too high also and can thus make deficit forecasts too low. For the most part, though, CBO under-predictions of future debt/ GDP ratios were likely due to tax cuts and spending hikes by Congress that are not under CBO's remit to forecast.

Figure 3: 10yr UST yields: 10-year out consensus forecasts (red) and realized (blue)

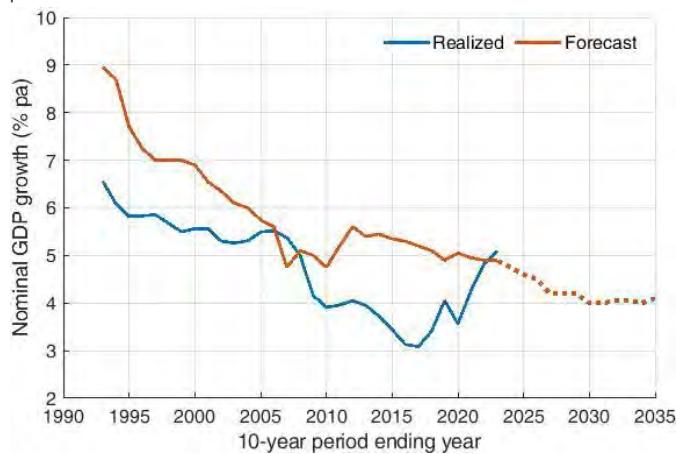
%. Realized and forecast values are 10-year averages shown at end of each 10-year period.



Source: J.P. Morgan, Wolters Kluwer / Haver Analytics, Board of Governors of the Federal Reserve System, Federal Reserve Bank of St. Louis.

Figure 4: US nominal GDP growth: 10-year out consensus forecasts (red) and realized (blue)

%. Realized and forecast values are 10-year averages shown at end of each 10-year period.



Source: J.P. Morgan, Wolters Kluwer / Haver Analytics, BEA, Federal Reserve Bank of St. Louis.

How should this track record affect our perception of upside or downside risk on CBO's long-term projections? On one side, its over-predictions of debt/GDP for the late 90s and early 2000s coincided with the internet productivity boom that made the real economy grow faster than expected. It is thus

not inconceivable that current hopes of an AI boom in productivity will make the economy and tax revenues grow faster than projected by CBO. On the more pessimistic side, CBO is required to assume full sun-setting of the 2017 tax cuts. In the past, most sunsets were reversed by Congress. Much will depend this time on what party wins which of the three "houses" in Washington DC next week, but it still seems likely to us that at least some part of the 2027 tax cuts will be extended. Overall, we judge **risk to be modestly toward higher deficits and debt loads** than CBO projects.

### 3. Is the US federal budget deficit unsustainable?

Yes, and no, depending on what you mean by debt sustainability. The standard definition of debt sustainability is a deficit that keeps debt outstanding stable versus GDP as the overall economy is the ultimate source of funding for the debt. A deficit that is so large that it makes debt grow faster over the long run than the overall economy is considered unsustainable as "nothing can grow forever." That definition is fine as it is, but it ignores the question of what the relevant time frame is for debt sustainability.

Implicit in the concept of sustainability is the assumption that if debt keeps growing faster than GDP, at some point it will be too big and thus create "problems." But what is that point, and what problems will it create? Presumably what is meant is that the debt will be so large that not enough investors will be willing to buy it, thus requiring a lower price and higher cost of borrowing. This in turn requires more borrowing just to pay the coupons, eventually leading to a point where not enough buyers can be found at any price and the issuer defaults on its debt obligations. The problem we have in economics is that we do not know exactly, or even vaguely, what that level is. The reality is that over the past 20 years US federal debt-to-GDP has grown by 60%-points without any rise in real interest rates due to deficits that at almost each point did not meet the standard definition of a sustainable deficit. Hence, looking back, the US fiscal situation was "**sustainably unsustainable**."

### 4. What will be the economic impact of rising US government debt?

In 10 years, CBO projects that US potential GDP growth will slow from 2.4% over the past three decades to 2.1% and 1.6% in three decades from now. Some 0.6%-points of this slowing into the 2050s is due to slower labor force growth brought on by aging and low birth rates. Potential labor force productivity growth slows from 1.6% over the past three decades to 1.3% in the 2050s as a result of weaker educational attainment, climate change, and slower federal capital spending. It is not clear to us why this would be caused by high US debt

levels. The 10-year US Treasury yields projection stands at 4.1% by 2034 and 4.4% in 2054, no change from today's 4.3% and below what is priced by the UST term structure.

CBO argues that large deficits will crowd out the private sector, but its forecasts do not seem that directly affected by such crowding out. CBO [estimates](#) (pp. 37-38, 46-47) that each 1%-point rise in federal debt-to-GDP pushes up the 10-year yield by 2bp, which on its projections should raise it 40bp in 10 years and 140bp in 30 years, all else constant. But all else is not constant. Lower labor force and productivity growth and higher foreign and domestic savings will, under its assumptions, largely offset the upward pressure on interest rates from a rising debt load. **If they are right, then there is not really any crowding out** as increased federal borrowing is then offsetting a natural slowing in private sector capex and is funded by higher saving rates from domestic and foreign investors.

We are more wary, in particular with respect to any hopes of increased global savings. In our papers on demographics changes, summarized in [Demography and markets](#), Aug 24, 2024, we find significant evidence that aging reduces savings rates and thus pushes up interest rates. We have also judged increases in savings from an increase in inequality and ever-higher corporate profit margins to be unlikely ([Lowering our long-run US bond yield forecast](#), Nov 28, 2023).

## 5. What was the damage or cost from the near tripling of US debt/GDP over the past 20 years?

Some support for CBO's sanguine view of interest rates in the face of rapidly rising debt comes from the realization that the 10-year UST yield today is at the same level as 20 years ago, despite the 60%-point rise in debt/GDP over this period. Other things did indeed change over those years. As we argued in [Long-term forces point to higher US bond yields](#), Apr 4, 2022, real interest rates have been falling over the past 40 years due to increased macroeconomic stability, low inflation, and an EM savings surplus that was more than enough to offset increased US government borrowing.

One could argue that without such increased US borrowing, US interest rates would have been lower and private capital spending higher, and if this private capital had a more beneficial impact on growth than government deficit spending, the economy and incomes would now be higher. However, one should ask what would have happened to the economy if the government had not allowed its debt to rise as it did, considering that a significant part of the rise in debt came from government support during and after the Global Financial Crisis and Covid, as can be seen from Figure 1. We doubt the US economy would have performed as well over the past 20

years if the government had pursued a more hands-off approach during these two crises, similar to its initial unresponsive attitude during the early 1930s, which set us up for the Great Depression. Granted, it would have made sense to recover some of its lost revenues after these two crises had passed, but we see a high likelihood that if, post GFC and Covid, the federal government had tried to return to its previous debt/GDP level, the US economy and national income would not have reached today's levels.

## 6. What has allowed the US to raise debt so much more than most other countries?

Other economies have also been buffeted by GFC and Covid, but their governments have not allowed, or maybe have not been able to, let their debt rise as much as the US has. We would like to argue that this is because the **US has significantly more fiscal space** than almost all other countries, with possibly China and Japan coming close in this respect.

The IMF [defines fiscal space](#) as "room in a government's budget that allows it to provide resources for a desired purpose without jeopardizing the sustainability of its financial position or the stability of the economy," mostly in the context of emerging markets. To us, fiscal space means the ability to issue significantly more debt without creating seriously adverse conditions for borrowing costs or the currency. In our interpretation, we would consider the conditions and forces that support fiscal space as follows:

1. a low starting level of debt;
2. a private sector with a savings surplus exceeding the public sector's net borrowing requirements;
3. strong economic growth, driven by productivity and population, itself consisting of birth rates and immigration as this boosts future tax revenues and private sector savings;
4. significant assets, such as FX reserves or foreign bonds and equities held in a sovereign wealth fund that the government could liquidate in case of need;
5. deficit spending that makes productive capital investments that can be expected to generate enough revenue to pay back or simply fund the debt;
6. low tax rates, which make it easier to raise more revenue if needed without holding back the economy much;
7. limited financial repression, but with the ability to ratchet this up to funnel domestic savings to fund the deficit;
8. a number of factors that create confidence for foreign investors, such as a stable currency;
9. a stable and strong political environment;

10. self-sufficiency in food and energy;
11. friendly neighbors;
12. a strong military;
13. friendly and powerful allies; and,
14. probably size as the three countries with arguably the most fiscal space, the USA, Japan, and China, are also three of the four largest economies in the world.

**How many of these fiscal space boxes does the US tick today?** Simply doing a count of the above 14 boxes, we would say the US is seriously deficient on only three. The US does not have a low starting point on debt levels; does not have a national savings surplus, although with a current account smaller than the government deficit, its private sector does have a modest savings surplus; and it currently does not use its deficit spending to build revenue-producing infrastructure.

One could throw in that US politics is chaotic, unpredictable, polarized, and populist, with democratic standards weakening.<sup>3</sup> But the last eight years have shown the political system surprisingly resilient with the current administration having achieved quite a lot despite the narrowest majority in Congress ever for a sitting president. Overall, we judge that the **US government for the moment retains sufficient fiscal space not to be forced to drastically change direction.**

## 7. If Japan can do it, why not the US?

Japan has the lowest interest rates in the world and the highest government debt relative to its own economy. How can it do that? The Japanese government bonds – JGBs as we call them – amount to 260% of their GDP compared to 95% in the US. Does this tell us that policy makers and investors are wrong to worry about an unsustainable US fiscal situation? We do not think so as sustained high savings surpluses, financial repression, and a strong domestic preference to hold safe assets have allowed Japan to avoid a debt crisis so far.<sup>4</sup> These conditions do not apply to most other countries and surely not to the US. Japan has a long-standing domestic savings surplus, while the US has a large savings deficit. Japanese government debt rose sharply during a period of strong corporate saving and weak borrowing. Japan's savings are held in government debt to a much greater degree than in the US as Japanese households hold much of their wealth in deposits and insurance products, and banks and insurers are much larger relative to the economy. Both must hold large quantities of government debt. High savings and a preference

for fixed income mean there is strong and stable demand for government debt in Japan.

Deflation or low inflation since the 1990s has allowed the Bank of Japan to hold interest rates very low and buy a lot of government debt without worrying about any effect on inflation. In 2023, banks, insurers, and the BoJ held national government debt worth 166% of GDP. Net debt in Japan is also much lower than gross debt, with Japan's government holding financial assets worth 59% of GDP in 2023. These assets have historically delivered a higher return than the government's cost of funding.

While the US has an extraordinary ability to borrow due to the relative safe-haven role of US markets and the USD, it also has an extraordinary need to borrow. US cumulative deficits in the past five years were 7.6x the size of those of Japan. Thus, the lack of a debt crisis in Japan doesn't suggest that the risks are low in the US on its current path. Japan's advantages may fade into the future, if households allocate more to risky assets due to higher inflation, larger investment tax exemptions, and high recent returns, or if inflation forces tighter monetary policy. Both the US and Japan may need to tighten financial repression to ensure a strong and stable source of demand for their debt.

## 8. Why has Congress not acted?

In a democratic society, government policies should and will generally reflect what voters want them to do. We should thus see large deficits as simply a result of voters wanting the government to do more while preferring not to have to pay for it, at least not today. The dramatic surges in debt after the GFC and Covid over the past 20 years suggest that the demand for higher government spending was not just for favored government programs but more to be ready to support people and the economy in times of crisis.

Today also, though in smaller amounts, we see that with each new extreme weather disaster, the federal government stands ready to provide emergency funds to people, communities, and states in need. Just as the Fed is acting with larger and larger sums as the lender, or liquidity provider, of last resort, so is the **federal government becoming the insurer of last resort**. Banks have to pay fees for deposit insurance, but the broader government has not yet come around to convincing taxpayers they should pay it an insurance premium to be able to continue as the ultimate insurer in times of crisis.

## 9. What is the economic case then to make the US budget deficit sustainable?

3. See [Democracy metrics and equity markets](#), October 21, 2021.

4. A more detailed discussion can be found in [Government debt: Japan vs the US](#), July 5, 2024.

The case to us is largely one of **risk management**. While rises in US debt so far have done little damage to the economy in recent decades, that need not remain the case. That is, it is better not to play with fire. More important to us is the growing role of the government as the insurer of last resort. It surely helped the country and economy that the US government stood ready to underwrite the financial system during the GFC and provided massive fiscal support during Covid, healing the US economy much faster than, say, Europe, which does not have the same fiscal space as the US, after each of these crises.

The future will surely bring new crises and shocks that will create demands on the federal government to again come to the rescue. CBO projections assume no severe recession, pandemics, or financial crises, and the dramatic underestimates of past CBO projections tell us that risk is severely biased to the upside on US debt without corrective measures. Some of these crises are coming increasingly from extreme weather events brought on by global warming. To make sure the US will retain the fiscal space to act in future crises, it would be prudent to build up fiscal reserves, reducing deficits during good times as every prudent investor and financial institution knows.

#### **10. Will Congress act now, and what would force it to act?**

It seems quite unlikely to this analyst that Congress will suddenly become convinced of the wisdom of building fiscal reserves for the rainy days that will surely come. The fine balance between the two main parties in the US makes it very hard for any representative to act like a long-term statesperson as it is quite likely to us that there will always be a majority of voters who will object to the needed spending cuts and tax increases to stabilize the fiscal situation.

**The most likely driver for Congressional action would be a significant erosion of its fiscal space.** If we are right about the factors that determine the US's fiscal space, a mere run-up in debt or deficits by itself would not force significant action to slow the growth of debt.

It will probably need to be combined with developments that sap investor confidence in the ability of the country to service its debts without great economic costs. This would probably come from a combination of economic and political, if not military, setbacks that would create serious doubts – especially for foreign investors – about the country's ability to grow out of its debt problem. Think in terms of a combination of a bad recession, sustained low growth, sky-high interest rates, deflation, military defeats, domestic political violence, the emigration of business talent, or other setbacks. None of these

are on our near-term horizon, and any single one would probably not be enough, but a “polycrisis” with a number of these would likely greatly restrain the Treasury and force fiscal tightening, right at the wrong moment.

#### **11. What is the best way to tackle the deficit?**

In principle, one ought to choose to cut back the spending programs, and raise revenues sources (i.e., taxes), that have the least impact on the underlying economy, not only because of concern about jobs and growth but also because a weaker economy will by itself lower tax revenues and induce automatic stabilizers that increase outlays, such as support for the unemployed. That could entail higher taxes on products that have a low price elasticity of demand, such as so-called sin taxes. Higher taxes on people with low income elasticity (mostly high income), at least in the short run, raises total tax revenues more than income taxes on people who do not have enough to save. Empirical evidence squarely counters the argument frequently heard, and best known as the [Laffer Curve](#), that lower tax rates on business and high income people will stimulate the economy enough for total tax revenues to actually rise.<sup>5</sup>

Reviewing the multitude of options that Congress could use most effectively to reduce the deficit would require a much longer study than possible in this note. We will thus not try, except to make the point that it makes sense to **act gradually and steadily**, spreading the pain, as a sudden move to fiscal tightening can easily push an economy into recession, quickly lowering tax revenues and inducing a quick move to fiscal easing.

#### **12. Will our children and grandchildren have to pay for our excesses?**

Yes, and the fewer kids we have, the higher the cost of servicing the ever-rising debt will be. The CBO's long-term demographic projections show deaths exceeding births by around 2040, with any further population growth from then simply a function of net immigration. Dismal as this outlook may seem, it is dramatically better than that of most of Continental Europe and North Asia, where exceedingly low birth rates and little net immigration are now already leading to shrinking populations, putting serious pressure on pay-as-you-go national pension systems. In [Long-term impacts of immigration](#), June 5, 2024, we showed that increasing immigration has a strong beneficial impact on debt ratios as it does not increase budget deficits but does more than proportionally increase the size of the economy, thus lowering debt to GDP.

---

5. See, e.g., [Tax policy and investment in a global economy](#), Chodorow-Reich et al., NBER working paper March 2024.

## The Long-term Strategist

### Government debt: Japan vs the US

- Japan has the highest national government debt-to-GDP ratio, nearly twice that of the US, and the lowest interest rates. Does this tell us that policy makers and investors are wrong to worry about the seemingly out of control US fiscal situation?
- We do not think so as sustained high savings surpluses and a strong domestic preference to hold safe assets have allowed Japan to avoid a debt crisis so far. These conditions do not apply to most other countries and surely not to the US.
- Japan has a long-standing domestic savings surplus, while the US has a large savings deficit. Japanese government debt rose sharply during a period of strong corporate saving and weak borrowing.
- Japan's savings are held in government debt to a much greater degree than in the US. Japanese households hold much of their wealth in deposits and insurance products, and banks and insurers are much larger relative to the economy. Both have to hold large quantities of government debt.
- Deflation or low inflation since the 1990s has allowed the Bank of Japan to hold interest rates very low and buy a lot of government debt without worrying about any effect on inflation.
- High savings and a preference for fixed income mean there is strong and stable demand for government debt in Japan. In 2023, banks, insurers, and the BoJ held national government debt worth 166% of GDP.
- Net debt in Japan is much lower than gross debt. Japan's government held financial assets worth 59% of GDP in 2023. These assets have historically delivered a higher return than the government's cost of funding.
- While the US has an *extraordinary ability* to borrow due to the safe-haven role of US markets and the USD, it also has an *extraordinary need* to borrow. Cumulative US deficits in the past five years were 7.6x the size of those of Japan.
- Thus, the lack of a debt crisis in Japan doesn't suggest that the risks are low in the US on its current path.
- Japan's advantages may fade into the future, if households allocate more to risky assets due to higher inflation, larger investment tax exemptions, and high recent returns, or if inflation or currency weakening force tighter monetary policy.
- Both the US and Japan may need to tighten "financial repression" to ensure a strong and stable source of demand for their debt.

#### Long-term Strategy

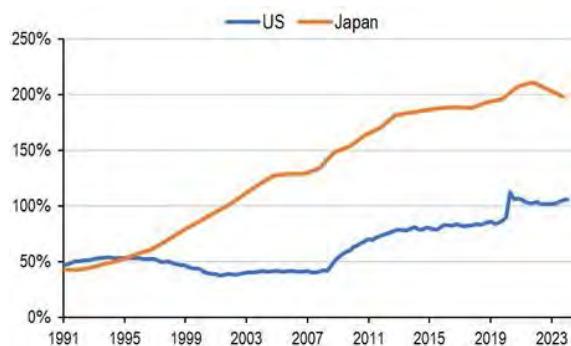
Alexander Wise <sup>AC</sup>  
(1-212) 622-6205  
alexander.c.wise@jpmchase.com

Jan Loeys  
(1-917) 602-9440  
jan.loeys@jpmorgan.com  
J.P. Morgan Securities LLC

In the debate about whether the US is at risk of a debt crisis given the current trajectory of government debt, some argue that the lack of a debt crisis in Japan, where central government debt<sup>1</sup> is almost double that in the US as a share of GDP – 198% vs 105% by year-end 2023 – suggests that this risk is low, particularly given the “exorbitant privilege” of the US due to the global role of the dollar. In this note, we assess this claim and find that **several factors have substantially reduced the historical probability of debt stress in Japan.** First, domestic savings have been persistently high in Japan. Second, these savings are heavily invested in fixed income, partly due to “financial repression.” Third, the Japanese government has substantial holdings of financial assets, which have historically generated a higher rate of return than the government’s cost of funding. The US does not enjoy these advantages, so **the Japanese experience does not imply that the risk of debt stress in the US is low** on the current path. Further, while these accommodative factors have historically reduced the risk of debt stress in Japan, there is **no guarantee they will persist into the future.**

Figure 1: Central government debt and loan liabilities as a share of GDP

%, Q1/1991-Q1/2024, quarterly (US) and annual (Japan).



Source: J.P. Morgan, Board of Governors of the Federal Reserve System, BEA, Bank of Japan, Japan Cabinet Office, World Bank, IMF.

## Factor 1 – High domestic savings

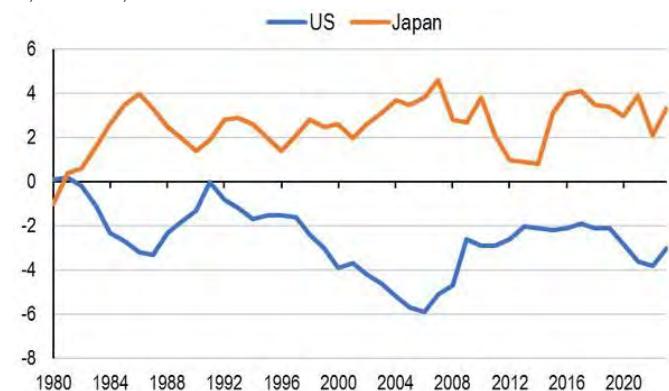
Japan has maintained a **persistent domestic savings surplus since the 1980s**, reflected in its current account surplus, while the US has maintained a persistent savings deficit, reflected in its current account deficit, as shown in Figure 2. Empirically, current account balances are negatively correlated with cur-

rent and future interest rates.<sup>2</sup> The logic behind this relationship is that a country with higher domestic savings than investment – equal to its current account surplus – will require higher interest rates when lending to countries with a savings deficit to compensate for the extra risk incurred, consisting primarily of FX risk among DM countries.

**Japan’s structural savings surplus thus contributed to the very low level of interest rates, which has eased government debt management.** By contrast, the structural savings deficit in the US raises the cost of borrowing, and the dependence on international capital adds an element of geopolitical risk in fiscal affairs.

Figure 2: Current account balance as a share of GDP

%, 1980-2023, annual.



Source: J.P. Morgan, IMF.

Corporates have contributed substantially to this domestic savings surplus. After the Japanese asset price bubble burst in the early 1990s, **Japanese corporates began to deleverage, saving and paying down debt instead of investing in growth**, a phenomenon behind Japan’s persistent economic stagnation in the view of economist Richard Koo, who termed it a “balance sheet recession.”<sup>3</sup> Figure 3 plots non-financial corporate debt as a share of GDP relative to the level in 1994. Between 1994 and 2022, corporate debt decreased by 43 percentage points in Japan, while it increased by 41 percentage points in the US. After the initial steep decline, Japanese corporate debt increased modestly prior to the GFC, before a renewed period of deleveraging until the pandemic, albeit less pronounced than in the 1990s, reflecting a continued reluctance by corporates to borrow. By contrast, US corporate debt increased by 20 percentage points after 2000. The continued accumulation of public debt in Japan was likely eased by anemic private demand for capital.

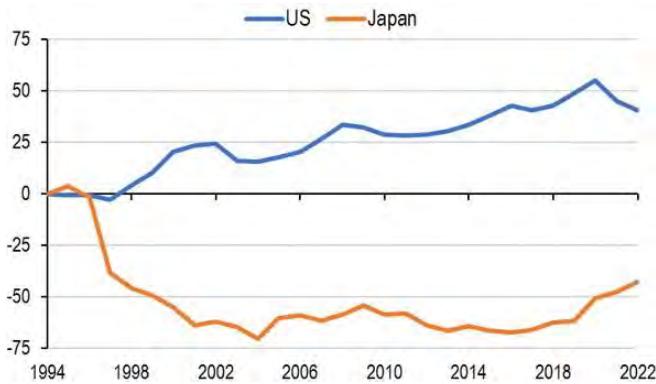
1. “Debt” is debt and loan liabilities of the central/federal government, based on flow of funds data from the Bank of Japan and the Board of Governors of the Federal Reserve System. This is distinct from the commonly cited “General government debt,” which includes state and local governments.

2. Martin Boileau and Michel Normandin, [Dynamics of the current account and interest differentials](#) (2008) 74(1) *Journal of International Economics* 35-52.

3. Richard Koo, *Balance Sheet Recession: Japan’s Struggle with Uncharted Economics and its Global Implications* (2003) *Wiley*.

Figure 3: Non-financial corporate debt as a share of GDP relative to 1994 level

%, 1994-2022, annual. All debt instruments.



Source: J.P. Morgan, IMF.

## Factor 2 – How savings are invested

**Banks play a larger role in financial intermediation in Japan than they do in the US.** This is partly a consequence of the relative preference of Japanese households to hold their financial wealth in currency and deposits. Based on flow of funds data, the currency and deposit share of financial assets was 52.6% among Japanese households in Q4/2023,<sup>4</sup> but only 12.0% among US households, which invest much more heavily in equities, as we recently discussed.<sup>5</sup> In 2023, assets held by depository corporations in Japan amounted to more than 410% of GDP, compared to roughly 97% in the US.<sup>6</sup>

**Like banks, insurance companies are also comparatively large in Japan.** In 2023, insurance reserves and annuities accounted for 18.4% of the financial assets of Japanese households. While the *US Financial Accounts* do not report holdings in a way that permits direct like-for-like comparison, life insurance reserves specifically accounted for 1.7% of the financial assets of US households in 2023, compared to 11.0% for Japanese households. In 2023, Japanese insurers held assets worth 89% of GDP, compared to 47% in the US.

**Jointly, the financial asset holdings of banks and insurers in Japan are much larger relative to the economy than in the US.** Figure 4 plots these combined financial assets of banks and insurers. In 2023, banks and insurers in Japan jointly held financial assets worth 505% of GDP, compared to

4. Bank of Japan, [Flow of Funds](#) (2024).

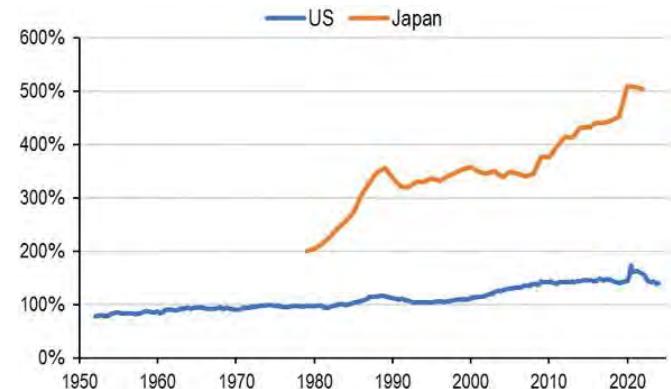
5. Board of Governors of the Federal Reserve System, [Financial Accounts of the United States – Z.1](#) (2024).

6. We analyze the stock of assets relative to GDP here as the stock of public debt is typically also assessed relative to GDP, allowing simple comparison of bank holdings relative to outstanding government debt.

141% in the US.

Figure 4: Assets of depository institutions and insurers as a share of GDP

%, Q4/1951-Q4/2023, quarterly (US) and annual (Japan).



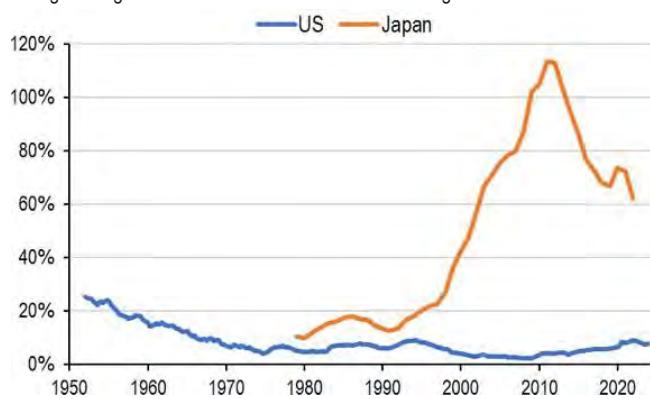
Source: J.P. Morgan, Board of Governors of the Federal Reserve System, BEA, Bank of Japan, Japan Cabinet Office, World Bank, IMF.

**For regulatory and financial reasons, banks and insurers maintain sizable holdings of government debt,** typically issued by the domestic government. As of 2023, flow of funds data suggest banks in the US and Japan held domestic government debt in similar proportions relative to their financial assets, around 6%. Insurers, however, maintain much higher allocations to central government debt in Japan. In 2023, government debt accounted for 42.2% of financial assets held by Japanese insurers, compared to 4.8% in the US.

Jointly, the proportionally higher allocations by insurers in Japan to central government debt, and the fact that banks and insurers are comparatively large in Japan, mean that **banks and insurers hold a very substantial share of this debt in Japan**, but relatively modest shares of outstanding government debt in the US. The combined central government debt holdings of banks and insurers are plotted relative to GDP in Figure 5. In 2023, banks and insurers jointly held central government debt equal to 62.4% of GDP in Japan, compared to just 7.7% in the US. At the peak in the early 2010s, prior to “Abenomics” and substantial quantitative easing, Japanese banks and insurers jointly held central government debt worth 114% of GDP. Whether this is the product of “financial repression” or simply fundamental preference differences, this provides a strong source of demand for government debt that allows the government to finance itself at persistently low interest rates.

Figure 5: Combined central government debt holdings of depository corporations and insurers as a share of GDP

%, Q1/1951-Q4/2023, quarterly (US) and annual (Japan). Includes imputed indirect holdings through shares in investment funds which hold government debt.



Source: J.P. Morgan, Board of Governors of the Federal Reserve System, BEA, Bank of Japan, Japan Cabinet Office, World Bank, IMF.

Bank and insurer holdings of government debt have declined relative to the size of the economy since the peak in the early 2010s, though holdings remain substantial. However, this coincided with the **significant increase in the government debt holdings of the Bank of Japan** as it vastly expanded its asset purchase program in 2013. This program was expanded with an explicit reflation objective after a prolonged period of very low inflation or outright deflation since the mid 1990s, as shown in Figure 6, which plots CPI inflation (ex. food and energy) in Japan on an over-year-ago basis.

Figure 6: CPI inflation (ex. food and energy) in Japan

% oya, 1/1990-12/2023, monthly. Temporary spikes in 1997 and 2014 are associated with increases in the consumption tax rate.



Source: J.P. Morgan, OECD.

Persistently low inflation effectively freed the BoJ from the constraint of price stability that typically binds other central banks. With a reflation mandate, the BoJ purchased government debt in extraordinary quantities, coming to hold debt worth roughly 100% of GDP by 2020. For so long as the BoJ

was empowered, and indeed encouraged, to buy government debt in any quantity it saw fit, **the risk of debt stress was effectively zero**, in our view. By contrast, central banks close to or above their long-term inflation targets must inevitably weigh the need for action against the possible inflationary impacts of asset purchases, as the Bank of England was forced to do in their response to the UK's "mini-budget" crisis in 2022. In our view, even the perception of a *de facto* constraint on the ability of a central bank to act raises the risk of bond market turmoil. Only now that inflation in Japan has finally pushed beyond the long-term target are questions being raised in earnest about the sustainability of the BoJ's balance sheet.

### Factor 3 – Government financial assets

When comparing government debt in Japan and the US, reference is commonly made to gross liabilities. When assessing the ability of governments to issue and service debt, their net financial position is arguably a more relevant metric. Based on flow of funds data, the **Japanese government held financial assets worth 59% of GDP** in Q4/2023, including domestic equity holdings worth 13% of GDP and foreign bond and equity holdings worth 24% of GDP. Net of these financial assets, central government debt and loan liabilities amounted to 140% of GDP in Q4/2023. These financial assets should generally **generate a higher rate of return than the government's cost of capital**, particularly during the period of very low interest rates in the developed world. For example, in the past 15 years, the MSCI Japan index has returned 10.1% pa in local currency terms, while the government's cost of capital was near zero. Overall, Chien et al. (2023) estimated that Japan's government realized a return about 2.1% pa greater than its funding costs between 1997 and 2022, with even higher excess returns in the latter part of this period.<sup>7</sup>

By contrast, in Q4/2023, the federal government of the US held financial assets worth 14% of GDP, with negligible holdings of equities. Net of these financial assets, federal government debt and loan liabilities amounted to 94% of GDP. Thus, **looking at government liabilities in net terms narrows the gap between Japan and the US by roughly half**.

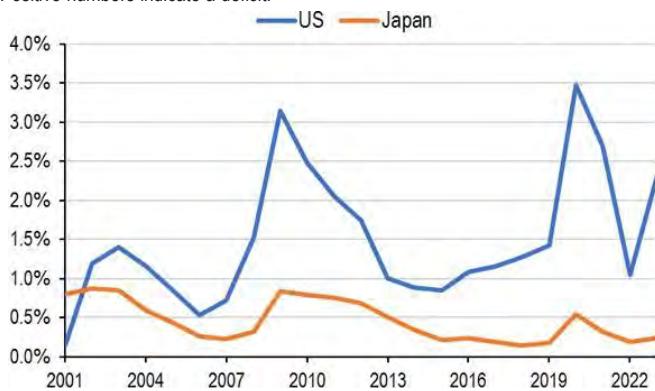
### Global role of the USD

There is no doubt that the US has an **extraordinary ability** to borrow given the safe-haven status of US markets and the role of the US dollar as the world's dominant reserve currency. All else being equal, this should reduce the likelihood of debt stress at any given level of debt-to-GDP. Putting aside the fact that all else is not equal as discussed above, what this

7. Yili Chien, Harold Cole and Hanno Lustig, [What about Japan?](#) (2023) Stanford GSB Research Paper #4620159

line of argument neglects is that the US has an **extraordinary need** for capital by virtue of its size. To illustrate, Figure 7 plots general government deficits of Japan and the US as a share of world GDP.<sup>8</sup> Between 2007 and 2023, cumulative deficits of the US were 4.5x those of Japan in common currency terms. In the five years ending 2023, the ratio of cumulative deficits was 7.6x. From a global perspective, the current and future financing needs of the US government are a substantial source of demand for capital, with the potential to strain global capital markets and push up the global cost of borrowing.

**Figure 7: General government deficit as a share of world GDP**  
 %, 2001-2023, annual. General government includes sub-national governments. Positive numbers indicate a deficit.



Source: J.P. Morgan, IMF.

## What does the future hold?

Our discussion to this point has considered factors that have historically reduced the likelihood of public debt stress in Japan. **However, these accommodative factors may not be permanent.** Indeed, there is some evidence that some may moderate. First, corporate debt and loan liabilities have increased from 102.8% of GDP in FY2019 to 113.7% in Q4/2023 in the flow of funds. If sustained, rising private demand for capital could compete with public demand, possibly raising the cost of borrowing. Second, the preference of Japanese households to hold financial wealth in deposits may wane if the recent rise in inflation proves to be durable. Holding wealth in deposits was relatively attractive to households during the period of low inflation or outright deflation. It was also consistent with their reduced risk tolerance after the collapse of the asset price bubble in the 1990s. Higher inflation, the 2024 expansion of the Nippon Individual Savings Account (NISA) tax exemptions, and recent strong returns in

8. Note that data are for general governments, which include sub-national governments. While our focus in this note has been on central government debt, deficit data are only reported by the IMF or OECD at the general government level.

domestic equities may make riskier assets more attractive. Furthermore, inflation at or above the BoJ's long-term target or continued currency depreciation may also effectively constrain its monetary policy moving forward. Taken together, these developments suggest **there is a risk that Japan is moving into a more challenging period for debt sustainability**, particularly with new spending priorities in defense and industrial policy.

Governments – Japan and the US included – have means to reduce the likelihood of public debt stress, beyond simply reducing debt and deficits. They can engage in "**financial repression**" by tightening policies that force or incentivize individuals or institutions to hold government debt, providing a strong and stable source of demand for that debt, which reduces borrowing costs. However, these measures are not likely to be cost free as they may lead to a misallocation of capital and reduce private sector dynamism. Given the level of public debt in Japan and the US, and the troubling trajectory of debt in the US based on CBO projections, this is a reality both governments may need to confront in the future. Another notable risk is the possibility that governments will **undermine central bank independence** to ensure that monetary policy eases public debt management, which would probably bring higher and more volatile inflation.



## The Long-term Strategist

### Long-run economic growth forecasts

- We construct econometric and machine learning models to forecast long-term economic growth for the 50 largest economies in the world.
- Forecasts are based solely on *currently* known economic fundamentals, and not on any views on *future* fundamentals. This produces both more objective forecasts and measures of uncertainty around them. Our combined model has smaller errors and reduced forecast bias relative to forecasting benchmarks. Investors with views on future fundamentals can use the forecasts as a starting point to bias their own forecasts.
- Fundamentals used consist of level of development, workforce growth, capital and human capital accumulation, trade intensity, international competitiveness, financial development and leverage cycles, fiscal debt, inflation, economic geography and global spillovers, and past growth.
- The models project that world GDP will grow at 2.8% pa over the coming decade, consisting of 1.6% in DM and 4.2% in EM. In DM, they see growth of 1.8% in the US, 1.4% in the Euro area and 0.8% in Japan. The secular slowing of the US reflects a near-uniform deterioration of its fundamentals.
- Within EM, the models forecast 5.1% growth in China and 5.2% in India in the coming decade. Across regions, they forecast 2.9% growth in LatAm, 4.7% in EM Asia, 3.9% in EM Asia ex-China, and 2.2% in CEEMEA.
- While we project slowing rates of growth in most economies – due largely to demographics and rises in global development – the global rate of GDP growth is projected to remain stable near the rate observed in the last 30 years as higher growth EM economies become a larger share of world GDP.
- Our forecasts imply that the global economy will grow from ~\$100tr in 2022 to ~\$130 trillion by 2032, and that the DM share of the global economy will decline to 50% over that time. China is projected to surpass the US as the world's largest economy in 2030.
- Risk and uncertainty are the message. Users of long-term economic forecasts need to recognize that these models, representing the best we can do in our judgment, still come with large uncertainty bands, averaging 1.3% root mean square errors across 50 large economies. This means that for an economy with say 2.5% expected growth, there are 1/3 odds growth over the next 10 years will be *outside* a range of 1.2-3.8%. For the US, we have *only* a 0.8% one sigma risk around the forecast of 1.8% growth.
- Long-term economic forecasting comes with larger errors than shorter-term forecasting, likely as growth shocks – up or down – tend to persist and compound over time. This contrasts with our opposite finding that asset return forecasting benefits from time diversification.
- That said, we do get some relief from forecasting across *groups* of countries as long-term growth surprises are only slightly correlated across countries, lowering the risk around regional or global forecasts to 0.3% one sigma risk on global growth, 0.7% on DM and 0.5% on EM.

As part of their investment process, most **corporates and strategic investors require assumptions about long-term economic growth** in the countries they operate in. But where do they get these numbers? The objective of this paper is provide **objective estimates for growth in the next 10 years in the world's 50 largest economies**, based on what we know today and without having to make arguably subjective assumptions about what the world will look like in the coming decade. We aim to regularly update these forecasts.

To make these projections, we construct **empirical models of long-run economic growth which are based purely on economic fundamentals**. In our analysis, two modelling approaches exhibit predictive power for economic growth in the next 10 years. The first is an econometric regression model with a variable regularization algorithm designed to improve predictive power. The second is a non-parametric machine learning regression model. Combining the forecasts of these two models further improves predictive power, as commonly occurs when one takes the average of different forecasting signals.<sup>1</sup> In the US, the combined model exhibits smaller forecast errors and less forecasting bias than the benchmark "Blue Chip" consensus long-run forecasts over the out-of-sample forecasting period. Across the full set of economies studied, the combined model also substantially outperforms adaptive expectation models, which produce forecasts that very closely resemble the *Blue Chip* consensus in the US.

## Data

Most databases generally do not provide continuous coverage of a very large set of economic fundamentals over a long period of time for a large set of countries. Thus, in analyzing the determinants of long-term economic growth, there is a strong trade-off between the growth determinants considered, and the countries and period of time studied. For example, if one used a wide array of economic fundamentals from the World Bank's *World Development Indicators*, one would struggle to validate any empirical model of long-term growth since there is inconsistent coverage of different economic fundamentals through time and across countries, leading the estimation sample to shrink rapidly with the addition of explanatory variables.

In our view, the **Penn World Tables (PWT) database** strikes the right balance between including an

<sup>1</sup> See, e.g., Robert Clemen, [Combining forecasts: A review and annotated bibliography](#) (1989) 5(4) *International Journal of Forecasting* 559-583.

informative set of growth determinants, while also maintaining near-uniform coverage of a large set of countries over an extended period of time.<sup>2</sup> The database includes data on GDP and its components, investment, capital, human capital, trade, population and productivity (more limited), amongst others, for 183 countries between 1950 and 2019, with country coverage typically beginning in 1950 or 1970 for countries already in existence by those years. Since coverage ends in 2019, we will extend explanatory variables using other sources to allow us to make forecasts for the decade ahead based on current fundamentals. In this paper, we restrict our analysis to the 50 largest economies in the world by nominal GDP in 2022 according to the IMF, accounting for ~95% of global GDP. They are listed in Table 1 in the results section.

Bearing in mind the trade-off between variables considered and data coverage, we **merge four additional time series with the PWT database**.<sup>3</sup> The first is domestic credit provided to the private sector by banks as a share of GDP, for which there is reasonable coverage for a large set of countries from the World Bank. The second is population decomposed by age, which is sourced from the UN. The third is public debt as a share of GDP, which is constructed by splicing data from IMF's *Historical Public Debt and Fiscal Monitor* databases. Finally, we merge inflation data from the IMF's *International Financial Statistics* database, with the global inflation database constructed by Ha et al. (2022) used to fill gaps in coverage.<sup>4</sup>

## Economic fundamentals

Using this constructed database, we consider a set of **economic fundamentals with putative effects on long-term economic growth**. These economic fundamentals are detailed and rationalized below. In our analysis, economic fundamentals in the preceding 10 years are used, though consideration was given to other lag structures. While longer lookbacks may smooth over short-term determinants of economic growth which are

<sup>2</sup> We use the *Penn World Tables 10.0* edition published by the Groningen Growth and Development Centre. For reference, see Robert Feenstra, Robert Inklaar and Marcel Timmer, [The Next Generation of the Penn World Table](#) (2015) 105(10) *American Economic Review* 3150-3182. The outcome variable is real GDP based on national accounts (*rdgpa*).

<sup>3</sup> For China, real GDP data are sourced from the World Bank due to inconsistencies between the measure reported in the *PWT* database and in national accounts.

<sup>4</sup> Jongrim Ha, Ayhan Kose and Franziska Ohnsorge, [One Stop Source: A Global Database of Inflation](#) (2022) *World Bank Policy Research Working Paper* 9737.

potentially undesirable for long-run forecasting purposes, they may also capture economic circumstances which are misrepresentative of current fundamentals due to ongoing structural change. Based on the analysis in this paper, 10-year lookbacks strike approximately the right balance between these competing considerations.

At this point, it is worthwhile emphasizing that there is a **difference between forecasting future potential GDP growth and future actual GDP growth** since actual GDP need not be equal to potential at any given point in time. When there is a large negative output gap, it is a reasonable presumption that actual growth will exceed potential growth over some horizon.<sup>5</sup> The objective of this paper is to forecast actual GDP growth, and thus consideration will need to be given to the phases of business cycles.

As explained below, the signs of the effects of some economic fundamentals – such as leverage growth – on future economic growth are ambiguous *a priori*. When forecasting growth in this paper, the effects of these variables will be disciplined by the data.

### Recent economic growth

Conditional on the other predictor variables, including recent economic growth as a predictor may capture other determinants of long-run economic growth which are immeasurable or were omitted due to data constraints. As observed in a [recent note](#), long-run consensus forecasts in the US are well-characterized by simple adaptive expectation models which assume future growth is a function of past growth. In this paper, growth in the preceding 10 years is used as a predictor of future growth.

### Workforce growth

As the employed labor force grows, the productive capacity of an economy will increase, provided there is no simultaneous decline in labor productivity that is sufficiently large to offset this increase. While the *PWT* database includes data on the number of persons engaged in work, coverage for this variable is relatively limited both across countries and through time. Labor force participation data over a long time frame and for a large set of countries are otherwise unavailable. As an alternative, we use the population aged 20-64 sourced

<sup>5</sup> The output gap is not used as a predictor variable due to insufficient data coverage across countries and through time. Data coverage is also insufficient for proxies for the output gap like unemployment deviations from historical averages – for example, ILO country-level unemployment data only start in 1991.

from the UN as a measure of the workforce. While this measure disregards changes in the labor force participation rate within this demographic, it controls for the effect of changes in population structure on the size of the labor force, and is nearly ubiquitously available in the UN data. In this paper, the annualized rate of workforce growth in the preceding 10 years by this measure is used as a predictor of future growth.

### Level of development

The rate of productivity growth in an economy tends to slow as economic activity shifts from high productivity growth agriculture and manufacturing to low productivity growth services, and within services from relatively high productivity growth service sectors to relatively low productivity growth ones.<sup>6</sup> These transitions happen systematically as the level of development increases, reflecting well-documented income and relative price effects on consumer demand which are induced by growth.<sup>7</sup> In this paper, the natural logarithm of real GDP per capita is used as a measure of the level of development of an economy. Based on empirical evidence that there is a non-linear relationship between the level of development and long-run growth, a quadratic GDP per capita term is also included.

### Capital accumulation

The canonical Solow model of long-run economic growth – which represented the starting point for modern growth empirics – emphasized the role of investment and capital accumulation as a driver of economic growth. Higher rates of investment contribute to faster growth of the capital stock, a factor of production in the economy alongside labor. In our paper, the average investment share of GDP in the preceding 10 years is used as a predictor of future growth. The average is taken over a 10-year period to smooth over annual volatility in the investment rate.

### Human capital accumulation

In an attempt to reconcile the standard Solow model with empirical evidence, Mankiw, Romer and Weil (1992) extended the model to include human capital accumulation.<sup>8</sup> Human capital may take many forms, but

<sup>6</sup> See, e.g., Georg Duernecker, Berthold Herrendorf and Akos Valentinyi, [Structural Change within the Services Sector and the Future of Cost Disease](#) (2022) *Working Paper*.

<sup>7</sup> See, e.g., Tomasz Swiecki, [Determinants of structural change](#) (2017) 24 *Review of Economic Dynamics* 95-131.

<sup>8</sup> Greg Mankiw, David Romer and David Weil, [A Contribution to the Empirics of Economic Growth](#) (1992) 107(2) *Quarterly Journal of Economics* 407-437.

typically encompasses education, health, knowledge and experience. Improvement along any of these dimensions should raise labor productivity, driving economic growth. The *PWT* database includes a human capital index based on years of schooling and returns to education. While an imperfect measure of the many facets of human capital, education is most commonly used to measure human capital in empirical growth analysis – including in Mankiw, Romer and Weil (1992). In our paper, the annualized rate of human capital growth in the preceding 10 years based on this human capital index from the *PWT* is used as an explanatory variable.

### Trade intensity

Standard economic trade theory asserts that reductions in barriers to trade, and the resultant increases in exports and imports, should support growth by enabling specialization according to comparative advantage. Whether this assertion holds in practice remains a subject of research, though it is conceivable that specialization in a low productivity growth sector could restrain future economic growth. In this paper, we use changes in the sum of exports and imports as a share of GDP in the preceding 10 years as a measure of recent changes in the trade intensity of an economy. This ought to be significantly positive for an economy undergoing trade liberalization, and significantly negative for an economy undergoing autarkic reform, such as during a trade war.

### International competitiveness

Growth in international competitiveness or terms of trade improvements, reflected in an increase in *net* exports, have the potential to support growth into the future. Amongst others, China, Japan and South Korea have all successfully pursued export-oriented development models. For example, after embarking on a program of export-promotion, net exports as a share of GDP in South Korea increased from approximately -6% in 1979 to around 7% in 1987, with real GDP growing at an annualized rate of about 8.5% in this period. In China, net exports peaked at about 6% of GDP in 2007. This competitiveness effect is notionally distinct from that of growing trade intensity as defined above since total trade may still grow or shrink in the absence of any change in competitiveness. This disconnect is evident in the fact that trade as a share of GDP actually declined by nearly 3 percentage points between 1979 and 1987 in South Korea, due to a decline in imports as a share of GDP. In this paper, the change in net exports as a share of GDP over the preceding 10 years is used as an explanatory variable.

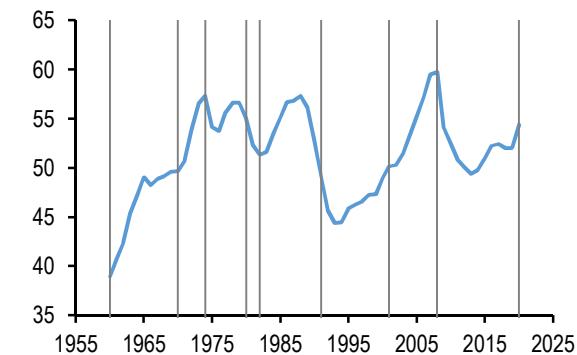
### Financial development and leverage cycles

The inclusion of a measure of credit provision to the private sector can be rationalized in several distinct ways. Firstly, it is well-established that financial development can facilitate economic growth by ensuring firms can access needed finance, as is highlighted by Rajan and Zingales (1998).<sup>9</sup> Increases in credit provision to the private sector may thus reflect improvements in the accessibility of finance, with a positive effect upon growth. Relatedly, the growth in credit may reflect an increase in the return upon investment and, consequently, the need for finance.

Distinctly, the growth or contraction of credit may reflect leverage cycles in an economy, with the growth in leverage during an expansion and deleveraging during a contraction. Figure 1 plots domestic credit provided to the private sector by banks as a share of GDP in the US, along with lines indicating recession years declared by the NBER. Recessions in the US often coincided with inflection points in leverage by this measure. This pattern may be reflective of a causal relationship from leverage to the state of the economy, with the build-up of leverage contributing to financial crises like the GFC. Regardless of the origin of the evident relationship, changes in the provision of credit to the private sector may be informative as to the current position in a business cycle.

Figure 1: US domestic credit provided to the private sector by banks as a share of GDP, with recession years

1960-2020, annual. Gray lines indicate recession years from NBER.



Sources: J.P. Morgan, World Bank, FRB of St. Louis, NBER.

While we have largely abstracted, to this point, from cyclical economic factors, they remain important to consider since the current point in the business cycle can substantially influence realized growth over the coming decade. For example, the *Blue Chip* consensus long-run

<sup>9</sup> Raghuram Rajan and Luigi Zingales, [Financial Dependence and Growth](#) (1998) 88(3) *American Economic Review* 559-586.

forecasts failed to anticipate any economic contraction in the lead-up to the GFC, leading to systematic overestimation of growth in 10-year windows spanning 2008, as [recently observed](#). Improvement of long-run forecasts in this respect could lead to meaningful outperformance of this benchmark. As noted below, our combined forecasting model predicted a noticeable slowdown in the US in the mid-to-late 2000s.

For these reasons, the growth of leverage could either indicate financial development or growing returns on investment, which portend well for future economic growth, or could serve as a leading signal of a forthcoming growth deceleration. In this paper, we use domestic credit provided by banks to the private sector since there is good country and time coverage for this variable in the World Bank data. The empirical analysis here will use the growth or contraction of leverage by this measure in the preceding 10 years as a predictor of future growth. Including the level of leverage – rather than the change in leverage – did not improve predictive power.

### Fiscal debt growth

Like private credit, the inclusion of a measure of public debt can be rationalized several ways. Firstly, there is a conjectured effect of public debt on growth, notably argued controversially by Reinhart and Rogoff (2010).<sup>10</sup> The authors of that paper argue that high levels of public debt as a share of output produce slower economic growth, likely due to the investment “crowding out” effect of public debt. However, GDP is on the denominator of the debt-to-output ratio, so slower growth would mechanically give higher debt-to-output ratios, *ceteris paribus*, and consequently the causality of this relationship is unclear.

Changes in public debt may also be informative as to the stance of fiscal policy. Increases in public debt may indicate an accommodative fiscal policy which is supportive of growth, while decreases may indicate fiscal austerity which weighs on economic growth.

Finally, like private leverage, changes in public debt may also be informative as to the current position in a business cycle, given debt typically grows as a share of GDP during economic contractions, with growing outlays but shrinking tax receipts. By contrast, the debt burden conventionally grows more slowly, or in fact shrinks, during economic expansions.

<sup>10</sup> Carmen Reinhart and Kenneth Rogoff, [Growth in a Time of Debt](#) (2010) 100(2) *American Economic Review* 573-578.

For these reasons, growth in the public debt-to-output ratio over the preceding 10 years is included as an explanatory variable in our analysis. Including the level of the debt-to-output ratio – rather than the change in that ratio – did not further improve predictions of future economic growth.

### Inflation

There are also several justifications for the inclusion of a measure of inflation. Firstly, the rate of inflation in an economy may be informative as to the stance of both monetary and fiscal policy. High or accelerating inflation may indicate the adoption of accommodative macroeconomic policies, and may also presage forthcoming tightening to control inflation, especially in countries with an inflation-targeting central bank. Relatedly, high or accelerating inflation may be a symptom that an economy is operating unsustainably above potential, with any reversion towards potential weighing upon future growth.

It has also been argued that excessive macroeconomic volatility may adversely affect long-run growth. For example, Ben Bernanke argued that “lower volatility of inflation improves market functioning, makes economic planning easier, and reduces the resources devoted to hedging inflation risks”.<sup>11</sup> Moreover, lower macroeconomic volatility could imply fewer and less severe recessions, with the possible consequence that hysteresis and scarring effects which depress future potential growth are reduced. On the other hand, we have [argued](#) that the Great Moderation has been marked by particularly slow economic recoveries, possibly in fact worsening hysteresis effects.

To accommodate these conjectured effects, the change in the annual rate of inflation over the preceding 10 years is included as an explanatory variable.<sup>12</sup> Including the average rate of inflation in the preceding 10 years yielded broadly comparable results.

### Economic geography and global spillovers

Due to trade and financial linkages, economic growth in other countries may also be an important determinant of domestic growth. These effects may be particularly

<sup>11</sup> Ben Bernanke, [The Great Moderation](#) (2004) Speech at the Eastern Economic Association.

<sup>12</sup> For the linear econometric regression model, the change in inflation is [winsorized](#) if the observed increase or decrease in inflation is greater than 10 percentage points in magnitude. Data are winsorized since extreme outliers associated with hyperinflationary events substantially skew estimates of the effect of inflation when imposing linear structure.

strong for countries with strong trade relationships, such as countries within the Eurozone or commodity producers dependent upon Chinese demand. The possibility of propagating financial shocks was also highlighted by the Eurozone debt crisis and the Asian Financial Crisis. In this paper, we explored the inclusion of a variety of measures which capture global economic spillovers, including recent growth in the US, recent growth in the US and China, recent growth within regions, and the interaction of exports to China as a share of GDP and recent Chinese growth. Including these measures did not improve the predictive power of our forecasting models, so they are omitted from the analysis, but are detailed here for the sake of completeness.

## Forecasting regression models

### Econometric regression model

Firstly, we construct an econometric regression model using the explanatory variables identified above. A standard multivariate linear regression model takes the following form:

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \cdots + \beta_n X_{nit} + \epsilon_{it}$$

$Y$  is the outcome of interest (real GDP growth over a 10-year horizon),  $X$  are the explanatory variables (described above) and  $\epsilon$  is the error term.

In order to improve the out-of-sample predictive power of this regression model, we use an algorithmic procedure called the Least Absolute Shrinkage and Selection Operator ([LASSO](#)). Intuitively, this procedure iteratively runs the regression subject to a parsimony constraint of varying strength, shrinking coefficients towards zero to reduce overfitting. This often leads to some variables being omitted where they do not enhance the predictive ability of the model. The optimal constraint chosen is the one which minimizes the model mean squared error (MSE) in a subset of the available data upon which the model was not iteratively estimated. Interested readers may refer to a formal description of this technique using the resources linked in the text and footnotes.<sup>13</sup> This approach is particularly helpful in the early years of our model estimation since there are relatively few data points, but a reasonably large set of explanatory variables. Generalization of this technique to [elastic net regularization](#) did not materially improve predictive power.

<sup>13</sup> A more comprehensive resource is Gareth James, Daniela Witten, Trevor Hastie and Robert Tibshirani, [An Introduction to Statistical Learning](#) (2021) pp. 225-288.

### Machine learning regression model

The model above is a parametric regression model, meaning we estimate the parameters  $\beta$  of the linear model specified. This is inherently a restrictive process, because we are specifying that growth is a linear function of economic fundamentals. As an alternative, we construct a non-parametric regression model, which more flexibly accommodates non-linear relationships between these variables. The family of models we consider are Gaussian Process Regression models. Interested readers are referred to a more comprehensive guide included in the footnotes for a formal description of these models, but we offer details and an intuitive account in the appendix.<sup>14</sup>

### What drives long-term growth?

Since our models were constructed with a view to optimizing forecasting performance, interpretation of the effects of different economic fundamentals on growth is more complicated than for a standard linear regression model.<sup>15</sup>

Coefficient estimates from the LASSO regression model are consistent with our priors for those variables where we had strong priors over the direction of the expected effect. **Faster previous economic growth, faster working age population growth, lower levels of development, higher investment, faster human capital appreciation, and faster international competitiveness growth are all associated with faster future growth.**

For other variables, the theoretical anticipated effect was ambiguous for reasons discussed above. The estimated coefficient on inflation growth is negative, likely indicating a forthcoming tightening of macroeconomic policy and the deleterious effects of macroeconomic volatility on growth. The estimated coefficient on trade intensity is weakly positive, but this marginal effect is conditional on international competitiveness, obscuring the estimated effect of globalization broadly considered. The coefficient on leverage and financial development is

<sup>14</sup> Carl Rasmussen and Christopher Williams, [Gaussian Processes for Machine Learning](#) (2006). See especially Chapters 1 and 2.

<sup>15</sup> For the LASSO econometric regression model, coefficients are shrunk towards zero to varying degrees and no standard errors are available, preventing one from conducting the normal tests for statistical significance. Note, however, that when estimating a standard linear regression model, many included covariates are statistically significant at some standard level of significance (1%, 5% or 10%). Forecasting performance, though, is worse. For the machine learning regression model, there are no estimated coefficients.

weakly positive. Finally, the coefficient on fiscal debt growth is weakly positive, likely reflecting the stance of fiscal policy and the possibility that an economy is in the early stages of a recovery from an economic slowdown, after which extended above-potential growth is to be expected.

For the non-parametric machine learning regression model, it is possible to investigate what we shall refer to as **local marginal effects**. By this, we mean the growth effect of changing an economic fundamental on the margin, conditional on the values of other covariates. For example, we can assess the counterfactual growth forecast for the US if the working age population grew at a slightly higher rate than observed in the 10 years before 2022. This marginal effect need not be the same if other economic fundamentals differed – thus, it is *local*.

For the **US** in 2022, the estimated local marginal effects of economic fundamentals in the machine learning model are broadly consistent with the estimated marginal effects in the LASSO econometric model, with four exceptions. For the first three, the *a priori* expected effect was ambiguous. The estimated effect of leverage growth is negative, as may be expected for a country with a financial system that is already well-developed – thus, leverage growth likely does not reflect financial development, which may support growth, but rather is a precursor to a slowdown. The estimated effects of trade intensity and fiscal debt growth are also weakly negative. Finally, the effect of human capital accumulation is negative, contrary to our prior. This may be reflective of the very high existing level of human capital in the US. In India and China – developing countries with smaller stocks of human capital – the effect is strongly positive.

Quantitatively, the **most important predictors** of future growth in our forecasting models are **past economic growth, workforce growth, the level of development, and human capital accumulation**.

## How good are our long-term growth forecasts?

To validate these models, we assess their **out-of-sample forecasting performance**. This entails estimating each model at various points in time, using only the data available to a hypothetical forecaster at that point of time, and comparing the forecasts generated by each model with the realization that is now known to us.<sup>16</sup> Both models are estimated after pooling data across

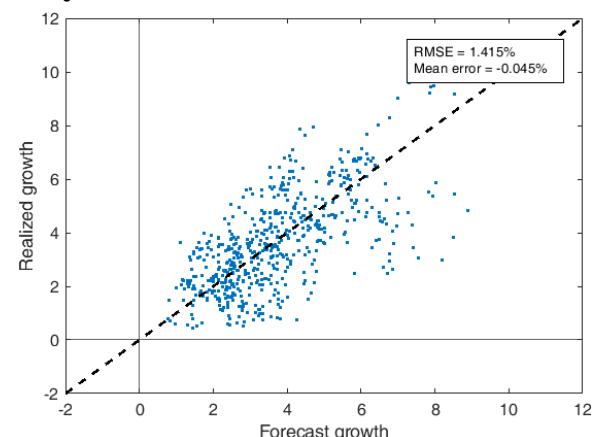
<sup>16</sup> See the appendix for details about the timing of forecasts and the information available to forecasters.

countries into a single estimation sample. Here, we forecast out-of-sample from 1990 through to 2019. The starting year is chosen to ensure that we have at least a modest initial sample to estimate the models.<sup>17</sup> We drop the Covid-19 pandemic years since their inclusion would substantially affect growth realizations for reasons unrelated to economics, and thus present an unduly negative view of forecast performance. Two metrics for evaluating the accuracy of these models are presented here: the root mean square error (RMSE) and the mean error (ME).

When forecasting, we take the **average of the econometric and machine learning model forecasts**, since combining the signals of different forecasting models commonly improves predictive power,<sup>18</sup> though this is not always true for every economy in our sample. Nevertheless, the combined forecasting model is used for all economies to ensure consistency.

**Figure 2: 10-year average growth rates: Realizations versus forecast of the econometric regression model**

%, 1990-2019, 10-year average annual growth rates. Dashed line is the 45-degree line.



Sources: J.P. Morgan, IMF, UN, World Bank, Feenstra et al. (2015), Ha et al. (2022).

Figures 2-4 plot the out-of-sample forecasts compared to the realizations for the econometric, machine learning and combined models, respectively. With a perfect

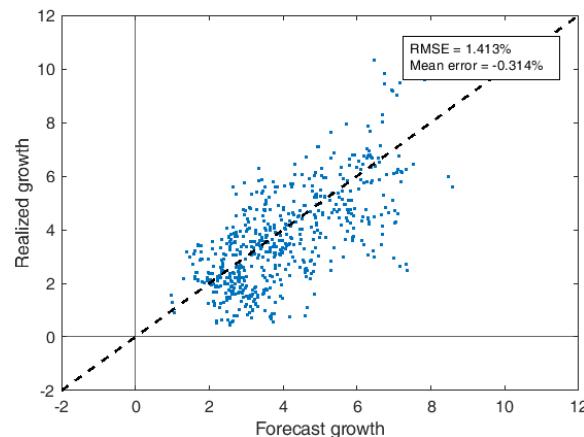
<sup>17</sup> The measure of leverage used in this paper begins in 1960, and we require the change in leverage in the preceding 10 years as an input. Hence, the first observation in our estimation sample is the growth in countries from 1970 to 1980. Thus, we have *at most* 10 highly-related 10-year growth observations per country when initially estimating the model in 1990 (though we almost uniformly have fewer *in fact*). Even after pooling across countries, this is a very demanding test of our models.

<sup>18</sup> See, e.g., Robert Clemen, [Combining forecasts: A review and annotated bibliography](#) (1989) 5(4) *International Journal of Forecasting* 559-583.

forecasting model, all observations would lie on the dashed 45-degree line. Each figure also reports the RMSE and ME of the model. We do not present metrics of model performance on an economy-by-economy basis, since there are insufficient out-of-sample forecast observations (due to data availability) in many economies to draw reasonable inference as to historical model performance separately.

**Figure 3: 10-year average growth rates: Realizations versus forecast of the machine learning regression model**

%, 1990-2019, 10-year average annual growth rates. Dashed line is the 45-degree line.



Sources: J.P. Morgan, IMF, UN, World Bank, Feenstra et al. (2015), Ha et al. (2022).

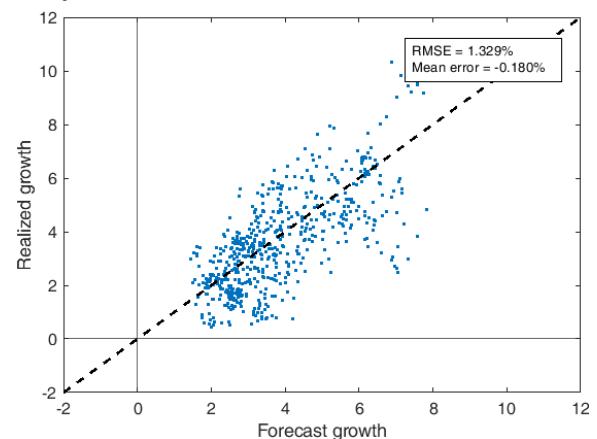
For all three models, observations are clustered around the 45-degree line. Put differently, **the three forecasting models exhibit low statistical bias**. This feature is apparent in the fact that forecast errors are approximately normally distributed around zero, as depicted for the combined model in Figure 5. By contrast, as we noted in a [recent note](#), long-run *Blue Chip* consensus forecasts in the US have historically proven materially biased in an economically bullish direction. The limited degree of bias in our models is largely the consequence of over-estimation of growth in Thailand and Indonesia for periods spanning the late 1990s, when both economies languished due to the Asian Financial Crisis, and grave political turmoil in Indonesia culminated in the resignation of President Suharto.

Pooling across all economies in the sample, the RMSEs for both the econometric and machine learning regression models are around 1.4%. The **RMSE of the combined model, as conjectured, is modestly lower than the RMSE of either individual forecasting model at around 1.3%**. Around two-thirds of all realizations are expected to lie within approximately one RMSE of the forecast level. By this metric, forecasting errors are relatively large. Note, however, that this includes many

EM economies which have experienced quite volatile growth, and arguably in some cases unpredictable growth, for highly idiosyncratic reasons such as institutional failure. **For DM economies, forecast errors tend to be somewhat smaller, with an average RMSE of 1.0%.**<sup>19</sup> For example, the RMSE of the combined model for the US is around 0.8%.

**Figure 4: 10-year average growth rates: Realizations versus forecast of the combined regression model**

%, 1990-2019, 10-year average annual growth rates. Dashed line is the 45-degree line.



Sources: J.P. Morgan, IMF, UN, World Bank, Feenstra et al. (2015), Ha et al. (2022).

In our view, moderately large forecast errors should not be taken as indicative of a fundamental flaw in the forecasting models. Forecasting growth over a long horizon is an inherently uncertain endeavor. **Sizable shocks and growth surprises, such as the GFC, can substantially affect the realized rate of growth over the subsequent decade.** Of great importance, in our mind, these forecasting models provide a low bias estimate of future growth, albeit with predictable uncertainty.

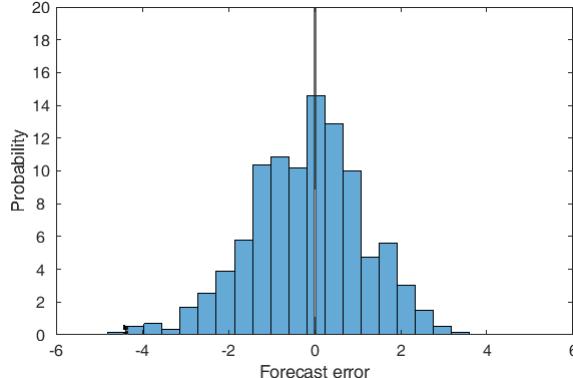
As we observed in a [recent note](#), the *Blue Chip* consensus long-run forecasts of US growth – which were derived from a survey of around 50 top corporate, financial and academic forecasting institutions – very closely resemble those from an adaptive expectations model in which the forecast for future long-run growth is equal to the average growth in the 15 years preceding the

<sup>19</sup> On average, forecast errors tended to be higher for less developed economies and those with more volatile growth. Consideration was also given to whether forecast errors were systematically related to any other economic characteristics. There was no relationship between the size of an economy – as distinct from the level of development – and forecast errors. There was also no relationship between forecast errors and inflation, or the *ex post* level of realized growth.

forecast date. While we do not have consensus forecasts for the long-run growth of all of the 50 largest economies in the world, we can evaluate the performance of our forecasting models against this adaptive expectations model, which we know very closely resembles the consensus forecasts in the US. The **ME and RMSE of our combined forecasting model are approximately 40% and 30% lower, respectively, than for the adaptive expectations model.** For an adaptive expectation model with a shorter 5-year lookback – which also produces forecasts closely resembling the *Blue Chip* consensus in the US – the analogous figures are 60% and 40%, respectively.

**Figure 5: Histogram of forecast surprises for the combined regression model of 10-year growth rates**

%, 1990-2019, annual data.



Sources: J.P. Morgan, IMF, UN, World Bank, Feenstra et al. (2015), Ha et al. (2022).

Next, we compare the performance of our forecasting models in the US to the *Blue Chip* consensus long-run growth forecasts, a forecasting benchmark. Figure 6 plots realized growth in the US in 10-year periods up to 2022, alongside the corresponding model forecasts and *Blue Chip* consensus forecasts. Over the out-of-sample forecasting period, the **combined forecasting model reduces forecasts errors (based on RMSE) and bias (based on ME) relative to the *Blue Chip* consensus** by approximately 25% and 65%, respectively. This fact notwithstanding, long-run growth forecasting remains an uncertain endeavor.

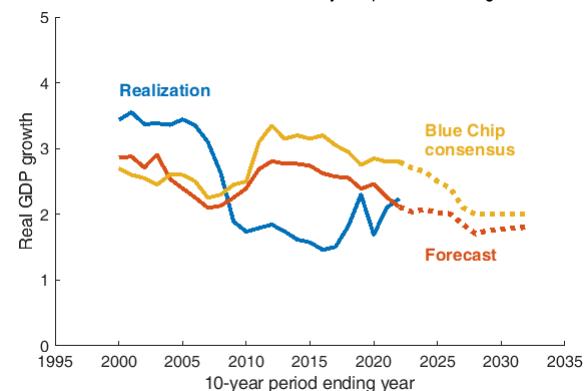
In the 1990s and early 2000s, the model predicted slightly faster US growth than the *Blue Chip* consensus, before a **projected slowdown in the mid-to-late 2000s, roughly coinciding with the GFC**. Thereafter, the combined forecasting model constructed in this paper persistently forecast **slower US real GDP growth than the *Blue Chip* consensus in the aftermath of the GFC**. Over the decade to 2022, realized growth was 2.2%,

compared to model forecast growth of 2.1% and consensus forecast growth of 2.8%.

The performance of our **forecasting models ought, in principle, to improve over time as the estimation sample increases**. Small samples likely weighed substantially on forecasting performance near the beginning of the out-of-sample forecasting exercise relative to a counterfactual scenario in which a longer estimation sample was available at that time. If one starts the out-of-sample forecasting exercise later than 1990, **bias shrinks to approximately zero**, while the **combined RMSE of the model across all 50 economies falls to 1.2%**. In our view, this reinforces the argument for using a quantitative forecasting model based on economic fundamentals looking forward from the present, when a sizable estimation sample is available.

**Figure 6: US 10-year growth rates: Realized and forecasts from combined model and Blue Chip consensus**

%, 1990-2032. Each data point is either realized growth over the previous 10 years or forecasts for those 10 years made 10 years earlier. Dashed lines indicate forecasts for 10-year periods ending after 2022.



Sources: J.P. Morgan, IMF, UN, World Bank, Feenstra et al. (2015), Ha et al. (2022), Wolters Kluwer/Haver Analytics.

Using the *Blue Chip* consensus forecasts for US growth in the next calendar year, it is also possible to compare the performance of long-run forecasts relative to short-run forecasts.<sup>20</sup> Over this period, the RMSE of the short-run *Blue Chip* consensus is 2.0%, with an underlying

<sup>20</sup> For the same period from 1990 to 2022, we use *Blue Chip* consensus forecasts for US growth in the following calendar year made in January – e.g. in 2009, we use forecasts made in January for growth in 2010. This is the best short-run analogue of our long-run forecasts, which are made for the following 10 years using fundamentals from the previous year – e.g. in 2009, we forecast growth from 2010 to 2019 (inclusive) using 2008 fundamentals which are known to the forecaster. See the appendix for more details on forecast timing.

data volatility of 1.9%.<sup>21</sup> By comparison, our long-run forecasting model has a RMSE of 0.8% in the US, with an underlying data volatility of 0.9%.

Note that the **RMSE for a 10-year average ought to be much lower** than that for 1-year forecasts if annual forecast errors are little correlated over time and thus can partly cancel out over the years. If there is *zero* serial correlation in annual growth surprises, then the standard deviation of forecast errors for *average* US growth over 10 years will equal that of 1-year errors divided by the square root of 10, or  $\frac{2.0\%}{\sqrt{10}}$ , which is 0.63%. The fact that our model at 0.8% RMSE produces a larger forecasting error is to us *not* proof that our models are not well-constructed, but that **annual growth surprises are positively correlated over time**. In previous research, we have found that annual consensus US growth revisions (equivalent to forecast errors) are indeed positively correlated over time. On average, a revision of 1-year out US growth forecasts was 2/3 to 3/4 times followed by a revision in the same direction since 1990.<sup>22</sup>

#### Figure 7: Global 10-year growth rates: Comparison of combined forecast model and realizations

%, 1990-2032. Data points are realized growth over the previous 10 years (blue and yellow) or forecasts for that period made 10 years earlier (red and purple). Dashed lines indicate forecasts for 10-year periods ending after 2022. Note that economies in the sample change annually based on forecast availability – see text for details. Dynamics partially reflect the changing sample over time.



Sources: J.P. Morgan, IMF, UN, World Bank, Feenstra et al. (2015), Ha et al. (2022).

One can also assess the out-of-sample performance of the combined model in forecasting global GDP, subject to one caveat. Due to data availability, it is not possible to forecast long-run future growth for every economy

<sup>21</sup> If 2020 and 2021 are omitted, short-run *Blue Chip* consensus forecasts have a RMSE of 1.7% with an underlying data volatility of 1.5%.

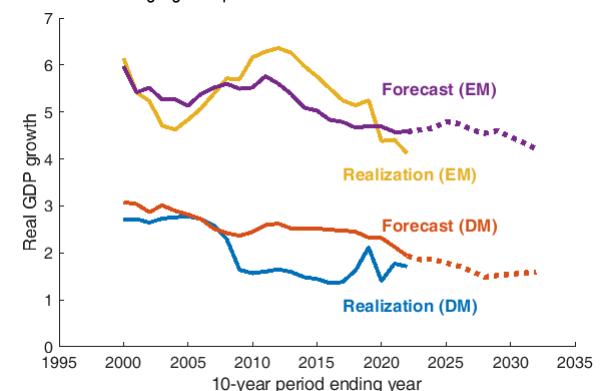
<sup>22</sup> See, e.g., John Normand, [Which Trade?](#) (Jan 7, 2004).

considered in our analysis for every year from 1990. Therefore, we consider a GDP-weighted average of long-run forecast growth for those economies for which it is possible to forecast in each given year and compare this to a GDP-weighted average of realized growth in that set of economies to ensure a like-for-like comparison. Figure 7 compares these forecasts and realizations. Note, however, that the depicted dynamics of growth partially reflect the changing sample over time.

Overall, the **RMSE of the combined forecasting model for global GDP is 0.3%**, while forecast growth exceeded realized growth on average by 0.3%. The improvement in forecasting performance at a global level reflects ‘diversification’ due to the **weak cross-country correlation between forecasting errors** – the average forecast error correlation between pairs of economies is 0.2. This weak correlation suggests that forecast errors largely reflect idiosyncratic growth surprises in countries, rather than fundamental or systematic error.

Figure 8: DM and EM 10-year growth rates: Comparison of combined forecast model and realizations

%, 1990-2032. Data points are realized growth over the previous 10 years (blue and yellow) or forecasts for that period made 10 years earlier (red and purple). Dashed lines indicate forecasts for 10-year periods ending after 2022. Note that economies in the sample change annually based on forecast availability – see text for details. Dynamics partially reflect the changing sample over time.



Sources: J.P. Morgan, IMF, UN, World Bank, Feenstra et al. (2015), Ha et al. (2022).

Analogous to Figure 7, comparisons between forecasts and realizations for DM and EM growth are presented in Figure 8. **For DM growth, the RMSE of the combined forecasting model is 0.7%**, with forecast growth exceeding realized growth on average by 0.6%. **For EM growth, the RMSE of the combined forecasting model is 0.5%**. The model was approximately unbiased, with forecasts exceeding realizations on average by 0.2%.

Thus far, we have assessed the performance of the models in forecasting the level of growth in countries.

One can also assess the performance of the models in **forecasting growth differences across countries**. When forecasting bilateral cross-country differences in growth, the RMSE of the combined model is 1.8%, with a mean error of 0.1%. The fact that this is meaningfully larger than the RMSE of forecasts of growth levels reflects the **weak correlation of forecast errors across countries**. All else being equal, stronger positive cross-country correlation of forecast errors for levels would tend to coincide with smaller forecast errors for differences.

In short, our model forecasts **exhibit little bias but produce wide uncertainty bands** which tend to be tighter for DM economies. **Growth errors/shocks are generally idiosyncratic to individual economies**, making for **larger forecasting errors in projecting growth differences between countries, but smaller ones for regional or global aggregates**. **Errors are larger than for shorter-term forecasts**, indicating that growth surprises tend to persist and compound over time.

## Forecasts for the coming decade

By extending the *Penn World Tables* from 2019 in the manner detailed in the appendix, we forecast real GDP growth for the coming decade based on the most current economic fundamentals for the 50 largest economies in the world.<sup>23</sup> The annualized rates of forecast real GDP growth from 2022-2032 for these countries and various country groupings are reported in Table 1.

Figures 9a (full) and 9b (closer detail) plot the forecast rate of future growth against the realized rate of economic growth since 1990. For a large majority of economies considered, **forecast future growth is slower than that realized since 1990, reflecting near-ubiquitous weakening in growth fundamentals around the world**. Relative to the past, most economies have recently grown more slowly, are **more developed** and relatively **more service-intensive**, and are experiencing **slower workforce growth**.

Table 2 compares current growth fundamentals in the US, China, Japan, the Euro area and EM (ex-China) to growth fundamentals in 1990. Table 2 also reports the forecasts for long-run growth made in 1990 and in 2022,

<sup>23</sup> The model is still estimated using data up to and including 2019. Data spanning the pandemic are omitted from this initialization since the rapid contraction and expansion of economies due to the pandemic would introduce excessive noise into the model which is unrelated to economic fundamentals. To forecast from 2022, the most current economic fundamentals available to us (the 2021 annual figures) are plugged into this estimated model.

and the realized average rate of economic growth in the intervening period.

**Table 1: Forecast annualized real GDP growth for 2022-2032 for the 50 largest economies and various groupings**

Annualized growth rates. See appendix for classification details. Economy weights within regions change each year of the forecast horizon based on forecast growth.

Argentina	2.1%	Malaysia	3.5%
Australia	2.1%	Mexico	3.0%
Austria	1.7%	Netherlands	1.3%
Bangladesh	6.0%	New Zealand	1.5%
Belgium	1.8%	Nigeria	4.3%
Brazil	2.8%	Norway	1.4%
Canada	1.9%	Pakistan	4.1%
Chile	3.4%	Philippines	4.6%
China	5.1%	Poland	1.9%
Colombia	3.9%	Romania	2.0%
Czech Republic	1.7%	Russia	1.6%
Denmark	1.0%	Saudi Arabia	2.9%
Egypt	3.8%	Singapore	3.5%
Finland	1.5%	South Africa	3.3%
France	1.6%	South Korea	2.4%
Germany	1.2%	Spain	1.1%
Hong Kong	1.5%	Sweden	1.4%
India	5.2%	Switzerland	1.3%
Indonesia	3.2%	Taiwan	1.6%
Iran	3.6%	Thailand	3.1%
Iraq	3.5%	Turkey	3.7%
Ireland	2.5%	UAE	2.2%
Israel	2.1%	United Kingdom	1.2%
Italy	1.3%	United States	1.8%
Japan	0.8%	Vietnam	5.4%
<b>Global</b>	<b>2.8%</b>	<b>Latin America</b>	<b>2.9%</b>
<b>DM</b>	<b>1.6%</b>	<b>EM Asia</b>	<b>4.7%</b>
<b>EM</b>	<b>4.2%</b>	<b>EM Asia (ex-China)</b>	<b>3.9%</b>
<b>Euro area</b>	<b>1.4%</b>	<b>CEEMEA</b>	<b>2.2%</b>

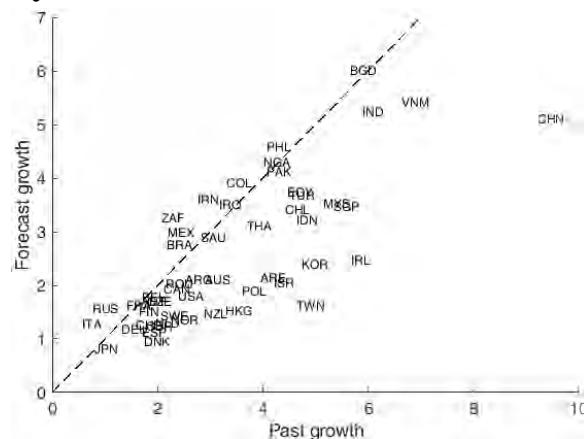
Sources: J.P. Morgan, IMF, UN, World Bank, Feenstra et al. (2015), Ha et al. (2022). Any long form nomenclature for references to China; Hong Kong; Taiwan; and Macau within this research material are Mainland China; Hong Kong SAR (China); Taiwan (China); and Macau SAR (China).

In the **US**, forecast long-run economic growth from 2022 of 1.8% is lower than both the decade-ahead forecast of 2.6% made in 1990 and the realized average of 2.4% between 1990 and 2022. Relative to 1990, recent economic and workforce growth are now considerably lower. Income per capita has increased substantially, coinciding with a substantial increase in the service-intensity of the US economy from around 65% of private

industry value added to around 80%.<sup>24</sup> Both capital and human capital accumulation have slowed, with the investment rate falling by around 4 percentage points. International competitiveness continues to deteriorate. The rate of fiscal debt accumulation has increased substantially – primarily due to the Covid-19 pandemic – and inflation has accelerated, foreshadowing sharp monetary tightening. Thus, there has been **near-uniform deterioration in the fundamental determinants of long-run US economic growth.**

**Figure 9a: Forecast long-run growth from 2022 versus realized growth since 1990**

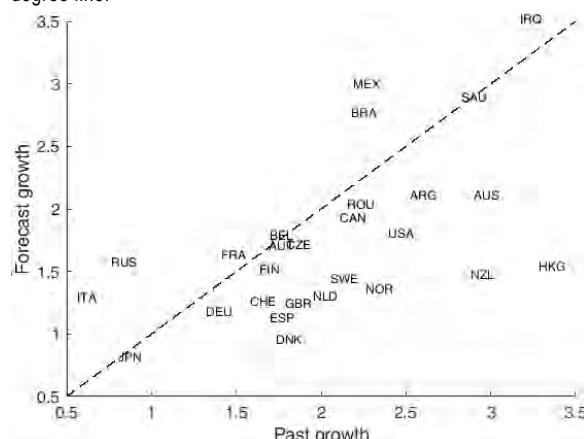
%, 1990-2022, average annual growth rates. Dashed line is the 45-degree line.



Sources: J.P. Morgan, IMF, UN, World Bank, Feenstra et al. (2015), Ha et al. (2022).

**Figure 9b: Forecast long-run growth from 2022 versus realized growth since 1990 (closer detail)**

%, 1990-2022, average annual growth rates. Dashed line is the 45-degree line.



Sources: J.P. Morgan, IMF, UN, World Bank, Feenstra et al. (2015), Ha et al. (2022).

In China, the forecast of 5.1% growth reflects the fact that determinants of economic growth have generally weakened, though remain comparatively strong in global terms. The rate of economic growth has continued to trend down, and the working age population has started to shrink. China has also developed very considerably, with the high productivity growth agriculture, mining and manufacturing sectors decreasing from about 60% of total value added in 1990 to about 40%, though the manufacturing value added share remains considerable at about 30%.<sup>25</sup> On the other hand, the very high rate of investment and continued rapid accumulation of human capital should still sustain comparatively high economic growth.<sup>26</sup>

**In Japan, most growth fundamentals have weakened since 1990, as in the US.** Prior to the ‘Lost Decades’ in the aftermath of the asset price collapse and deleveraging in the 1990s, economic growth in Japan was rapid, the working age population was growing at a moderate pace, and investment was high. Through the lens of the model, the subsequent economic stagnation reflected both a deterioration of the fundamentals of economic growth, but also significant economic underperformance relative to those fundamentals. Looking forward, while the drivers of economic growth have unambiguously worsened, there are fundamentals to sustain economic growth, albeit at one of the slowest rates in the world at 0.8%. Relative to the US, the Japanese economy is less developed – with scope for productivity catch-up – and more manufacturing intensive. Investment and the rate of human capital accumulation are also higher. Balancing against these factors, demographic forces will weigh more heavily on Japan than any other country.

**In the Euro area, most fundamental determinants of growth have also weakened since 1990.** In countries which now comprise the Euro area, recent growth as of 2022 is substantially lower than in 1990. As a whole, the Euro area is more developed. There has been approximately no recent growth in the working age population. While the investment rate has remained stable, the rate of human capital accumulation has approximately halved since 1990.

<sup>25</sup> Groningen Growth and Development Centre, *Economic Transformation Database* (2021).

<sup>26</sup> Assuming a closing of the estimated 2.5% output gap in the long term, our forecast of 5.1% *actual* growth is broadly consistent with the [forecasts of our China economics team](#), who see a decline in *potential* growth from 6% to 5% from 2021 to 2025, from 5% to 4% from 2026 to 2030, and to below 3.5% by 2035.

**Table 2: Determinants of changes in long-run growth in the US, China, Japan, the Euro area, and EM ex-China**

Growth rates are annualized. Except for the level of development, variables are based on the preceding 10 years and are as defined in the text above. Fundamentals are the most recent observable when making a forecast in the specified year – that is, annual figures from the prior calendar year, as detailed in the appendix. Forecasts and fundamentals are the GDP-weighted average across countries for which we have a forecast in the specified year. Weights within regions change each year of the forecast horizon based on forecast growth. Euro and EM (ex-China) forecasts are omitted in 1990 since most or all countries in those groups are missing forecasts in 1990, though many fundamentals are available.

	<b>US</b>		<b>China</b>		<b>Japan</b>		<b>Euro area</b>		<b>EM (ex-China)</b>	
<b>Economic fundamental</b>	<b>1990</b>	<b>2022</b>	<b>1990</b>	<b>2022</b>	<b>1990</b>	<b>2022</b>	<b>1990</b>	<b>2022</b>	<b>1990</b>	<b>2022</b>
Recent growth	3.1% pa	2.1% pa	9.7% pa	6.0% pa	4.3% pa	0.6% pa	2.3% pa	0.9% pa	2.2% pa	2.8% pa
Workforce growth	1.4% pa	0.5% pa	2.9% pa	-0.1% pa	0.7% pa	-0.9% pa	1.1% pa	0.0% pa	2.5% pa	1.2% pa
Level of development (GDP per capita)	\$39,646	\$63,109	\$853	\$11,001	\$29,672	\$39,223	\$32,458	\$47,233	\$896	\$16,361
Investment rate	26.3%	22.4%	22.6%	45.0%	34.5%	24.4%	27.1%	26.0%	16.8%	24.4%
Human capital growth	0.3% pa	0.1% pa	1.2% pa	0.9% pa	0.6% pa	0.3% pa	0.8% pa	0.4% pa	1.2% pa	1.0% pa
Trade intensity growth	-1.1% pt	-2.3% pt	2.5% pt	2.8% pt	-0.5% pt	-1.8% pt	10.6% pt	-3.9% pt	-8.1% pt	-3.5% pt
International competitiveness growth	-1.2% pt	-0.5% pt	0.0% pt	-1.6% pt	5.7% pt	-1.8% pt	1.3% pt	0.6% pt	-1.5% pt	0.5% pt
Financial development and leverage change	0.5% pt	1.9% pt	16.3% pt	29.8% pt	51.6% pt	18.7% pt	N/A	-8.1% pt	12.5% pt	14.9% pt
Fiscal debt growth	22.8% pt	33.6% pt	5.5% pt	25.0% pt	19.7% pt	51.1% pt	16.3% pt	11.6% pt	13.5% pt	18.1% pt
Inflation change	-3.6% pt	1.5% pt	16.3% pt	1.0% pt	-1.4% pt	0.0% pt	-5.1% pt	0.0% pt	112.2% pt	1.3% pt
<b>Forecast</b>	<b>2.6% pa</b>	<b>1.8% pa</b>	<b>7.6% pa</b>	<b>5.1% pa</b>	<b>3.5% pa</b>	<b>0.8% pa</b>	<b>N/A</b>	<b>1.4% pa</b>	<b>N/A</b>	<b>3.2% pa</b>
<b>Realized from starting year</b>	<b>2.4% pa</b>		<b>9.2% pa</b>		<b>0.8% pa</b>		<b>1.4% pa</b>		<b>3.7% pa</b>	

Sources: J.P. Morgan, IMF, UN, World Bank, Feenstra et al. (2015), Ha et al. (2022)

While forecast growth of 1.4% is comparable to realized growth since 1990, over which period growth fundamentals were mostly more favorable than at present, realized growth was hampered substantially by the Eurozone crisis. This adverse growth surprise is implicitly faded in our forecasting model based on fundamentals.

**In EM (ex-China), the evolution of growth fundamentals is more mixed.** On one hand, working age population growth is substantially slower than in 1990. While EM countries have developed substantially since then, the adverse growth effect of this development is likely to be moderated by the fact that many countries are still in the process of industrializing. Recent economic growth is also moderately higher than in 1990. While the rate of human capital accumulation is marginally lower, the investment rate has increased appreciably. Moreover, net exports have recently grown

as a share of economies indicating growing international competitiveness. On net, the positive and negative developments are largely offsetting, so forecast growth of 3.2% is comparable to that experienced since 1990.

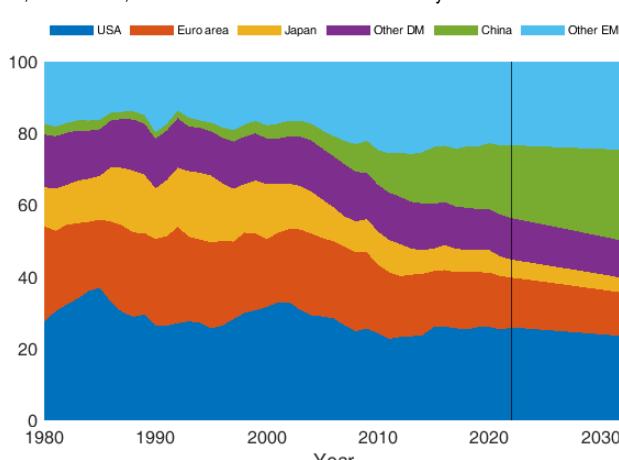
**Globally**, even though we predict the secular slowing of most economies, the projected rate of growth of 2.8% is not statistically significantly different from the realized rate of growth since 1990 of 2.7%. The **projected stability of global growth reflects the shift in economic activity in the global economy towards higher growth EM economies**.

## Size of the global economy and DM-EM shares

Using the model forecasts, it is possible to **forecast the size and composition of the global economy out to 2032**.<sup>27</sup> Projecting forward from 2022, it is assumed that differences in inflation are offset by changes in the exchange rate – a form of PPP theory. Under this assumption, our forecasts imply that the global economy will grow from \$98 trillion in current USD in 2022 to \$129 trillion in 2032. If the US dollar were to depreciate over this horizon, as we expect given the dollar is presently historically expensive, this terminal figure would be higher. If the US dollar were to depreciate by 10% over this time, GDP in 2032 would likely be in the vicinity of \$140 trillion.

**Figure 10: Historical and projected composition of the global economy**

%, 1980-2032, annual. Black line indicates current year.



Sources: J.P. Morgan, IMF, UN, World Bank, Feenstra et al. (2015), Ha et al. (2022).

Historical and projected country shares of world GDP are plotted in Figure 10. Under the PPP assumption specified above, it is projected that the DM share of the global economy will shrink to 50% in 2032, and that China will surpass the US as the largest economy in the world in 2030. The projection of the DM share is not particularly sensitive to a 10% depreciation of the US dollar against all currencies. However, if the US dollar were to depreciate 10% against the renminbi, China could surpass the US as soon as 2027. This shift in the composition of the global economy towards higher growth EM economies is critical in projecting that global growth will slow only modestly, even though rates of growth are likely to slow within most countries.

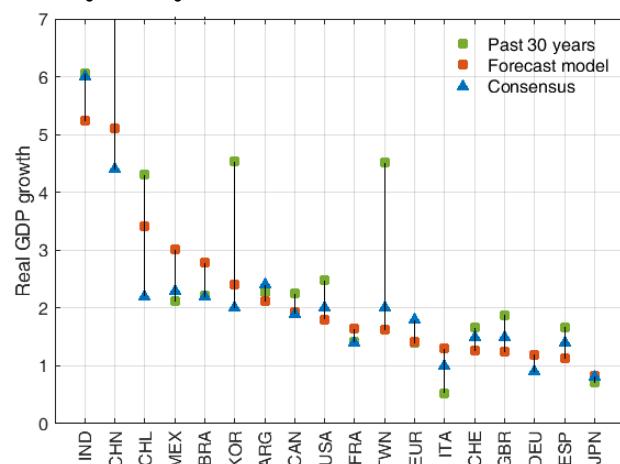
<sup>27</sup> Nominal GDP data in US dollars from 1980 to 2022 are sourced from the IMF *World Economic Outlook*.

## How do our current forecasts compare to consensus?

Figure 11 plots our forecasts for the coming decade against the consensus and the realized rate of growth in the past 30 years.<sup>28</sup> **In the US, our forecast of 1.8% annualized growth is below the consensus of 2%. In the Euro area, our forecast of 1.4% annualized growth over the coming decade is materially below the consensus of 1.8%.** The largest differences between our forecasts and consensus are for China and India. In China, our forecast of 5.1% annualized growth over the coming decade is moderately higher than the consensus of 4.4%. In India, our forecast of 5.2% annualized growth is moderately lower than the consensus of 6%. On average across economies, our forecasts are neither more nor less bullish than the consensus.

**Figure 11: Long-run growth forecasts versus the consensus and the realized rate of growth in the past 30 years**

%, average annual growth rates. Sorted based on model forecast.



Sources: J.P. Morgan, IMF, UN, World Bank, Feenstra et al. (2015), Ha et al. (2022), Wolters Kluwer/Haver Analytics, Consensus Economics.

## What isn't in the forecasts?

This paper constructs objective models for long-run economic growth which are based only on currently observable fundamentals. Since forecasts are based only on current data, the models do not capture **structural changes which lead to deviations from trends which are already observable**.

<sup>28</sup> The consensus is from the *Blue Chip* consensus for the US, and *Consensus Economics* for all other countries. Note that the Euro area forecasts from *Consensus Economics* are not necessarily consistent with the underlying country level forecasts.

Across the board, one factor which may play a role in shaping long-term growth is **de-globalization spurred by the rise of ‘geoeconomics’ and ‘friend-shoring’**, with a growing sense of urgency in reconstituting supply chains in the aftermath of the Russia-Ukraine war. Generally speaking, de-globalization is not yet fully reflected in economic data. For example, global trade as a share of GDP plateaued around 2008, with only a slight decline thereafter.

Estimates in this paper suggest that, on average, growing trade intensity has a weakly positive effect on long-term growth, with stronger effects for net exporters. Thus, any appreciable retrenchment in global trade would likely exert some downward pressure on long-run growth rates, particularly for EM producers dependent on foreign demand as a driver of economic growth.

## Conclusion

We construct econometric and machine learning models based purely on economic fundamentals to forecast long-run economic growth for the coming decade for the 50 largest economies in the world. The final forecasting model, which combines the econometric and machine learning models, outperforms forecasting benchmarks, such as the long-run *Blue Chip* consensus and adaptive expectation models, with smaller forecasting errors and reduced forecasting bias. Over the coming decade, we forecast that real GDP will grow at an annualized rate of 1.8% in the US, 5.1% in China, 0.8% in Japan, 1.4% in the Euro area, and 5.2% in India. In the US and the Euro area, these forecasts are lower than the current consensus of 2% and 1.8% pa, respectively. Real GDP is forecast to grow at an annualized rate of 2.8% globally, 2.9% in LatAm, 4.7% in EM Asia, 3.9% in EM Asia (ex-China), and 2.2% in CEMEA. All told, forecasting growth in the long run remains an uncertain endeavor, with a one-sigma risk of 1.3% for country growth forecasts, falling to 0.8% for the US.

## Appendix – Machine learning regression model

Intuitively, Gaussian Process Regression models create a distribution of functions which are consistent with the estimation sample, but where consideration is given only to functions which obey a rule that observations with similar inputs (i.e. similar economic fundamentals) should have similar outputs (i.e. similar economic growth rates). One needs a mathematical tool to calculate the ‘similarity’ between sets of inputs – this tool is the kernel, which comes in many different forms. With

different kernels, one creates different distributions of functions.

One might naturally wonder how it is possible to construct a distribution of functions. In practice, a function can be constructed by drawing a sample vector of  $n$  points (which jointly define a function) along the desired domain from a multivariate normal distribution with a covariance matrix (which characterizes the correlation between points in that vector) defined by our measures of similarity – see [Gaussian Processes](#).

To forecast a future growth rate associated with a set of economic fundamentals, one calculates the mean of the distribution of functions evaluated at that set of economic fundamentals. As more data become available, the set of functions consistent with the data is narrowed. In addition to its flexibility, an advantage of this modelling approach is that one can calculate prediction confidence intervals using the distribution of functions.

In this paper, we use the rational quadratic kernel, though we evaluated the performance of the regression model with a set of very standard kernels. It is worth noting that the performance of the model with this kernel is very similar to, though marginally better than, the performance with a squared exponential kernel, the most commonly used kernel.

## Appendix – Forecast timing and data details

When assessing the historical forecasting performance of the model, it is important that the model is always estimated using only the information available to a hypothetical forecaster at the time of making that forecast. This is referred to as out-of-sample forecasting. Thus, it is important for us to specify the timing of forecasts and therefore what information would be available at that time to the forecaster. For example, take the annualized rate of real GDP growth from the 2009 level to the 2019 level, which to be precise reflects the rates of growth in 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018 and 2019. We specify that this forecast is made in 2009, at which point the forecaster has access to fundamentals up to and including 2008. Since many fundamentals, such as population or real GDP, are reported for the whole year, the final 2009 figures are not yet known to the hypothetical forecaster.

Analogous to the model validation exercise, looking forward from the present date, we forecast the annualized rate of real GDP growth from the 2022 level to the 2032 level. As explained immediately above, this forecast

makes use of economic fundamentals recorded in 2021, which are the most recent annual figures available to us.

As indicated earlier, the most current version of the *PWT* database includes economic fundamentals through to 2019. Thus, in order to forecast growth for the coming decade using the most recent fundamentals, we must extend the measures used from this database. For measures of real GDP, population and working age population, we extend existing data using the growth rates after 2019 for these variables reported by the IMF.<sup>29</sup> Import, export, investment and human capital data are extended by extrapolating the trend observed in the 5 years through to 2019.

Data are not available for all variables for all economies considered in this analysis. Specifically, leverage data from the World Bank and CPI data from the IMF are not available for Taiwan. For the leverage measure, we use loans made by financial institutions as a share of GDP from the National Statistics Bureau of Taiwan. CPI data are used from the same source.

There are also non-trivial gaps in the coverage of the leverage measure from the World Bank for Argentina, Canada, China, Iran, Iraq, Saudi Arabia, and Switzerland. Thus, these values are imputed as follows. For Canada, growth rates in the measure of leverage after 2009 are constructed synthetically by averaging growth rates in Australia and the UK, which broadly resemble those of Canada for the period in which data are available for all three countries. The same procedure is used to construct leverage for Switzerland after 2017. Leverage growth rates for the world are used for Argentina, China, Iran, Iraq and Saudi Arabia for the periods in which these data are unavailable – from 2018 for Argentina, from 1978 to 1984 for China, from 2017 for Iran, from 2019 for Iraq, and from 2018 for Saudi Arabia. Since the World Bank leverage data only extend up to 2020, the 2021 level of leverage is taken to be equal to the 2020 level.

To allow us to forecast growth in China from the start of the out-of-sample forecasting exercise in 1990, fiscal debt as a share of GDP in China from 1979 to 1983 is assumed to be equal to the level in 1984.

## Appendix – Country classifications

*Global* – 50 largest economies in the world.

<sup>29</sup> The growth rate of the working age population is taken to be equal to the growth rate of the total population.

*DM* – Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Singapore, Spain, Sweden, Switzerland, United Kingdom, United States.

*EM* – Argentina, Bangladesh, Brazil, Chile, China, Colombia, Czech Republic, Egypt, India, Indonesia, Iran, Iraq, Malaysia, Mexico, Nigeria, Pakistan, Philippines, Poland, Romania, Russia, Saudi Arabia, South Africa, South Korea, Taiwan, Thailand, Turkey, United Arab Emirates, Vietnam.

*Euro Area* – Austria, Belgium, Finland, France, Germany, Ireland, Italy, Netherlands, Spain.

*Latin America* – Argentina, Brazil, Chile, Colombia, Mexico.

*EM Asia* – China, India, Indonesia, Malaysia, Pakistan (missing data), Philippines, South Korea, Taiwan, Thailand.

*CEEMEA* – Czech Republic, Israel, Poland, Romania, Russia, South Africa, Turkey.



## The Long-Term Strategist

Commodity-linked assets as a long-run inflation hedge

- Inflation risk has significantly risen in Developed Markets, and especially in the US.
- Agriculture, livestock, industrial metals, and energy futures returns are positively correlated with US inflation over long investment horizons.
- In equities, energy stock returns over market are correlated with US inflation over the short run, up to 1 year, while long-run inflation is better hedged with Global Utility stock over market.
- Excess returns on EM commodity currencies, but not DM ones, are more positively correlated with US inflation over long investment horizons than non-commodity currencies.
- Managers who can only use an overlay of commodity futures should hedge short-term inflation risk primarily through energy, combined with industrial metals and livestock. Our analysis suggests that longer-term inflation risk requires more agriculture and livestock and a small amounts of energy futures. Precious metals are not useful.
- Managers with no constraints on how to use commodities should use half global commodity stocks vs market and the rest the above futures-only portfolio. Longer-term risk is best managed with 20% EM commodity FX, 30% global utilities vs market, and the rest the above long-term futures overlay.
- This was previously published as part of [J.P. Morgan Perspectives: The return of Commodities<sup>1</sup>](#), July 19.
- [Video](#).

As the global economy recovers from the economic shock of the pandemic, a number of observers have argued that the US economy, amongst others, may experience a sustained increase in inflation. Whereas some have emphasized the role of demographic or secular changes, we have argued that the possibility of reflation in the US is underpinned by a paradigmatic shift towards growth-oriented fiscal policies, in conjunction with a growing central bank tolerance of inflation (see, e.g., Bruce Kasman, [\*Keep it simple: Inflation is a policy choice\*](#), 13 May 2021).

---

### Long-term Strategy

**Jan Loey** AC

(1-212) 834-5874

jan.loey@jpmorgan.com

J.P. Morgan Securities LLC

**Shiny Kundu**

(91-22) 6157-3373

shiny.kundu@jpmorgan.com

J.P. Morgan India Private Limited

---

<sup>1</sup> The author acknowledges the extensive research input from Alex Wise.

Inflation can be a serious risk to one's financial assets or liabilities. Many investment managers are thus looking into the effectiveness of various assets as hedges against inflation. While existing research has primarily emphasized the role of commodity-linked assets as an inflation hedge over a short investment horizon,<sup>2</sup> in this paper we consider also the role of these assets as a hedge against US inflation over a longer investment horizon. Specifically, we consider the performance of three broad classes of commodity-linked assets: commodity futures, commodity equities, and commodity currencies. We examine the performance of these assets with changes in both *realized* and *expected* inflation in the US as one's financial condition can be affected by either one of them.

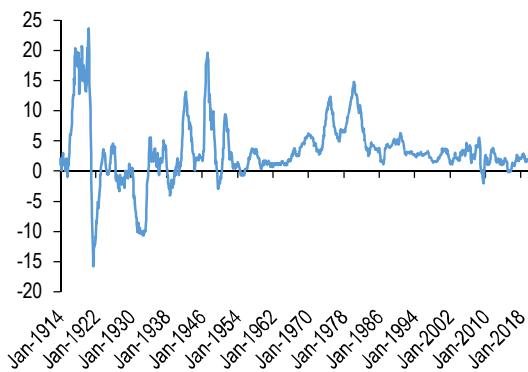
## Inflation and inflation expectations

In our analysis, we consider the performance of commodity-linked assets as **both realized and expected inflation** change. Just as the return on these assets may reflect changes in realized inflation, the returns on these assets may also reflect changes in inflation expectations over time, given the perceived role of commodity-linked assets as a hedge of inflation. Notionally, changes in realized inflation and changes in inflation expectations are both distinct risks to investors.

In this paper, **realized inflation** is measured as growth in the Consumer Price Index (CPI) sourced from the Bureau of Labor Statistics (BLS). These data extend back to 1913. Figure 1 plots the rate of inflation over a year ago in these data. The relative low and stable inflation rates during the 'Great Moderation' are evident from the mid-1980s.

**Figure 1: CPI Inflation in the US**

% change over a year ago. Monthly from 1/1914 to 4/2021.



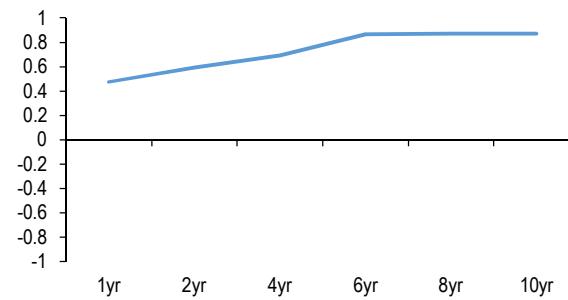
<sup>2</sup> See, e.g., [Commodities Strategy](#) and [Metals Weekly](#).

Data on **inflation expectations** over different time horizons are sourced from the Federal Reserve Bank of Cleveland and extend back to 1982. Figure 2 plots the correlation between rolling windows of realized inflation and expectations of inflation for that period at the start of the window. Since 1982, longer-term inflation expectations have closely tracked realized inflation. Consequently, results from the analysis in this paper are comparable for realized and expected inflation over longer investment horizons. Therefore, most results presented in the main body of this paper relate to realized inflation, for which longer time series data are available.

The return on commodity assets are all derived **from total return indices** on commodity futures, stocks and currencies. They are the return on a certain amount of long-only capital invested in that asset class. For futures, the index providers add the return on cash, even as only a small part of the notional is used for collateral, in order to make the return data comparable with other long-only indices. For FX, the indices include the income on cash in that currency. For our purposes, we will instead make use of **excess returns** on these indices, as a manager will already start with a fully invested portfolio and will have to either borrow cash, use existing cash holdings, or move from non-commodity equities into commodity-linked ones. The excess returns on futures thus take out the return on USD cash. For FX, it deducts the USD cash from foreign cash income, and for equities, we use the excess return on commodity stocks over that of the overall equity market.

**Figure 2: Correlation between realized inflation and ex ante inflation expectations (rolling windows of various lengths)**

Monthly data from 1/1982 to 4/2021.



## Commodity futures

First, we consider the returns on commodity futures as inflation and inflation expectations change. To begin, we consider excess returns on the S&P GSCI, an aggregate commodity index that extends back to January 1970 and

includes commodities from the agriculture, livestock, precious and industrial metals, and energy sectors.

In the first column of Table 1, we report the rolling correlations between excess returns on this index and realized inflation over various horizons in the full sample. Over all horizons, the correlation between returns and realized inflation is moderate.<sup>3</sup>

The correlations reported in the *second* column of Table 1 are from a restricted sample that drops data between 1973 and 1981. These years are dropped due to the occurrence of sizable oil shocks in 1973 and 1979, which gave rise to a 10-fold rise in the price of oil – a key commodity – through to 1981.<sup>4</sup> We omit these years, because we consider inflation of this kind to be unrepresentative of the kind of demand-driven inflation which is to us a much more plausible scenario for the next five years. In this restricted sample, the correlations between realized inflation and excess returns are very strong over long horizons.

In the final column of Table 1, we report the rolling correlations between excess returns on this index and expected inflation at the start of the rolling window. These correlations are low over medium investment horizons, but increase to a high level over longer horizons.

To allow comparison between results based on realized and expected inflation measures, we report correlations with realized inflation over the limited period in which inflation expectation data are available in the third column of Table 1. Over long horizons, the correlation of returns with realized inflation is somewhat higher than with expected inflation. Due to the fact that realized and expected inflation are quite highly correlated over longer horizons, as observed above, we present results using realized inflation measures hereafter due to the availability of longer time series. Moreover, there is relatively limited variation in long-term inflation

expectations for the period in which these data are available. Full results for inflation expectations are presented in the appendix.

**Table 1: Correlation between realized and expected inflation and excess returns on the S&P GSCI (rolling windows of various lengths)**

Monthly data from 1/1970 to 4/2021.

	Inflation			Inflation expectations
	1970-2021	1970-1972, 1982-2021	1983-2021	
1 month	0.19	0.28	0.31	--
3 month	0.35	0.53	0.56	--
6 month	0.37	0.61	0.64	--
1 year	0.33	0.65	0.66	0.04
2 year	0.32	0.64	0.65	0.12
4 year	0.32	0.71	0.73	0.30
6 year	0.27	0.72	0.73	0.51
8 year	0.34	0.80	0.80	0.65
10 year	0.36	0.77	0.76	0.54

Source: S&P, Bureau of Labor Statistics, Federal Reserve Bank of Cleveland.

Now, we consider disaggregated classes of commodities. S&P GSCI excess return indices are available for five key sectors: **agriculture, livestock, precious and industrial metals, and energy**. While the coverage of years is not uniform across these indices, we present results from the common sample (1983-2021) to facilitate comparison between these sectors. Figure 3 plots the rolling correlations between excess returns and US inflation over various timeframes for each sector. Over longer investment horizons, we find that excess returns on energy, industrial metals, agriculture, and livestock commodities are highly correlated with inflation. By contrast, **precious metals excess returns are weakly negatively correlated with inflation**.<sup>5</sup> This is consistent with arguments in the academic literature that gold is a poor hedge of inflation, in spite of the popular perception otherwise.<sup>6</sup>

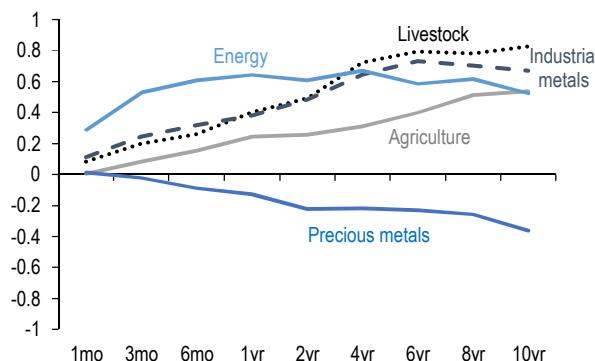
<sup>3</sup> These results are consistent with Levine, Ooi, Richardson and Sasseville (2018). They construct monthly excess returns data for a growing portfolio of commodities from 1877 to 2021, and find that excess returns are higher on average when inflation increases. See Ari Levine, Yao Hua Ooi, Matthew Richardson and Caroline Sasseville, ‘Commodities for the Long Run’ (2018) 74(2) *Financial Analysts Journal* 55-68.

<sup>4</sup> One could also omit data from 1982 to 1985, over which years the price of oil declined substantially. Results are largely unchanged from those reported in the second column of Table 1 when omitting data from 1973 to 1985.

<sup>5</sup> This is the primarily the consequence of very high excess returns in precious metals in the 2000s and the Great Recession, during which inflation was relatively low.

<sup>6</sup> See, e.g., Erb and Harvey, ‘The Golden Dilemma’ (2013) 69(4) *Financial Analysts Journal* 10-42.

**Figure 3: Correlation between inflation and excess returns on the S&P GSCI sectors indices (rolling windows of various lengths)**  
Monthly data from 1/1982 to 4/2021.



Source: S&P, Bureau of Labor Statistics.

## Commodity equities

Second, we consider the performance of equities of commodity-producing companies as inflation changes. We source data on excess returns over market in USD on US and world equities in 10 sectors from 1973 from Datastream.<sup>7</sup> As above, we drop data from 1973 to 1981 due to the effects of oil supply shocks in this period. One may anticipate different performance of equities when inflationary events are associated with demand and supply shocks. To the extent that inflation arises in the next few years, it is anticipated to be demand-driven. In any case, the results are comparable when using the full sample.

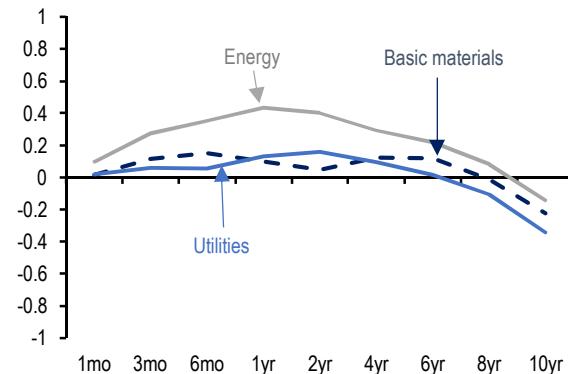
Using these data, we assess the performance of three key commodity-linked sectors (basic materials, energy, and utilities) relative to the total market by considering returns in excess of the market. Due to the aggregated nature of these data, it is not possible to isolate specific economic activities within these sectors which relate directly to commodities. For example, it is not possible to omit renewable energy equipment production equities from the energy sector index.

Figure 4 plots the correlations between US inflation and returns on US equities in these three sectors in excess of the US market over various timespans. Over short and moderate length horizons, excess returns on US energy equities are moderately correlated with inflation. Over long horizons, these returns are approximately uncorrelated with inflation. By contrast, excess returns

on US basic materials and utilities equities are only weakly positively correlated with inflation over short and moderate horizons, and negatively correlated over very long horizons.

**Figure 4: Correlation between inflation and returns on US equities in excess of the US market in three key sectors (rolling windows of various lengths)**

Monthly data from 1/1982 to 4/2021.

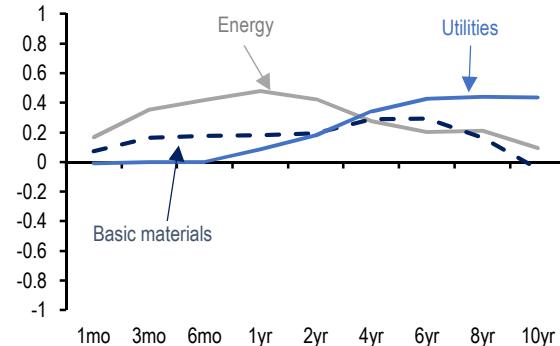


Source: Datastream, Bureau of Labor Statistics.

Figure 5 plots the correlations between US inflation and excess returns on world (DM and EM) equities in these three sectors in excess of the world market over various timespans. Over most investment horizons, excess returns on world energy, basic materials, and energy equities are moderately correlated with US inflation.

**Figure 5: Correlation between inflation and returns on world equities in excess of the world market in three key sectors (rolling windows of various lengths)**

Monthly data from 1/1982 to 4/2021.



Source: Datastream, Bureau of Labor Statistics.

While these sectors are aggregated to an extent, that does not permit the exclusion of economic activities that are not directly related to commodities, such as renewable energy equipment production, excess returns in these sectors – especially energy – are very highly correlated

<sup>7</sup> The 10 sectors are: Basic materials, Consumer discretionary, Consumer Staples, Energy, Financials, Healthcare, Industrials, Telecommunications, Utilities, and Technology.

with excess returns on equities of commodity producers from the MSCI USA and ACWI Commodity Producers Indices for the more limited period of time for which those indices are available.<sup>8</sup> These indices only include companies which produce commodities.

## Commodity currencies

Finally, we consider the performance of portfolios of developed and emerging market commodity currencies as compared to a portfolio of non-commodity currencies. For developed markets, we source excess return data from 1987 for the Australian dollar, the Canadian dollar, and the New Zealand dollar from the J.P. Morgan Cash Index. For emerging markets, we source excess return data from 1997 for the Brazilian real, the Chilean peso, the Mexican peso, and the South African rand from the J.P. Morgan ELM+ index.<sup>9</sup> We source excess return data for non-commodity currencies, the British pound and the Japanese yen, from the J.P. Morgan Cash Index.

We consider the excess returns over US cash on an equal-weighted portfolio of the developed market commodity currencies, an equal-weighted portfolio of the emerging market commodity currencies, and an equal-weighted portfolio of the non-commodity currencies. The returns thus consist of local interest income minus US cash and any appreciation in the foreign currencies against the US dollar.

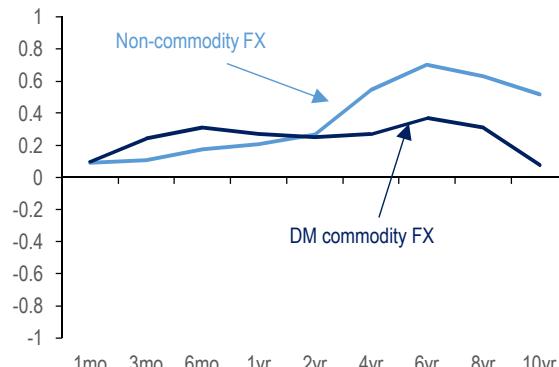
Figure 6 plots the correlations between US inflation and excess returns on the portfolios of non-commodity currencies and developed market commodity currencies over various horizons after 1987. The returns of both portfolios are moderately positively correlated with US inflation over long horizons. However, returns on the commodity currencies are more weakly correlated with inflation than the non-commodity currencies. This indicates that developed market commodity currencies are no better as a hedge of US inflation than non-commodity currencies.

<sup>8</sup> Both indices are available from 1999 to 2021. The MSCI USA Commodity Producers Index consists of 18 mid- and large-cap US commodity producers. The MSCI ACWI Commodity Producers Index consists of 214 mid- and large-cap commodity producers in 23 developed markets and 27 emerging markets.

<sup>9</sup> While other currencies, such as the Norwegian krone or the Russian ruble, may also be taken to be ‘commodity currencies’, the currencies analyzed here are chosen for reasons of data availability.

**Figure 6: Correlation between inflation and excess returns on portfolios of DM commodity currencies and non-commodity currencies (rolling windows of various lengths)**

Monthly data from 12/1987 to 4/2021.

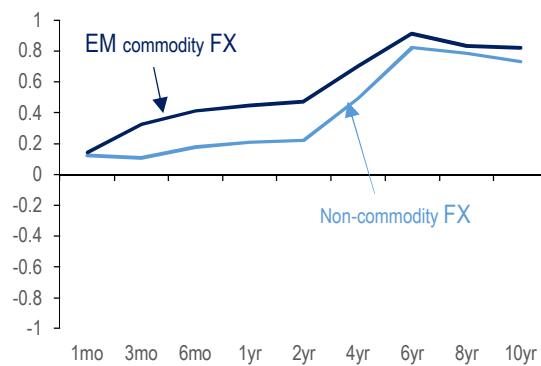


Source: J.P. Morgan, Bureau of Labor Statistics.

Figure 7 plots the corresponding correlations between excess returns on portfolios of non-commodity currencies and emerging market commodity currencies over various investment horizons after 1997. Over long horizons, returns on these portfolios are highly correlated with US inflation. Over all horizons, EM commodity currencies are more strongly correlated with US inflation than non-commodity currencies. This analysis indicates that WM commodity currencies may be more effective as a hedge of US inflation than other currencies.

**Figure 7: Correlation between inflation and excess returns on portfolios of EM commodity currencies and non-commodity currencies (rolling windows of various lengths)**

Monthly data from 6/1997 to 4/2021.



Source: J.P. Morgan, Bureau of Labor Statistics.

## Hedging strategies

Given a choice of hedging assets that are not fully correlated with each other, we have found in the past that the most effective strategy is to use a portfolio rather than just the “best” one. We thus proceed to

consider what **portfolios** of commodity-linked assets generate excess returns that are most strongly correlated with US inflation over various investment horizons. To begin, we consider the construction of a portfolio that consists of the three broad commodity-linked asset classes. Thereafter, we consider the construction of portfolios within commodity futures and within commodity equities. We do not consider portfolio allocations within commodity currencies, because the analysis above indicated that only EM commodity currencies were more effective hedges of inflation than non-commodity currencies.

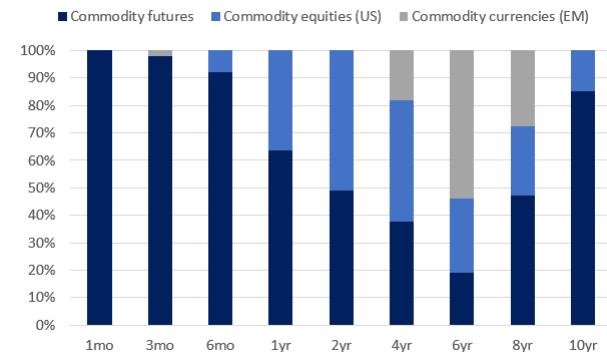
### Across broad commodity-linked asset classes

To determine what portfolios of hedging assets most strongly correlate with US inflation, we require data from each of the three broad asset classes over a common period of time. For commodity futures, we use the S&P GSCI aggregate commodity index. For commodity equities, we use the MSCI USA Commodity Producers Index.<sup>10</sup> And for commodity currencies, we use the equal-weighted portfolio of EM commodity currencies constructed above. Jointly, these data sets span from 1999 to 2021.

In Figure 8, we plot the portfolio weights that maximize the correlation of portfolio returns with US inflation over various investment horizons. Over short horizons, returns on portfolios constructed almost entirely of commodity futures are mostly strongly correlated with inflation. Over medium horizons, the most strongly correlated portfolios consist of commodity futures and commodity equities. Over long investment horizons – with the exception of 10 years – the most strongly correlated portfolios also consist of EM commodity currencies.

**Figure 8: Portfolio weights that maximize the correlation of returns on a portfolio with inflation over various investment horizons**

Monthly data from 12/1998 to 4/2021.



Source: S&P, MSCI, J.P. Morgan, Bureau of Labor Statistics.

### Within commodity futures

Within commodity futures, we considered five different commodity sectors: energy, agriculture, livestock, precious and industrial metals. There is coverage of these five sectors in the S&P GSCI indices from 1983 to 2021.

In Figure 9, we plot the sector weights that maximize the correlation of commodity futures portfolio excess returns with US inflation over various horizons. Over short horizons, optimal inflation hedging portfolios consist primarily of energy, industrial metals and livestock futures. Over longer horizon, portfolio weights on energy and industrial metals futures decrease, while portfolio weights on agriculture and livestock futures increase. Precious metals do not form part of the commodity futures portfolio that is most correlated with US inflation over any time horizon. Over all investment horizons, the correlation of returns on these portfolios is higher than on the aggregate commodity index, which heavily weights energy futures.<sup>11</sup> Over long horizons, the correlations with inflation are materially higher.<sup>12</sup>

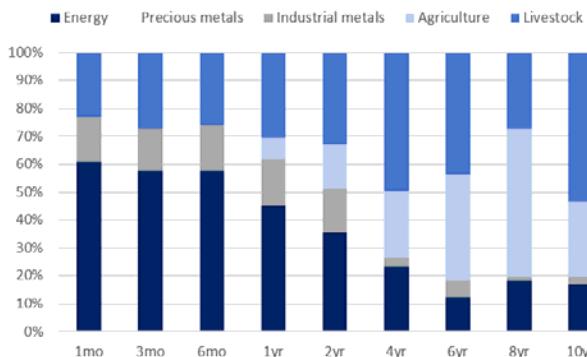
<sup>10</sup> We use this index instead of the Datastream sector indices because it consists of commodity producers across different sectors in the Datastream data, and because the use of these data in this context does not substantially restrict the period of time which we can analyze, due to constraints on the availability of commodity currency data.

<sup>11</sup> For reference, 2021 weights are approximately 62% energy, 16% agriculture, 7% livestock, 11% industrial metals and 4% precious metals.

<sup>12</sup> For example, the 10-year rolling window correlation for the optimal hedging portfolio of commodity futures is 0.89, while the correlation for the aggregate commodity futures index over the same period is 0.76.

**Figure 9: Portfolio weights that maximize the correlation of returns on a commodity futures portfolio with inflation over various investment horizons**

Monthly data from 1/1983 to 4/2021.



Source: S&P, Bureau of Labor Statistics.

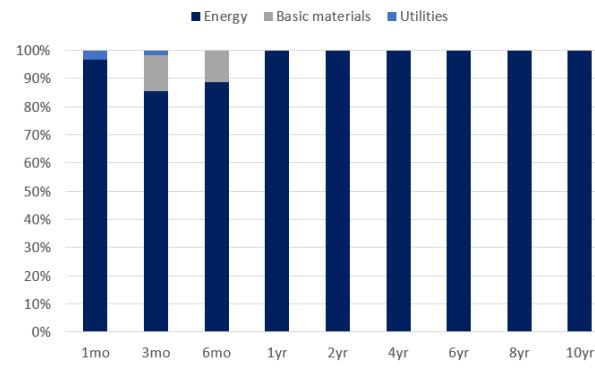
### Within commodity equities

Within commodity equities, we considered returns in three key sectors: energy, basic materials and utilities. Returns data in each sector are sourced from Datastream from 1982 to 2021.

In Figure 10, we plot the sector portfolio weights that maximize the correlation of returns on a portfolio of US commodity equities in excess of the US market with inflation over various investment horizons. Over all investment horizons, these portfolios consist almost entirely of US energy sector equities.

**Figure 10: Portfolio weights that maximize the correlation of returns on a US commodity equities portfolio in excess of the US market with inflation over various investment horizons**

Monthly data from 1/1983 to 4/2021.



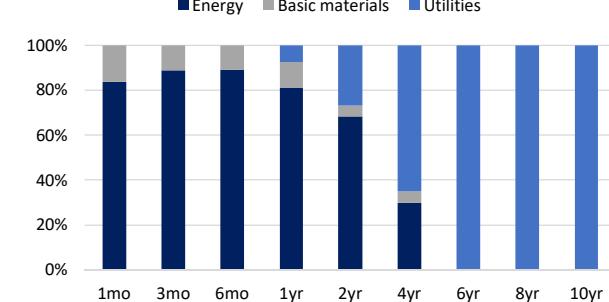
Source: Datastream, Bureau of Labor Statistics.

In Figure 11, we plot the corresponding weights that maximize the correlation of returns on a portfolio of **world** commodity equities in excess of the world market with US inflation. Over short investment horizons, these

portfolios are dominated by energy sector equities, as in the US. However, over longer horizons, these portfolios are increasingly dominated by the utilities sector.

**Figure 11: Portfolio weights that maximize the correlation of returns on a world commodity equities portfolio in excess of the world market with US inflation over various investment horizons**

Monthly data from 1/1983 to 4/2021.



Source: Datastream, Bureau of Labor Statistics.

### What to choose?

With so many “good” choices among the different commodity asset classes to hedge inflation, the next question for a financial manager is obviously which of these combinations is best. One is tempted here to throw all of our different choices in one pot and let the optimizer pick the combination that best hedges inflation. We will not do this, as it is our experience that the greater the number of choices and the more correlated they are to each other, the more likely the optimizer will throw up corner solutions and allocations that are highly dependent on minute differences in the historic correlations.

Instead, a simple review of the optimizations in Figures 8-11 already suggests the most plausible hedging strategies. We will distinguish between the manager who needs to hedge short-term inflation surges, up to 2 years, or those who are in need for longer-term inflation protection, up to 4-10 years in the future. And we will distinguish also between the unconstrained manager, who can fine tune their full portfolio of global bonds and equities to protect against inflation, or the one who can only use an overlay of commodity futures. Below, we take “round” number allocation from Figures 8-11 that broadly average results for different time horizons on the understanding that these are not statistically different from the precise percentage point allocations produced by the optimizations. We outline these strategies in Table 2.

The **unconstrained** manager seeking to hedge **short-term** risk can do this well through a 50/50 combination of commodity futures and global energy stock longs against the global equity index. The commodity futures would themselves consist for 1/2 of energy and 1/4 each of industrial metals and livestock. The unconstrained manager in need of **longer-term** hedges should focus a lot less on energy and hold a more diversified hedge portfolio of some 20% EM commodity FX, 30% global utility stocks vs world, and 50% commodity futures, of which 2/5 is in both livestock and agriculture and 1/5 is in energy.

Quite a few managers will only be able to use a commodity futures overlay, as their equity and FX allocations may be managed in specialist portfolios with straight risk/return mandates on a standard benchmark. Short-term inflation risk for them can be well managed with some 50% in energy futures and the other half equally in industrial metals and livestock futures. A longer-term inflation hedging portfolio would be 40% each in livestock and agriculture and 20% in energy.

**Table 2: Hedging strategies over different investment horizons**

	Futures only	Unconstrained
Short term (up to 1yr)	<ul style="list-style-type: none"> <li>• 50% energy</li> <li>• 25% industrial metals</li> <li>• 25% livestock</li> </ul>	<ul style="list-style-type: none"> <li>• 50% global energy equities vs world</li> <li>• 25% energy futures</li> <li>• 12.5% industrial metals futures</li> <li>• 12.5% livestock futures</li> </ul>
Long term (4yrs to 10yrs)	<ul style="list-style-type: none"> <li>• 20% energy</li> <li>• 40% livestock</li> <li>• 40% agriculture</li> </ul>	<ul style="list-style-type: none"> <li>• 30% global utility equities vs world</li> <li>• 20% EM Commodity FX</li> <li>• 10% energy futures</li> <li>• 20% livestock futures</li> <li>• 20% agriculture futures</li> </ul>

Source: J.P. Morgan

## Conclusion

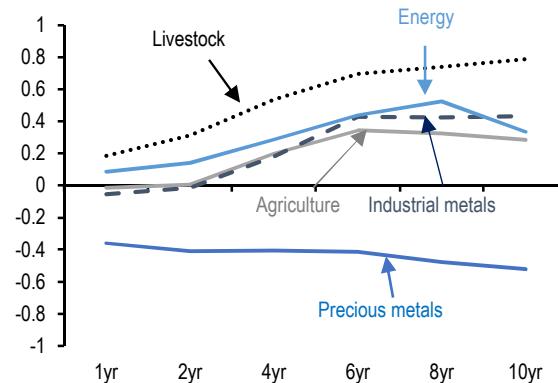
This paper has considered the role of commodity futures, commodity equities, and commodity currencies as a hedge of inflation over a long investment horizon. Our analysis provided evidence that agriculture, livestock, industrial metals, and energy commodities, along with commodity equities and emerging market commodity currencies, are effective hedges of long-term inflation. This analysis indicated that precious metals, such as gold, are not an effective inflation hedge.

## Appendix - Inflation expectations results

In this section, we present the full set of results presented in the main body of this paper, with inflation expectations instead of realized inflation. Each figure presents the correlation of excess returns in a period with inflation expectations for that window at the start of the period.<sup>13</sup> These results broadly reflect the results using realized inflation, with one exception – emerging market commodity currency returns are no better as a hedge of expected inflation than non-commodity currencies.

**Figure 12: Correlation between inflation expectations and excess returns on the S&P GSCI sectors indices (rolling windows of various lengths)**

Monthly data from 1/1982 to 4/2021.

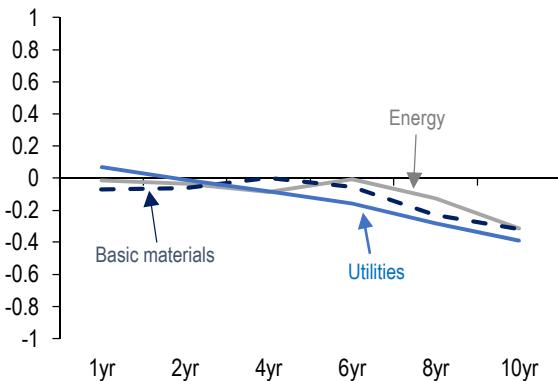


Source: S&P, Federal Reserve Bank of Cleveland

<sup>13</sup> Specifications in which excess returns were correlated with *changes* in inflation expectations typically yielded very low correlations over all investment horizons. This may be taken to reflect the noise in inflation expectations, and the lack of substantial variation in expectations during the Great Moderation, which spans the entire period for which data is available.

**Figure 13: Correlation between inflation expectations and returns on US equities in excess of the US market in three key sectors (rolling windows of various lengths)**

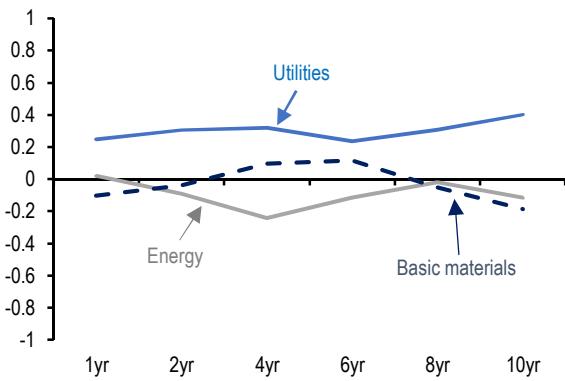
Monthly data from 1/1982 to 4/2021.



Source: Datastream, Federal Reserve Bank of Cleveland

**Figure 14: Correlation between inflation expectations and returns on world equities in excess of the world market in three key sectors (rolling windows of various lengths)**

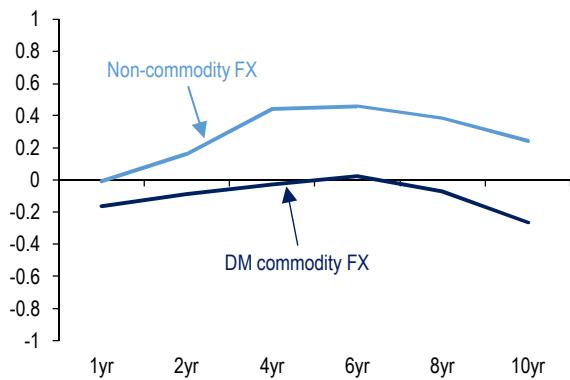
Monthly data from 1/1982 to 4/2021.



Source: Datastream, Federal Reserve Bank of Cleveland

**Figure 15: Correlation between inflation expectations and excess returns on portfolios of developed market commodity currencies and non-commodity currencies (rolling windows of various lengths)**

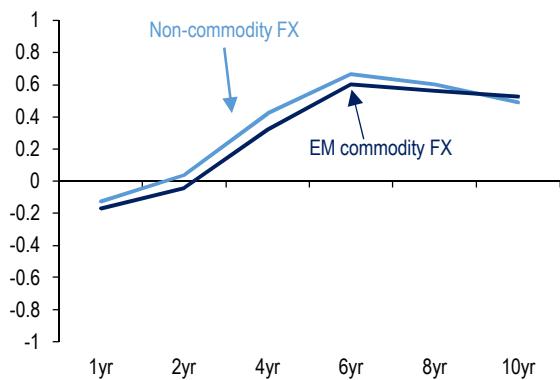
Monthly data from 12/1987 to 4/2021.



Source: J.P. Morgan, Federal Reserve Bank of Cleveland.

**Figure 16: Correlation between inflation expectations and excess returns on portfolios of emerging market commodity currencies and non-commodity currencies (rolling windows of various lengths)**

Monthly data from 6/1997 to 4/2021.



Source: J.P. Morgan, Federal Reserve Bank of Cleveland.

## The Long-term Strategist

### Business concentration



- Business concentration has been rising over the past 20 years, especially in the US.
- Greater concentration has coincided with, and been blamed for, lower growth, investment, innovation and interest rates, and higher profits and income inequality.
- The empirical finance literature has not been able to pinpoint a single driver of this rise in concentration. It could result from more tolerant antitrust enforcement and a greater role of regulations and lobbying in raising barriers to entry, but is probably more due to the rise of superstar firms, globalization and greater economies of scale, scope and network.
- Whether productivity or anticompetitive practices are at work, higher concentration likely goes hand in hand with higher profit margins.
- The current US administration has started to focus its antitrust attention more on Big Tech. A new administration, if elected, could also bring size-focused antitrust back with a vengeance, although a lack of popular anger at Big Tech, defensive action by more socially responsible industries, and many other policy issues vying for attention make a “return of antitrust” only a modest risk factor.
- European competition authorities have probably for long been less tolerant of “size,” but this could give way in coming years to greater support for “EU champions” if de-globalization continues.
- If antitrust does come back in the US, we expect, all else constant, lower company earnings growth, and higher odds of underperformance versus the rest of the world.
- This note was also issued as part of J.P. Morgan Perspectives, The Credit Crisis that Wasn't: The Returns Crisis that Looms, Sep 21, 2020.
- [Video](#).

Business concentration has been rising in the developed world over the past 20 years and has become a contentious political issue, particularly in the US, where it is seen by some, if not many, as the cause of much of what has gone wrong in the economy. In this note, we review how and where markets have become more concentrated, the diverse drivers of this change, how it has affected financial markets, how it might develop in the future, and how different scenarios would affect the investor.

## What is market concentration?

Market concentration is the number and relative size of the companies competing with each other in a given market. It is typically measured by the market share of the biggest four or eight companies in a market (CR4, CR8), or the sum of the squared market shares of each competitor (Herfindahl-Hirschman Index, or HHI). The main challenge in measuring concentration is delineating where one market stops and another begins, along both product and geographical lines. For example, are apples and oranges in the same “fruit” market or in different ones, and is the Florida orange market in the same one as California, or does it extend to Mexico and beyond?

Economists address this challenge by defining Standard Industrial Classifications (SIC), *inter alia*. The US started the first SIC in 1937, which now classifies industries along increasingly granular lines in a 4-digit code system. J.P. Morgan, for example, is in the 4-digit group 6021 of National Commercial Banks, where the first level “6” is for Finance, Insurance and Real Estate, the second level “0” for Banks, the 3<sup>rd</sup> level “2” for Commercial banks, and the 4<sup>th</sup> level “1” for National.<sup>1</sup>

## Has business concentration increased?

Figure 1 shows US industrial concentration from 1972 to 2014 with a Herfindahl-Hirschman Index, sales-weighted at the NAICS 3-digit level (99 industries). Concentration fell significantly from the ’70s to the ’80s and ’90s, quite possibly linked to de-regulation and early globalization, but then started rising steadily to record highs in the last decade. Many studies have confirmed with other measures and granularity rises in US concentration since the late 1990s.<sup>2</sup> Empirical studies on Europe generally show either little increase in concentration or just less than in the US.<sup>3</sup>

<sup>1</sup> The US also uses a 6-digit NAICS (North American Industrial Classification System), with Mexico and Canada, while the UN uses an international ISIC and the EU its own system called NACE.

<sup>2</sup> See, e.g., Furman, J., and Orszag, P. (2015), ‘A Firm-Level Perspective on the Role of Rents in the Rise in Inequality’ Paper presented at Columbia University’s ‘A Just Society,’ Centennial Event in Honor of Joseph Stiglitz; Thomas Philippon, The Great Reversal, 2019; or Matej Bajgar et al., *Industry Concentration in Europe and North America*, 2019, CEP Discussion paper 1654.

<sup>3</sup> An [OECD hearing on market concentration](#) in 2018 concluded that “In Japan, Germany and France there also appears to have been a slight increase in concentration. However, there is not a

## Why is concentration important?

In one of your first Economics classes, you were taught the model of “perfect competition”—a market in which there are so many buyers and sellers that none have any impact on the price, thus becoming “price takers,” where prices converge on marginal cost and profits just cover the required return on capital. Its opposite is a monopoly, or monopsony, where there is only one seller or buyer who becomes a price maker, setting it at a level that maximizes profits of the seller, or surplus of the buyer. In each case, the quantity produced will be below the one in perfect competition, and thus does not maximize economic welfare. Markets in between, with few buyers or sellers, from oligopoly to duopoly, are by implication considered less competitive, the more concentrated they get. **Concentration and competition thus came to be seen as tightly linked to each other.**

**Figure 1: US business concentration**

1972 – 2014, Herfindahl-Hirschman Index, NAICS 3-digit level



Source: [Grullon, Larkin & Michaely](#), Are US Industries Becoming More Concentrated?, Oct 2018, Swiss Finance Institute Research papers series, #19-41.

The political battle against excessive concentration started in the US with the Sherman Antitrust Act of 1890, which made actions to monopolize a market illegal. But it was only at the start of the new century under President Teddy Roosevelt that the government began to seriously implement it. The motivation had little to do with economic models and more with a conviction that companies and their combinations—then called “trusts”—were too big and powerful relative to government and labor. Excessive corporate concentration and power were thought to have led to worsening worker exploitation. Antitrust enforcement and follow-up competition laws in later decades went hand in hand with the expansion of laws and regulations to protect workers and labor unions.

similar change in Italy, Spain or the UK.” Matej Bajgar et al. find significant increases in European business concentration but generally only half as much as in the US.

Other countries followed the US example, in particular the European Community that enshrined competition law into its founding Treaty of Rome (1957) and placed enforcement in the Brussels-based European Commission.

In the US, the ascendancy of the **Chicago School** belief in free markets from the late 1970s on led not only to deregulation and globalization, but also to a rethink of how to implement antitrust laws. The latter was led by Robert Bork's 1978 book, *The Antitrust Paradox*. Prof. Bork argued that those implementing antitrust laws focused too much on market share, and thus size, whether from organic growth or acquisitions, as the main measure of monopoly power. Concentrated markets can actually be quite competitive ("contestable") if it is easy for outside firms to enter. Even duopolies can become like dueling giants that keep prices low. Bork argued that the ultimate aim of antitrust laws was really consumer welfare,<sup>4</sup> implying that large companies that competed strongly and/or that grew through greater efficiencies should not be punished simply because they have become big. Hence, big firms should be considered "bad" only if big behaves badly, i.e., anti-competitively.

Since Bork, the debate has continued to rage between those arguing that size reflects success and efficiency, versus those arguing that size and concentration are a threat to competition. Since, both the US and Europe have focused their interventions more on anti-competitive practices (price fixing, predatory pricing, tying, exclusive dealing, etc.) and on M&A transactions. On M&A, the EU has probably been focused more on size and concentration than the US.

## What explains the rise in concentration?

There are two main competing views of the causes of increases in US industrial concentration. We will call them loosely "**anti-competition**" and "**superstar firms**." They mirror the debate between "large is anti-competitive" and "only consumer welfare matters." The two views are not exclusive, and can operate at the same time, or in different times, sectors, or countries.

One of the most vocal proponents of the anti-competition view is arguably NYU's **Thomas Philippon**. Prof.

<sup>4</sup> Note that the Sherman Act does not mention consumer welfare, directly or indirectly, and that there thus remains controversy about Bork's argument, even as it has remained a core principle of US antitrust policy since.

Philippon argues in *The Great Reversal* that the rise in US market concentration since 2000 brought with it higher profit margins, weaker wage growth, higher income inequality, falling capital spending and falling productivity growth. He believes the rise is primarily due to a more permissive attitude by antitrust officials and regulators towards large companies and M&A, both linked to changes in campaign financing that gave large companies more opportunities to gain influence with policy makers to reduce competition in their favor.<sup>5</sup>

Not everyone agrees that US markets have become less competitive, or even concentrated. The US Department of Justice, and in particular its Antitrust Division<sup>6</sup> begs to disagree. Its main argument is **that industrial concentration is not the same as market concentration** as the relevant size of a market on which it judges a "hypothetical monopolist" would possess significant *market* power is much smaller—more granular, more local—than the SIC/NAICS industry categories across which one can measure *business* concentration. Finding, for example, that the food production industry in the US has become more concentrated does not say anything about whether the market for fresh fruit in Pittsburgh is now less competitive. In a few areas like wireless telecoms, airlines, and banking, where we have more granular market data than SIC-4, [Werden & Froeb](#) cite studies that show no evidence of increased concentration at the level of the local market they consider relevant for competition analysis.

Given this difficulty, a new strand of the anti-competitive view has focused on **markups** of price over marginal cost, instead of concentration. If some markets have become more concentrated but are fully contested, competition should prevent the emergence of excess profits. Measuring such markups could thus be a more

<sup>5</sup> There is a long [history](#) of US campaign finance regulation. The last two decades, punctuated by the 2010 US Supreme Court decision on *Citizens United v. FEC*, have seen a gradual loosening of restrictions on the ability of citizens, trade unions and corporations to provide electoral campaign funding, mostly as such restrictions were seen as in conflict with the First Amendment right of free speech.

<sup>6</sup> Werden and Froeb, [Don't Panic: A Guide to Claims of Increasing Concentration](#), Antitrust Magazine, American Bar Association, Fall 2018. (Premium content)

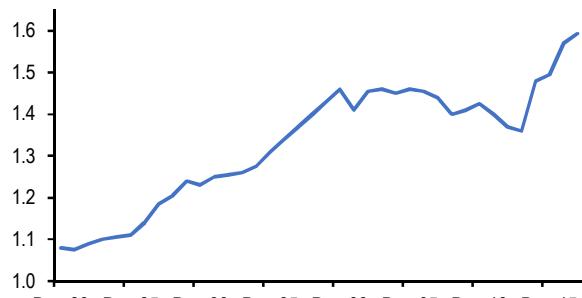
direct way to search for any weakening in the competitiveness of markets.<sup>7</sup>

Some of the earlier work on markups was done by Jan De Loecker and Jan Eeckhout,<sup>8</sup> who consider high markups a measure of **market power**. They do find evidence of steadily rising markups across the world since the 1980s (Figure 2), though more pronounced in the US and Europe and less in EM. A separate study by the [IMF](#)<sup>9</sup> last year confirmed rising markups, but found little in EM. Both find that the rise is apparent across sectors, but fairly concentrated at the top end of the distribution.

The main competing explanation of increased industrial concentration and market power is the emergence of **superstar firms**. Superstar firms have superior products and/or productivity and can thus capture a larger share of a market. A recent McKinsey study<sup>10</sup> argues such firms show up in all industries, are more global and innovation intensive, and have more skilled labor, and intangible assets. Superstar status does not last, though, as they find a lot of churn at the top.

**Figure 2: Global markups**

1980 – 2017, ratio of price to marginal cost. 1.6 means a 60% markup. Not the same as a profit margin which measures price over all-in cost.



Source: [Jan De Loecker and Jan Eeckhout, Global Market Power](#), June 2018, NBER.

<sup>7</sup> Markups are different from margins, which are price over all-in costs, including fixed costs that do not change with output and are thus zero at the margin. High markups over marginal cost will be needed in an industry with high fixed costs.

<sup>8</sup> See, for example, De Loecker, Jan, and Jan Eeckhout. 2017. [The Rise of Market Power and the Macroeconomic Implications](#). NBER WP 23687; and [Global Market Power](#), June 2018, NBER WP 24768.

<sup>9</sup> [The Rise of Corporate Market Power and its Macroeconomic Effects](#), World Economic Outlook, April 2019, Chapter 2.

<sup>10</sup> ['Superstars': The dynamics of firms, sectors, and cities leading the global economy](#), McKinsey Global Institute, October 2018.

Superstar firms have always been there, but David Autor et al., who launched the idea, believe that in the last two decades “technology or market conditions—or their interaction—have evolved to increasingly concentrate sales among firms with superior products or higher productivity, thereby enabling the most successful firms to control a larger market share.”<sup>11</sup>

**Who is right?** As with much in economics, both views of the causes of increased business concentration are likely right to some extent. Reviewing the evidence, this analyst, as does the [IMF](#) in its 2019 WEO, sees more support for the superstar firm hypothesis. From the empirical literature, we pick up that the rise in concentration and markups is almost entirely due to **the top decile** of the size and market distribution, which supports the superstar firm hypothesis. In addition, the steady **digitalization** of the world has created significant network effects and requires high upfront fixed costs that in turn create economies of scale. This combination of **network and scale** economies can in the extreme create what economists call “natural monopolies” where a company’s average and marginal costs keep falling as output rises. This industry will naturally converge on a single supplier, the monopolist. Utilities are a typical example of this.

A third piece of evidence against the pure anti-competition view is that becoming a superstar firm does not mean you will stay there for long, as many that reach the top in one decade fall behind in the next, as shown by [McKinsey](#). There is considerable churn at the top, which is a landmark of a competitive market. A company with a truly innovative and market-beating technology or product will dominate only until the next one comes around. The history of the US technology sector of the last few decades is a vivid example of this.

**There are also indications of reduced business dynamism in recent decades.**<sup>12</sup> The fall in both the birth rate of new companies and mortality of existing companies in the last two decades together with the falling share of young firms and slower job reallocation in the US do suggest a weakening of Schumpeterian

<sup>11</sup> See [The Fall of the Labor Share and the Rise of Superstar Firms](#), David Autor et al., A shorter version can be found in [Concentrating on the Fall of the Labor Share](#), David Autor et al., American Economic Review: Papers & Proceedings 2017, 107(5): 180–185.

<sup>12</sup> For a good survey of this topic and its relation to rising business concentration, see [Ten Facts on Declining Business Dynamism and Lessons from Endogenous Growth Theory](#), Akcigit and Ates, April 2019.

“Creative Destruction,” rising barriers to new entry, and/or a growing number of Zombies, kept alive by super-easy monetary policy.

One way to tie all these forces together is to look at the high upfront costs of advanced technology and the steady growth of prudential and environmental regulations as creating network and scale effects that allow the more productive companies to gain market share faster than in the past, and that raise barriers to entry by potential outside companies. In turn, as these companies gain size and heft, many could well be trying to protect their position by acquiring potential competitors or influencing legislators and regulators to skew the playing field to their advantage.

### What impact on investors?

To gauge what impact future changes in concentration could have on portfolios, we need to analyze what impact they had in the past on markets and companies. There is little macro research<sup>13</sup> on this topic, and we thus need to start from principles.

Higher business concentration that is brought on by anticompetitive practices should raise profits but should also weaken output, and thus economic growth. At the margin, it should thus be positive for bonds, credit and equities, even as it is not good for the overall economy. If it instead comes from stronger economies of scale and/or scope, it is good for output and growth. The impact on earnings and credit spreads depends on whether these economies are competed away through lower output prices. If it is only a few superstar firms that realize these economies and prices will thus be set by the less productive marginal producer, sector earnings will rise, in particular those of the more productive firms. If prices come down in line with these lower average costs, then we should see stronger demand for this product and a rise in total profits even if profit per unit sees no change.

**Our presumption should thus be that higher business concentration should go hand in hand with higher earnings.** At the macro level, that is what one finds. Empirical studies on markups, margins and concentration cited above show that these go hand in hand, but also that

<sup>13</sup> There is a literature of the impact of M&A transactions on the share prices of the merging companies, generally concluding that “it all depends” on prices paid and execution. See R. Stunda, *The market impact of mergers and acquisitions on acquiring firms in the U.S.*, Journal of Accounting and Taxation, September 2014, and references therein.

the relation is very low-frequency. That is, it is not short-term but more a trending long-term relation that does not make it easy to decide which causes which.

The impact of higher concentration on **bonds** depends very much on what it does to growth and capital spending. If it weakens growth, concentration leads to lower interest rates and higher bond prices. The anti-competition view of rising concentration implies reduced capital spending, as a monopolist restricts output, and thus would be consistent with the trend of lower capex rates, productivity growth and interest rates seen across the world over the past two decades.

The superstar firm view on rising concentration is ambiguous on growth and capex. If size is driven by economies of scale and scope, you may need less capital to produce more, but this lowers prices and raises demand and output. Overall, the impact of rising concentration seems too ambiguous to come to a clear conclusion on the impact on bonds.

### Where is market concentration headed?

The number and relative sizes of companies in a market in principle depends on the **cost structure** of the companies competing there, the **cost/barriers of new entry**, and any **regulatory/legal restriction on company size**.

As to **costs**, if all companies in a competitive market have the same **cost structure**, the market will consist of N firms, where N is total market production/sales divided by the minimum average-cost output level of each firm. If that level is 1 million units, then there will be 10 equally sized firms in a 10 million unit market. The more costs are fixed and do not vary with output level, firms will gain from greater **economies of scale**, spreading these fixed costs over larger and larger output levels, they will be naturally larger, and there will be fewer of them. Not all companies are equally productive, though, or have the same cost structure, creating a natural diversity of company sizes. **Market concentration will be higher, the stronger economies of scale and scope are, and the greater the diversity among firms in their cost structures and levels.**

Future market structure should thus depend on whether companies in the 2020s will see stronger economies of scale and scope, and/or greater diversity in cost and productivity. The steady **digitalization** of modern economies, which requires heavy upfront costs, suggests

increasing economies of scale and thus greater market concentration in the future. With the current pandemic still not under control, heavy R&D spending in the pharmaceutical industry to find a vaccine and other medicine could easily increase concentration in this industry.

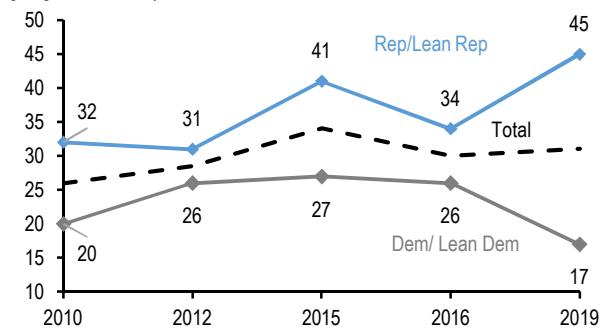
As to **barriers to entry**, we see the biggest risk coming from **de-globalization** and the US-China Great-Nation conflict we have been writing about in the past year.<sup>14</sup> By definition, globalization from the 1980s to some 10 years ago opened up markets, and a proper consideration of the cross-border nature of global markets should thus have concluded that globalization helped reduce market concentration as the relevant market to judge competition grew from national to international, even as globalization likely increased the average size of companies.<sup>15</sup> A return of borders, trade wars, and a move to sovereignty in technology by the US, China, and Europe will by design shrink the size of markets across which companies can compete. It is not implausible that greater “economic nationalism” will boost support for “**national champions**” both to enhance perceived national prestige and national security. Raising barriers to foreign competitors raises business concentration and weakens competition.

As to constraints to company size, this comes down to “**whether antitrust returns**.” As discussed above, US competition policy has gone through two major revolutions in the past 130 years. After the near complete laissez-faire of the 1800s, the Sherman Antitrust Act and following legislative and regulatory actions in the US and elsewhere steadily imposed restrictions on how large companies could become. The driving force behind this was not economic models, but a rising fear of large companies and a conviction that they were at least partly responsible for what was going wrong in the US economy and society.

Some of this anger and suspicion of large companies may well be reemerging today. On average, the percentage of Americans saying large corporations are having a “positive effect on the way things are going in the

country” has actually been slowly *rising* over the past decade, but the gap between Republicans and Democrats sharing this positive perception widened dramatically. The Democrat score fell to its lowest level—at 17%—in a decade in last year’s Pew Research Center survey, a meaningful development if polls showing presidential candidate Biden running ahead become reality (Fig 3).

**Figure 3: American views of large corporations**  
% who say large corporations have a positive effect on the way things are going in the country



Source: <https://www.pewresearch.org/fact-tank/2019/07/29/americans-have-become-much-less-positive-about-tech-companies-impact-on-the-u-s/>

Part of this is understandable as it comes naturally from size and power: if something goes wrong in society, you will be blamed if you are large, powerful and doing well. While it goes too far to make large US companies responsible for the growing polarization of US politics, it is natural, though unfair, that people make a link between large company profits on one side and growing income inequality, the offshoring of factories, stagnant middle-income wages, environmental degradation and climate change on the other.

At the same time, there are a number of factors that suggest to this analyst that a **return of concentration-focused antitrust should not be our modal view for the next few years**.

For one, if Biden wins, he will likely have a lot of other “fish to fry”—the economy, the pandemic, tax reform, the deficit, China, infrastructure, and climate change, just to name a few. Like all new presidents, he will have to choose carefully what he will be able to get through Congress, even if he were to have a Democratic majority in both the House and Senate. Legal action on antitrust, thus, may well be quite low on the priority list. Do watch out for appointments at the FTC and DoJ, as more strict regulatory action and enforcement can change the landscape rapidly for large companies. On the campaign trail, although Biden has been a lot less strident on

<sup>14</sup> See [De-globalization](#), April 5, 2019, [De-globalization Update 2020](#), April 23, and [Pandemic accelerates paradigm shifts](#), Joyce Chang et al., July 8. pp. 73-145.

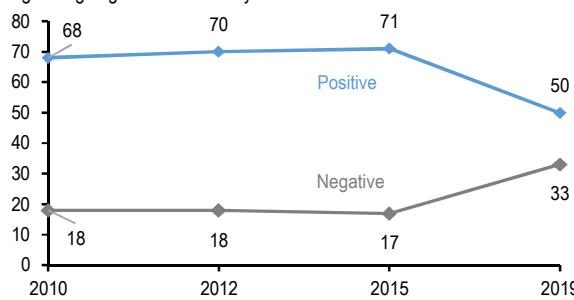
<sup>15</sup> Note that almost all studies of market concentration only look at national markets and not across borders.

antitrust than Senator Warren and has a centrist track record, as Vice President from 2009-17, he nor President Obama pursued a radical antitrust policy.

If President Trump gets reelected, one might expect no change in policy, which appears relatively relaxed on large corporations, mergers and acquisitions. However, we probably should expect **some tightening of antitrust enforcement on conduct** rather than on M&A. Last month, Assistant Attorney General Delrahim announced<sup>16</sup> a **re-organization of the Antitrust Division's Civil Enforcement Program**. The re-organization should help to "ensure the effective implementation of and compliance with antitrust judgments," rather than new regulations. A new Civil Conduct Task Force will in turn put more resources on investigating antitrust law conduct violations. Finally, the Antitrust Division's six civil sections are getting reorganized to focus more "time on technology markets and the competitive characteristics of platform business models." Overall, this seems **more a new threat to Big Tech** than to large M&A combinations.

**Figure 4: American views of Tech companies**

% who say technology companies have a positive/negative effect on the way things are going on in the country



Source: <https://www.pewresearch.org/fact-tank/2019/07/29/americans-have-become-much-less-positive-about-tech-companies-impact-on-the-u-s/>

A second factor is this analyst's perception that, notwithstanding the Figure 3 Pew Research Center survey showing reduced positive perceptions of large companies by Democrat-leaning Americans, there does not appear to be as much anger against large companies as during the birth of antitrust 130 years ago. Specifically on Big Tech, Americans have become less positive on them (Figure 4), but the growth and popularity of these companies suggest that people do not seem unhappy with their services as Big Tech either charges a zero price or

<sup>16</sup> <https://www.justice.gov/opa/pr/assistant-attorney-general-makan-delrahim-announces-re-organization-antitrust-divisions-civil>

one that is very competitive. The Big-4 Tech companies' hearing in front of the [House Judiciary Committee on July 29](#) may have been uncomfortable for them, but it did not appear to present a big "smoking-gun" case that is eliciting widespread voter anger.

Third, **companies are not sitting still** and are aware of the responsibility and attention that their success and size bring. They understand they need to be seen as "part of the solution" and not "part of the problem." Hence, large US companies are increasingly taking action—through words, deeds and money—to be seen as socially responsible. Some have been doing this for a long time. Others were egged on by the growth of Socially Responsible Investing, also known as ESG, and Sustainable investing.<sup>17</sup> Most recently, the **US Business Roundtable**, issued a [statement](#) on the purpose of a corporation. Over 180 of the largest US companies signed a fundamental commitment to all stakeholders, not just shareholders, but also customers, employees, suppliers and communities. See Chang and Harano, pp 57-63 in [J.P. Morgan Perspectives](#) on the rise of "Stakeholder Capitalism."

In the European Union, competition law and enforcement are a team effort between the European Commission's DG on Competition and the National Competition Authorities (NCAs). EU Competition law and practice are similar to the US, focused on anti-competitive mergers, cartels, and conduct, but they also monitor national state aid that could distort competition within the Single Market. In casual terms, the Commission is usually taking the role of the "bad guy" with the NCAs more supportive of the position of their national champions. As discussed in our recent [De-globalization Update 2020](#), a return of borders and the Great-Nation conflict between the US and China are likely at the margin making the EU more inward-looking with tightened restrictions on takeovers by non-EU companies. **Hence, this analyst sees the balance shifting towards greater tolerance, if not support, for "EU champions," and thus also higher business concentration in Europe.**

<sup>17</sup> A number of previous issues of our *J.P. Morgan Perspectives* have focused on ESG and SRI. Our most recent one is [ESG and COVID-19: Friends or Foes?](#), Joyce Chang et al., 18 May 2020.

Jan Loeys  
(1-212) 834-5874  
jan.loeys@jpmorgan.com

Shiny Kundu  
(91-22) 6157-3373  
shiny.kundu@jpmorgan.com

**Global Markets Strategy**  
The Long-term Strategist  
30 September 2020

**J.P.Morgan**

## What to invest in if you expect changes in market concentration?

If we are right, overall market concentration is unlikely to come down much, with digitalization, the post-pandemic world, and the rise of national champions biasing the future towards further increases. That should support further rises in profit margins. But we need to accept two-sided risk, especially, if Biden wins the presidency and were to appoint a more progressive Attorney General. This could make antitrust enforcement a lot more concentration-focused. We would imagine that Big Tech and Pharma would be vulnerable, maybe followed by Banking. Aside from already promised corporate tax increases, which would also become more progressive under Biden, one should consider a return of antitrust as a negative for these sectors, and given their size, the overall US equity market, implying underperformance versus the rest of the world.



# Long-term risk

## The Long-term Strategist

Does cash lower or raise long-term risk?

- Many longer-term investors hold significant amounts of cash.
- We have zero cash in our Strategic allocation as we believe that its lower return, while keeping the value of your savings more stable, does not help much in realizing longer-term financial goals.
- In this note, we simulate the impact of adding cash to equity-bond portfolios both in the accumulation stage 20 years before retirement and during the decumulation stage, when you need to fund spending out of savings.
- Adding cash does lower volatility and the uncertainty about the future value of your savings, both short and long term, but at a price of a reduced return.
- That said, when we define long-term risk in terms of falling short of your objective of reaching a particular level of wealth and spending in retirement, we find that adding cash does not lower these long-term risks and can even raise the risk of falling short of your long-term goals.
- This is because the volatility-reducing impact of cash is offset by its lower return.
- At modest allocations to cash, below 20%, the best you can hope for is that it does not actually raise long-term risk, though it still lowers returns. Above 20% in cash, you get much greater stability in the value of your savings, but a lower return and an increased risk you will fall short of your long-term objectives.
- The only way to have more stable savings and reduced risk to your long-term goals is to save more and spend less.
- Despite these results, you may still want to hold decent amounts of cash in your savings if you are quite uncertain when you will need your savings, have uncertain sources of income and/or have little to fall back on if your retirement savings fall dramatically in value.

### Long-term Strategy

**Jan Loeys** <sup>AC</sup>  
(1-917) 602-9440  
[jan.loeys@jpmorgan.com](mailto:jan.loeys@jpmorgan.com)

**Alexander Wise**  
(1-212) 622-6205  
[alexander.c.wise@jpmchase.com](mailto:alexander.c.wise@jpmchase.com)  
J.P. Morgan Securities LLC

We have no cash in our Strategic Asset Allocation, as shown in the appendix at the end of this note. We know that many individual savers do hold significant amounts of cash-like assets in their savings beyond what they need for regular transactions. If you have substantial cash holdings, you are likely concerned about the negative impact of sudden market falls on your financial future and less about any need to earn a higher return.

The motivation to try and protect the value of your retirement savings by holding a lot of safe assets such as cash could come from not knowing when you will need to access your savings, from understandable worries that major market losses may not be recovered over following years, from not having a state or private defined-benefit pension to fall back on in the case your own savings are wiped out, or where lower than expected returns would seriously threaten your standard of living (that is, you go hungry).

Even rational long-term investors may thus have valid reasons to reduce the shorter-term volatility of their savings by adding cash to a traditional bond and equity portfolio. In this note, we try to assess the trade-offs and costs in holding cash in one's strategic portfolio and where and when such costs might be manageable.

We have argued that while cash may be default free, to long-term investors, who need to roll over cash all the time at unknown future yields, the eventual return on cash is uncertain though likely lower than that on bonds.<sup>1</sup>

Our aversion to cash in a strategic portfolio is based on a belief that while cash does lower portfolio volatility over the short term, and over the long term, it increases the risk that savers will not achieve their ultimate goals which for most is a comfortable and safe retirement. There are three drivers of this view that the relative safety of cash over the short term does not fully extend to the long-term investor. Each involves measuring more accurately what the risk is to your savings 1 or 2 decades out and defining more clearly what your long-term goals really are.

The first, developed several years ago in our [Bonds time diversify much better than you think](#), Feb 14, 2020, is that certain assets have returns that tend to mean revert over the years, thus reducing the possible range of the ultimate long-term returns relative to that implied by short-term volatility. In many financial pricing models, it is assumed that

long-term returns are a sequence of short-term returns that are uncorrelated over time and have identical distributions. This allows one to convert short-term volatility into long-term risk via **square root of time rule**. Accordingly, the volatility of the 10-year pa return will be 1-year volatility divided by the square root of 10. If returns are negatively correlated over time – they mean revert – then 10-year out risk will be lower. And vice versa if returns are positively correlated – they have momentum. We found that asset classes sitting in between the pure equity and bonds world – we call them hybrids – such as preferred stocks, utilities, infrastructure, real estate, convertible bonds, high-yield bonds have long-term return volatilities much lower than that implied by their short-term volatility. The long-term investor with patience and an ability to ignore the short-term noise of markets can thus be more confident about what such hybrids will be worth some 10 years out and thus has little need to stabilize his savings with large holdings of cash.

A **second** argument for lower long-term risk, developed in [Short- vs long-term risk](#), Feb 1, 2023, is that risk should be defined as downside to your return expectations. Risk is thus not mere volatility but the odds and extent that you will be wrong in your expectations about the future value of your savings. On that basis, the long-term investor has one advantage over the more tactical investor in that they know the price/IRR of the asset class they are buying and that knowing their entry point allows one to narrow the range of long-term returns one is likely to earn on those assets to below what is implied by short-term volatility. Again no major reason to hold a lot of cash, although the argument weakens a bit when one has an investment horizon well beyond 10 years as the ability of current IRRs to accurately forecast future returns can weaken beyond 10 years out.

A **third** argument for reduced risk and the focus of this note, is that long-term investors should really broaden out their concept of risk as not just return uncertainty, but more as the probability and extent to which your portfolio may not achieve the ultimate goals of your financial strategy and needs.

## Long-term risk from the point of view of your long-term objectives

Most individual investors, and the asset managers and insurers that serve them, are saving for old age with the objective to be able to maintain their lifestyle when they retire. There are two stages of savings management. In the first – the **accumulation stage** – you are still working and putting part of your earnings aside to build up enough savings to be able to retire in comfort at, say, the standard age of 65. In the second phase – the **decumulation stage** – you use your accumu-

1. As argued earlier this year in [Ten topics in strategic investing: How safe is your cash?](#), Mar 19, 2024.

lated savings to fund your spending in retirement.

**Long-term risk** in the **accumulation stage** is the risk that your chosen portfolio fails to deliver enough return to achieve your target retirement wealth at age 65. We do not incorporate the risk here that you may be unable to save enough during your working years due to unforeseen falls in income as it is not a function of how much you put into cash, although the macro correlation of job losses and equity falls during a recession are one argument to maintain a healthy allocation to safe assets. We defined in recent [notes](#) the long-term risk in the decumulation stage as the risk that you will run out of money before passing away, either because of lower than expected portfolio returns or as a result of living longer than expected. Short-term risk in both stages is simply the volatility of the value of your savings.

**What happens to your long-term risk** in either of these two stages **when you try to reduce short-term risk by adding cash to a bond and equity portfolio?** We know adding cash will reduce short-term volatility of your portfolio. By itself, this should also reduce long-term risk, but the lower return on cash to be expected over the long run should also be expected to reduce the ultimate value of your savings after the accumulation stage, when you are ready to retire, increasing the risk that you will not achieve your target spending in retirement. If you then also hold cash while you are withdrawing money in retirement, its lower return should raise the risk that you will run out of money before you pass away. **Which effect – lower return vol and lower return – dominates in their impact on your long-term risk?**

### Adding cash at the accumulation stage

We simulate adding increasing amounts of cash to a 60/40 equity-bond portfolio in the accumulation stage and to a 30/70 equity-bond portfolio in the decumulation stage that we have [found](#) to be roughly optimal at this stage, as your investment horizon is now shorter. For the first stage, we use a 20-year horizon to keep the analysis simple, avoiding the complexity of the growth in your retirement funds from annual savings out of income. An earlier starting point in retirement savings, at a younger age, will increase the impact of adding cash to long-term risk and vice versa for later starting points, but the overall impact should be qualitatively the same.

We simulate ~100k random draws from the distributions of the US Aggregate Bond Index and the S&P 500, with annual volatilities and correlations equal to those since 1976 and with means based on the very long-term return [expectations](#) we have used in recent months of 8.1% compounded pa on the S&P 500, and 4.7% on the US Aggregate Bond Index,

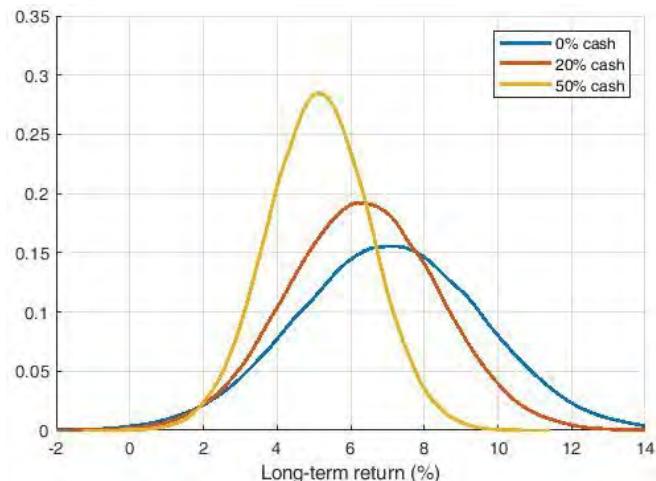
consisting of 4.1% on US Treasuries and 5.2% on high-grade corporates. Our 60/40 equity-bond portfolio with zero cash has a 20-year out mean projected *compound* return of 7.1%.<sup>2</sup>

To this 60/40 equity bond portfolio, we add steadily more cash, reducing both bonds and equities in proportion. A 20% allocation to cash thus means we reduce the equity and bond holdings to 48% and 32%, respectively. Throughout, we assume that cash offers a long-term expected return of 3% pa, with volatilities and correlations to 30-70 returns defined by the historic record since 1976.<sup>3</sup>

Figure 1 shows the return probability density in our simulations for three different portfolios: one with zero cash; one with 20% cash; and a third one with 50 % cash. It shows how the **mean return falls, and the distribution gets tighter as we add cash**, each time moving the distribution to the left.

Figure 1: Probability density of 20-year returns on different cash allocations on top of a 60/40 US equity-bond portfolio

% 20-year compound pa return on x-axis. Three different portfolios with zero, 20% and 50% allocations to cash. Kernel probability density estimate.



Source: J.P. Morgan, Board of Governors of the Federal Reserve System, Bureau of Labor Statistics, Bureau of Economic Analysis, Robert Shiller, Refinitiv, S&P, Bloomberg Finance L.P.

2. Our 8.1% and 4.7% pa forecasts for US equities and bonds over the next 20 years are for compound returns. Our simulations take random draws from the return distributions of these two assets classes with annual volatilities and correlations equal to the historic record since 1976. The means of these distributions must be the mean *arithmetic* returns consistent with our projected *compound* returns. We use the approximate conversion rule of adding 0.5%\*variance to the compound return to obtain a mean arithmetic return for both.

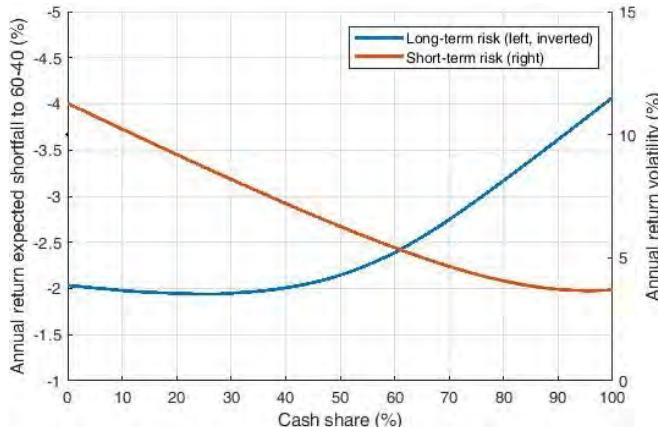
3. This cash portfolio is invested in 3-month Treasury Bills. The 3% pa return is roughly consistent with our [current long-term forecast](#) of a 0.6% real yield on 3-month bills, and our operating assumption that inflation will average about 2.5% pa in the long term.

**Long-term risk** to this 45-year-old saver should be the **risk and extent to which they do not end up in 20 years' time with enough savings to afford themselves a comfortable retirement**. We take the expected growth of the zero-cash portfolio as the one that should produce exactly this target wealth at age 65. Adding cash lowers the expected return, but also makes the eventual level of your wealth less uncertain. We can combine the negative impact of lower return on this long-term risk and the positive impact of reduced uncertainty by calculating the “expected shortfall” against the target wealth position produced by the 7.1% pa compound mean return on the 60/40 portfolio. To do so, we take the expected value of the part of each distribution to the left of a 7.1% 20-year return, and from this subtract the 7.1% mean return on the 60/40 portfolio. In the case of the zero-cash portfolio, this expected value is 5.0%, giving a shortfall of about 2.0% relative to 7.1% (after rounding). For the 20% cash portfolio, this expected shortfall is nearly the same as lower uncertainty (a tighter distribution) offsets the impact of a lower return. For cash allocations above 40%, the lower return dominates, and the expected shortfall rises more sharply.

Figure 2 plots our **two measures of risk: the long-term risk – expected shortfall** – (left axis) and the **short-term return volatility** (right axis) of our portfolio for varying cash shares. The red declining line shows that as we add cash, the annual volatility of the portfolio steadily declines, as expected. Long-term risk, on the blue line is the expected shortfall below the expected return of the 60/40 equity-bond portfolio.

Figure 2: Long and short-term risk in the accumulation stage of saving for retirement at different cash shares

%. Portfolio consists of cash and non-cash allocations. Non-cash component is allocated 60-40 to the S&P 500 and the US Agg. Short-term risk is annual return volatility. Long-term risk is expected shortfall below 60-40 expected return.



Source: J.P. Morgan, Board of Governors of the Federal Reserve System, Bureau of Labor Statistics, Bureau of Economic Analysis, Robert Shiller, Refinitiv, S&P, Bloomberg Finance L.P.

**In short**, in the accumulating stage of saving for old age, when you are still saving to build your financial retirement

nest, adding cash to our traditional 60/40 equity-bond portfolio has the expected impact of reducing both the expected return and short-term volatility of your savings. But it does not help to reduce long-term risk as the impact of more stable cash return is offset by the lower cash return making it more likely that your savings at age 65 will fall short of your needs. At relatively low allocations to cash, the two effects fully offset each other, and long-term risk does not rise. At cash levels above 40%, the impact of a lower return on cash starts to dominate and long-term risk starts rising steadily.

### Adding cash at the decumulation stage

Once you have chosen to retire, you need to decide how to **convert your accumulated savings into a dependable income stream** such that you run only a negligible risk of running out of money. We have discussed different aspects of this problem over the past 3 months (see Library further down this note). At its most basic level, it consists of deciding how much you can spend of your savings each year to make sure you do not run out of money prematurely. Your optimal spending or withdrawal rate will depend on the expected return on your portfolio, how long you expect to live, and on how you expect your spending needs to change over time due to inflation and/or changing needs. We showed two months ago that a US male and female with average, though trend improving mortality rates can spend 5.2%/5.0 pa of their starting savings if they simply want to spend a fixed nominal amount each year for the remainder of their lives. The optimal equity bond allocation for this spending rate is about 30/70, given current entry points in the market. We will use the 5% optimal spending rate of a female, as representative.

Figure 3 plots our **two measures of risk: the long-term risk** (left axis) and the **short-term return volatility** (right axis) of our portfolio for varying cash shares. Unlike in the first accumulation stage, we now do not define long-term risk as the downside risk to your end portfolio as, ignoring any desire to leave a bequest, your optimal spending strategy will aim to leave nothing behind so as to maximize your consumption in retirement. Instead, we define **long-term risk as the odds of running out of your savings before you pass away**.

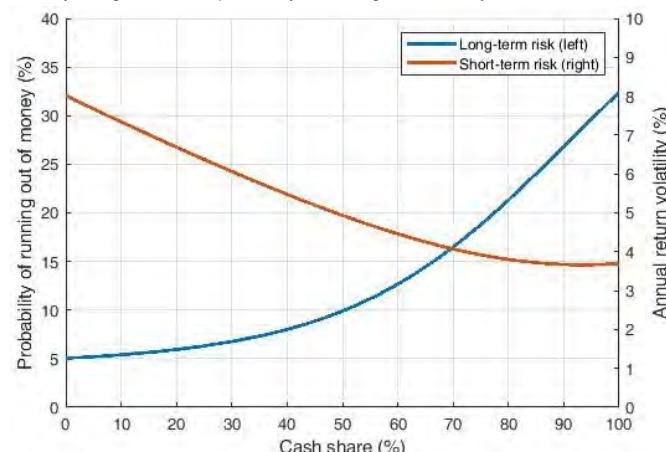
With no cash, a ~5% spending rate is low enough to keep the risk of running out of money to about 5% (1 in 20), and the volatility of annual returns is 8.0%. Adding cash to the portfolio raises the risk of running out of money, though somewhat modestly up to cash shares of around 30%.

This is because adding cash has **two competing effects that are initially roughly offsetting**. The negative effect on the risk of running out of money comes from the **lower long-**

**term return on cash.** The positive effect comes from the **reduced volatility of returns**, as drawdowns are a serious risk to a retiree invested in relatively volatile assets. When starting with a relatively low allocation to cash, adding cash has a steady negative effect on volatility, and this almost fully offsets the adverse effect of lower long-term expected returns. For instance, raising the cash share to 30% reduces return volatility to about 6.1%, and raises the risk of running out of money to 6.8%.

Figure 3: Long and short-term risk in the decumulation stage of saving for retirement at different cash shares

%. Portfolio consists of cash and non-cash allocations. Non-cash component is allocated 30-70 to the S&P 500 and the US Agg. Short-term risk is annual return volatility. Long-term risk is probability of running out of money.



Source: J.P. Morgan, US Social Security Administration, Board of Governors of the Federal Reserve System, Bureau of Labor Statistics, Bureau of Economic Analysis, Robert Shiller, Refinitiv, S&P, Bloomberg Finance L.P.

However, the **negative marginal effect on volatility of adding cash to the portfolio wanes with ever higher cash allocations**. As a consequence, the **risk of running out of money picks up quickly with cash shares above 30%**. In the extreme case with a 100% cash portfolio, we estimate that the probability of running out of money is about 32%, which is likely to be unacceptably high to most people.

The effect of adding cash to a portfolio on the risk of running out of money varies meaningfully with the withdrawal rate. In general, **adding cash to the portfolio has a larger adverse effect on the risk of running out of money with higher withdrawal rates**. For instance, if the withdrawal rate were increased by 0.5%, making a 30% allocation to cash would increase the risk of running out of money by about 4.4%-points, rather than 1.7%-points. This risk would rise to almost 46% with a portfolio consisting only of cash.

**For moderate changes in the expected long-term return on the non-cash component of the portfolio, the effect of adding cash to a portfolio does not meaningfully change.** For example, if returns on bonds and equities were each lowered 0.5%, the risk of running out of money would be roughly 2.5-3.0%-points higher with any cash allocation below 50%. With higher cash allocations, the risk of running out of money in this lower-return scenario converges to the risk in our benchmark case, as changes in the non-cash return become less relevant as it becomes a smaller part of the portfolio.

## One way out with cash is to save more and cut spending

If you want to reduce the overall volatility of the value of your savings by holding cash, but do not want to run increased long-term risk to your financial objectives, there is a way out of this quandary. It is simply to save more in the accumulation stage than what you would have to do if you invested solely in bonds and equities, without cash. In the decumulation stage, it means you accept to spend less and live on a lower income.

## Then how much cash should you hold?

The standard answer in economics is to say it depends on your preferences, or utility function in our jargon. But that is a bit of a cop-out. What can we say concretely about the choice you make on cash holdings and how much you should care about reducing short-term fluctuations in the value of your retirement savings? What are the conditions in which you should have little to no cash, and under which should you consider having more.

As economists we use a lot the term “**risk aversion**” as a “psychological” condition that we do not understand, leaving it therefore up to you how much risk to take in your investments. But it is possible to be more concrete about this. For example, if your source of income that you rely on to fund your ultimate retirement – likely your job – is not safe and is particularly risky during economic downturns when equities are more likely to fall, then it makes sense to hold your savings in assets that do not fall at the same time you lose your income. This does not make you risk averse. Instead, it makes you subject to a lot of risk, motivating you to hold more cash or other safe assets, such as bonds, in your retirement savings.

A first condition should be your **investment horizon**: your age in the accumulation stage and your life expectancy in the decumulation stage. The longer you have in front of you, the lower the need to hold cash as your longer horizon improves the odds that any significant drawdown in your savings will

be offset by higher returns on risky assets in the future.

If you have **decent access to other sources of income**, such as a state or company defined-benefit pension on which you can fall back, or simply human capital that you can convert into significant extra income, you have little need to reduce short-term volatility with large cash holdings.

**Funding status, or how far are you from enough savings to retire on?** For a pension plan, this means the extent to which current assets can cover future pension liabilities. A recent analysis of the pension funds of Fortune 1000 companies finds a U-shaped relation between their allocation to equities and their funding status.<sup>4</sup> Heavily underfunded pensions have higher allocations to equities than those close to 100% funded. Translating this to individual savers is not obvious. If they are far from having enough to retire on and still far from retirement, it makes sense to be fully in risk assets and to minimize lower return cash holdings, while closer to retirement and fully funded may decide to take less risk, although this would probably involve more bonds rather than more cash.

If you have access to **other ways to reduce the risk** of significant drawdown in your savings, such as by holding an annuity, you have little reason to hold cash.

## Conclusion

We have no cash in our strategic allocation. Our motivation is that cash is lower return than bonds and equities over the long run, even as it helps to stabilize your portfolio, both short and longer term. Your decision on how to save for retirement and spend from it during retirement should be based on both expected returns, target wealth and spending levels, and risk, both short- and long-term. As always in economics and life, you can't have it all and there are significant trade-offs between these various objectives.

Specifically with respect the cash asset class, adding it to your long-term savings will lower return and volatility, but we argue and find that **cash does not lower long-term risk**. This is because we define long-term risk in terms of the odds and extent to which your asset allocation does not achieve your long-term goals of reaching sufficient wealth at the start of your retirement and being able to maintain your desired lifestyle during retirement at minimal risk of running prematurely out of money. This is primarily because the volatility-

reducing impact of cash is offset by its lower return, which makes it harder to achieve your long-term goals. At relatively low levels of cash allocations, up to 20%, the best you can hope for is that it does not increase long-term risk too much, although it will still pull down returns. Above 20% in cash, the impact of a lower return implies you are likely increasing the risk you will not achieve your long-term financial goals, despite making your savings more stable. It is not irrational to hold decent strategic allocations to cash when your sources of income are quite uncertain, when you are close to retirement, when you have enough to retire on comfortable, and when you have no other sources of income or wealth to rely on.

4. [2022 Asset Allocations of Fortune 1000 pension plans](#), WTW, Mercedes Aguirre and Brendan Macfarland, Dec 2023.

## The Long-Term Strategist

Top long-term risks and what to do about them

- We identify and analyze the top long-term risks for world markets that have odds, timing and impact, which are to us biased to be higher, earlier, or bigger than we think are priced in by the markets.
- These risks, from the most impactful to markets to the least, come from Climate Change, worsening US-China tensions, a Tech/AI boom, demographics, inflation, DM government debt, domestic polarization, and post-GFC market structure.
- Each are “known” and priced into markets by assessed odds and impact. We think several are more likely or more impactful than is priced in.
- The majority of these risks, Tech excluded, should bring higher interest rates, upward pressures on prices/inflation, a weaker dollar, lower growth, EM underperformance, higher macro and market volatility, and risk premia. This world benefits the active investor.
- If realized and more extreme than expected, these forces will likely give us somewhat lower nominal returns on the global bond and equity market than their current prices suggest. But most of the impact will be on the different performance of countries, regions, sectors and asset classes.
- Investors concerned about these longer-term risks should overweight bonds up to 5-year maturities, cost-efficient macro-active managers, domestic banks, Value, Tech, inexpensive green/sustainable assets, agriculture prices, and inflation linkers against global benchmarks...
- ... and should underweight longer-duration bonds, JPY, SEK and CHF bonds, the US dollar, P&C insurers, and assets located in areas with higher flood, heat, fire, storm, or droughts risks, which includes a lot of EM.

The starting point of creating your long-term portfolio should be to buy a global equity fund plus an allocation to bonds in your own currency, with the amount a function of risk tolerance and investment horizon. Our industry searches for *higher* return-to-risk assets in countries, sectors, issuers or asset types that can systematically beat this simple portfolio. But, once the information is out on certain high-Sharpe assets, they get bought and the excess return is arbitraged away.

In this note, we attempt to find better asset types, countries, sectors, and maturities by trying to identify **longer-term forces and risks** that we think are not fully priced in. Each of these sections presents our long-term risk factors, addressing their impact on economies, sectors and markets, and how long-term investors can adjust their strategic allocation to incorporate them. The list will be different from the typical “top 10 risks” issued by our strategists at the start of the year, as these are generally only 1-2 years out and may have no impact over the 10-year horizon.

### Long-term Strategy

**Jan Loeys** AC

(1-917) 602-9440

jan.loeys@jpmorgan.com

**Joyce Chang** AC

(1-212) 834-4203

joyce.chang@jpmorgan.com

**Amy Ho** AC

(1-212) 622 9364

amy.ho@jpmchase.com

**Alexander Wise** AC

(1-212) 622-6205

alexander.c.wise@jpmchase.com

J.P. Morgan Securities LLC



Jan Loey <sup>AC</sup> (1-917) 602-9440

jan.loeys@jpmorgan.com

J.P. Morgan Securities LLC

Joyce Chang <sup>AC</sup> (1-212) 834-4203

joyce.chang@jpmorgan.com

Amy Ho <sup>AC</sup> (1-212) 622 9364

amy.ho@jpmchase.com

Alexander Wise <sup>AC</sup> (1-212) 622-6205

alexander.c.wise@jpmchase.com

**Long-term Strategy**

**The Long-Term Strategist**

18 July 2023

**J.P.Morgan**

## Four clusters of risk

Many of the risks that we can envision meaningfully impacting long-term returns are related to each other and are **mutually reinforcing**. We can broadly categorize them into four different clusters:

- **Macro:** Worsening demographics in terms of aging, longevity and population growth; rising government budget deficits and debt loads; liquidity destroying post-GFC market structures; and an uncertain commitment to inflation control.
- **Politics:** Populism, polarization and inequality; rising US-China tensions; de-globalization and de-dollarization.
- **Nature:** Climate change accelerates beyond the tipping point and dramatically increases the number of extreme weather events, such as droughts, floods, storms, firestorms, and famine; biodiversity worsens dramatically and the world sees recurring pandemics.
- **Tech:** Digitalization and AI accelerate; rapid increases in productivity, but with a big rise in unemployability, and worsening cyber warfare.

These risks are **not unknown to you**. The overall market's view on their probability, timing and impact will be in the price. These risks will have market impact if investors change their mind on odds/timing and impact. And these risks should have an impact on your asset allocation, if your views on odds, timing and impact differ from what is priced in and/or your particular conditions are quite vulnerable to a worsening of these risks. For quite a few of these risks, we see higher odds of adverse outcomes, as we discuss below.

## The macro risk cluster

Our long-term macro risks come from **four angles**: changing **demographics** as population growth is slowing, as higher incomes induce families across the world to have fewer children; an apparent levelling off of longevity, partly due to the rising incidence of pandemics; the aging of many societies; dramatically rising government deficits and debt loads, incurred during the past decade of easy money, now facing higher interest costs; a dramatically changed market structure, most of it due to post-GFC rule making; and the increased risk that DM policy makers, led by the US, focus less exclusively on controlling inflation and more on supporting job growth.

### Risk I: Demographics

Demographic trends, such as slowing population growth, falling fertility rates, increased life expectancy and aging, move

very slowly and thus generally will not produce dramatic surprises. Instead, the long-term risks from demographic trends are more likely to come from their **unexpected impact** rather than from sudden changes in these trends. **These impacts are to us on the balance between savings and investment, growth, inflation, and the equity risk premium.**

**(1) A fall in savings vs investment, driving real interest rates higher:** In [A demographic reversal to start pushing real interest rates up](#) (Mar 2, 2022), we find that two aspects of demographics, life expectancy and aging, have had a significant impact on the balance between national savings and investment in past decades and thus on interest rates across the world. Specifically, we find that rising life expectancy in the last four decades is likely to have been a driver in the rise of national savings rates and, as a result thereof, the secular decline in real bond yields in much of the world. Aging, or the rise of the dissaving elderly cohort relative to the saving/working and young/middle-aged cohort, has the opposite impact as it lowers national savings vs investment and thus tends to push up real interest rates.

The overall net impact of rising life expectancy and a rising share of the dissaving elderly on real interest rates depends on their relative magnitude, which means how fast each is changing in each country multiplied by the size of their economy. In our [study](#), we found that rising life expectancy dominated until the mid-2010s, and thus drove real interest rates down in much of the world in the preceding decades. But since ~7 years ago, the rising share of the elderly in the US and China, which, together, is almost half of world's GDP, and some flattening out in life expectancy, have pushed the net impact of these two demographic forces towards higher real rates of interest. Using the UN's long-term demographic forecasts, we see further upward pressure on real interest rates from aging over the next decade. Together with other drivers of real rates, some to be discussed later in this paper, we expect the real yield on 10-year USTs to fluctuate around 2.5% by the early 2030s.<sup>1</sup> Not everyone agrees with our view, with the *Blue Chip Consensus* of US economists projecting a

1. In a 2019 paper on the [Macroeconomics of Aging and Policy Implications](#), the IMF staff uses a similar approach on assessing the net impact of life expectancy and aging on real interest rates, concluding the future impact is ambiguous as a lot of EMs remain still at a point where rising life expectancy should dominate the rising share of the dissaving elderly. We can see this in principle, but remain with our view of higher future real interest rates as China, with an economy larger than the rest of EM, is now also rapidly aging that the overall GDP-weighted impact of aging countries should be to push real rates up.

Jan Loey <sup>AC</sup> (1-917) 602-9440  
jan.loey@jpmorgan.com  
J.P. Morgan Securities LLC  
Joyce Chang <sup>AC</sup> (1-212) 834-4203  
joyce.chang@jpmorgan.com

Amy Ho <sup>AC</sup> (1-212) 622 9364  
amy.ho@jpmchase.com  
Alexander Wise <sup>AC</sup> (1-212) 622-6205  
alexander.c.wise@jpmchase.com

## Long-term Strategy

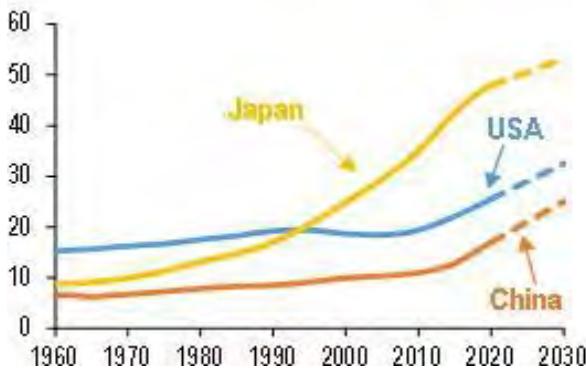
J.P.Morgan

18 July 2023

real yield of only 1.1% 10 years from now.

One counter argument we hear a lot is that Japan should be seen as the poster child of how aging will keep real interest rates low. Japan saw a steady rise in the demographic weight of the elderly decades before this happened in the US and China (Fig 1) and has since had among the lowest interest rates in the world. Co-incidence is not causation, however. Bonds are a global market driven by global forces, producing a strong low-frequency correlation in real yields across the world.<sup>2</sup> Japan was aging while the rest of Asia, led by China, was seeing dramatic increases in life expectancy that in our GDP-weighted framework outweighed Japanese aging in driving the trend decline in real global and Japanese bond yields.

Figure 1: Old-age population as a percent of middle-age population %, 1960-2020, annual data. Dashed lines are forecasts.



Source: J.P. Morgan, UN Population Division.

**(2) Economic growth to slow, eventually:** Aging and the overall slower population growth<sup>3</sup> should slow labor force growth and thus also overall trend growth. There is no immediate reason to expect this to be offset by higher productivity growth, although it is possible that the lack of sufficient labor will induce companies to substitute them with more capital (see further on the possible impact of AI). In our recent paper on [Long-term economic growth forecasts](#) (Oct 10, 2022), we use these demographic changes and other

2. We show this high correlation in [Real bond yields in DM: Long-term projections](#), Feb 21, 2023. The paper does show that relative demographics do have an impact on real yield spreads between countries, even as the trend in the global average level of real yields remains the main driver of country real yield level changes over time.

3. World population growth has already slowed from 2% pa in 1950 to 0.9% pa in 2021, as fertility rates fell from 4.9 per female to 2.3. In high-income countries, fertility fell from 3.01 to 1.56 over this period. Source: [ourworldindata.org](#). By the end of the century, world population should start shrinking.

economic fundamentals to project that **DM growth should slow to 1.6% pa over the next decade and EM to 4.2%, down from 2.0% and 4.8%, respectively since 1990**. Even with this slowing, global growth itself should not slow and stay around 2.8% as the rising share of EM's faster growth should offset the impact of both EM and DM slowing on their own.

There is a widespread argument, coming especially from central banks, that lower growth translates directly into lower interest rates, including equilibrium real short rates ( $r^*$ ). In [Dark sky: the ill-fated search for  \$r^\*\$](#) , (Mar 8, 2023), Lupton and Weitzenfeld argue that central banks' approach to estimating their  $r^*$  is overly dependent on trend growth. Many other economists, including us, view interest rates more as driven by the balance of the supply and demand for capital – savings vs investment – where economic growth is just one of the many factors that can affect this balance.

**(3) Inflation risk to the upside, slightly:** Slower population growth could be neutral for inflation as it reduces both the demand and supply side. There is an argument, though, put forward by Charles Goodhart and Manoj Pradhan,<sup>4</sup> that the rise of the elderly is inflationary as they seek to keep up consumption. Life expectancy is still rising, but so is morbidity, especially dementia and related illnesses for which there are currently no cures. The elderly will consume more medical services and demand greater social security, raising the demand side, while the supply side, productivity and labor supply, will stay weak, partly as the elderly care industry, with little productivity growth, will become a larger part of the overall economy. Political pressure for medical support will rise, pushing governments into bigger deficits with resistance to higher taxation. All this should add to inflation and contribute to structurally higher interest rates.

**(4) Equity risk premium higher as the investment horizon shrinks?** We have heard the argument that the rising share of the elderly should shorten the investment horizon of the average investor who by the Rule of 100 should target an allocation to equities in their savings equal to 100 minus their age. One could argue that the average investor will thus hold less equities and more fixed income, lowering equity yields relative to bond yields. We have tried before to correlate demographics with asset choice, but have not found much and thus downplay this risk. More likely, secular movements in equity risk premia are driven more by perceptions of risk and the relative cost of holding equities over bonds that have been

4. See Charles Goodhart and Manoj Pradhan's [The Great Demographic Reversal: Aging Societies, Waning Inequality and an Inflation Revival](#) (2020), and our webinar with the authors in [Is Inflation coming back?](#) Mar 10, 2021.

Jan Loey <sup>AC</sup> (1-917) 602-9440

jan.loey@jpmorgan.com

J.P. Morgan Securities LLC

Joyce Chang <sup>AC</sup> (1-212) 834-4203

joyce.chang@jpmorgan.com

Amy Ho <sup>AC</sup> (1-212) 622 9364

amy.ho@jpmchase.com

Alexander Wise <sup>AC</sup> (1-212) 622-6205

alexander.c.wise@jpmchase.com

**Long-term Strategy**

**The Long-Term Strategist**

18 July 2023

**J.P.Morgan**

steadily coming down in recent decades.

## Risk II: Rising government debt

Higher government borrowing by itself raises the demand for capital and thus requires higher interest rates to induce more saving or to crowd out private borrowing. But the impact could be even larger. **Rising leverage and debt ratios** always are at risk of creating negative feedback, or *doom loops*. During good times, a borrower will take on a lot of debt, but when credit conditions suddenly change, they cannot lower their leverage much as investors have grown cautious, which raises their funding costs and in turns worsens default risk, which raises spreads further and so on.

The Great Moderation reduced macro-economic uncertainty and steadily brought risk premia down over this period, with term premia on longer bonds settling around zero in the decade before Covid. Together with a number of other forces, rising longevity, inequality, financial repression, and capital-light industries, real interest rates steadily fell over this period and were broadly negative in much of DM. It is thus no wonder that over this period, both the **private and the public sector loaded up on debt, without actually raising the share of their income/revenues paid in interest and thus not raising red flags on their credit worthiness.**<sup>5</sup>

The problem with high debt-to-income ratios is that **interest rate levels can change much faster** than these debt ratios, creating the risk of a “**debt doom loop**.” Higher interest rates increase debt burdens and thus increase default risk, which raises funding costs further. For sovereign debt, it increases the risk of debt monetization, fiscal dominance, currency depreciation, and rapid losses for the domestic levered holders of such debt (typically banks and insurers, but also pension funds), that could in turn require higher spending to bail out failed institutions.

There is little disagreement about where US debt/GDP is headed over the next 10 years, as economists generally trust the [projections of the Congressional Budget Office](#). The CBO is tasked with making non-partisan projections of the US federal budget, based on current law, to aid Congress in making its decisions on spending and revenues. But there is diversity of opinion about its impact on interest rates. The CBO expects that higher US/GDP ratios, which it projects will rise by ~20pp over the coming decade, will raise 10-year US Treasury yields to 3.8% in 10 years’ time, compared with the

March Blue Chip Consensus of US economists at 3.2%. CBO and Consensus have a similar view on long-term US inflation (2.3% and 2.1%, respectively) and they thus project **1.5% and 1.1% real 10-year UST yields, respectively, 10 years from now**.

To us, a rising debt/GDP ratio is one factor to put upward pressure to real bond yields. Our modal view is of a **2.5% real 10yr UST yield in the early 2030s**. But the risk is here that if interest rates rise by more than forwards or is generally expected, it can in turn create a negative feedback loop – through debt sustainability concerns, or capital losses by levered investors – that pushes real yields even higher.

A related risk of high debt, but one that initially points to lower short rates, is **fiscal dominance**, where the central bank becomes constrained in fighting inflation when the government is highly indebted and could be pushed into a debt doom loop by rapid increases in interest rates. Central bank concern about financial instability among the buyers of the government debt is related to this risk.

To these analysts, this doom loop risk is probably not that pronounced in Europe or the US, but there are legitimate questions around **Japan**. Japan has a much higher government debt, both gross and net, than any other DM country and has been operating near zero interest rates for much longer. This should mean that its financial sector will be much more negatively affected by interest rate hikes. Japan’s inflation has been surprising on the upside steadily since early in the Covid pandemic, as has happened in the rest of the world (Fig 2), but the BoJ has not moved policy, unlike the steady tightening in virtually all other countries. Only China did not raise rates, which is supported by the lack of upside inflation surprises in China.

Our Japanese strategy team under Thoru Sazaki have [argued](#) that with Japan’s large public debt, its economy may not be able to tolerate higher interest rates and that “real yields in Japan are likely to remain in deep negative territory for an extended period of time” producing **multi-year yen weakness** and to us, **higher inflation**.

5. For recent overviews and analyses of these debt ratios, see Lupton and Parrish, [One more giant leap for global debt](#), July 12, 2022; and Lupton and Wise, [Up, up, and away: Assessing government debt sustainability](#), Feb 22, 2023.

Jan Loey <sup>AC</sup> (1-917) 602-9440  
jan.loey@jpmorgan.com  
J.P. Morgan Securities LLC  
Joyce Chang <sup>AC</sup> (1-212) 834-4203  
joyce.chang@jpmorgan.com

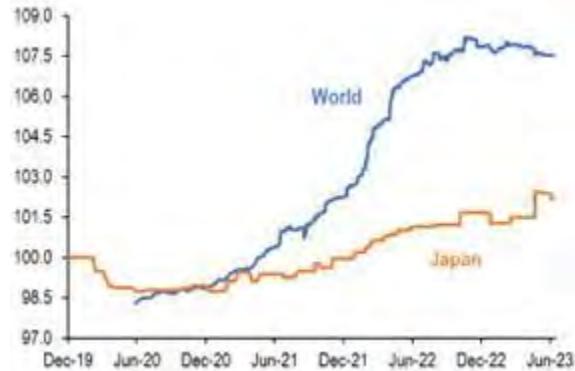
Amy Ho <sup>AC</sup> (1-212) 622 9364  
amy.ho@jpmchase.com  
Alexander Wise <sup>AC</sup> (1-212) 622-6205  
alexander.c.wise@jpmchase.com

## Long-term Strategy

J.P.Morgan

18 July 2023

Figure 2: Inflation forecast revision index for Japan and the world  
%, Jan 2020-July 2023. January 1, 2020 = 100.



Source: J.P. Morgan, Bloomberg Finance L.P.

### Risk III: Post-GFC market structure

**Financial stability has become a more important risk as market size and structure have transformed since the GFC with market liquidity and depth worsening over time.** A key attribute of the next crisis will likely be severe liquidity disruptions and the most recent crises originated in risk-free assets, specifically the ability of dealers to intermediate transfers of risk. The Treasury market has grown six-fold over the last 15 years, but the number of primary dealers has not grown, and dealer inventory of Treasuries has been relatively steady over the same period. The shift from active fundamental to quantitative and passive investment and the automation of market-making reduce the ability of the market to prevent large drawdowns. Financial intermediation has not kept pace with the massive increase in the size of financial markets. The decline in real rates contributed to US debt and equity market capitalization more than doubling to reach \$123tr in 2022 from \$57.5tr in 2010.

**Banks are playing less of a role in providing liquidity as regulatory changes have contributed to a reduction of market makers and inventories.** Regulatory burden emanating from the post-GFC era makes it prohibitive for banks to provide adequate market-making liquidity. Trading volumes have not kept up the pace, and turnover remains substantially lower than it was before the GFC, as increased regulation on trading desks including aspects of the Volcker rule, TRACE, higher capital charges, and changes in derivative capital rules have all played a part in reducing market liquidity. Market structure has also moved away from human risk-taking activity (e.g., block traders, prop desks, etc.) that is slower and often rely on valuations (reversion) to programmatic liquidity that is faster and relies on volatility-based VAR to quickly adjust the amount of risk taking (liquidity provision).

More automated market makers have picked up the slack, and our US Treasury team estimates that more algorithmic liquidity providers now account for a 75% share of Treasury market depth, up from 40-50% a decade ago. An increase in volatility typically leads to an increase in systematic selling, with forced de-leveraging of systematic strategies leading to record speeds of equity declines, with bonds unable to offset equity losses. Algo activity in Treasuries has created a link between rapid trading and volatility in rates.

**This feedback loop between volatility, illiquidity, and flows has led to greater market fragility.** During the “Great Liquidity Crisis” of 2020 at the onset of the pandemic, the VIX for equity markets reached record highs, prompting machines to pull liquidity, triggering a vicious feedback loop of volatility, illiquidity and outflows. These developments culminated in what was essentially a black swan event, with the S&P 500 experiencing an outright crash. The 8-12% daily declines in mid-March resulted in the market recording its quickest bear market ever and highest volatility since 1987 and wiped out 3-years’ worth of gains on the S&P 500. The repricing in 10-year USD interest rates reached nearly six times larger than what was priced ex-ante into options markets, and S&P 500 market depth fell by more than 90% to levels worse than those experienced during the Wall Street Crash of 1929.

**The speed of recent crises has been accompanied by emergency actions and historic intervention from the Fed, followed by other central banks, to prevent a deeper financial crisis.** The Fed stepped in at an unprecedented pace, purchasing about an 11% share of public debt outstanding (8% of GDP). As mini-crises have played out, such as the current regional banking stress, the Fed has adopted a proactive and rapid policy response that relies on both familiar and innovative tools to stabilize markets and support the economy. The Fed’s approach has touched more capital markets and ventured into non-market lending, with market expectations that the Fed is the first and sometimes only line of defense.

**Beyond market liquidity and depth, the bigger market transformations are occurring outside of traditional regulated markets with the rise of the alternative asset universe.** Private equity, private debt, digital assets, real estate and hedge funds have expanded at a faster pace than the universe of traditional bonds and equities. J.P. Morgan’s [global strategists estimate](#) that the size of the alternative asset universe has reached \$26tr. Regulatory arbitrage is already forcing many activities, from certain types of lending to certain types of trading, outside the banking system. The rapid price adjustment in crypto assets, which fell from a peak of \$2.2tr to a trough of \$800bn before stabilizing at the current ~\$1.2tr

Jan Loey <sup>AC</sup> (1-917) 602-9440  
jan.loey@jpmorgan.com  
J.P. Morgan Securities LLC  
Joyce Chang <sup>AC</sup> (1-212) 834-4203  
joyce.chang@jpmorgan.com

Amy Ho <sup>AC</sup> (1-212) 622 9364  
amy.ho@jpmchase.com  
Alexander Wise <sup>AC</sup> (1-212) 622-6205  
alexander.c.wise@jpmchase.com

**Long-term Strategy**  
**The Long-Term Strategist**  
18 July 2023

**J.P.Morgan**

market capitalization.

The **impact** of a more rigid market structure is to **amplify market moves**, especially in fixed income where most of the changes have already taken place.

## Risk IV: Changing policy choices

The Great Moderation came about from a growing conviction among economists in the 1970s and 1980s that central banks should primarily focus on keeping inflation low and stable. This resulted from a view that, in the long run, central banks cannot really raise long-term growth, except by creating a stable macro-economic, price and financial environment. The long-run Phillips curve (inflation vs unemployment) was argued to be vertical. Creating a stable macro environment was expected to reduce long-term uncertainty, and thus boost capital spending and in turn long-term economic growth and employment.

In the end, economic growth weakened across DM countries, and income and wealth inequality worsened dramatically. There are many hypotheses of what drove these outcomes, from technology, the growing share of the services sector, globalization, and so on. But it can also be argued that the growing focus on controlling inflation, which, in principle, is caused by an overheating economy and an overtight labor market, induced policy makers, probably unintentionally, to keep economies on average “underheated,” and the labor market operating below full unemployment more often than not. The multitudes of long-term unemployed workers then created much hysteresis, as they lost skills, connections and thus productivity, which was arguably a significant driver of lower growth in the last few decades.

The obvious solution is to keep the economy more often close to full capacity and full employment, through post-recession monetary and fiscal stimulus. Keeping workers in their job where they steadily acquire more skills is a great way to boost overall productivity growth. The closer the economy is to full employment, the closer it is to overheating, the higher the odds inflation will rise above target and the shorter the business cycle, even without any intention of the central bank to raise long-term inflation.

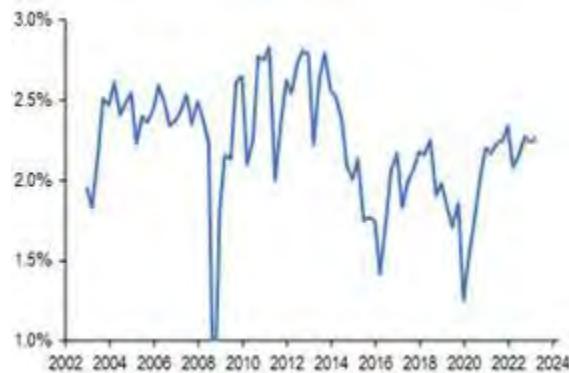
Our economists have made the valid point that inflation is ultimately a policy choice. The question is indeed whether monetary and fiscal policy makers will remain narrowly focused on inflation control over the next decade, not just through words but also through actions, as they have been pre-Covid, or whether there will be greater political pressure, on both monetary and fiscal policy makers to give greater weight than before to near-term jobs growth.

Our earlier argument that we expect a secular rise in real interest rates creates another risk to inflation. Economic forecasters, including those working in central banks, tend to extrapolate current rate levels well into the future when making long-term forecasts ([How good are long-term forecasts?](#), June 14, 2022). Hence, if we are right that equilibrium rates will be steadily rising over the coming decade, this creates a serious risk that on average, central banks’ estimates of  $r^*$  (the level needed to keep inflation unchanged) will with their hindsight turn out to have been too low, and thus not keep inflation unchanged as they had assumed.<sup>6</sup>

## Impact of the macro risk cluster

The overall impact of our macro risk cluster, if the risks are realized, would be to **raise interest real and nominal interest rates**, **raise market volatility**, and thus **risk premia, lower returns** relative to those priced into markets, **raise the average rate of inflation**, probably only modestly, but more importantly **raise inflation volatility, shorten business cycles**, and in the process **raise the return from tactical trading**.

Figure 3: US 5-year 5-year forward inflation break-even rate %, quarterly, Q1/2003-Q2/2023.



Source: J.P. Morgan, Bloomberg Finance L.P.

**We do not think these implications are priced in.** The last three years have already given us a foretaste of what a **world of higher inflation, macro volatility, bond yields, and risk premia** would look like, but forecasters and markets are pricing that this will remain a one-off event with macro conditions returning after the next recession to pre-Covid times. Inflation forwards in DM countries beyond the next 2 years

6. In [Real yields along the US curve: Long-term projections](#) (Mar 13, 2023), we derive forecasts for the full real US Treasury yield curve, deriving targets of a **0.9% real 3-month T-bill rate and a 1.1% real Fed Funds Rate**. This is similar to the [NY Fed's Q1 estimate](#) from the original Laubach-Williams 2003 model, but well above the more recent Holston-Laubach-Williams model.

Jan Loey <sup>AC</sup> (1-917) 602-9440  
jan.loey@jpmorgan.com  
J.P. Morgan Securities LLC  
Joyce Chang <sup>AC</sup> (1-212) 834-4203  
joyce.chang@jpmorgan.com

Amy Ho <sup>AC</sup> (1-212) 622 9364  
amy.ho@jpmchase.com  
Alexander Wise <sup>AC</sup> (1-212) 622-6205  
alexander.c.wise@jpmchase.com

## Long-term Strategy

J.P.Morgan

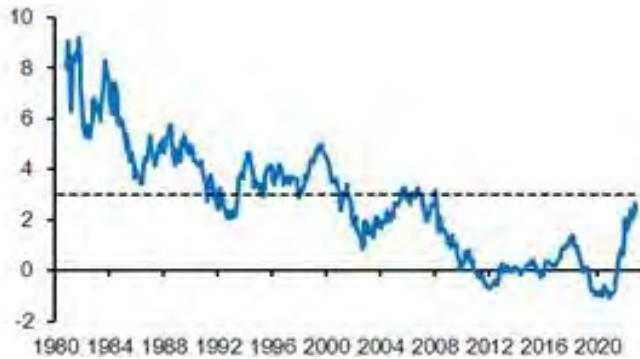
18 July 2023

remain very close to their 20-year averages, thus pricing a return to the low inflation rates of the Great Moderation (Fig 3 for US).

Real yields (10-yr US TIPs) have moved to above their 20-year average but remain well within that period's range. Fig 4 shows this for the yield on the broad US bond market, the US Aggregate Index, from which we deduct a measure of long-term expected inflation.

Figure 4: Real yield on the US Aggregate Bond Index

% monthly, 7/1981-7/2023. Last observation is July 6, 2023. Dashed line is decade-ahead real yield target.



Source: J.P. Morgan, Federal Reserve Bank of Philadelphia, Bloomberg Finance LP

The 5y-5y real UST forward yield at 1.4% is on its 20-year average, also pricing a return to “normal”. The 10y-10y forward real UST yield at 1.8% only just in recent days moved to the top of its post GFC range, which is still the bottom of its pre-GFC range. Current US term premia, equity multiples and credit spreads are at their Great Moderation averages, thus not pricing any change in macro risk from the Great Moderation. US federal debt-to-GDP has been steadily rising over the past 50 years, but there is little evidence that the market is pricing any concerns about this debt trajectory.

The wisdom of the market, thus prices in that the high inflation, bond yields and market volatility will fade in the next 1-2 years and that we will return to the macro conditions prevailing in the two decades pre-Covid. But is that right? While we do not have a crystal ball, we see a number of developments that are creating a good chance that inflation, bond yields, risk premia and macro volatility will be structurally higher than pre-Covid and higher than is priced in by markets and than we see reflected in the consensus of long-term forecasts.

## What should investors do about the Macro Risk Cluster?

Investors who want to protect themselves against these risk scenarios should:

- **Underweight longer-duration bonds** (stay at 5-year or lower).
- **Underweight Japan, Sweden and Switzerland bonds** that are due to see the largest rise in bond yields against forwards based on our forecasts.
- **Overweight inflation indexed bonds as forward break-even inflation rates price in no rise in long-term inflation from before Covid.**
- **Overweight Financials and Value** that tend to outperform in a rising bond yield environment.
- **Overweight Commodity producers**, though not gold producers, as commodities positively correlate with inflation over the long run. Gold correlates negatively.
- **Overweight REITs with annual resets of rents and infrastructure, with inflation-indexed output prices.**
- **Incorporate cost-efficient active managers, including market neutral hedge funds** in a strategic allocation as they gain from high macro volatility.

## Nature Risk Cluster

We can see three areas of risk emanating from a vengeful “Mother Nature” – **Climate Change**, also known as Global Warming, a collapse of **Biodiversity and Deforestation**, and an increasing frequency and severity of **Pandemics**. Each, at its core, is the result of the massive expansion of humanity and economic activity this past century laying waste to the natural world.

### Risk I: Climate Change accelerates

It is widely understood, and a consensus, that our world has been warming up since 1900 by over 1°C, much of it due to the greenhouse effect of increased carbon dioxide and methane emissions into the atmosphere. A hotter world is seeing higher sea levels, as warmer water expands, and ice caps start melting. Weather patterns are becoming more unstable, with rain falling at the wrong times and places, creating more floods, heatwaves, droughts, forest fires, and worsening water scarcity.

**The world is only too aware** that temperatures have risen and weather has become more volatile. As discussed above, for Climate Change to impact markets, it needs to be worse or more benign than generally recognized and priced into markets. But how do we know what is expected and priced in? The scientific community has been forecasting Climate Change since the 1970s. A review of such models, published

Jan Loey <sup>AC</sup> (1-917) 602-9440

jan.loey@jpmorgan.com

J.P. Morgan Securities LLC

Joyce Chang <sup>AC</sup> (1-212) 834-4203

joyce.chang@jpmorgan.com

Amy Ho <sup>AC</sup> (1-212) 622 9364

amy.ho@jpmchase.com

Alexander Wise <sup>AC</sup> (1-212) 622-6205

alexander.c.wise@jpmchase.com

**Long-term Strategy**

**The Long-Term Strategist**

18 July 2023

**J.P.Morgan**

in 2017 in [Carbon Brief](#), actually finds that:

*“Climate models since the 1970s have generally been quite skillful in projecting future warming. While some were too low and some too high, they all show outcomes reasonably close to what has actually occurred, ...”.*

A [NASA 2020 study](#) similarly finds that:

*“Now a new evaluation of global climate models used to project Earth’s future global average surface temperatures over the past half-century answers that question: most of the models have been quite accurate... The authors found no evidence that the climate models evaluated either systematically overestimated or underestimated warming over the period of their projections.”*

The world’s rising sea levels and temperatures are, thus, **no surprise to scientists, but are they thus also not to investors?** This, we seriously doubt as Climate Change was until recently not discussed much in markets and media focus has increased substantially only relatively recently.<sup>7</sup> This may be because it is difficult for private sector corporates and markets to invest on opportunities or risks that are decades away as the present value of such far-away events will be quite low relative to those nearer to today. In addition, investors may well be thinking of scientists as Cassandras who thrive on apocalyptic projections and should instead be more confident that, given an incentive, markets and human ingenuity can fix these problems as they emerge.<sup>8</sup>

**Is Climate Change priced in?** A series of studies find that evidence of a pricing of Climate Change in asset prices is quite mixed as investors are quite uncertain as to what impact adverse weather events will have, what policies government will pursue, what technologies will become successful to mitigate if not reverse climate change, and what low-carbon technologies will be successful.<sup>9</sup>

---

7. See, e.g., [Media and Climate Change Observatory](#).

8. Many remember the apocalyptic forecasts of the 1972 [Club of Rome](#) scientists who on the basis of then-known reserves of resources projected that “without substantial changes in resource consumption, the most probable result will be a rather sudden and uncontrollable decline in both population and industrial capacity.” Resource scarceness then pushed up oil prices that led to higher supplies as it became worthwhile to drill further, and lowered demand as a higher cost induced consumers to conserve on energy.

9. In [Pricing of climate risk in financial markets: A summary of the literature](#), BIS Papers No. 130, Dec 2022, Eren et al. conclude that “While studies find that these risks are starting to be priced, concerns are growing that current prices do not fully reflect the risks.”

To us, more acute **climate risks** can come from so-called “tipping points,” where Climate Change is cascading in inherently unpredictable ways. Such tipping points include, e.g., disintegration or sliding off of Greenland or Antarctic ice sheets, which may be closer than once anticipated,<sup>10</sup> or permafrost thaw releasing vast reservoirs of methane into the atmosphere, feeding back into the Climate Change process.

**What impact** should we expect from an acceleration in Climate Change, or simply markets becoming more reflective of the consequences? We can see impact on economic **growth**, food price **inflation**, real **interest rates**, more **vulnerable parts of the world underperforming**, and **sectoral impacts** from both adaptation strategies and government efforts to mitigate the impact of climate change.<sup>11</sup>

**(1) Growth: The growth impact is not clear, though it could be negative in the most extreme climate scenario.** Large parts of the world becoming too hot to live, adverse weather events becoming more frequent, and more extreme volatility will do serious damage to the world capital stock, lowering potential output. But this will induce rebuilding and the construction of defenses that in turn add to economic activity. The net impact on global growth is thus considered quite small. Only if the **world warms much faster** than most expect, by a net +4°C by 2100 from 1900, and thus destroys capital, labor supply, and infrastructure much faster than the ability to reconstruct, would extreme weather likely significantly offset new economic activities.

**(2) Inflation: food and broader energy inflation risk is biased up.** The Russia-Ukraine war has triggered the third major global food price crisis in 15 years, bringing new challenges as concerns about geopolitics and supply chain security have magnified the fundamental instability across the global food system. Structurally higher food inflation and agricultural commodity price are likely to endure as food security has become a national security issue. Export restrictions have surged since the onset of Russia’s war on Ukraine, with 20 countries maintaining an active food export restriction and four countries with fertilizer export restrictions.<sup>12</sup>

Short term, an increased number and severity of floods and droughts should damage agricultural output, and thus push up food price inflation. More medium to longer term, this is less

---

10. Boers and Rypdal, [Critical slowing down suggests that the western Greenland Ice Sheet is close to a tipping point](#) (2021)

118(21) Proceedings of the National Academy of Sciences.

11. We addressed a number of these in [Climate change investing](#), May 30, 2019.

12. [Food insecurity: A new normal](#), J.P. Morgan Perspectives, Sep 20, 2022.

Jan Loey <sup>AC</sup> (1-917) 602-9440  
jan.loey@jpmorgan.com  
J.P. Morgan Securities LLC  
Joyce Chang <sup>AC</sup> (1-212) 834-4203  
joyce.chang@jpmorgan.com

Amy Ho <sup>AC</sup> (1-212) 622 9364  
amy.ho@jpmchase.com  
Alexander Wise <sup>AC</sup> (1-212) 622-6205  
alexander.c.wise@jpmchase.com

**J.P.Morgan**

**Long-term Strategy**

18 July 2023

clear as more carbon dioxide in the atmosphere is believed to raise yields of wheat, cotton, clover, soybeans, and rice. In addition, farmers will not sit still, with adaption in farming practices, irrigation, location, seeds, and other technologies raising overall productivity. **Nordhaus** expects such adaptations to climate change in the very long run to keep yields up and food prices down.<sup>13</sup>

A just released paper by the **ECB**<sup>14</sup> argues, however, that:

*"Projections from state-of-the-art climate models show that in the absence of historically un-precedented adaptation, future warming will cause global increases in annual food and headline inflation of 0.92-3.23 and 0.32-1.18 percentage-points per year respectively, under 2035 projected climate."*

Over a period of only 10 years out, it seems reasonable to conclude that a significant worsening of weather volatility will first raise food and also overall headline inflation, before over the longer run these price rises induce the adaptations that Nordhaus is counting on to eventually push agriculture yields up and prices down.

Dramatic rises in temperature in already hot areas around the equator will force people to either move to cooler parts of the world, or governments to spend lavishly to protect citizens, workers and food production against the heat. Much of this will require air conditioning and irrigation systems that are energy intensive. Demand for both renewable energy and fossil fuels will rise. Current futures price in Brent at ~\$63 by 2030, vs \$76.5 spot. Our 2030 forecasts foresee a \$63-78 range under 2% inflation, depending on the IRR required by oil companies, and \$80-100 under 4% inflation. More rapid climate change than scientists' current forecasts would create significant upside to these oil price projections.<sup>15</sup>

(3) **Higher interest rates.** In our [Long-term forces point to higher US bond yields](#), Apr 4, 2022, we tried to project how a changing balance of savings and investment will determine the direction of real interest rates over the next decade. One force that contributed to falling real interest rates in previous decades was a decline in overall capital spending as low-capital intensity sectors, such as services, grew relative to more capital-intensive sectors. With rising profit margins, the US

13. [Projections and uncertainties about climate change in an era of minimal climate policies](#), NBER wp 22933, Sep 2017, and in other papers.

14. [The impact of global warming on inflation: averages, seasonality and extremes](#), Kotz et al., May 2023.

15. [Oil 2030: Long Term Incentive Oil Price](#), Kaneva et al., June 28, 2023.

corporate sector, e.g., became a net saver rather than a net borrower as in earlier times. When gauging the impact of different forces on the future balance between savings and investment, we argued that the required investments needed, either public or private, to help the world towards net zero by 2050 would amount to over 2% of world GDP, thus offsetting the decline in global capex growth rates in previous decades. Climate change is thus a force that is set to push up real interest rates across the world.

Our view that climate capex on net pushes up real interest rates in the world is **debated**, as is the issue of how aging affects interest rates debated above. The core of the disagreement comes down to whether one should think of real interest rates primarily driven by economic growth, or by the balance between the supply and demand of capital, which means savings versus investment. The slowing in DM growth over the past 3 decades coincided with the steady rise in savings versus investment over the same period making it hard empirically to determine which view is right. The ECB's model<sup>16</sup> on how Climate Change will affect real interest rates relies more on slowing growth and thus points to lower real rates, while acknowledging that others put more emphasis on the required boost to climate investing.

**(4) Location, location, location:** Climate change will have very uneven impacts on different parts of the world. A few extra degrees to already hot parts of the world, most around the equator, can easily make these places too hot to live and work, drastically raising mortality and morbidity there, and forcing whole populations to migrate. With a lot more livable space in the Northern than the Southern hemisphere, this means **massive migration** flows into the US and Canada, Europe and the Scandies, and northern China, Korean, Japan and Russia. In the South, New Zealand, Southern Australia, South Africa, and the southern portion of South America will see the same. Countries facing this surge in migration may try to control it but will be unable to do so entirely. Conflict will be inevitable. Within countries, similar migration pressure will come from low lying coastal areas and those with water scarcity issues.

**Developing economies** face greater potential downside risks since the poorest regions will likely be both disproportionately affected by Climate Change and **inadequately equipped to cope with these changes**. Part of this derives from wars (hot or cold), pandemic and climate change raising to the risk of **recurring energy and food security crises**. The food security crisis has impacted 2.3bn people was exacerbated by the Russian war on Ukraine. The war has also worsened the

16. See [The effects of climate change on the natural rate of interest: A critical survey](#), Mongelli et al., Nov 2022.

Jan Loey <sup>AC</sup> (1-917) 602-9440

jan.loey@jpmorgan.com

J.P. Morgan Securities LLC

Joyce Chang <sup>AC</sup> (1-212) 834-4203

joyce.chang@jpmorgan.com

Amy Ho <sup>AC</sup> (1-212) 622 9364

amy.ho@jpmchase.com

Alexander Wise <sup>AC</sup> (1-212) 622-6205

alexander.c.wise@jpmchase.com

**J.P.Morgan**

**Long-term Strategy**

**The Long-Term Strategist**

18 July 2023

energy crisis and permanently reshaped global commodity markets, exacerbating fossil fuel price volatility, which was already a risk stemming from an imbalance between supply and demand.<sup>17</sup>

Over the long term, excess upstream reserves to ensure the availability, affordability, security, and sustainability of natural resources would be required, while downstream processing capacities such as smelting, and refining would also need to be built out. The management of strategic and commercial inventories would also have to change, which means that OECD strategic inventories of commodities like oil, metals and grains will have to increase significantly.<sup>18</sup>

Could a worsening climate also create more **De-globalization** as countries impose carbon border taxes to prevent companies from relocating highly-taxed high-carbon activities to countries that do not impose those carbon taxes, then importing back the finished product? This is possible, but it would not necessarily be a net loss to the world. In addition, carbon knows no borders. Climate Change is the ultimate global crisis that requires cooperation from all and could not be mitigated unless most countries cooperate. It has to be one's hope/belief that **climate change will on net bring nations closer together**.

**(5) Climate mitigation and adaptation policies.** Carbon pricing and taxation and other actions encouraging a shift to low-carbon solutions are now becoming policy. The World Bank, in its “State of Carbon Pricing report” notes that as of April 2022, there are 68 Carbon Pricing Instruments (CPIs) operating – with 3 more scheduled for implementation – up from 23 ten years ago. This includes 34 ETS and 37 carbon taxes. Yet, with the exception of a few mechanisms (EU ETS, RGGI, California & South Korea), these mechanisms tend to not be a driver of decarbonization, since carbon prices are too low and the basis of calculation includes too many exemptions, either because emissions sources are out of scope, or because they receive credits for free, driven by competitiveness concerns. Notably, Japan, Indonesia, Thailand, and India all increased their Nationally Determined Contributions (NDCs) to the Paris Agreement this year. Singapore also meaningfully increased its long-term carbon tax rate to S\$50-80/tCO<sub>2</sub>e by 2030 (~US\$36-68), marking a 10x increase from current levels.

## Risk II: Worsening biodiversity and deforestation

Biodiversity is what it says: the number and diversity of species on earth. It has been declining dramatically over the past 50 years, by some measures by 70% (wildlife population), with over 100,000 species threatened by extinction,<sup>19</sup> brought on by the expansion of humanity and its activities across the world, foremost through deforestation, but also by Climate Change. Further worsening would produce greater physical and liability losses in food production, tourism, health and well-being. Nature is also the cheapest carbon sink and a great protection against rising sea levels. The encroachment on nature is a prime driver of the rise in pandemics.

Biodiversity, Climate Change, and deforestation are **closely connected**. But it is much **harder** for firms and investors to **know what to do about biodiversity**, it is a lot more complex (not simply about going low carbon), **harder to measure one's impact**, and quite **location specific** (carbon is all over). For companies with agricultural supply chains, our food/HPC analysts highlight that biodiversity can be enhanced by regenerative agriculture practices. Regenerative agriculture is “a set of system practices that goes beyond optimizing productivity of farm commodities, by finding a balance with ecosystem services. Its impacts are multiple, it increases biodiversity, protects soil health, and improves water quality and water retention in fields and farms”, which also mitigates Climate Change.<sup>20</sup>

Beyond trying to achieve impact, investors concerned about worsening biodiversity should pursue the same strategies as for Climate Change, probably emphasizing **being long Ag prices** (upside due to downside on yields), **companies who report their biodiversity impact** (likely less liability risk), and the **health care** sector. The last one assumes the impact of higher morbidity (and thus demand for medical care and medicine) offsets the impact of reduced species diversity that is a rich source of finding new medicines.

## Risk III: More frequent pandemics

Climate Change, growth in international travel, growing and aging populations and the threat posed by zoonotic diseases contribute to the risk of another pandemic. Urbanization and densification are accelerating with increasing numbers of people living in rapidly expanding and increasingly high-density cities across Asia and Africa. Urban centers can amplify poverty, conflict and deepen inequities, resulting in more

17. [Commodities maps redrawn: shifting trade flows, de-dollarization, and surge in gold reserves](#), Natasha Kaneva, May 31, 2023.

18. [Global Commodities: Bretton Woods 2.0—back to the 1950s](#), Natasha Kaneva, Apr 28, 2022.

19. [Living planet report 2020 – bending the curve on biodiversity loss](#). WWF, 2020, Almond et al.

20. [European Staples ESG: The Conscious Consumer #4: Deforestation and Biodiversity](#), Aug 12, 2021.

Jan Loey <sup>AC</sup> (1-917) 602-9440  
jan.loeys@jpmorgan.com  
J.P. Morgan Securities LLC  
Joyce Chang <sup>AC</sup> (1-212) 834-4203  
joyce.chang@jpmorgan.com

Amy Ho <sup>AC</sup> (1-212) 622 9364  
amy.ho@jpmchase.com  
Alexander Wise <sup>AC</sup> (1-212) 622-6205  
alexander.c.wise@jpmchase.com

## Long-term Strategy

J.P.Morgan

18 July 2023

complex epidemics.<sup>21</sup>

According to Airfinity Ltd., there is a 28% chance that a pandemic as deadly as COVID-19 could occur within the next decade as viruses emerge more frequently. Many high-risk pathogens don't have vaccines or treatments. Airfinity finds that if effective vaccines are rolled out 10 days after the discovery of a new pathogen, the likelihood of a pandemic drops to 8%.

### How should investors handle climate risk?

**Location:** For investors, a large determinant of returns will not be what they buy, but where. With many EMs near the equator, and EMs frequently of not having the strong governance required to handle an existential crisis like Climate Change, the presumption should be that **climate risk is a vote against holding EM exposure.**

Real estate investors, from large pensions and sovereign wealth funds to individuals, will need to increasingly consider the potential damage from flooding, fire, storms and drought, much of which will be a function of location. There are a growing number of data sets that allow one to assess such risks. It is our strong impression that much of these risks are not yet in local prices, if only by looking at massive price gains and immigration in such locations as Florida, that score quite high on flooding, hurricane, drought, and wildfire risk. A recent report on [stacker.com](#) shows that US counties with higher risk of coastal flooding, hurricanes, wild fires, and drought saw higher immigration between 2015 and 2019 than countries with relatively lower such risks. Only counties with higher heat wave and river flooding risks saw relatively lower immigration.

**P&C Insurance companies:** In principle, a greater number of physical risks facing companies and people should increase the market and pricing for insurance. However, we are biased to think that physical climate risk will be more a negative to P&C. For one, the greater risk and difficulty in quantifying them and in gaining geographic diversification mean that insurance premia need to rise a lot, frequently making such products unaffordable to many, or simply inducing the insurer to stop offering such policies. The government or state is then forced to step in, putting more pressure on their budgets.<sup>22</sup>

**Agriculture:** We argued in [Climate change investing](#), May 30, 2019, that a strategic position in Ag futures, and in partic-

ular wheat, are probably a decent hedge against climate risk. The S&P GSCI Ag index is up 50% since while the Wheat futures subindex is up 15%. Adding exposure to regenerative agriculture makes sense.

Is a **low-carbon strategy**, embedded in many ESG funds, the right strategy? Stocks of companies with lower carbon emissions have generally performed in line with the overall equity market over the past decade. But there is a good argument that they will do better over the coming decade as, so far, the most obvious policy to wean the world of fossil fuels, a properly high price/tax on carbon, has barely been used. Fifty years ago, the world was able to escape the dismal "Limits to Growth" 1972 projections of the 1972 [Club of Rome](#), based on looming scarcity of resources through a massive rise in oil prices, that boosted new oil prospecting and global energy conservation. Today, the only way to convince the world to dramatically cut carbon emission is to put a seriously high price on it. When that happens, a low carbon asset allocation should outperform.

**The price matters.** Thematic investing on climate change has become quite popular and not just because of the ESG "movement" or EU mandates for asset managers and companies to disclose their sustainability impact. Both investors aiming to have positive impact on climate transition and those just trying to ride the new green technology wave are buying thematic funds that focus on this impact and technology. One caveat is in order, though. As we discovered in [Is thematic investing worth it?](#) (Jan 18, 2022), thematic funds have generally underperformed in recent years, both because of high fees and because such funds tend to be launched only their target asset has outperformed and have generally become expensive. **The price you pay matters.**

### Political Risk Cluster

The core political risk to us is **fragmentation** of the world, both at the **national and international** level, and the division of our political and economic space into competing groups that lead on zero/negative sum activities. **Any fragmentation**, worse than what we have observed so far, **would ultimately come from deep dissatisfaction with the status quo, likely due to economic dislocation and extreme inequality.**

If it were to get much worse than today, it would seriously damage cooperation and mutual understanding between different groups within a country and among countries at a time of global threats that humanity can only address and survive by working together. This fragmentation can be as mild as simple antagonism but could deteriorate into violence and outright war. The worse it gets, the greater the negative

21. [Imagining the future of pandemics and epidemics: a 2022 perspective](#), World Health Organization.

22. See, e.g., [Climate shocks are making part of American uninsurable. It just got worse](#), NY Times, June 2, 2023.

Jan Loey <sup>AC</sup> (1-917) 602-9440  
jan.loey@jpmorgan.com  
J.P. Morgan Securities LLC  
Joyce Chang <sup>AC</sup> (1-212) 834-4203  
joyce.chang@jpmorgan.com

Amy Ho <sup>AC</sup> (1-212) 622 9364  
amy.ho@jpmchase.com  
Alexander Wise <sup>AC</sup> (1-212) 622-6205  
alexander.c.wise@jpmchase.com

**Long-term Strategy**  
**The Long-Term Strategist**  
18 July 2023

**J.P.Morgan**

impact on governance and thus growth. Countries with worse internal polarization would perform worse.

At the **domestic** level, fragmentation comes in the form of **polarization, populism** and **gridlock** at the legislative level. At the **international** level, it could come as **de-globalization** all the way to another world war.

## Risk I: Domestic polarization and populism

**Polarization** is what it says: Citizens and voters move away from the center into opposing poles that have little communication with each other and mostly aim to oppose whatever the other side proposes. **Populism** is related in that it is an ideology that divides a country stereotypically into just two groups – virtuous people and corrupt elites (elites can be individuals, their political parties, and/or a country's institutions), prioritizes national interests and citizens over international ones and immigrants, and tends to frame political relationships in highly antagonistic terms.<sup>23</sup>

**Both stand in opposition to open, democratic societies and cross-country integration and cooperation.** Both wax and wane over time and seem largely a response to growing inequality and economic dislocation and **marginalization**. Three interrelated factors have likely contributed to growing income inequality in most countries: technological progress (e.g. the rise of automation), globalization, and deregulation of financial markets. All three trends have generated winners and losers and have weighed on middle-class income and jobs. The rise in income inequality alongside the increase in economic dislocation in the wake of the pandemic has also led to popular discontent with globalization. There are no signs that support for anti-establishment parties will decrease in the short run. Populism could remain a political force for a considerable time with political risks unlikely to fade.

**Political dysfunction or deterioration of governance could lead to destabilizing political acts or omissions.** In recent years, many countries have been downgraded on governance and democracy, while populism is on the rise. For example, Freedom House downgraded the US in 2017 and 2020 in their annual *Freedom in the World* report.<sup>24</sup> There is a risk that this trend of deteriorating governance continues or even accelerates. We have previously documented how downgrades in these rankings are associated with subsequent equity market and currency underperformance in the long

23. We discussed the rise of populism in a number of notes in *Paradigm Shifts: What lies ahead?* Joyce Chang et al., J.P. Morgan Perspectives, April 5, 2019.

24. The ‘political rights’ rating of the United States was downgraded in 2017, while the ‘civil liberties’ rating was downgraded in 2020.

run.<sup>25</sup> We see a significant risk that populism, the US-China strategic competition and the drive to develop national champions and self-sufficiency in sectors crucial to national security will **damage global growth and profit markets**.

## Risk II: US-China strategic competition intensifies

**At the core, the risk of global fragmentation into a bipolar, or multi-polar world is to us the rise of China and its challenge to US hegemony.** This strategic competition between the two largest economies in the world does not have to be destructive and could simply bring the best in each as rules-based competition forces countries and companies to spruce up their own act to the benefit of world growth. But **history** gives many examples where such competition between a rising and defending power led to disaster. Hence, this a major risk one has to focus on, especially as recent interactions between the two nations have become more confrontational.

The rise of China is leading to **higher military spending globally and a realignment of global economic and military alliances** with heightened focus on national security threats. Both the US and China are taking a more aggressive military stance toward each other. Military threats related to **Taiwan** are top of mind as the People’s Liberation Army (PLA) activity has increased around the Taiwan Straits. A conflict between the US and China over Taiwan is not outside the realm of possibilities as the framework established more than 40 years ago between Taiwan, the US and China has become more fragile.

**Semiconductors** are at the heart of the US-China strategic competition, and **Taiwan holds a pivotal role as a key supplier of intermediate products, especially in high-end tech**. Semiconductors have quickly become one of the top traded goods in the world, with the industry remaining global and highly competitive, and the race is on to acquire the most advanced technology as advanced semiconductors are now vital to the defense industry. Taiwan has built a leading position in the manufacturing of advanced semiconductors through cost, efficiency, technology infrastructure, scale of production, and overall competitiveness. This includes Taiwan’s strong position in the industry’s fabless-foundry model, and manufacturers’ well-established client relations and trust with downstream tech companies globally. Taiwan’s fabrication of the most advanced processor chips remains unparalleled. The Taiwan Semiconductor Manufacturing Company (TSMC) manufactures 90% of the world’s most advanced processor chips and produces one third of all new computing

25. *Democracy metrics and equity markets*, October 21, 2021.

Jan Loey <sup>AC</sup> (1-917) 602-9440  
jan.loey@jpmorgan.com  
J.P. Morgan Securities LLC  
Joyce Chang <sup>AC</sup> (1-212) 834-4203  
joyce.chang@jpmorgan.com

Amy Ho <sup>AC</sup> (1-212) 622 9364  
amy.ho@jpmchase.com  
Alexander Wise <sup>AC</sup> (1-212) 622-6205  
alexander.c.wise@jpmchase.com

## Long-term Strategy

J.P.Morgan

18 July 2023

power added each year. Taiwan's tech dominance is entrenched, and material disruptions could bring the semiconductor supply chain to its knees.

An intensification of US-China competition could become **Cold War 2.0**, a two-bloc system with the liberal order of the Global West pitted against a Global East Sino-Russia alliance, and increasingly, an Eastern axis that includes the Middle East – this is to us a risk scenario. But the future **may also become more multi-polar than bipolar**, as Emerging Markets, often referred to as the **Global South** – including the largest EM countries: India, Indonesia, Brazil, Saudi Arabia, South Africa and Turkey – emerge in their own right as pivotal global swing states. EM countries will resist binary choices, and one should expect them to diversify relationships and act in their own self-interests. **This more multi-polar world likely has much less damaging impact on economies and markets. To judge risk to the investor, we will thus focus on the more bipolar US/China conflict.**

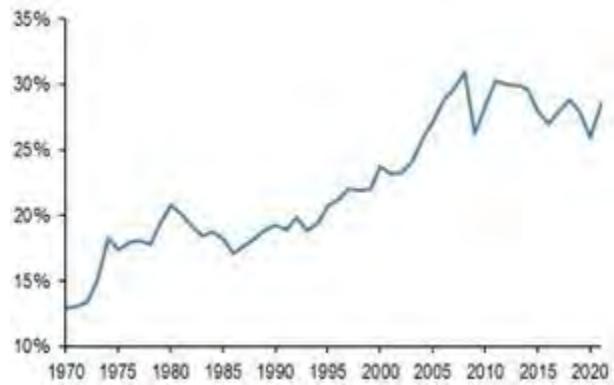
If US-China tensions intensify and we get more global fragmentation, it would likely lead to **de-globalization in trade and finance**, as these countries, and others allied to them, seek to minimize the risks associated with foreign dependence in critical industries, such as technology, energy, and food. The thrust of these efforts are coming through industrial policies to support import substitution in sectors important to national security, with the Tech industry seen as the most important. Hence, it would encompass significant de-coupling in **Tech. In finance, it could also lead to de-dollarization.**

### Impact I: de-globalization and de-dollarization

So far, words have been harsher than actions with not that much evidence yet of either de-globalization or de-dollarization.<sup>26</sup> On de-globalization, there is an argument that global trade intensity has fallen slightly from its 2008 peak, though there is no clear and pronounced downward trend (Figure 5).

Figure 5: World trade as a share of GDP

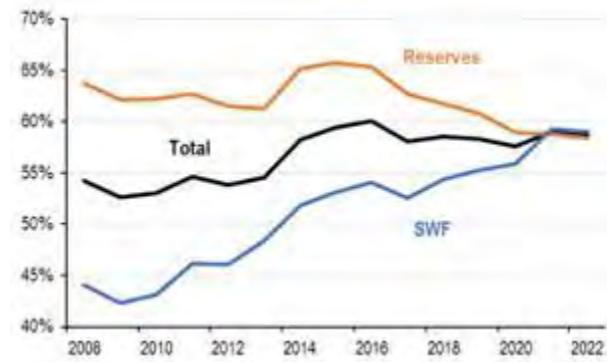
%, 1970-2021, annual data. Trade is the average of exports and imports.



Source: J.P. Morgan, World Bank.

Figure 6: US dollar share of allocated reserves, sovereign wealth fund assets and combined total

%, 2008-2022, annual. Reserves are the Q4 numbers in each specified year. USD share of GABI is based on market value. USD share of MSCI ACWI is based on market capitalization. Sovereign wealth fund shares are estimated assuming a 70-30 allocation to global equities and bonds. Total combines reserve and sovereign wealth fund holdings.



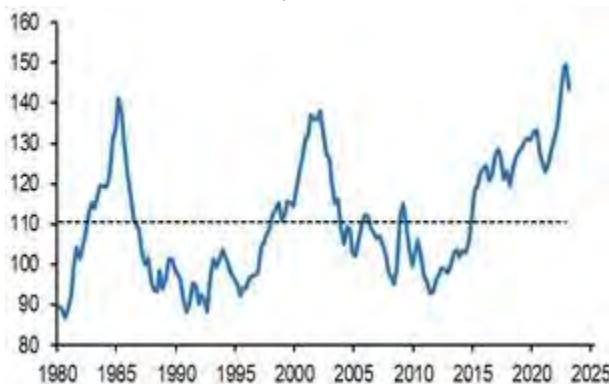
Source: J.P. Morgan, IMF, MSCI, Statista, Bloomberg Finance L.P.

As to **de-dollarization**, Fig 6 shows that the US dollar share of allocated international reserves fell steadily from 73% in 2001 to 58% in 2022, though this was more than offset by the growing dollar share in portfolios of sovereign wealth funds, through which countries with persistent current account surpluses have increasingly accumulated assets which generate a higher return than reserves.<sup>27</sup>

26. [Globalization 2.0: Neither deglobalization nor slo-balization](#), Apr 26, 2023.

27. [The de-dollarization risk scenario](#), Jun 16, 2023.

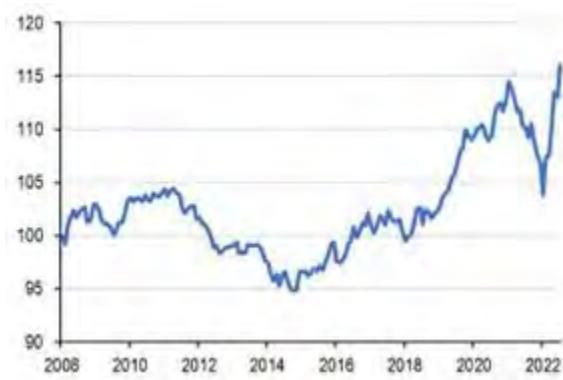
Figure 7: Real US exchange rates against DM currencies  
Q1/1980 – Q1/2023. Dashed line is average since Q1/1980. Equal weighted portfolio of Australia, Canada, Euro/ECU, Japan, Sweden, Switzerland, and the UK.



Source: J.P. Morgan, IMF, Bloomberg Finance L.P.

Figure 8: Relative price of SPX Foreign Revenue Exposure Index to SPX

11/2008-5/2023, monthly. Ratio normalized to 100 in 11/2008.



Source: J.P. Morgan, Bloomberg Finance L.P.

**Evidence for de-globalization and de-dollarization to date is not clear and unambiguous.** This leads us to the view that **these risk scenarios are not currently priced in by the market.** As shown in Fig 7, the dollar is currently very expensive in historical terms, suggesting that a narrative of secular dollar decline is not prevalent in the market. Also, as shown in Fig 8, the price of the S&P500 Foreign Revenue Exposure Index has increased relative to that of the S&P 500 over the period in which trade intensity of the global economy arguably declined slightly, which appears inconsistent with market pricing of de-globalization.

While there are credible arguments that there will be some de-globalization and de-dollarization into the future, **this is not a foregone conclusion.** There remain some **strong forces which weigh against them.** Both corporates and consumers have strong vested interests in global integration, which has simultaneously benefitted businesses and delivered lower prices for consumption goods and services. Still, popular sup-

port for trade integration is not unwavering since research generally indicates that free trade produces small net benefits for most of the population, but large and visible net losses for a small share of the population who bear the labor market consequences. As it relates to the dollar, strong network advantages accrue to a ubiquitous global currency by virtue of its functions as a medium of exchange, store of value, and unit of account.

**Given these incentives, the forces driving de-globalization and de-dollarization must be powerful.** In the case of **de-globalization, a random accident**, such as the 1914 “shot heard around the world” could force governments into **tit-for-tat retaliations** with unstoppable momentum as politicians are unable to stop it given pressures from extreme nationalists.

**There is also a political risk of rising protectionist and isolationist sentiment as a backlash to globalization and economic dislocation,** as occurred after the Great Depression. There is a large body of empirical evidence that economic dislocation, induced by trade or otherwise, is causally associated with isolationist and anti-trade sentiment, and political positioning and legislative voting on issues related to globalization.<sup>28</sup> This backlash may manifest itself in diminishing support for, or active opposition to, multilateral institutions such as the WTO, and lead to the rise of regionalism that creates distinct economic and financial spheres of influence.

As to **de-dollarization**, faster or deeper de-dollarization would likely require: (1) adverse events which undermine the perceived safety and stability of the dollar, and the standing of the US as the world’s leading economic and military power, that are dramatically worse than anything seen since WWII; and (2) positive developments outside the US which enhance the credibility of alternative currencies. On the US side, in our **judgment**, the most acute risks stem from political dysfunction and polarization, ineffective governance, sustained economic instability, and geopolitical conflict. For example, political dysfunction could stymie efforts to restrain the rapid growth in the national debt projected by the CBO, potentially leading to fiscal dominance or preventing a government from stabilizing the economy during a crisis due to fiscal constraints. Further, sustained elevated inflation in the US – while inflation is low and stable in China – could shift

28. See, e.g., Feigenbaum and Hall, *How Legislators Respond to Localized Economic Shocks: Evidence from Chinese Import Competition* (2015) 77(4) Journal of Political Economy 1012-1030; Choi et al., *Local Economic and Political Effects of Trade Deals: Evidence from NAFTA* (2021) NBER Working Paper #29525; and Katitas, *Politicizing Trade: How Economic Discontent and Identity Politics Shape Anti-Trade Campaign Appeals* (2023).

Jan Loey <sup>AC</sup> (1-917) 602-9440

jan.loey@jpmorgan.com

J.P. Morgan Securities LLC

Joyce Chang <sup>AC</sup> (1-212) 834-4203

joyce.chang@jpmorgan.com

Amy Ho <sup>AC</sup> (1-212) 622 9364

amy.ho@jpmchase.com

Alexander Wise <sup>AC</sup> (1-212) 622-6205

alexander.c.wise@jpmchase.com

**J.P.Morgan**

#### Long-term Strategy

18 July 2023

perceptions about the economic stability of the US relative to China.

**On China's side** – as the key contender to supplant the role of the US and the dollar in the global economy – de-dollarization could be accelerated by meaningful economic, financial and political reform. Amongst other actions, relaxing capital controls, opening markets, implementing measures to promote market liquidity, bolstering the rule of law, reducing appropriation and regulatory risk, and promoting Chinese government bonds as an alternative safe asset could all cement China and the renminbi as a credible alternative to the US and the dollar. This latter change would be critical in a truly bipolar world, as the West currently has a virtual monopoly on safe assets.

While these risks should not be dismissed by a strategic investor, we regard the **likelihood of rapid and deep de-dollarization over the coming 10 years as quite low**. A much more likely outcome is **partial de-dollarization**, with the RMB partially assuming some of the current functions of the dollar among non-aligned countries and China's trading partners.

### Impact II: Tech decoupling

US-China strategic competition is **in some respects a tech war**, with the conflict moving beyond pure trade issues to include technology, intellectual property rights, AI, and cybersecurity. **The decoupling trend in technology is thus likely to continue**. Our colleagues Hariharan, Yao, et al. see competition and self-reliance as the prevailing trends in the next few years, rather than cooperation. Chinese Internet companies have actively pursued international expansion, leading to more room for both competition and cooperation with US Internet names. With Chinese internet companies' expansion into overseas markets, there are rising concerns from the US side that their apps will be used to enhance China's influence in foreign populations or to send sensitive data back to China, creating national security risks for the US.

**Online media, cloud and digital payments** will likely face the most scrutiny from the US authorities. Hariharan, Yao, et al. see separate ecosystems in the evolution of software and tech hardware with China on a path to achieve self-sufficiency. However, China has lagged global players in "building-block" technologies, especially in semiconductors.

China is currently focused on innovation in three leading industries: biomedicine, artificial intelligence, and the "new track" of future industries, including the digital economy, green and low carbon and the metaverse, to foster multiple high-level industrial clusters. The 14th five-year plan adopted in October 2020 identifies the semiconductor industry as a top technology priority. We have argued that semiconductors

have become the new oil and gas equivalents for the tech economy as semiconductors are the ultimate foundational technology in the digitizing world.<sup>29</sup> Semiconductors are also at the heart of the US-China national security concerns as about 75% of global semiconductor manufacturing capacity is concentrated in China and East Asia, while 100% of advanced semiconductor manufacturing capacity is located in Taiwan. China has also set a goal to fully modernize its military by 2027 based on "informatization, intelligentization and mechanization," and has invested heavily in AI, quantum computing, hyper sonics and microelectronics.

**The US recognizes that its industrial policy measures alone will have limited impact on China's military expansion unless it is followed up with strict curbs by other countries.** In an effort to construct a new export control agreement with a small group of friendly nations, the Biden administration had proposed two new initiatives—the "Chip 4" (or "Fab 4") alliance and the US-EU Trade and Technology Council (TTC). The "Chip 4" is a proposed alliance between the US, Japan, South Korea, and Taiwan to increase cooperation on sophisticated semiconductor design and production as well as to counter China's growing influence in global semiconductor supply chains.

### Impact III: Rise of industrial policy

Disruptions to the global supply chain caused by the COVID-19 pandemic and Russian invasion of Ukraine have led to a **resurgence in industrial policy with G7 countries mirroring the type of industrial policy that China has long employed**. The rise in the share of commercial policies that constitute industry policy increased from 18% in 2009 to 46% in 2019, with the most dramatic increases occurring since 2019. Trade restrictions are on the rise to secure domestic supply, while governments are introducing import restrictions in the name of national security concerns. Recently introduced policies include a rise in targeted incentives by governments via subsidies and investments that include greater government funding in promoting innovation research and onshore production.

**Industrial policy has become a national security issue as the US focuses on securing supply chains based on relationships with trusted partners and is calling for globally coordinated export restrictions as geopolitical rivalry intensifies.** New US industrial policies, including the Bipartisan Infrastructure Law, Inflation Reduction Act (IRA) and CHIPS and Science Act, have the goal of reconfiguring trade and supply chains to boost domestic industry while working

29. [The new industrial policy war and the vital role of advanced semiconductors](#), Amy Ho et al., 15 June 2023.

Jan Loey <sup>AC</sup> (1-917) 602-9440  
jan.loeys@jpmorgan.com  
J.P. Morgan Securities LLC  
Joyce Chang <sup>AC</sup> (1-212) 834-4203  
joyce.chang@jpmorgan.com

Amy Ho <sup>AC</sup> (1-212) 622 9364  
amy.ho@jmchase.com  
Alexander Wise <sup>AC</sup> (1-212) 622-6205  
alexander.c.wise@jmchase.com

**Long-term Strategy**  
**The Long-Term Strategist**  
18 July 2023

**J.P.Morgan**

in tandem with friendly allies or partners. The procurement of transition minerals will be critical to address the new Super Cycle for “green metals”. The IRA incentivizes the onshoring of green industrial manufacturing by subsidizing solar manufacturing or electric vehicles with batteries made in the North America. European, South Korean and Japanese automakers have taken issue with the IRA requirement that electric vehicle (EV) assembly can only take place in North America.

## Economic and market Impact

There are many implications of global fragmentation and the events which catalyze or accelerate these changes. De-globalization would likely **adversely affect growth and raise yields** in countries maintaining large current account deficits, like the US. It could also raise **inflation or inflation volatility**, depending on the responses of monetary authorities. In equities, de-globalization is likely to have different effects on different sectors and styles. Any de-globalization is likely to coincide with resurgent industrial policy in strategic sectors like technology, energy and commodities, primarily in the form of subsidies, which would **benefit recipient industries** (*Industrial policy, deglobalization and strategic asset allocation*, Jan 27, 2023). Geopolitical or economic shocks which spur de-globalization would also likely adversely affect all financial markets.

De-dollarization and severe shocks to the perceived safety and stability of the dollar and US markets would cause a **direct depreciation of US assets, outright and versus others**. They would likely produce **higher bonds yields, lower equity multiples, and a weaker USD**. As with de-globalization, it would also likely have different effects on different equity sectors and styles. De-dollarization per se probably has little impact on growth and inflation, but the adverse events which could catalyze de-dollarization would probably worsen both.

## What should investors do about the Political Risk Cluster?

Investors concerned by the risk of de-globalization or events which accelerate it should:

- **Underweight large caps** as multinationals benefitted most from globalization due to lower input costs, access to new markets, and ability to tax arbitrage.
- **Overweight producers of commodities, energy, food and technology, especially in DM**, which will gain subsidies and market power.
- **Overweight DM** as de-globalization is likely to bring resurgent industrial policy, which DM have the greatest fiscal and administrative capacity to pursue, while many EMs do not have capacity to effectively pursue competitive

tive industrial policy and are relatively dependent on foreign demand.

- **Reduce exposure to countries that are at risk of not being considered “friendly” in the future.**

Investors concerned by the risk of de-dollarization or events which accelerate it should:

- **Underweight USD and US markets.**
- **Underweight longer-duration bonds in the US** (stay at 5 year or lower) due to the likelihood underperformance in a rising real yield environment.
- **Overweight Value within US equities** as Value has tended to outperform Growth in a rising real yield environment.
- **Underweight large Financials**, which benefit disproportionately from the rest of the world’s need to hold and transact in dollars.

## Tech Risk Cluster

**Technological innovation is always a long-term risk factor** for investors, on both the up- and down-side, as the Tech equity sector has long term the most volatile earnings growth,<sup>30</sup> and second highest return volatility (only Consumer had higher return volatility).

Tech innovation is a prime driver of productivity growth and the relative performance of different companies, sectors, countries, and income groups. And **today**, Tech has arguably become a **more prominent risk factor as innovation accelerates, largely through AI**, and the sector is increasingly **“weaponized”** as an instrument in the growing strategic competition among nations.

As discussed in the Political Risk Cluster, the technology sector has emerged as a central target of renewed **industrial policies as national security considerations** are prioritized by governments, which have spurred increases in private investment and R&D into emerging technologies, accelerating advancements in AI, quantum computing, biotech and a host of other technologies.

**Emerging technologies can also bring long-term risks ranging from unexpected productivity gains, spread of disinformation, to an unmanageable churn in blue- and white-collar jobs and a rise in cybercrime.** The rapid development and deployment of new technologies will also require governments to balance the need to quickly establish guard-

30. *Health Care: A Strategic Sector OW*, May 11, 2018.

Jan Loey <sup>AC</sup> (1-917) 602-9440  
jan.loey@jpmorgan.com  
J.P. Morgan Securities LLC  
Joyce Chang <sup>AC</sup> (1-212) 834-4203  
joyce.chang@jpmorgan.com

Amy Ho <sup>AC</sup> (1-212) 622 9364  
amy.ho@jpmchase.com  
Alexander Wise <sup>AC</sup> (1-212) 622-6205  
alexander.c.wise@jpmchase.com

## Long-term Strategy

18 July 2023

J.P.Morgan

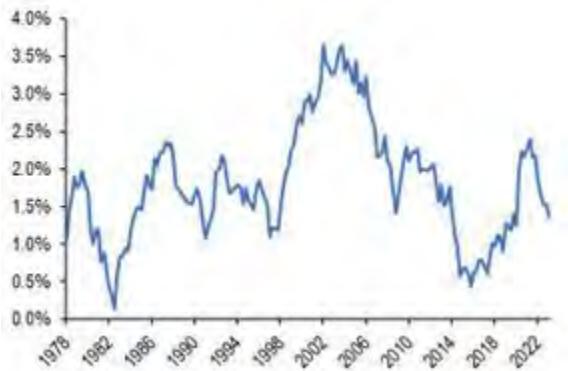
rails in the usage of new technology but also avoid overregulation that may curb innovation and competitiveness.

### Risk from Tech (AI): productivity boom

**There is a risk scenario in which the latest tech innovation, AI, brings faster productivity growth which raises potential GDP growth and leads to downside price pressures and higher real rates.<sup>31</sup>** According to a [Brookings Institution paper](#) (Baily, Brynjolfsson, and Korinek), generative AI induced increases in productivity growth from increased efficiency of output production and the acceleration of innovation over a decade could leave the US economy 5% larger after a decade.

And indeed, **from the mid-1990s, the new technology of the internet did boost US productivity growth over the next 10 years**, but then this fell back to earlier levels, and even lower during the 2010s (Fig 9). We know that much of the initial boost to productivity was generated by IT-producing industries, with only some boost to IT-using industries in the early part of the 2000s.

Figure 9: US nonfarm output per worker growth  
%, 1972 to 2023 Q1, 5-year moving average compound annual growth



Source: US Bureau of Labor Statistics, FRED data.

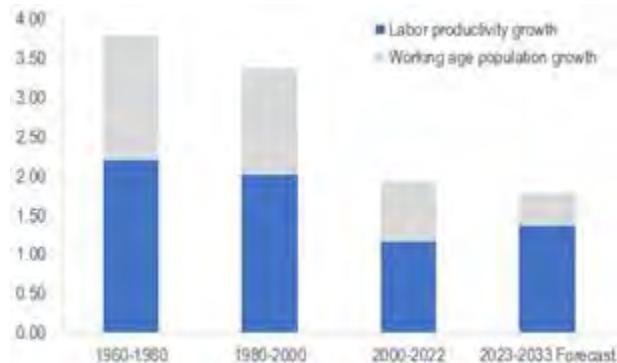
On a more conceptual level, the hopes and dreams of the 90s internet revolution were that universal and immediate access to all human knowledge through the web would make people and companies **infinitely better informed** and thus able to make better decisions, boosting economic governance and efficiency. It is probably only now that we have become more aware that an increasing part of what is on the web should be politely described as “misinformation”, possibly overall making the average citizen maybe less well informed than before, if not outright “misdirected”. The short-lived productivity boost to IT-using industries in the early 2000s may thus not

be a total surprise.

The hope should be that AI will be able to separate real from fake information, although early examples of strange “creativity” by large-language models are probably telling us that these models are still at the start of a steep learning curve.

Figure 10: Contribution of workforce growth and labor productivity growth to US GDP growth: historical and forecast

% pa. Historical working age population (20-64) growth is from the UN Population Division, while future is “Potential Labor Force” growth from CBO. Future GDP growth is based on Blue Chip consensus forecasts.



Source: J.P. Morgan, BEA, CBO, UN, Haver Analytics.

The current **consensus** view of US economists is that **AI will not boost productivity growth** (Fig 10), which will continue to **slow on its long-term trend path**, partly due to aging holding back innovation, or less productive sectors, such as the public sector, becoming a larger part of the economy.

Still, we economists are not very good at forecasting long-term productivity growth<sup>32</sup> and we should thus accept that there is a decent chance/risk that AI produces a **productivity boost like the one during the dot-com years**.

### Impact of a Tech/AI productivity boost

At the top-down level that is our focus, we can see three broad impacts under a risk scenario that AI and other Tech boost productivity growth for a 5-year period, possibly longer. First is lower **inflation** and higher **real yields**, followed by what **sectors and countries** will be relative winners and losers under this risk scenario. The sector question includes the question whether one should **chase this year's massive rally in tech stocks**.

(1) On the first **macro** impact, our risk scenario is a boost to the supply side that should put **downside pressure on prices**

31. For further analysis see [US: AI and interest rates](#), Michael Feroli, July 13, 2023

32. For evidence, see [How good are long-term forecasts?](#), June 14, 2022.

Jan Loey <sup>AC</sup> (1-917) 602-9440  
jan.loey@jpmorgan.com  
J.P. Morgan Securities LLC  
Joyce Chang <sup>AC</sup> (1-212) 834-4203  
joyce.chang@jpmorgan.com

Amy Ho <sup>AC</sup> (1-212) 622 9364  
amy.ho@jpmchase.com  
Alexander Wise <sup>AC</sup> (1-212) 622-6205  
alexander.c.wise@jpmchase.com

Long-term Strategy  
The Long-Term Strategist  
18 July 2023

J.P.Morgan

as higher productivity makes companies more efficient and competition among them will thus induce them to at least pass on these cost savings to the consumer. If sustained over time, at the margin push inflation down. Long-term inflation will likely not fall that much as central banks remain to a large extent in inflation control mode, though maybe not as much as before (see Policy Choice risk scenario above), and will thus resist any sustained downward pressure on inflation. Note that most of the other risk scenarios discussed earlier in this note put upward pressure on inflation. Our US Economics team also finds that faster productivity growth due to AI could lift longer-term interest rates ([US: AI and interest rates](#), Michael Feroli, July 13, 2023).

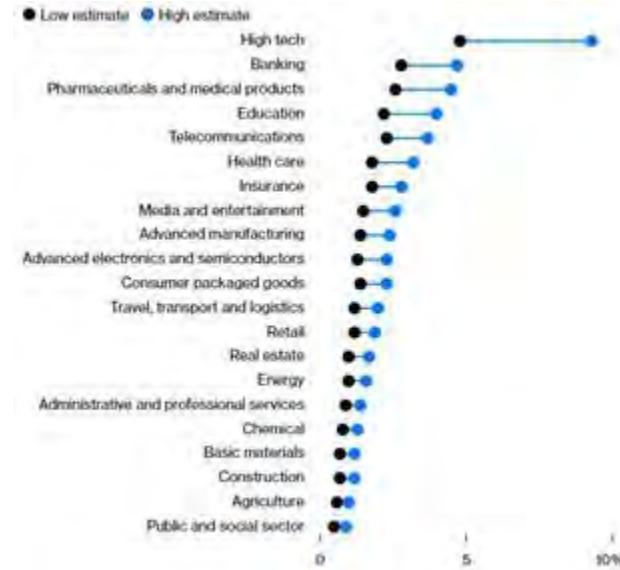
**(2) What companies and sectors should do best? High tech, financials and life sciences** are among the industries that could see the biggest impact from generative AI as a percentage of their revenues, while **more labor-intensive sectors such as construction and agriculture will see the least impact along with the public and social sector**, according to a [report](#) by McKinsey & Co. (Fig 11). The bulk of potential value in high tech comes from generative AI's ability to increase the speed and efficiency of software development, while in banking, it would improve on efficiencies such as required reporting, monitoring regulatory developments, and collecting data, and in the life sciences industry, generative AI is poised to make significant contributions to drug discovery and development.<sup>33</sup>

Part of the gains to the tech sector, both from selling AI related products and applying the new tools themselves are likely to some degree already in Tech share prices as the Information Technology sector has outperformed the rest of the US equity market by 33% YTD, this accounting for over half of the S&P500 YTD gains. **Should investors in our productivity boost risk scenario chase the Tech rally, or see it as just a repeat of the Nasdaq Bubble and stay away?**

Figs 12 and 13 in combination suggest to us that our productivity boost risk scenario does warrant a strategic overweight of the tech sector by the long-term investor today. Fig 12 shows the long-run performance of the US tech sector over the overall US equity markets since 1926, as a ratio of the cumulative total return of the two. **Tech is a volatile sector and goes in waves.** We are now in the third wave. The first wave was a 20-year long bull market in Tech coming out of WWII to the mid-1960s, that was then unwound over the following 20 years. The second wave was the shorter 1990s Nasdaq boom-cum-bubble. The third wave started right after, if not during the GFC and has not reversed yet.

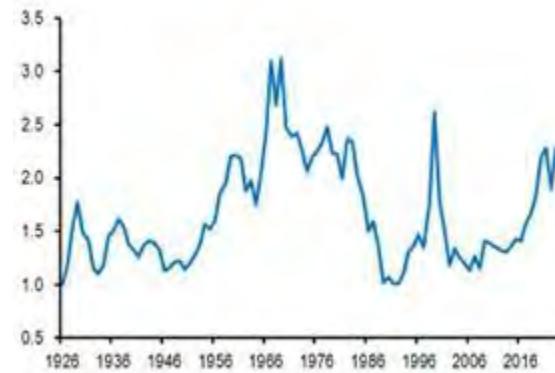
<sup>33</sup> [The economic potential of generative AI: The next productivity frontier](#), Michael Chui et al., McKinsey & Co., Jun 14, 2023

Figure 11: Projected efficiencies from AI over coming years as share of industry revenue



Source: McKinsey & Co., Bloomberg Finance L.P.

Figure 12: Cumulative return US Tech sector over broad equity market Ratio, total return index over market, 1926 =1. Last observation is May 2023.



Source: J.P. Morgan, Kenneth R. French ([http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data\\_library.html](http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html))

The investor must thus decide whether we are in a long wave, like the 20-year up and then down after WWII or the relative shorter 1990 boom. If the latter, one might consider staying away. The deciding factor should probably be whether we have currently reached the same excesses of the late 1990s. To guide us on this, Fig 13 shows the forward multiple of the S&P 500 Tech sector since the mid-1990s. Its current 30x PE is decently above the 20x of the overall S&P 500, as one would expect for a growth sector, but is miles below the over 80x achieved during the Nasdaq boom. **This suggests that if Tech-led by AI does have a positive impact on economic productivity, lasting a more than a few years, investors intrigued by this risk scenario should maintain a strategic overweight in the Tech sector.**

Jan Loey <sup>AC</sup> (1-917) 602-9440  
jan.loey@jpmorgan.com  
J.P. Morgan Securities LLC  
Joyce Chang <sup>AC</sup> (1-212) 834-4203  
joyce.chang@jpmorgan.com

Amy Ho <sup>AC</sup> (1-212) 622 9364  
amy.ho@jpmchase.com  
Alexander Wise <sup>AC</sup> (1-212) 622-6205  
alexander.c.wise@jpmchase.com

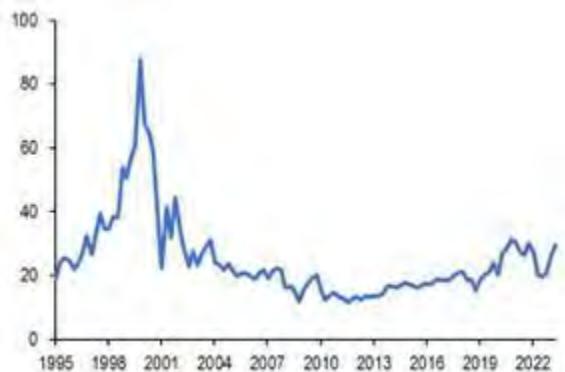
J.P.Morgan

## Long-term Strategy

18 July 2023

Figure 13: S&P Information Technology PE multiple

Quarterly, Q1/1995-Q2/2023. PE multiple is adjusted price divided by estimated earnings.



Source: J.P. Morgan, Bloomberg Finance L.P.

(3) Can we say something definitive about what **countries** will be relative winners of a tech-led productivity boom? Quite a few researchers are looking at this issue, but we find these indicate that different countries/regions have both relative advantages and disadvantages to the point that we can see **some biases as to who will gain more, but not enough to produce clear strategic allocation recommendations. At the very margin, we can probably make a slight case for the US relative to China and DM vs EM but do not see enough of an advantage to invest on these.**

Figure 14: Four quadrants of national AI strategy implementation



Source: Brookings Institution.

**(1) US/China:** The US currently leads in AI, but it is argued that China is well positioned for AI dominance in the long run as it has a better government strategy for advancing AI along two key dimensions, technology and people. According to the [Brookings Institution](#), China possesses some demographic advantages and benefits from strategic investment in AI. However, it is not the highest in either dimension – the US is higher in the technology dimension, and India, Singapore, and Germany are all higher on people (Figure 14).

**Weighing against this argument is the observation that the US is currently technologically pre-eminent, notwithstanding claims about comparative demographic weakness.** The frontier of AI has been substantially advanced to the present point by researchers in the US, and a large share of the world's leading scientists resides in the US, the legacy of generations of skilled immigration. While there are more leading AI researchers that completed their undergraduate studies in China than in any other country, more than half of them came to the US to pursue graduate degrees and over 90% stayed after graduation. These advantages can be self-sustaining as the flow of promising researchers maintains the status of leading American universities and corporates, which continue to attract talent.

**However, current US immigration policies risk losing high-skilled immigrants.** For example, a numerical cap on H-1B work visas constrains US companies from hiring foreign talent. Nearly 70% of top machine learning researchers residing in the US said that visa and other immigration problems were an obstacle to recruiting foreign scientists.<sup>34</sup>

**If the US can maintain control over the semiconductor supply chain and maximize its inflow of talent, it can remain ahead in the race for AI dominance.**<sup>35</sup> The US currently dominates key chokepoints in the equipment needed to produce advanced semiconductors which gives the US leverage over the AI supply chain as China remains heavily import-dependent in the sector, imports of electronic integrated circuits amounted to \$433bn in 2021 (equivalent to 16% of China's total imports, dwarfing its spending of \$300bn on oil imports). China is also two or more generations behind the US semiconductor industry technologically and with rising trade restrictions, independent analysts argue that the US looks to “freeze in place” China’s capacity to develop and scale leading edge semiconductors.<sup>36</sup>

**(2) EM/DM:** New technologies, such as AI, risks widening the gap between developed and emerging economies by shifting more investment to developed economies where automation is already established while most emerging markets have received a limited share of the global investment into AI. For example, Comin and Mestieri (2018) argue that divergence in the intensity of adopted technology use accounts for cross-country income divergence in the 20th century. The developed world has the leading edge in the AI revolution given their greater economic capacity and skilled workforces. In

34. [America Can Win the AI Race: It Has the Resources—Now It Needs a Plan](#), Paul Scharre, Foreign Affairs, 4 Apr 2023.

35. Ibid.

36. [Freeze-in-Place: The Impact of US Tech Controls on China](#), Reva Goujon, et al., Rhodium Group, 21 Oct 2022.

Jan Loey <sup>AC</sup> (1-917) 602-9440

jan.loey@jpmorgan.com

J.P. Morgan Securities LLC

Joyce Chang <sup>AC</sup> (1-212) 834-4203

joyce.chang@jpmorgan.com

Amy Ho <sup>AC</sup> (1-212) 622 9364

amy.ho@jpmchase.com

Alexander Wise <sup>AC</sup> (1-212) 622-6205

alexander.c.wise@jpmchase.com

**J.P.Morgan**

**Long-term Strategy**

**The Long-Term Strategist**

18 July 2023

contrast, developing countries have more pressing concerns, such as education, sanitation, health care and food security, which places significant investment in digital transformation lower on their priority list.

**While there is an argument that EM countries can leverage AI-as-a-service to overcome infrastructure gaps, allowing them to “leapfrog” stages of development and converge with DM countries, the empirical evidence presented by Comin and Mestieri (2018) weighs against this argument.** While there may be microeconomic development applications of these technologies, it is not clear that AI obviates macroeconomic challenges in the delivery of quality education and health services to workforces. It may also particularly hollow out low-skill employment opportunities accessible to developing countries. AI adoption in developed economies may simultaneously bolster industrial competitiveness there, reducing the scope for developing countries to use manufacturing as a pathway to development and as a destination for excess unskilled labor flowing out of low-productivity subsistence agriculture. Thus, we consider it **on the margin more likely that AI will be relatively advantageous for DM vs EM.**

**There is also a risk that Tech could exacerbate income inequality and labor market polarization, favoring high-income occupations.** For example, research by [Edward W. Felten, et al.](#), finds that advances in AI may lead to positive employment and wage growth for high-income occupations, but has no meaningful impact on low- or middle-income occupations. For high-income occupations, a one standard deviation increase in the AI Occupation Impact (AOI) score, which is a measure that links advances in specific applications of AI to workplace abilities and occupations, is associated with an increase in employment growth of 3.94%-pts and wage growth of 1.40%-pts, but the AIOI has no meaningful relationship with employment or wage growth for low- or middle-income occupations. Hence, findings from the study indicate that it is possible that advances in AI may lead to greater growth in employment and wages for high-income occupations than for low- and middle-income occupations and could have troubling implications for income inequality.

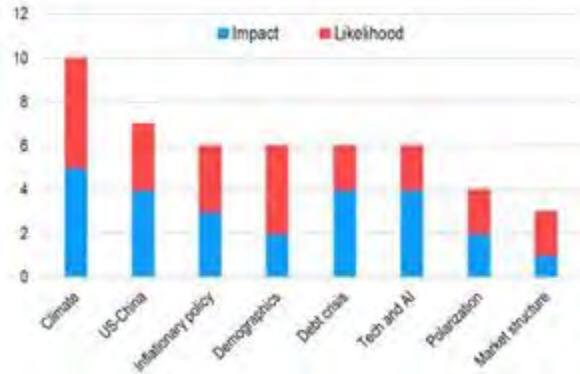
## How to rank these risks?

There are two dimensions along which we can assess the risks discussed above: probability and impact. Risks which are more likely and more impactful warrant greater attention from strategic investors. As a simple rubric, we rate each risk from 1-5 based on each characteristic, with 5 indicating the greatest risk along that dimension, and 1 indicating the least risk. Fig 15 plots the sum of these risk scores. Below, we dis-

cuss the rationalization behind this ranking in order of most acute to least acute risk.

Figure 15: Risks ranked by probability and impact

1 = least risk, 5 = most risk.



Source: J.P. Morgan.

In our view, the most acute risk is of worse or faster than anticipated **Climate Change**. Realization of climate risks could have far-reaching and potentially catastrophic implications, though these are more likely to be realized in the more distant future. The mixed evidence of pricing climate risks suggests the realization of a worse outcome than priced in is very likely.

Next in line is probably a significant intensification of **US/China tensions** as these are the two largest economies in the world, making up close to half of world GDP. Outright war would obviously be most devastating, but we do not give this a high probability. But there are many other levels of conflict, short of war, that can do a lot of damage to world economies and markets. Third in terms of odds and impact would for us be a quartet of a government debt crisis, sustained higher and volatile inflation, aging driving up real rates and inflation, as well as a Tech & AI boost to productivity over a 5-year period.

We see the all-but-lowest odds and impact coming from domestic polarization, with market structure driven spikes in volatility as the one we are least concerned about.

## Conclusion

Long-term risks are quite different from the ones one normally thinks of over the coming year, although there is some overlap. None of the ones we mention are unknown to you, but each could come with higher odds, earlier, or with greater impact than we currently see priced into markets where risk premia remain too low to us. We see the main risks coming from faster Climate Change that does damage in locations of

Jan Loey <sup>AC</sup> (1-917) 602-9440  
jan.loeys@jpmorgan.com  
J.P. Morgan Securities LLC  
Joyce Chang <sup>AC</sup> (1-212) 834-4203  
joyce.chang@jpmorgan.com

Amy Ho <sup>AC</sup> (1-212) 622 9364  
amy.ho@jpmchase.com  
Alexander Wise <sup>AC</sup> (1-212) 622-6205  
alexander.c.wise@jpmchase.com

**Long-term Strategy**

18 July 2023

**J.P.Morgan**

fast rising house prices, and where it becomes too hot to live, work and produce food. Second in line, is a more antagonistic relation between the US and China that moves the world from a positive sum environment of the past 20+ years towards one that is net destructive to the world.

Still significant risk come from an aging world population leading to reduced savings, changing political and policy priorities that are less stability oriented, high government debt burdens incurred during the times of easy money that markets will become less willing to fund, and the new tech innovation of AI. For these risks to affect markets they need to become more extreme than the collective wisdom of the markets currently prices in. We do not claim to be more clairvoyant than the sum of the largest investors in the world but believe that strategic investors should and will consider alternate scenarios for the world and should tilt some of their holdings away from the collective of these longer-term risks. For us, this means overweighting bonds up to 5-year maturities, cost-efficient macro-active managers, domestic banks, Value, Tech, inexpensive green/sustainable assets, agriculture prices, and inflation linkers against global benchmarks. And it also means underweighting longer-duration bonds, JPY, SEK and CHF bonds, the US dollar, P&C insurers, and assets located in areas with higher flood, heat, fire, storm, or droughts risks, which includes a lot of EM.

## The Long-term Strategist

### Long- versus short-term risk



- The ability to forecast long-term returns relatively accurately implies that longer-term investors should hold more risky assets such as equities.
- The standard efficient markets assumption implies that the ultimate risk on the annual return on a long-term portfolio equals short-term volatility divided by the square root of time, or the years in your investment horizon.
- The classic Samuelson time invariance result shows that under typical risk aversion preferences, efficient markets imply that the optimal equity-bond allocation is the same, irrespective your holding period, as risk simply expands with time.
- Long-term risk is significantly lower, though, not so much because of any mean reversion in returns on bonds and equities, which is very weak, but because knowing today's asset price allows us to make quite accurate predictions on 10-year out returns.
- Our simple current IRR-based models of US bond and equity 10-year out returns have a forecast RMSE just 3/10th of annual vol divided by  $\sqrt{10}$ .
- We thus confirm market practice to hold more equities, the longer one's investment horizon, with one major nuance. As important as investment horizon is, so too is whether you can ignore or absorb shorter-term volatility and drawdowns. Leverage or uncertainty about when you need the funds requires even long-term investors to pay attention to short-term risk. This likely implies that investors should use a weighted average of short- and long-term risk estimates, depending on the uncertainty over when funds are needed.
- A USD based investor who can truly ignore or absorb shorter-term market volatility and drawdowns and who has no need for funds over the next 10 years has little reason to invest in much else than equities, with minimal if any allocation to bonds, given today's pricing and expected returns.
- We have argued that we are in a world of higher macro and market volatility. Higher shorter-term risk likely also raises longer-term return uncertainty. To us, this means that investors should at the margin give up some long-term strategic risk in favor of more short-term tactical risk.
- [Video](#).

### What is risk?

In Finance, we couch most investment decisions in terms of risk and return. *Return* stands for what one can objectively expect to earn on different assets over one's investment horizon and *Risk* means the probability and magnitude of underperforming these expectations. Risk exists because the future is uncertain and shocks can emerge from many different places.

The most common way to measure risk is the standard deviation, or **volatility**, of past returns, measured over a period long enough to produce statistical significance. **For the long-term investor**, which is our focus, risk should by this metric be measured by the standard deviation of returns over longer holding periods. This creates a problem, in particular for our target 10-year investments, when we do not have long enough time series data, and where we have them, there may be concerns that they relate to times when volatility was structurally different.

The solution to this problem has been to “bootstrap” higher-frequency data through the **square-root-of-time** rule. A return over 10 years can be seen as the sum of 10 annual returns, ignoring compounding. If markets are efficient, these returns will be uncorrelated over time, and the expected future return at any time should not be affected by past market movements. Assuming additionally that volatility does not change over time, this makes asset returns independent and identically distributed random variables, or **i.i.d.** in our jargon. By implication, the expected *cumulative* return and variance over 10 years will be 10 times the 1-year expected return and variance, and its volatility, which is the square root of the variance, will be annual volatility times  $\sqrt{10}$ . The expected *average annual* return will be the same as the one for 1 year out, and the expected standard deviation around it will equal the volatility of annual returns divided by  $\sqrt{10}$ .

In short, our industry has been happy to take the square-root-of-time approach as a handy way to come up with measures of long-term risk since they are easy to calculate and alleviate the problem of not having enough long-term return data.

## Long-term risk when markets are not efficient and thus not i.i.d.

There is plenty of empirical evidence that **some asset class returns are not purely random but are partially predictable** because their prices tend to revert to historic means, and/or because we have other information beyond past return distributions to help us assess the mean and risk of future returns. Both of these factors are most relevant over longer holding periods and each allows us to make more accurate predictions about future returns than simply using past volatility, and to lower our assessment of long-term investment risk relative to the square-root-of-time rule applied to short-term volatility.

We have discussed and analyzed both of these forces – **mean reversion** and **using asset class IRRs** – to assess

long-term risk, in papers on [Time Diversification](#) in hybrid assets and on forecasting long-term bond and equity returns (see the most recent update in [Long-term forecasts: Update January 2023](#), January 6, 2023). These papers all lead to a conclusion that **10-year out investment risk is much lower than short-term volatility times  $\sqrt{10}$** . We will call short-term risk “**volatility**” or “**vol**” and risk on our long-term return forecasts “**uncertainty**”.

**Table 1: Three measures of risk on US bonds and equities**

%, 1982-2022, quarterly, standard deviation of 1-year returns; standard deviation of 10-year compound annual returns times  $\sqrt{10}$ ; RMSEs of our IRR based recursive forecasting models times  $\sqrt{10}$ .

	1yr	10yr	RMSE
US Agg	7.1%	8.5%	2.2%
SPX	17.5%	17.0%	5.0%

Sources: J.P. Morgan, Bloomberg Finance L.P.

Table 1 shows the difference between short- and long-term risk for the two US benchmarks: The US Aggregate Bond Index (the “AGG”) and the S&P500 since 1982. The first column is simply the standard deviation of 1-year returns. The second column is the standard deviation of 10-year compound annual returns, multiplied by  $\sqrt{10}$  to make them comparable with short-term volatility. It aims to measure whether the historic record reveals any mean reversion in annual returns. The third column is the root mean squared error (RMSE) of our bond and equity 10-year out return models based on current IRRs (see the recent [update](#)) also multiplied by  $\sqrt{10}$  for comparability. This is our preferred measure of long-term risk to your price-based expected return on these asset classes over the next 10 year.

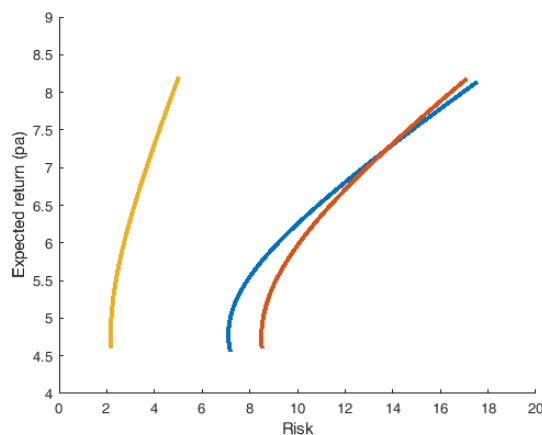
The first two columns show 1- and 10-year past return volatility are very close to another, indicating **there was little historic mean reversion within 10-year holding periods in the past on the broad US bond and equity market**<sup>1</sup>. In recent papers, however, we did find significant mean reversion in past annual returns for US Hybrids, that live on the border world between pure bonds and equities – equity-like bonds and bond-like equities – such as high-yield bonds, convertible bonds, utility stocks, preferred shares and REITs<sup>2</sup>.

<sup>1</sup> Jeremy Siegel, in his well-known *Stocks for the Long Run* (2014, 5<sup>th</sup> edition), shows that since 1802 and in *real*, inflation-adjusted terms, US stocks did show modest mean reversion over periods of 10 years and more, while US bonds did not.

<sup>2</sup> See [60/40 in a zero-yield world](#), June 30, 2020; and [The International 60/40 problem and US Hybrids](#), Sep 29, 2020.

In contrast, our preferred measure of long-term risk – the accuracy of our return forecasts – show **much lower long-term risk** than the simple volatility of 10-year returns over the past. For both the broad US equity and bond markets, forecasting accuracy shows us that 10-year out returns are only about one third as risky as an uninformed look at past return volatility suggests or as indicated by applying the square-root-of-time rule to 1-year return volatility.

**Figure 1: US efficient frontiers based on three measures of risk**  
 %, 1982-2022. Return is pa based on IRR based forecasts and is thus the same for each. Risk is standard deviation of 1-year returns (blue); standard deviation of 10-year compound annual returns times  $\sqrt{10}$  (red), and RMSE of our IRR based recursive forecasting models times  $\sqrt{10}$  (yellow).



Sources: J.P. Morgan, Bloomberg Finance L.P.

To see the dramatic impact of this lower long-term risk, Figure 1 uses the risk measures of Table 1 to create three different efficient frontiers across US equities and bonds since 1982. Each uses the same 10-year out expected return – 4.6% on US bonds and 8.2% in equities – from our [update](#) earlier this month. The ones based on past 1-year return volatility or annualized 10-year return volatility are indistinguishable from each other, but the third based on forecast accuracy has moved dramatically to the left, with both bond and equity return uncertainty reduced by 2/3<sup>rd</sup>. In percentage point terms, this move to the left has more impact on equity risk and thus significantly steepens the risk return trade off line, setting us up for a larger equity allocation for the long-term investor.

## How should bond-equity allocations depend on investment horizon?

To most investors and advisors, it is obvious that the long-term investor should have a higher allocation to risky assets than the short-term one. After all, both in principle and empirically, we find that the probability of risky equities beating safer bonds increases steadily as the holding period lengthens. Jeremy Siegel, in his well-known *Stocks for the Long Run*, shows that since 1802, US equities have beaten US Treasuries 60% of the time over 1-year holding periods, but 74% over 10-year and 84% over 20-year holding periods.

These empirical observations have been used by many to support the classic *Rule of 100*, according to which one's portfolio should have an equity allocation equal to 100 minus one's age. Target-date funds, which make equity allocations a function of how far one is from one's chosen retirement age, are a practical application of this rule.

Despite the near universal consensus of financial advisors for allocating more to risky assets as one's investment horizon lengthens, the more academic finance literature has long resisted this notion with **Paul Samuelson** famously challenging Time Diversification in his 1963<sup>3</sup> paper. Samuelson argued that given certain plausible utility functions and an assumption that asset returns are uncorrelated over time, both expected cumulative portfolio returns and return variances will simply expand linearly with the number of years, but will in effect not change shape, thus making one's optimal portfolio invariant to the investment horizon.

## How does this result square with the observation that, even with i.i.d. returns, the probability of equities beating bonds increases with the investment horizon?

The main insight from Samuelson is that while the probability of equity outperformance grows with time, any losses from underperformance also grow cumulatively with time. Such higher losses are not enough to prevent the “expected loss” of equity underperformance – probability times magnitude of loss – from still falling with time. However, when combined with standard risk-averse utility functions, the greater disutility of higher potential cumulative losses due to equity underperformance are enough to convince such an

<sup>3</sup> Paul Samuelson, Risk and Uncertainty: A Fallacy of Large Numbers (1963) *Scientia* 1-6.

investor to keep their equity bond allocation unchanged when looking at longer investment horizons.

To show this, consider risk-averse investor with a **standard power utility function** who needs to choose how much to allocate to bonds and equities to maximize their utility. For any given level of relative risk aversion, the equity allocation of a utility maximizing investor remains the same over different investment horizons, despite the fact that equities beat bonds more commonly over longer horizons. That is because a risk-averse investor with a power utility function derives greater “disutility” from the larger potential underperformance of equities versus bonds over longer holding periods, even if these occurrences are less probable over the longer run<sup>4</sup>.

What happens now when we allow investors to recognize that using current IRRs on bonds and equities allows them to get a better picture of what return they are set to earn 10 years out, thus reducing their long-term risk? For this, we use our own measure of long-term returns risk derived from the forecasting errors of the forecasting models discussed above. As shown in Figure 1, this moves the risk return efficient frontier to the left with both equity and bond long term risk falling proportionally versus short term risk. **Both the reduction on overall risk on one's portfolio and the larger percentage point drop in equity risk produce now a higher optimal equity allocation for our risk averse investor.** As can be seen from the steep risk return trade-off line in Figure 1, an investor who can afford to look only at the downside to their portfolio in 10 years' time, should have almost all in equities and very little on bonds.

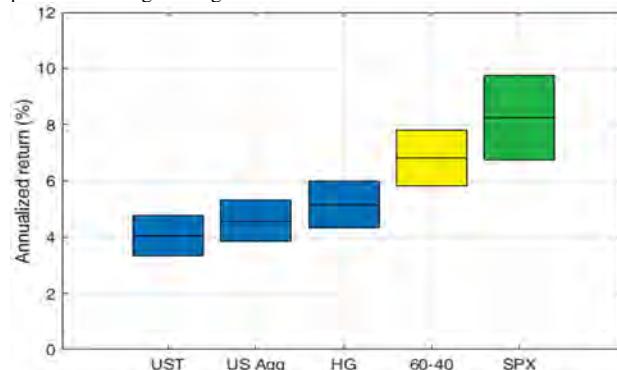
Figure 2 shows this differently with long-term risk ranges around our 10-year out return forecasts. Notice how the 1-sigma *downside* to US equities still exceeds the 1-sigma *upside* on US bonds, creating a higher than 90% probability that equities will beat bonds at the end

<sup>4</sup> For both a more in-depth mathematical treatment and discussion of the Samuelson invariance result see John Campbell and Luis Viceira, *Strategic Asset Allocation: Portfolio Choice for Long-Term Investors* (2002) Oxford University Press. An excellent non-mathematical review of these issues can be found in Mark Kritzman, [What practitioners need to know ... About Time Diversification](#), Financial Analyst Journal, 2015, pp 29-34.

of 10 years, despite a much lower probability of equities doing better in any given year.

**Figure 2: Expected return and risk ranges 10 years out on US equities and bonds**

%, as of end 2022, as in [January update](#). Midpoint in each bar is expected return and top and bottom of bars are expected return plus/minus 1-sigma long-term risk.



Sources: J.P. Morgan, Bloomberg Finance L.P.

In short, we find **good support for the classic recommendation that investors with a longer investment horizon, such as younger people who are further away from retirement than older people, should indeed hold a larger share of their savings in equities.**

Our results do suggest an **important nuance** to this classic result, namely that it is not just the length of one's investment horizon that matters, but also whether one can ignore, or absorb, short-term volatility. To the long-term investor, short-term volatility is also known as **drawdown risk** – the risk that one's portfolio sees sudden drawdowns in value. The long-term investor who is still far away from needing these funds ought not panic at that point when they recognize that the lower prices on their asset holdings improve their future expected returns, allowing them to recover their losses to some extent before the funds are needed.

**There are quite a few circumstances that might not permit the investors to ignore short-term drawdowns.** These include **leverage**, forcing the investors to cut their holdings early; a small **portfolio size**, a drawdown from which could seriously endanger one's standard of living; **uncertainty about when the funds are needed**; or probably most frequently, the existence of **multiple investment horizons** when one needs to fund a retirement income over 2-3 decades.

Overall, it is quite likely that **not that many investors, who consider themselves long-term strategic, can**

**fully ignore short-term drawdown risk.** How do they decide then what the right risk exposure and equity/bond mix should be? Optimizing across three variables – one return and two different measures of risk – with a complex utility function is not easy. We think that the simplest approach would be for any investor to perform in effect a two-dimensional optimization, as with the efficient frontier on Figure 1, where risk is a weighted average of short-term volatility and long-term return uncertainty. The weights an investor would put on long-versus short-term risk would be a function of investment horizon, portfolio size, uncertainty about when one needs the funds, any leverage, and the length of time over which one needs to spread withdrawals to funds one's spending.

## Does a longer than 10-year horizon imply even higher equity allocations?

**Probably yes, though not one-for-one.** We have found that a 10-year out horizon dramatically lowers the uncertainty on the ultimate value of one's equity and bond holdings. Does it, therefore, follow that if your investment horizon is, say 20 years, or even several generations out, you should hold even more equities and less fixed income? Our prior is yes, even as we may not have the data to show this categorically. For one, the tight relation between the starting yield and 10-year out returns of standard bond indices is largely due to the fact that most of these indices have a duration around 5-6 years, with "bond math" dictating that the starting yield will equal the future return on a bond portfolio as long as the holding period is just under twice the duration of the portfolio. Over 20 years, the second 10-year holding period return will be driven by the index yield 10-year from now on which has a lot more uncertainty. Hence, bond portfolio return uncertainty starts rising significantly when the holding period rises beyond 10 years.

For **equities**, forecasting errors could also rise but this could be offset by rising mean reversion of equity returns as holding periods grow from 10 to 20 and 30 years, as highlighted by Jeremy Siegel in his *Stocks for the Long Run*. Partly offsetting these return uncertainty arguments is that the longer one's investment horizon, the more uncertainty there will probably be about this horizon and the more likely it will be that the investor will have intermediate liquidity needs.

In short, we suspect indeed that investors with longer than 10-year horizons will hold even more equities, although this will likely rise only slowly.

## Does long-term uncertainty rise when shorter-term risk volatility goes up?

We have argued in [Where are we in Regime Change? Macro volatility, deglobalization, and secular rise in yields](#), Nov 8, 2022, that there is a good case to be made that we have seen the **end of the Great Moderation**, a period since the mid-1980s when central banks focused on controlling inflation and keeping expansions going for longer. The objective of the inflation policy regime was to reduce long-term uncertainty in order to boost long-term investing and therewith economic growth. In the event, both inflation and macro volatility did fall dramatically, but we did *not* see better growth and capital spending – on the contrary. Today, this analyst thinks policy makers will ultimately be less focused on just inflation control and will pay more attention than before to keeping the economy closer to full employment. Together with the sudden instability of the monetary forecasting models (Phillips and Beveridge curves, NAIRU, and probably  $r^*$ <sup>5</sup>) and any inflationary impulse of de-globalization, this should **shorten business cycles and raise macro-economic volatility**.

Should one expect higher short-term macro volatility then to also raise longer-term uncertainty on the average rate of growth, inflation and asset returns over the coming decade or will time diversification or our forecasting models offset this?

In principle, **one would expect higher short-term vol to raise long-term uncertainty**. For one, assets such as equities that have higher short-dated vol than bonds also produce higher long-term uncertainty as shown by their higher forecasting error, as shown above. Table 1 shows that moving from shorter volatility to using forecasting risk (RMSE) lowers our measure of long-term risk proportionally (by ~70%) for both bonds and equities. It is thus not implausible that higher short-dated volatility will also raise long-term uncertainty.

This should in turn move the efficient frontier in Figure 1 somewhat to the right, implying at a margin a lower equity allocation. We have discussed in our regime change papers that higher macro volatility and thus higher short-term risk create a necessary, though not sufficient, condition for active managers, such as hedge funds, to outperform that market. Hence, we conclude here that **higher short-term volatility should at the margin induce the investor to take more tactical risk and less strategic risk**.

<sup>5</sup> We have argued in [Long-term forces point to higher US bond yields](#), April 4, 2022, that a variety of factor will likely push real interest rates up over the coming decade. This will affect not just bond yields but also the equilibrium short rates that the Fed calls  $r^*$ .



## The Long-term Strategist

How good are long-term forecasts?

- 
- **Corporates and strategic investors need to make long-term forecasts for economic and financial variables that will impact the performance of their investment decisions but also need measures of risk around those forecasts.**
  - The *Blue Chip Economic Indicators* survey contains consensus long-run economic forecasts since 1979. This allows us to assess the performance of an extended history of long-run forecasts and to use the historical performance to construct forecast risk intervals.
  - Historically, long-run forecast errors have been relatively large, with performance somewhat worse for nominal measures than for real measures. Thus, forecast risk intervals are relatively wide.
  - While forecast errors are quite large, forecast bias is relatively small for the majority of real variables, such as real GDP and its components. By contrast, there are large and persistent biases in forecasts of some variables, such as inflation, interest rates, and net exports.
  - Forecast biases almost uniformly lean toward the economically bullish side, for example with lower unemployment or higher real GDP growth forecast than in fact is realized.
  - Long-run consensus forecasts appear to have been made in an adaptive manner, closely resembling the realized average over the five years preceding the issuance of a forecast.
  - While performance of adaptive approaches to forecasting is reasonable for stationary variables, it is relatively poor for non-stationary variables. Thus, a structural approach to forecasting, which we have attempted in a number of previous papers, is in our mind preferable for the latter. However, we do not yet have a track record on our structural 10-year out forecasts, and this will obviously take a long time to assess.
  - Hence, it is reasonable that managers use long-term consensus economic forecasts, but should combine these with our measures of forecast accuracy to understand the risks around these forecasts.
- 

Both corporates and strategic investors need to make long-term forecasts on economic and financial variables that will impact the performance of their investment decisions over the years and decades to come. But each such forecast should be combined with a measure of risk around that forecast. A classic way to judge these risks is to look at the past volatility of the variables one is trying to forecast. But that, by itself, does not tell us much about the delivered accuracy of long-term forecasts. For that, we need to investigate how past long-term forecasts compare with what actually happened.

For the US, we can do that with the extended history of bi-annual 10-year out forecasts collected by Wolters Kluwer since 1979 in the *Blue Chip Economic Indicators* publication (“*Blue Chip*” for short) and aggregated by Haver Analytics, Inc. Twice a year, some 50 leading business economists from banks, corporates, and professional research organizations are surveyed on their long-run forecasts for macroeconomic variables.

We focus on the average of these forecasts—the so-called consensus—as a best-case scenario since studies have shown that a group of forecasters is collectively more accurate over time than the average accuracy of the individual forecasters in the group.<sup>1</sup> In this paper, we assess how accurate long-run consensus forecasts have been, describe how these forecasts are made, and calculate forecast risk intervals based on past forecast accuracy.

## The survey data

Since 1979, the *Blue Chip Economic Indicators* survey has asked respondents in bi-annual issues about their multi-year forecasts for a broad selection of US macroeconomic variables, including GDP growth, its components, auto sales, housing starts, corporate profits, unemployment, inflation, and interest rates.<sup>2</sup> Forecasts are for two five-year windows, which typically start two and seven years after the issue year.<sup>3</sup> For example, the March 2022 survey asks respondents about their forecast for average US real GDP growth (among other variables) in the 2024-28 and 2029-33 windows.

In a [recent note](#), we argued that “long term” should be taken by strategic investors to be around 10 years, since this typically allows one to look past short-term considerations dominated by the business cycle. Hence, we evaluate the accuracy of these consensus forecasts by comparing realizations in 10-year windows with the average of the two constituent five-year window

<sup>1</sup> See, e.g., Robert Clemen, [Combining forecasts: A review and annotated bibliography](#) (1989) 5(4) *International Journal of Forecasting* 559-583.

<sup>2</sup> Since 1983, these surveys have been conducted in March and October. Between 1979 and 1983, surveys were conducted in either March, May, October, or November.

<sup>3</sup> In the analysis presented here, we use the long-run forecasts from the March issue (or the May issue before 1983). We also conducted our analysis using the October issues (*not presented*) and found the results to be nearly identical. This is unsurprising given the similarity between long-run forecasts made in March and October of the same year. Thus, this choice is of little practical consequence.

forecasts. As a practical matter, long-run forecasts for these two windows are invariably very similar.

## How accurate have long-term consensus forecasts been?

Figures 1a-b, spread over the next two pages, show the consensus forecasts for 15 US macro variables, plus those for the real 10-year US Treasury yield, derived from the forecasts for the nominal yield minus those for CPI inflation. The same figures also depict the realized values for these variables over the corresponding 10-year period. The “consensus” is the average across the ~50 forecasters. The forecast and realized values are depicted at the end of each 10-year period. The dotted lines show forecasts for 10-year periods with a realization that is as yet unobserved. In the appendix, we present the top and bottom 10 forecasts for a selection of variables.

Each chart also reports the average of the forecast errors (mean error, ME) and the root-mean square errors (RMSE). We use the RMSE instead of standard deviation of the errors to account for the possibility, and reality, that forecasters make systematic errors on the up- or downside.<sup>4</sup> Table 1 lists in tabular form these two metrics of forecast accuracy for each macro variable as well as the standard deviation of the underlying variable. This allows an assessment of whether forecast errors are large relative to the variation in the data.

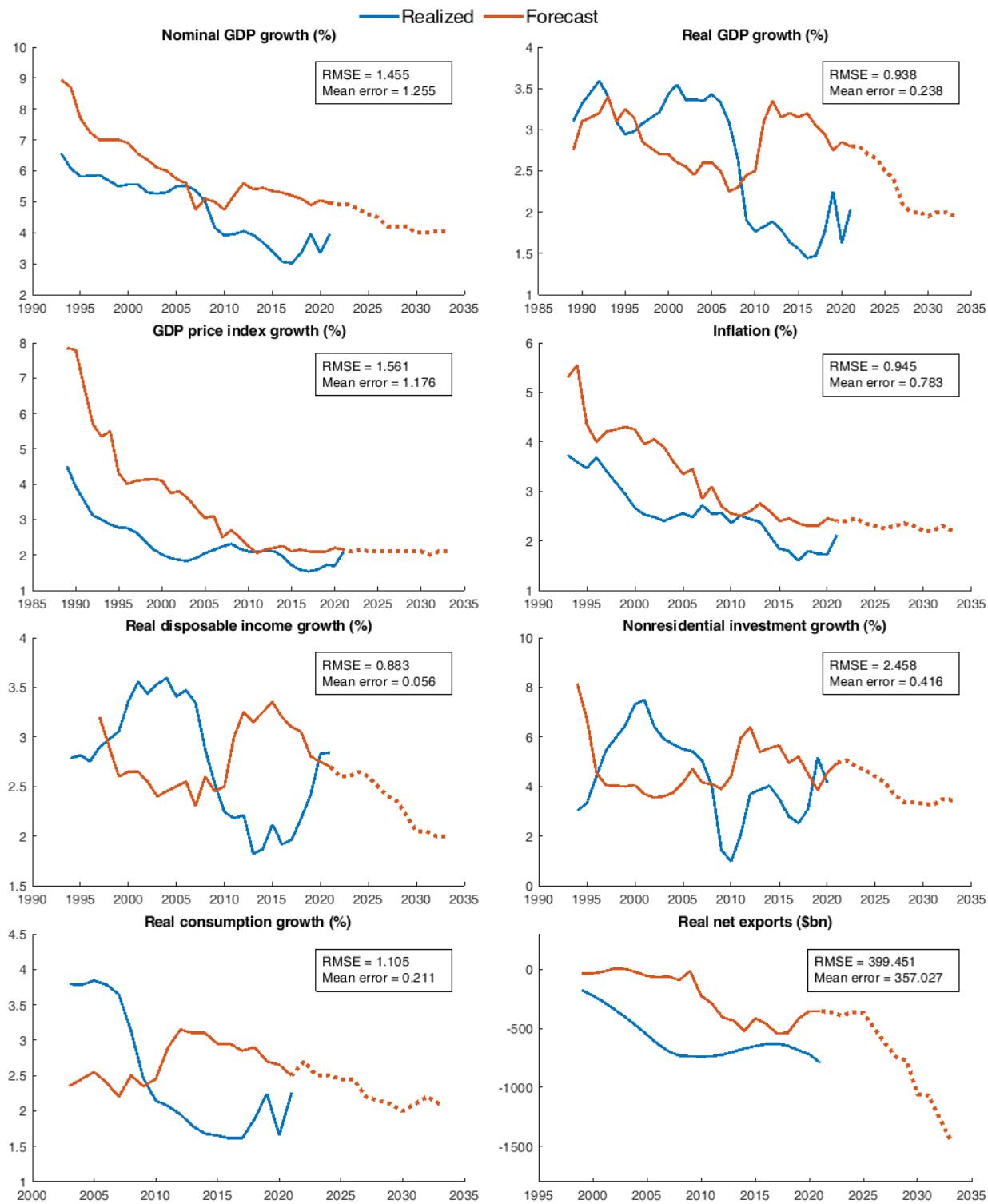
## What do we find?

1. Forecast errors appear relatively large with the RMSEs of the long-run forecasts exceeding the standard deviations of 10-year averages of the data. That does not immediately mean they are “inefficient” in the sense of not making full use of all relevant information, as many of these macro variables appear non-stationary. That is, the means of their distributions seem to be changing over time. If these mean changes are not forecastable, then they will produce large, persistent forecast errors.
2. Forecasting performance is somewhat worse for nominal measures than for real measures.

<sup>4</sup> The reason that RMSEs are much better than standard deviations of forecasts error is that a forecast that is always wrong by the same amount will show little volatility of the error, erroneously suggesting high accuracy.

**Figure 1a: Forecast and realized values for US macro variables over 10-year periods**

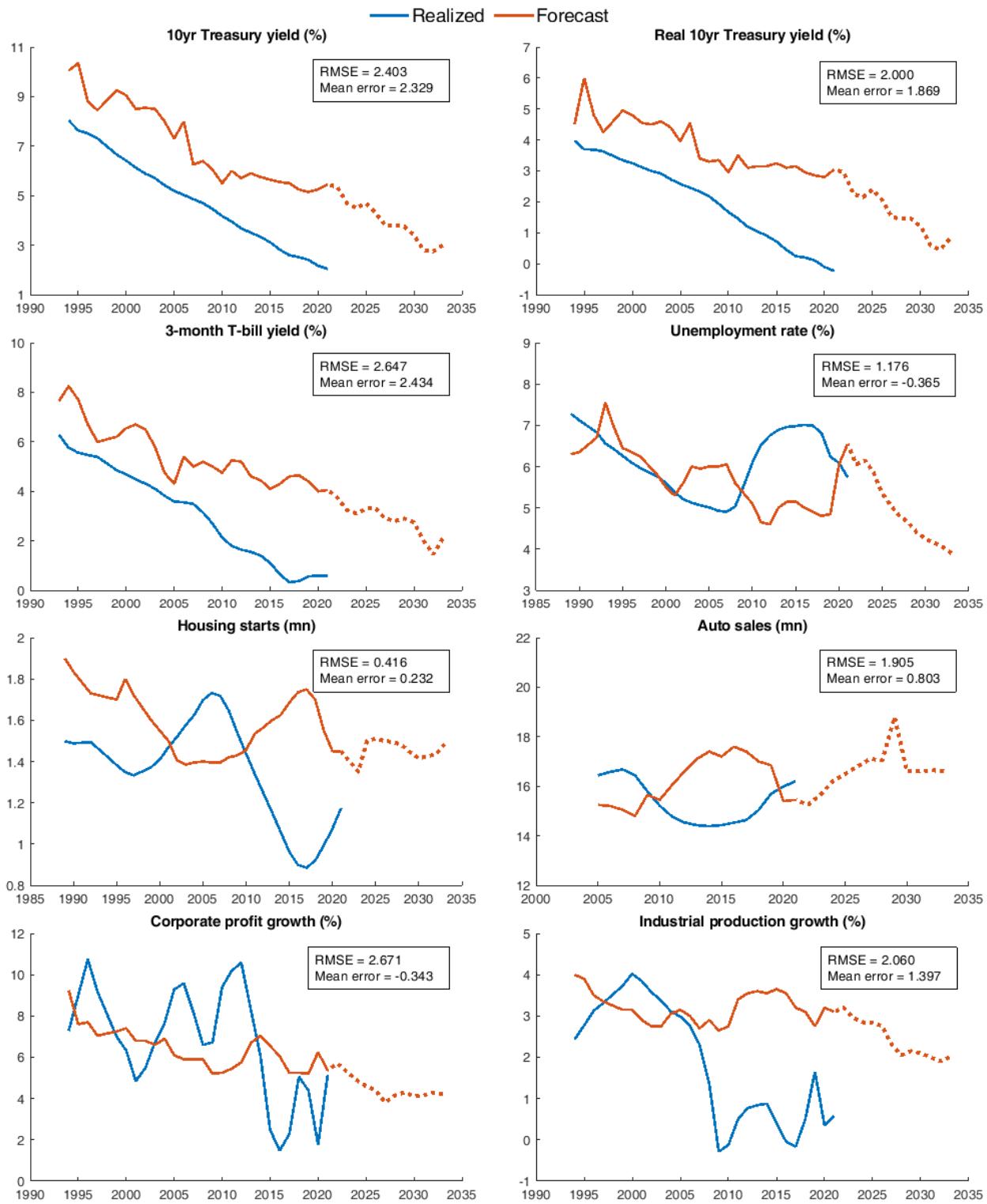
Annual data. Forecasts are from March (or May) surveys. Realized and forecast values shown at end of each 10-year period.



Sources: J.P. Morgan, Wolters Kluwer/Haver Analytics, BEA, BLS, Board of Governors of the Federal Reserve System.

**Figure 1b: Forecast and realized values for US macro variables over 10-year periods**

Annual data. Forecasts are from March (or May) surveys. Realized and forecast values shown at end of each 10-year period.



Sources: J.P. Morgan, Wolters Kluwer/Haver Analytics, BEA, BLS, US Census Bureau, Board of Governors of the Federal Reserve System, Federal Reserve Bank of Philadelphia.

**Table 1: RMSEs and mean errors of long-run economic forecasts, and standard deviations of data**

Annual data. See appendix for data details.

Variable	Standard deviation	Forecast RMSE	Forecast mean error
Nominal GDP	1.03%	1.45%	1.25%
Real GDP	0.76%	0.94%	0.24%
GDP price index	0.66%	1.56%	1.18%
Inflation (CPI)	0.60%	0.94%	0.78%
Real disposable income	0.61%	0.88%	0.06%
Nonresidential investment	1.68%	2.46%	0.42%
Real consumption	0.85%	1.10%	0.21%
Real net exports	178bn	399bn	357bn
Industrial production	1.43%	2.06%	1.40%
Corporate profit	2.64%	2.67%	-0.34%
10yr Treasury yield (nominal)	1.78%	2.40%	2.33%
10yr Treasury yield (real)	1.31%	2.00%	1.87%
3-month T-bill yield	1.88%	2.65%	2.43%
Unemployment rate	0.75%	1.18%	-0.36%
Housing starts	0.25mn	0.42mn	0.23mn
Auto sales	0.84mn	1.91mn	0.80mn

Sources: J.P. Morgan, Wolters Kluwer/Haver Analytics, BEA, BLS, US Census Bureau, Board of Governors of the Federal Reserve System, Federal Reserve Bank of Philadelphia.

3. There is large **error persistence, or bias**, for certain variables, most notably inflation, interest rates, and net exports, where forecasts were always above what was actually realized over the following 10 years. For these variables, the mean error is significantly different from zero and large versus the volatility of the underlying series.
4. But forecasts for the majority of the real variables, real GDP growth and its components, show only small bias that is probably not statistically significant. For these variables, the mean error is below the volatility of the underlying series.
5. **Corporate profit growth** was the only nominal variable with little bias, which is surprising given it

exhibits the same long-term trend as **nominal GDP** for which there was large upside bias.

5. On average, **forecast bias leans toward the bullish side**. For example, unemployment was forecast on average to be lower than realized, while GDP growth was forecast on average to be higher than realized.

## What explains large forecast errors?

With forecast errors relatively large compared to delivered volatility and exhibiting persistent bias on the macro growth-bullish side, the suspicion might emerge that these forecasts may not be efficient or rational and may be more salesmanship than objective forecasting.

We are not convinced this criticism is right, but we need to at least investigate it and assess whether different approaches could do better. A first port of call is to see whether we can understand how these forecasts are actually made and whether such approaches to forecasting make sense. There is a large literature on forecasting that reveals that the dominant approach is what economists call "**adaptive**." That is, forecasters generally base their forecasts for the future on what they have observed in the recent to more distant past.

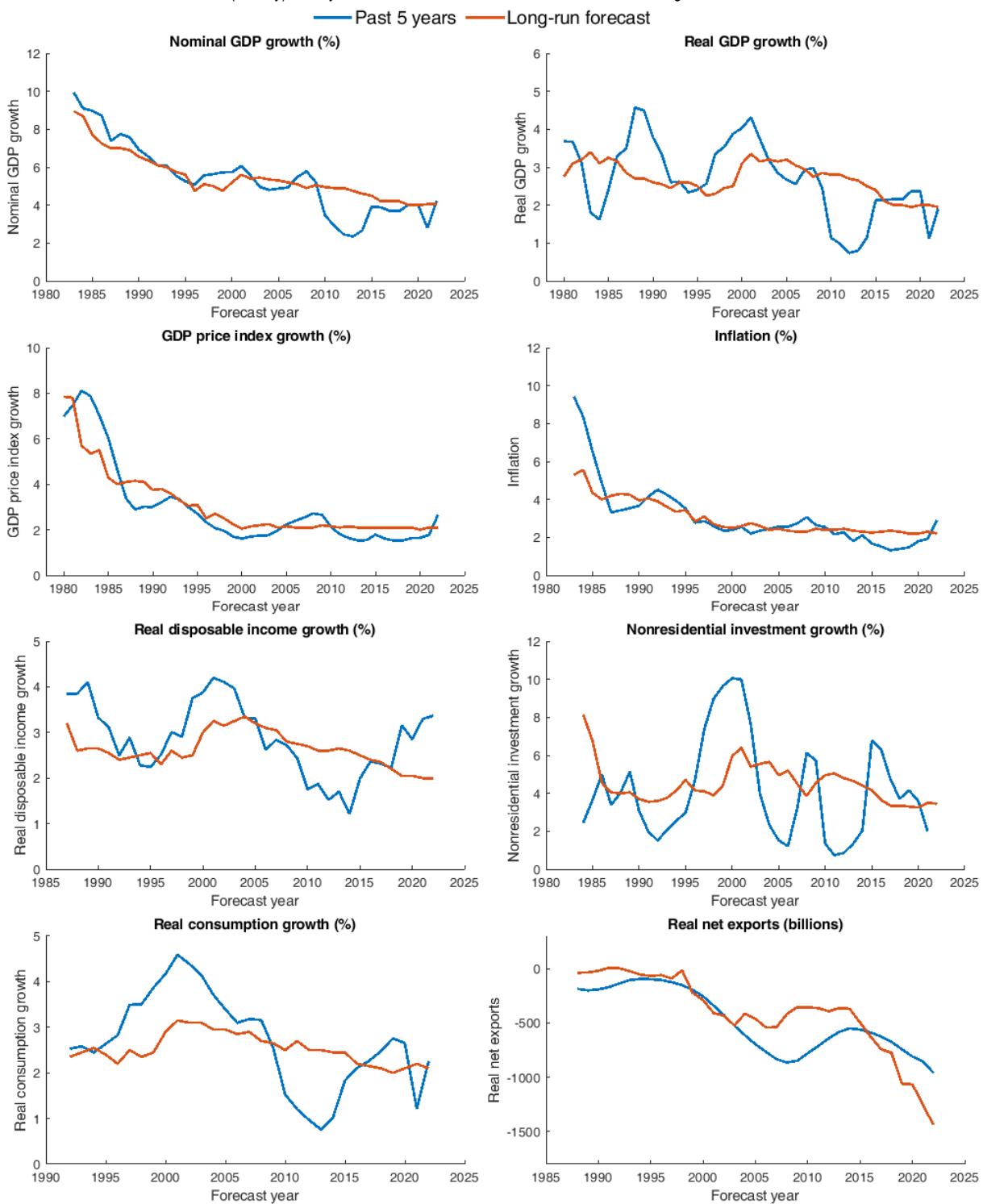
Figures 2a-b show the 10-year forecasts for the 16 macro variables against the five-year rolling average of these variables up to the year when the 10-year forecasts were made. Uniformly across different variables, averages in the preceding five years closely resemble the forecasts made.

**Whether it is reasonable to construct forecasts in an adaptive manner is an open question.** Fundamentally, the 16 macro variables considered boil down to real economic growth, real interest rates, and inflation, since most of the real economic activity variables are components of GDP and are thus tightly related to overall economic growth. While economic theory identifies many long-run determinants of these variables, empirical research has not settled on a singular quantitative forecasting model that is everywhere and always appropriate.

With respect to **economic growth**, it is an accounting identity that growth is determined by labor force and labor productivity growth. While demographic trends are relatively predictable, these trends do not necessarily indicate the path of labor force participation, while labor productivity growth is notoriously difficult to forecast.

**Figure 2a: Forecasts versus rolling averages in the preceding five years**

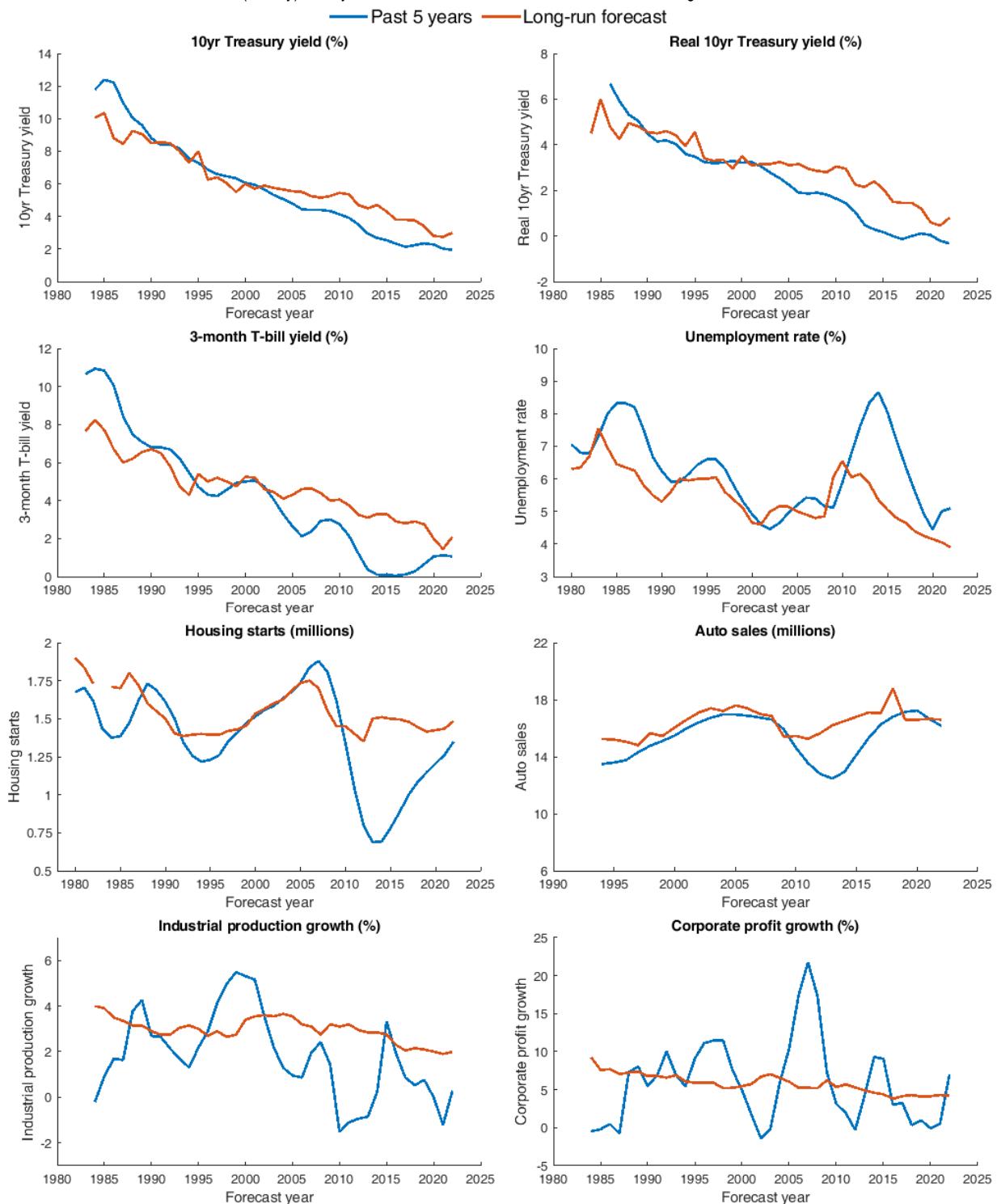
Annual data. Forecasts are from March (or May) surveys. Forecast values shown at the date of forecasting.



Sources: J.P. Morgan, Wolters Kluwer/Haver Analytics, BEA, BLS, Board of Governors of the Federal Reserve System.

**Figure 2b: Forecasts versus rolling averages in the preceding five years**

Annual data. Forecasts are from March (or May) surveys. Forecast values shown at the date of forecasting.



Sources: J.P. Morgan, Wolters Kluwer/Haver Analytics, BEA, BLS, US Census Bureau, Board of Governors of the Federal Reserve System, Federal Reserve Bank of Philadelphia.

In relation to **real interest rates**, economic theory dictates that rates are governed by the supply and demand for capital (saving and borrowing), but empirical research has not settled on an exhaustive quantitative model that reconciles the many factors, as we recently [discussed](#).

**Inflation** is postulated to be driven by the imbalance between aggregate supply and demand, but there are substantial difficulties in quantifying the latter *ex ante*. However, inflation forecasting has been simplified somewhat in recent decades as central banks have given primacy to inflation control objectives. Inflation forecasts will thus reflect perceptions of the credibility of central banks and their capacity to give effect to their stated objectives.

With a lack of theoretical consensus on how to quantitatively forecast these macro variables, it is probably reasonable for economic forecasters to use recent history as a guide. If the variable is believed to have a stable mean, then the forecasts should use as long as possible a history over which to estimate the mean. By contrast, one should use short look-backs to project the future for macro variables that are understood or observed to be non-stationary

Based on the preliminary evidence that forecasts are made adaptively, we assess in Table 2 which look-back period between 1 and 15 years best characterized (in the RMSE sense) the forecasts made for each variable. For real economic variables, forecasts typically closely resembled averages over long periods before the issuance of the forecast. For nominal variables, such as inflation, forecasts more closely resembled averages over shorter periods.

The third column of Table 2 reports the look-back period between 1 and 15 years that would have performed best in forecasting (in the RMSE sense). Comparison of the second and third columns reveals that, within the class of adaptive expectation models, **our inferred forecast adaptive lags were generally close to optimal**. The greatest divergence between actual and optimal adaptive forecasting was observed in forecasts of interest rates. *Ex post*, it is apparent that interest rates were non-stationary over the survey period. However, consensus forecasts appeared to continually predict a return to “normality” or “equilibrium.”

## Can we do better?

In the preceding analysis, it is clear that **an adaptive approach to forecasting performs relatively poorly**

**when the variable to be forecast is non-stationary.** In these cases, there is a compelling argument for considering structural trends or changes when constructing forecasts.

**Table 2: Look-back periods that best characterize forecasts made (left) compared to those that provided the most accurate forecasts (right)**

Annual data

Variable	Forecast look-back years	Optimal look-back years
Nominal GDP	6	4
Real GDP	15	12
GDP price index	7	1
Inflation (CPI)	3	2
Real disposable income	15	13
Nonresidential investment	15	15
Real consumption	15	15
Real net exports	1	1
Industrial production	15	15
Corporate profit	15	15
10yr Treasury yield (nominal)	11	1
10yr Treasury yield (real)	14	1
3-month T-bill yield	15	1
Unemployment rate	15	15
Housing starts	15	15
Auto sales	4	10

Sources: J.P. Morgan, Wolters Kluwer/Haver Analytics, BEA, BLS, US Census Bureau, Board of Governors of the Federal Reserve System, Federal Reserve Bank of Philadelphia.

In recent papers, we have tried to do better than simply using a rolling average of past values to make long-term forecasts. In [A demographic reversal to start pushing real interest rates up](#) (March 2, 2022), we used demographic projections to assess how the balance between savings and investment is likely to change in the coming decade, with implications for real interest rates. In [Long-term forces point to higher US bond yields](#) (April 4, 2022), we

combined demographics with 10 other structural forces driving interest rates to forecast that the real UST 10-year bond yield will reach ~2.5% in 10 years. In [Long-Term FX Forecasts](#) (December 14, 2021), we used the mean-reverting property of real exchange rates to make better long-term FX forecasts. Finally, in [Inflation, markets and the end of the Great Moderation](#) (September 27, 2021), we made the argument that political and policymaker dissatisfaction with the fact that central bank inflation control coincided with, and maybe contributed to, weaker economic growth and worsening wealth inequality and is thus leading the US fiscal authority to focus on creating faster recoveries, which will speed up the business cycle and produce more volatile but probably also higher inflation on average.

This approach is an application of the well-known [Lucas Critique](#) in econometrics. Accordingly, policymakers choose optimal policy rules on the basis of past experience when these new rules may not have been in place yet. When the rules change, economic behavior adapts to it, and the new rules may no longer be optimal. When policymakers recognize this, they re-optimize and choose a new set of rules, which after a while will again turn out to be suboptimal. A variation to this is also known as the [Goodhart Law](#): whatever the central bank tries to control will eventually become unstable in its relation to the policymaker's ultimate objective.

During major unanticipated events, especially those on the downside such as recessions or crises, this learning process of policymakers and economic agents can accelerate and lead to faster behavioral changes that one can call regime changes, or paradigm shifts.<sup>5</sup> We would argue that we are currently at the beginning of such a regime shift in US economic policy that will reverberate across the world and will induce some other countries to follow the US lead, especially if it is successful.

**Are our more structural and model-based approaches to long-term forecasting, which we have published in *The Long-term Strategist* over the past four years, superior to the *Blue Chip* consensus?** We feel comfortable with our views, but, given our short sample, **cannot prove objectively that they are superior** to a consensus of a sample of top economists in the country. A single forecaster, confident as they may be, is generally not as accurate in their views as the average of

<sup>5</sup> Our sister publication, *J.P. Morgan Perspectives*, has an annual issue dedicated to such paradigm shifts. The last two are Joyce Chang et al., [Paradigm Shifts: What Lies Ahead?](#) (April 5, 2019) and [Pandemic Accelerates Paradigm Shifts](#) (July 8, 2020).

the top forecasting houses in the country. **We must thus stay humble in our forecasting abilities and cannot reject the hypothesis that the *Blue Chip* consensus is probably the best we have.**

## Using past accuracy to assess risk around current long-term forecasts

For a number of measures, bias in long-run forecasts is relatively small and forecast errors are approximately distributed around zero with dispersion characterized by the RMSE. For these measures, it is reasonable to use the distribution of forecast errors to construct confidence intervals around long-run consensus forecasts made in 2022. Table 3 contains long-run consensus forecasts and confidence intervals within which approximately two-thirds of realizations should fall based on historical forecasting performance for all variables where the absolute value of the mean forecasting error is smaller than the standard deviation of the underlying data.<sup>6</sup> As is evident in the RMSEs, these confidence intervals are relatively wide, even where forecasts were approximately unbiased.

**Table 3: Long-run consensus forecasts for 2024-2033 for measures with approximately unbiased forecasts and two-thirds confidence intervals based on historical forecast errors**  
Annual data.

Variable	Forecast average (2024-2033)	Two-thirds lower bound	Two-thirds upper bound
Real GDP	1.95%	1.01%	2.89%
Real disposable income	2.00%	1.12%	2.88%
Nonresidential investment	3.45%	0.99%	5.91%
Real consumption	2.10%	1.00%	3.20%
Industrial production	2.00%	-0.06%	4.06%
Corporate profit	4.20%	1.53%	6.87%
Unemployment rate	3.90%	2.72%	5.08%
Housing starts	1.485	1.069	1.901
Auto sales	16.60	14.695	18.505

Sources: J.P. Morgan, Wolters Kluwer/Haver Analytics, BEA, BLS, US Census Bureau, Board of Governors of the Federal Reserve System.

## Conclusion

Corporates and strategic investors need to make long-term forecasts of economic and financial variables that

<sup>6</sup> The confidence interval is constructed as the point forecast plus and minus the RMSE.

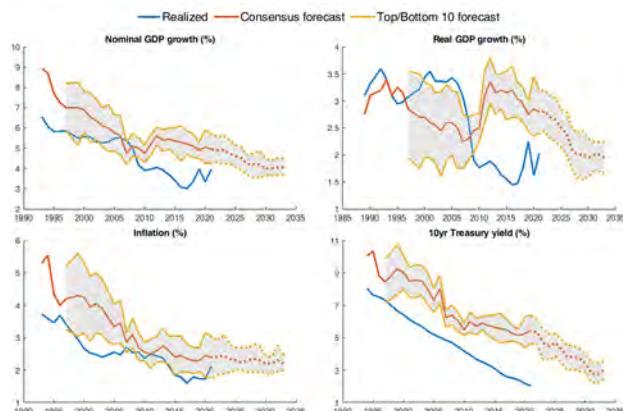
will impact the performance of their investment decisions, but they also need measures of risk around those forecasts. An extended history of long-run *Blue Chip* consensus forecasts reveals that forecasting errors have been relatively large, with performance somewhat worse for nominal measures than for real measures. While forecast errors are quite large, forecast bias is relatively small for the majority of real variables, such as real GDP and its components. By contrast, there are large and persistent biases in forecasts of some variables, such as inflation, interest rates, and net exports. Using this forecasting record, it is possible to construct forecast risk intervals, which are relatively wide for most variables.

## Appendix: Top and bottom 10 forecasts

In addition to the consensus forecasts, most *Blue Chip* surveys also report the averages of the top and bottom 10 forecasters. These forecasts are plotted in Figure 3 alongside the realized values for these variables over the corresponding 10-year period. These forecasts are approximately symmetric about the consensus forecast. For those variables for which forecasts were persistently upward biased, the average of the bottom 10 forecasts predictably outperforms the consensus. This is not more generally true for variables with approximately unbiased consensus forecasts. It is worthwhile noting that the dispersion of these long-run forecasts around the consensus decreased in surveys issued in the mid 1990s, likely reflecting a recognition of the advent of the Great Moderation.

**Figure 3: : Top and bottom 10 forecast and realized values for US macro variables over 10-year periods**

Annual data. Forecasts are from March (or May) surveys. Realized and forecast values shown at end of each 10-year period.



Sources: J.P. Morgan, Wolters Kluwer/Haver Analytics, BEA, BLS, Board of Governors of the Federal Reserve System.

## Appendix: Data details

*Blue Chip* forecasts for growth variables are reported as the average change year over year in five-year windows. For example, the March 2010 survey asks respondents about their forecast for average US real GDP growth (among other variables) in the 2012-16 and 2017-21 windows. To be precise, these windows refer to the average rate of real GDP growth in 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, and 2021. The corresponding rate in the data is calculated as follows:

$$g_{2012-21} = \left( \frac{GDP_{2021}}{GDP_{2011}} \right)^{\frac{1}{10}} - 1$$

The starting point is taken to be GDP recorded in 2011 to ensure that we include growth in 2012, not growth from the 2012 level. For measures of inflation, we calculate the realized rate using the final recorded price index in 2011 and 2021, instead of an annual index level.

The precise measure of pretax corporate profits is not specified in the *Blue Chip* survey. For comparison with economic data, we use “Corporate profits before tax (without IVA and CCAdj)” data from the US National Income and Product Accounts (NIPA).

Date coverage in the *Blue Chip* forecasts varies by variable. Table 4 indicates the first and last long-run forecast used for each variable. Earlier long-run forecasts for auto sales are dropped due to inconsistencies in the survey question—some surveys asked only about cars, other surveys asked about cars and light trucks.

While the surveys do not ask about expectations for real 10yr Treasury yields, we construct implied consensus forecasts for real yields using forecasts for nominal 10yr Treasury yields and inflation. In order to construct forecasts for *ex ante* real yields at a point in time, one needs forecasts for nominal yields and inflation expectations at that time. While we do not have forecasts for inflation expectations in the future, we note that long-run forecasts of inflation in five-year windows beginning two and seven years out are invariably very similar, so it is reasonable to infer that forecasters would anticipate future inflation expectations at approximately that level. Thus, we assume that future inflation expectations are equal to forecast future inflation. As it happens, forecasts of *ex ante* real yields are equivalent to forecasts of *ex post* real yields under this assumption.

**Table 4: Date coverage for long-run forecasts used in analysis**

See text for discussion of 10yr real Treasury yield forecasts.

Variable	First forecast	Last forecast
<i>Nominal GDP</i>	1983	2022
<i>Real GDP</i>	1980	2022
<i>GDP price index</i>	1980	2022
<i>Inflation (CPI)</i>	1983	2022
<i>Real disposable income</i>	1984	2022
<i>Nonresidential investment</i>	1984	2022
<i>Real consumption</i>	1992	2022
<i>Real net exports</i>	1988	2022
<i>Industrial production</i>	1984	2022
<i>Corporate profit</i>	1984	2022
<i>10yr Treasury yield (nominal)</i>	1984	2022
<i>10yr Treasury yield (real)</i>	1984	2022
<i>3-month T-bill yield</i>	1983	2022
<i>Unemployment rate</i>	1980	2022
<i>Housing starts</i>	1980	2022
<i>Auto sales</i>	1994	2022

Sources: J.P. Morgan, Wolters Kluwer/Haver Analytics.

For the purposes of evaluating the accuracy of real yield forecasts, real yields in the historical data are constructed at a monthly frequency by subtracting 10-year-ahead expected inflation from the nominal 10yr Treasury yield. Annual rates are then constructed as the average monthly rate. Inflation expectations are from either the Survey of Professional Forecasters, the Livingston Survey, or the *Blue Chip Economic Indicators*, depending on availability. All of these data are sourced from the Philadelphia Fed.<sup>7</sup>

<sup>7</sup> Inflation expectations are available at a quarterly frequency. Inflation expectations are taken to be the same for each month within a quarter. Where there are no 10-year ahead inflation expectations data for a quarter, the value is interpolated.

## The Long-term Strategist

Bonds time diversify much better than you think

- Time diversification requires mean reversion in periodic returns. Long run, we do find mild mean reversion in US equity returns and mean aversion in US Treasuries, which is the basis for the classic advice that young people should hold more equities than older ones.
- Equities time diversify better because both earnings growth and multiples mean revert over the long run, while real bond yields and inflation have not.
- We disagree, though, with the broad advice that long-term investors should have lower weights on bonds than short-term investors.
- For one, the risk on bonds 10-years out is much lower than indicated by historic volatility as the price/yield at which you buy bond funds significantly narrows the range of outcomes and thus risk relative to the broader range of historic returns.
- Equity return uncertainty 10 years out also falls once you take account of today's entry price, but less than for USTs. Beyond 10-years out, equity return risk does fall vs USTs.
- Time diversification is usually seen as a dichotomy between stocks and safer government bonds. This misses an important third asset -- high-yield corporate bonds – that fit in between stocks and USTs and that combine the best of both, making them tops for time diversification.
- HY bonds, both DM and EM, time diversify best as HY spreads and defaults mean revert more reliably and faster than equity returns do.
- Target date funds should include HY corporates, both DM and EM, instead of only equities and government bonds, and allocate steadily more to HY, in longer dated portfolios. Ideally, they should also regularly rebalance allocations based on the current yield of different asset classes.

### Long-term Strategy

**Jan Loey** AC

(1-212) 834-5874

jan.loey@jpmorgan.com

J.P. Morgan Securities LLC

**Shiny Kundu**

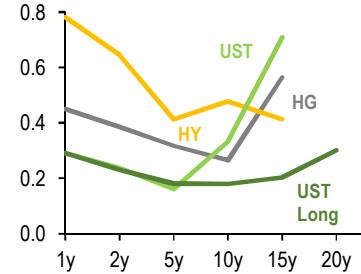
(91-22) 6157-3373

shiny.kundu@jpmorgan.com

J.P. Morgan India Private Limited

Ratios of annualized standard errors of regression against yield of USTs, HG and HY bonds to US equities, by holding period

Standard errors multiplied by square root of holding period. UST Long with 20y period refers to history since 1876. Other ratios are for more recent histories as in Table 3.



Source: J.P. Morgan, S&P, Bloomberg Barclays,  
<http://www.econ.yale.edu/~shiller/data.htm>.

### What is Time diversification?

Investors can reduce risk by diversifying their holdings across different types of assets that are not highly correlated to each other. Similarly, they can diversify portfolio risk over time by holding assets over longer periods if the periodic returns on their holdings are themselves negatively correlated over time. Thus **time diversification** holds if low returns in one year are followed by higher ones in another year, and vice versa.

## Evidence

Time diversification requires *negative* serial correlation in asset returns<sup>1</sup>. It manifests itself in holding-period return annualized volatility falling as assets are held over longer periods. To check this, we make use of two long time series for the US: equity and bond (UST) returns from the Robert Shiller database since 1876, and equity, UST, HG and HY bond returns over more recent periods, depending on availability.

Tables 1 (LHS) and 2 show that the **standard deviations of compound annual total returns on these asset class returns fall as holding period lengthens<sup>2</sup>**. However, this does not tell us that risk falls with holding period or that there is time diversification. A 1% risk on a 10-year annual compound return obviously creates more end-of-period wealth risk than that same 1% on a shorter period.

**Table 1: Volatility of Compound US Returns by Holding Period, Outright and Annualized**

%, annual, 1876-2014. Annualized vol is the standard deviation of the compound returns times the square root of the number of years in the holding period.

Holding Period	Volatility		Annualized Vol	
	Equities	USTs	Equities	USTs
20y	3.53	2.29	15.80	10.25
15y	4.21	2.41	16.31	9.34
10y	4.99	2.55	15.79	8.06
5y	7.56	2.93	16.90	6.56
2y	12.79	4.08	18.09	5.77
1y	17.42	5.96	17.42	5.96

Source: J.P. Morgan, <http://www.econ.yale.edu/~shiller/data.htm>. Last observation 2014.

The best way to detect time diversification is to convert the different period return volatilities to an annual basis through the **square root of time rule**. That is, if there is no serial correlation in annual returns, then the risk around the compound return over say 10 years is the same as that on one year when multiplied by the square root of time, 10. Without serial correlation, the

<sup>1</sup> Low, but positive serial correlation is not enough to diversify risk across time. The theorem of market efficiency implies asset prices are random walks with trend, and returns are uncorrelated over time. If returns are serially uncorrelated, the efficient frontier does not change for different holding periods and time diversification does not work.

<sup>2</sup> We calculate returns and volatilities over all possible holding periods in our samples. It would be ideal to employ only non-overlapping periods, but we find that these give us virtually the same results.

probability of equities outperforming bonds does not change with holding period. Table 1 (RHS) and Table 3 show the results of this annualization. Figure 1 shows the same in graphical form.

**Table 2: Volatility of compound US returns by holding period**

% standard deviation, annual, start of series in parentheses

Holding Period	Equities (1951)	USTs (1972)	HG (1972)	HY (1983)
15y	4.01	2.45	2.32	1.54
10y	5.08	2.85	2.69	2.44
5y	7.12	3.53	3.89	4.35
2y	11.87	4.66	5.99	8.98
1y	17.13	6.31	8.58	14.56

Source: J.P. Morgan, S&P, Bloomberg Barclays. Last observation is 2019.

**Table 3: Annualized volatility of compound US returns by holding period**

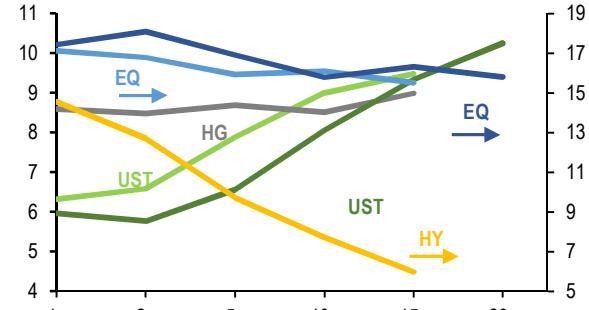
%, annual, start of series in parentheses. Annualized vol is the standard deviation of the compound returns times the square root of the number of years in the holding period.

Holding Period	Equities (1951)	USTs (1972)	HG (1972)	HY (1983)
15y	15.52	9.48	8.98	5.97
10y	16.08	9.00	8.51	7.73
5y	15.93	7.88	8.69	9.73
2y	16.78	6.58	8.47	12.70
1y	17.13	6.31	8.58	14.56

Source: J.P. Morgan, S&P, Bloomberg Barclays. Last observation is 2019.

**Figure 1: Annualized volatilities of compound returns on different asset classes by holding period**

%, EQ and UST lines with 20yr periods refer to history since 1876. Others are for more recent histories as shown in Table 3.



Source: J.P. Morgan, S&P, Bloomberg Barclays, <http://www.econ.yale.edu/~shiller/data.htm>.

We notice that equity return volatility on 10-year holding periods is about 1 % point lower than its 1-year volatility on both the last 70 and 140 years of history. That is, it is

~1% lower than it would be if returns had been serially uncorrelated, thus showing slight time diversification.

**With US Treasuries, we find the opposite, as annualized volatility increases with holding period.** In the case of US HG corporate bonds, we find neither positive nor negative serial correlation and thus see no evidence here of time diversification. **HY bonds, in contrast, time diversify best.**

The results in Tables 2-3 including corporate bonds are not strictly comparable across asset classes as they are not each for the same period. Table 4 presents the same calculations for annualized volatility for only the shortest common history since 1983. It no longer shows time diversification for equities, reduces the mean aversion for bonds and now offers slight time diversification for HG corporate debt. The absolute levels of time diversification shift a bit, but the relative conclusions remain the same.

**Table 4: Annualized volatility of compound US returns by holding period since 1983**

%, annual, start of series in parentheses

Holding Period	EQ	USTs	HG	HY
15y	16.14	7.02	6.33	5.97
10y	17.60	7.03	6.31	7.73
5y	18.15	6.49	6.27	9.73
2y	17.08	6.22	6.68	12.70
1y	16.48	6.06	7.01	14.56

Source: J.P. Morgan, S&P, Bloomberg Barclays. Last observation is 2019.

### And in real terms ...

Much of the Finance literature analyses time diversification on real, inflation-adjusted returns, as there are more relevant for investors over the long run than nominal ones. Table 5 below repeats the Table 1 analysis of equity and UST returns since 1876 now for real returns by deducting CPI annual changes from nominal returns. We find little changed, except that UST volatility is a bit higher in real than in nominal terms.

**Table 5: Volatility of compound real US returns by holding Period, outright and annualized**

%, annual, nominal return minus 1-year % change in CPI, 1876-2014.

Holding Period	Volatility		Annualized Vol	
	Equities	USTs	Equities	USTs
20y	3.31	2.48	14.81	11.08
15y	4.19	2.96	16.22	11.47
10y	5.29	3.49	16.71	11.03
5y	7.78	4.43	17.41	9.91
2y	12.91	6.49	18.25	9.18
1y	17.68	8.73	17.68	8.73

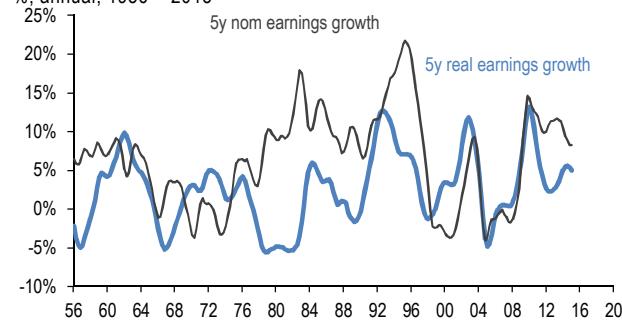
Source: J.P. Morgan, <http://www.econ.yale.edu/~shiller/data.htm>. Last observation 2014.

### What makes time diversification work?

For time diversification to work, some of the components of return need to be negatively correlated over time. That is, they **need to mean revert**. We know from the empirical finance literature that at least in equities, returns are generally positive serially correlated (displaying momentum) from month to month and quarter to quarter, but tend to be negatively correlated, and thus mean revert, over a number of years<sup>3</sup>. Equity price movements consist by identity of changes in earnings and in price-earnings multiples. Figure 2-3 show the multiples and 5-year rolling earnings growth of S&P500 companies at the index level, displaying both shorter-term higher-frequency momentum and longer-term, lower-frequency mean reversion.

**Figure 2: 5-year earnings growth S&P 500, real and nominal**

%, annual, 1956 – 2015

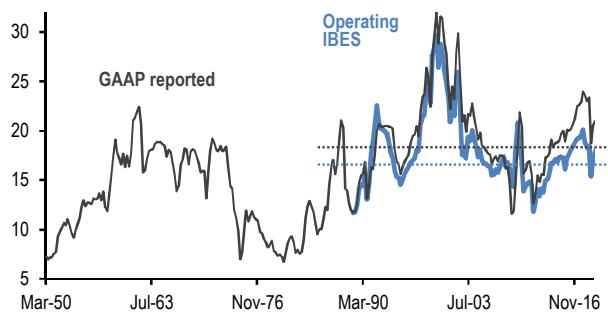


Source: J.P. Morgan, S&P, last observation is 2020.

<sup>3</sup> See e.g., Empirical Asset Pricing. The Cross Section of stock Returns, Bali, Engle and Murray, Wiley, 2016, 494 pp. See also my [What have I learned?](#), The JPMorgan View, Nov 10, 2017, where I summarize what I learned from decades as a tactical strategist and where I conclude that short term, momentum drives both fundamentals and asset prices.

**Figure 3: 12 Trailing PE S&P 500, reported vs operating**

Quarterly, Q1 1950 – Q4 2019



Source: J.P. Morgan, Thomson Reuters, Bloomberg, S&P. Last observation is 2019.

**This mean reversion is not on display in the case of bonds.** Figure 4-5 show both nominal and real bond yields at a global level since 1970-75, providing steady trending declines for more than 40 years now. This momentum over periods longer than 10 year is the likely cause of the expanding return volatility when bond portfolios are held over longer periods.

**Figure 4: Global government bond yields**

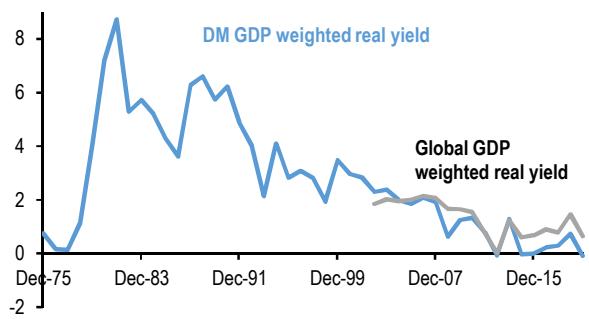
%, nominal, 10-year maturity, GDP weighted, 1970 – 2019. EM is measured through our GBI EM index.



Source: J.P. Morgan, OECD, last observation is Dec 2019.

**Figure 5: Real global government bond yields**

%, 10-year maturity minus 5-year rolling headline inflation, GDP weighted, 1970 – 2019. EM is measured through our GBI EM index.

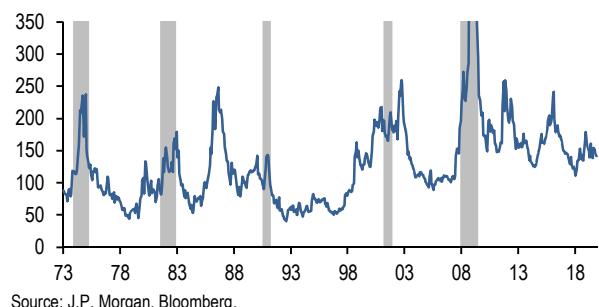


Source: J.P. Morgan, OECD, last observation is Dec 2019.

For corporate bonds, Figure 6-7 shows the clear mean reversion over business cycles in US HG spreads and HY credit spreads and defaults. Mean reversion in spreads was thus able to offset mean *aversion* in UST yields. In the case of HG, this brought time diversification to zero, but in the case of HY, where spreads are much larger and more volatile, spread mean reversion has dominated and made HY bonds the best for time diversification.

**Figure 6: US High Grade credit spreads over USTs**

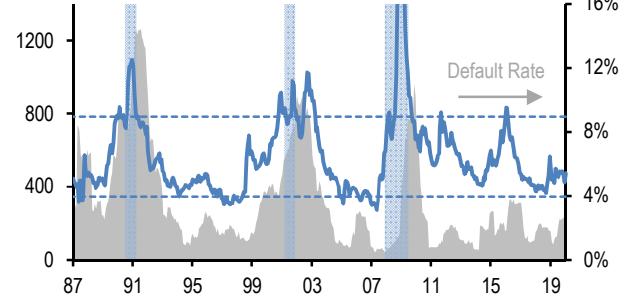
bp, monthly, 1973 – Oct 2019.



Source: J.P. Morgan, Bloomberg.

**Figure 7: US High-Yield credit spreads over USTs**

bp, monthly, Jan 1987 – Dec 2019.



Source: J.P. Morgan, Bloomberg.

## Knowing where you start makes a difference

The above results are consistent with the consensus of the Finance literature on time diversification<sup>4</sup>. We do think, however, that there is an **important consideration missing from this literature that “unfairly” biases long-term investors against fixed income.**

The important consideration is that at the start of any period over which to judge asset returns and risks, **investors have important information that greatly narrows the scope of possible returns they can earn on these assets**. That information is the **price and IRR at which we buy the asset**. The above studies on time

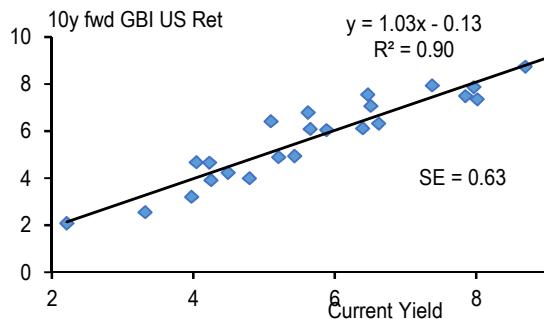
<sup>4</sup> For an overview, see e.g., [The Time Diversification puzzle: A Survey](#), Bianchi, drew and Walk, Financial Planning Research Journal, Sep 2016.

diversification implicitly assume that the next X years of returns are generated by random sampling from the population of past returns. This approach assumes the investor knows nothing more about the future than the historical returns and thus can only estimate risk from the range of historic returns.

As investors, though, we **do know** that the starting yield of an asset is important information to assess future returns. It is less well known that it also tells us something about how much risk we run around these return expectations. Consider Figure 8 that shows the 10-year rolling compound returns on our US Treasury index against the index yield at the start of each of these 10-year periods since index inception in 1986. The fit is very tight and the standard error of the regression is only 63bp. Figure 9 shows the 10-year rolling return on the S&P500 against Robert Shiller's cyclically adjusted PE ratio (CAPE) at the start of each period. The fit is much looser, but the standard error is still only 2.9% and a lot lower than the 5% standard deviation of 10-year compound returns over the past 70 and 140 years shown in Tables 1-2 for US equities.

**Figure 8: 10-year rolling US Treasury compound returns against starting yield**

%, annual, index yield at start of each 10-year period on x-axis, 1986- 2019

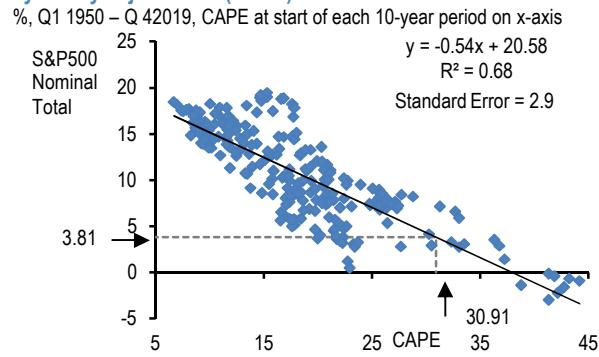


Source: J.P. Morgan, last observation is Dec 2019.

## Why does knowing where you start make a difference?

In the case of equities, knowing the multiple at which you buy the index at the start of your holding period narrows the range of returns you could earn exactly because these multiples tend to mean revert over the medium to long term. It allows you to pinpoint with less uncertainty how multiples could change over time and what kind of returns you can earn. It thus could lower your risk of disappointment.

**Figure 9: 10-year rolling SPX compound returns against starting cyclically adjusted PE (CAPE)**



Source: J.P. Morgan, <http://www.econ.yale.edu/~shiller/data.htm>.

In the case of bonds, the explanation is very different. Bond returns consist of income and price gains/losses. The latter, in the case of default-free bonds, are a direct function of duration times any change in yield that in turn determines future income. The annual return over T years can thus be written (approximately) as average income (mean of starting and ending yield Y) and price change, which equal the change in yield times duration DU, spread over T years, plus the annual slide<sup>5</sup> down the curve.

$$\begin{aligned} TR &= (Y_0 + Y_T)/2 + (Y_T - Y_0)*DU/T + \text{slide} \\ &\quad \begin{matrix} 0 & T & 0 & T \end{matrix} \\ TR &= Y_0 \text{ if } (Y_T - Y_0)/2 = (Y_T - Y_0)*DU/T \quad \text{ignoring slide} \\ &\quad \begin{matrix} 0 & 0 & T & 0 & T \end{matrix} \\ \Rightarrow T &= 2*DU \end{aligned}$$

Ignoring slide for the moment, the annual return over T years will thus equal the starting yield for a bond portfolio as long as the portfolio is held over a period that is twice the duration of the portfolio. With slide, we need to reduce this by about 1-2 years, depending on the average steepness of the curve. Most major bond indices have a modified duration not too far from 6 years. Our UST index duration has averaged 6.3 years over the past 5 years and 5.3 years since inception in 1986. With UST yields now near all time lows, duration has crept up to 7 years. With index duration only slowly changing over time, this implies that over the past few decades, the starting yield would have been a very good estimate of

<sup>5</sup> For those not into bond math, slide is part of bond returns when the curve is upward sloping. By definition, bonds eventually mature and each year lose 1 year in remaining maturity. If the yield curve is unchanged at the end of the year, but is upward sloping, then the yield of each bond will be lower and their price thus higher. Another way of looking at slide is that most bonds are issued at a longer maturity and thus higher yield/coupon than the index average we use for our shortcut approximation for return above. Adding slide is a way of adjusting for this income difference.

what returns to expect over next 10 years. Hence, the close fit in Figure 8. The error, and thus the risk around using the current yield to project future returns would be higher for both shorter and longer holding periods than 10 years<sup>6</sup>.

Beyond the above math, yield is a very good indicator of future return on default-free bonds over a 10 year horizon because any changes in yield that create price volatility in the short term will eventually be offset by changes in coupons on newly issued bonds entering the index. Consider a bear market with steady rises in yields and thus capital losses on bonds. As these bonds gradually mature and are replaced by newly issued bonds, the higher coupons on this new debt eventually offset the earlier capital losses as long as we are considering a period of about twice the duration of the portfolio and duration is relatively stable.

## Impact of starting yield on time diversification

Tables 6-7 replace our volatility measures of Tables 1-3 with the standard error of regressing 1 to 15- or 20-year returns on USTs, HG, HY and Equities against their relevant index yields at the start of each holding period. For HG and HY, we take the index yield, but deduct average annual losses due to downgrades into HY (for HG) and due to default (for HY). This only affects the intercept of the regression. For equities, we use the trailing 12-month earnings yield plus 5-year rolling annual inflation<sup>7</sup>. Figure 10 shows the same in graphical form.

We observe the following

- 1. Return uncertainty declines across all asset classes** after we take account the starting yield. Knowledge reduces uncertainty. Accounting for the starting yield reduces return uncertainty, the further in time one looks.

<sup>6</sup> Risk is not zero, as duration does change over time due to changing issuance patterns and yield changes themselves changing the effective duration of the portfolio. Also, yields may not change in a smooth linear fashion as assumed in our return approximation.

<sup>7</sup> An earnings yield -- the reverse of the PE ratio -- is a real concept and we thus needed to add a measure of expected inflation to make them comparable with our nominal bond yield analysis. Using instead Robert Shiller's cyclically adjusted earnings yield did improve our ability to project 10-year out equity returns but not by much as we thus stay with the simpler trailing PE ratio.

- The reduction in risk from holding assets over a longer period does not really come from any mean reversion in returns that lies at the core of the time diversification thesis, but from using value measures that are more telling about long-term return than about the next few years. Using current yield is valuable information to judge future returns and risks on our holdings, but its value and thus risk reduction improves the further in time we look.

**Table 6: Standard error of compound US returns by holding period, outright and annualized, of regression of returns against start-of-period yield**

%, annual, 1876-2014. Annualized vol is the standard deviation of the compound returns times the square root of the number of years in the holding period

Holding Period	Standard Error (SE)		Annualized SE	
	Equities	USTs	Equities	USTs
20y	3.09	0.93	11.98	3.61
15y	3.69	0.75	14.29	2.89
10y	4.11	0.74	13.01	2.33
5y	7.26	1.31	16.24	2.93
2y	12.74	2.93	18.02	4.15
1y	17.41	5.06	17.41	5.06

Source: J.P. Morgan, S&P, Bloomberg Barclays. Last observation is 2014.

**Table 7: Standard error of compound US returns by holding period of regression of returns against start of period yield**

%, annual, start of series in parentheses

Holding Period	Equities (1951)	USTs (1972)	HG (1972)	HY (1987)
15y	2.06	1.46	1.16	0.85
10y	3.71	1.23	0.98	1.77
5y	6.49	1.04	2.06	2.68
2y	11.67	2.77	4.50	7.54
1y	17.17	4.98	7.71	13.42

Source: J.P. Morgan, S&P, Bloomberg Barclays. Last observation is 2019.

**Table 8: Annualized standard error of compound US returns by holding period of regression of returns against starting yield**

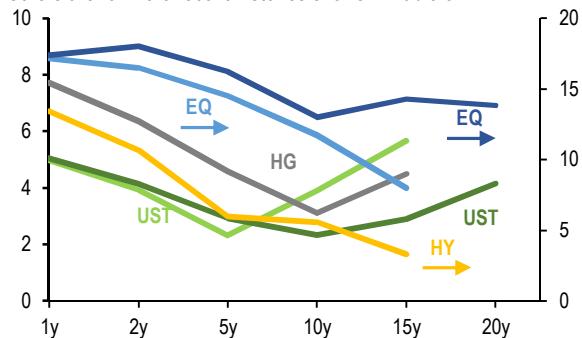
%, annual, start of series in parentheses. Annualized vol is the standard deviation of the compound returns times the square root of the number of years in the holding period

Holding Period	Equities (1951)	USTs (1972)	HG (1972)	HY (1983)
15y	7.99	5.66	4.50	3.30
10y	11.73	3.90	3.11	5.59
5y	14.50	2.33	4.60	6.00
2y	16.51	3.92	6.36	10.66
1y	17.17	4.98	7.71	13.42

Source: J.P. Morgan, S&P, Bloomberg Barclays. Last observation is 2019.

**Figure 10: Annualized standard errors of compound returns of regressing different asset classes against starting yield by holding period**

%, EQ and UST lines with 20yr periods refer to history since 1876. Others are for more recent histories shows in Table 8.

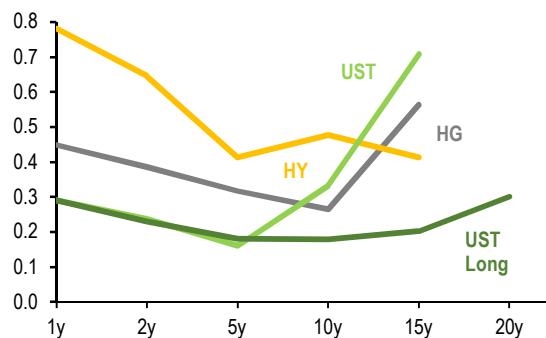


Source: J.P. Morgan, S&P, Bloomberg Barclays,  
<http://www.econ.yale.edu/~shiller/data.htm>.

3. **UST risk** falls enough to now show lower annualized risk at longer-holding periods. This can be interpreted as evidence for **time diversification**, as it must come from early period price changes being offset by later changes in income. But the real factor holding down return risk is knowing the starting yield of your bond portfolio.
4. Broadly consistent with the 2-times-duration rule discussed above, UST uncertainty starts rising again after 10 years on the longer history and 5 years out on our 1951 history. HG bond risk similarly rises after 10 years.
5. Changes in the relative risk of bonds versus equities as we lengthen the holding period no longer favor equities. In fact, at about 5-10 year holding periods, USTs time diversify better than equities. However, this starts reversing as we lengthen the holding periods beyond ten years. Figure 11 depicts the ratios of UST, HG and HY standard errors to those of equities at the same holding period.
6. HG time diversifies now even more dramatically than USTs, showing less risk than USTs at holding periods from 10 years on. **HY bonds remains the time diversification champion.**

**Figure 11: Ratios of annualized standard errors of USTs, HG and HY bonds to US equities by holding period**

Standard errors of regression multiplied by square root of holding period. UST Long refers to history since 1876. Other ratios are for more recent histories as shown in Table 3.



Source: J.P. Morgan, S&P, Bloomberg Barclays,  
<http://www.econ.yale.edu/~shiller/data.htm>.

## Investment implications

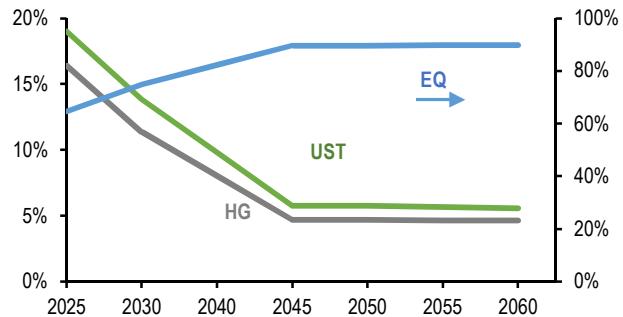
1. **Pure time diversification** that relies on mean reversion of returns, ignoring entry points, does favor equities over government bonds, steepening the risk/return trade off line as we look at investment horizons from 5 years on, with the relative advantage for equities rising as the horizon lengthens.
2. The **advantage for equities** comes largely from real bond yields and inflation trending over long periods and thus not reverting to any mean within a decade.
3. Time diversification **does not lower outright risk**. End-of-period uncertainty on one's wealth still rises with time. Only the relative risk of equities falls versus government bonds.
4. There is more to bonds than USTs. The annualized risk on **HG** corporate bonds does not rise with time, while **HY** bonds, benefitting from mean reversion of spreads and default losses, see **more dramatic time diversification than equities**.
5. We argue that the **entry price/IRR at which you buy your assets** is more important for return uncertainty than statistical mean reversion. Starting yield affects strongly both return and risk on your investments. An asset's IRR is the best indication of what return to expect over the medium to long term, and in turn narrows the range of potential returns you could earn relative to the much wider range delivered in the past.
6. The value of taking your entry point into account to gauge future returns and risk grows the further you look into the future, but only up to a point. Bond

- uncertainty falls most up to 5-10 years out and then reverses for safer bonds while riskier assets such as equities and HY still see further falls in uncertainty.
7. Hence, **investors who only plan 5-10 years out have no reason to favor equities more than those who only look 1 year ahead.** It is only those investing for 15 years or more that should have more equities.
  8. The exception is **HY bonds. Whether ignoring your entry point and taking it into account, HY bonds time diversify better than equities and safer bonds.** For 5- to 15-year out horizons, HY bonds should have a higher strategic weight versus equities and safer bonds than to an investor with only a 1-2 year horizon. HY bonds do not offer a great return to risk on a year-to-year basis, but with greater mean reversion than equities can offer much improved returns to risk over long holding periods.
  9. With only 37 years of return history for HY bonds, relative to some 150 year for USTs and equities, one should not draw strong conclusions on horizons over 20 years in the future. At the same time, the HY results have withstood the test of the x-sigma event of the GFC. Spreads and default losses have been very stationary over this period. We thus feel good about advising to keep higher allocations to HY in 20-year portfolios.
  10. **What to do today?** Our contribution to the time diversification debate is to show that entry points matter and provide good guidance on what returns and risks to expect over the medium term. And we add that this debate has missed the best asset class for time diversification-- HY bonds. With most major bond indices, including HY, now trading near or at all time lows in yields, the question arises, though, whether the now historically low expected returns on bonds do not offset their low risk advantage versus equities on a 5-10 year horizon.
  11. **Value considerations:** In the case of the **Euro area and Japan**, with government bond yields zero to negative and high grade bonds at around 50bp, there is low risk on these bonds 10 year out, in our view, but also no return. Hence, we believe an investor with a positive return target should heavily overweight equities on both the short and the medium term.
  12. In the **US**, bond yields are also near all-time lows, but equity multiples and profit margins are also decently above historic means, with the S&P profit margin just below its all-time high. Based only on our IRR based

regressions, the expected 10 year-out return on UST, HG, HY and SPX equities would be 2.8%, 3.1%, 5.6% and 7.2%, respectively. Using the shorter history from Fig. 10, deducting long-term credit losses for HG and HY and incorporating a view that US profit margins are likely to come down, we would come up with returns of 1.6%, 2.7%, 3.7% and 4.7% for these four asset classes<sup>8</sup>. The expected excess returns do not seem out of order with very long-term means and thus do not suggest that in the US, a long-term investor should favor equities over bonds more so than a short-term investor. If the investor has a minimum return target, we believe this does make the case for a higher equity weight, but that should not be a function of their investment horizon.

13. Do **target date funds** still make sense then? Target date funds are dynamic allocation funds that start with high equity weights for far-out dates and then automatically reduce in favor of bonds with each passing year. Target date funds are thus the supreme expression of the time diversification thesis.
14. Our results suggest that **target date funds should be allocating across three, not just two asset classes:** equities, safer bonds and riskier fixed income (HY and similarly risky bonds). Ideally, they should also regularly rebalance, say once a year, on the basis of the then current yield of these three asset classes. Fig 12 shows the allocation to equities, government bonds and HG corporates by the various target date funds that Vanguard offers in the US. From our point, it misses an allocation to HY as the asset class that time diversifies best.

**Figure 12: Asset allocation of Vanguard target date funds**



Source: J.P. Morgan, Vanguard, as of end 2019.

<sup>8</sup> A more extensive analysis of 10-15 year out expected returns has for a long time been produced by our colleagues in JPMorgan Asset Management, [Long-term Capital Market Assumptions](#), 2020. It similarly offers low future returns, without a large excess return on equities.



# Regime change

## The Long-term Strategist

What went wrong with capitalism?

- *What went wrong with Capitalism?* is the title of a book written last year by Ruchir Sharma, Chairman of Rockefeller International.
- Ruchir argues we have *too little* capitalism, not too much as one might have thought.
- His main argument is that macro-stability policies with ever-bigger ZIRP and QE and bailouts of leading companies are weakening economic growth and resilience as these policies are keeping too many zombie companies alive that are not investing and that are crowding out newer and better business.
- The Capitalism of Creative Destruction is fading. Ruchir does not want a return to 19<sup>th</sup> Century Laissez Faire but finds we need to find a better balance between growth vs stability, with more competition and Creative Destruction as the best way to boost economic growth. To raise growth, our economies and businesses need some “hard love.”
- We believe that Ruchir is right in his analysis, but also believe that voters and governments in democratic countries simply do not want the volatility and disruption that Capitalist Creative Destruction brings, and that they are willing to pay for this in the form of lower growth. Just like investors are willing to sacrifice return for lower risk.
- Still, Ruchir is right in pointing out that the Stability & Bailout Culture, as we would call it, has gone into overdrive in the last 10-15 years and has reached the point of declining return; so, it makes sense to dial it back in the next crisis. Also, stabilizing an economy in the short run, as during a recession, may not keep it more stable over the long run as macro “stability begets eventual instability.” This is because, protected by the macro nanny state, economic agents become ever more daring and careless with each new bailout cycle, as typically happens in Minsky Cycles.
- We sense some form of bailout fatigue setting in, although it will probably be markets that will prevent governments from ever greater stimulus during the next crisis. This is already happening for smaller countries.
- Investors should in our mind still assume that in the next economic and/or market downturn, governments will still do their best to stabilize the economy and markets and prevent the failure of the largest businesses that are crucial to the overall economy, such as in utilities, transportation, health, and banking. Given that governments will try to spend their way out of the next crisis, we think it best to assume there is more upside than downside on real interest rates over coming years.

### Long-term Strategy

#### Jan Loeys AC

(1-917) 602-9440  
jan.loeys@jpmorgan.com

#### Alexander Wise

(1-212) 622-6205  
alexander.c.wise@jpmchase.com  
J.P. Morgan Securities LLC

*What went wrong with Capitalism?* is the title of a book written last year by Ruchir Sharma, Chairman of Rockefeller International. In this note, we present the book's main argument, present our take on it, and conclude with what this could mean for us as strategic investors.

## What is capitalism?

In a capitalist system, economic decisions are largely made by private individuals and businesses, and most property is privately owned. The government sets and enforces the rules for a competitive economy and provides public goods and services that it is most efficient in providing, such as national defense, police, fire brigades, roads, consumer protection, and support during national emergencies. The government raises taxes to fund these services.

In Capitalism, the price mechanism is the core communication and motivation device that assures that resources and labor are allocated where they are most wanted and needed. In a competitive economy, there is open entry and exit into and out of markets, making sure that consumers get the best product and price, and workers a competitive wage. Adam Smith's Invisible Hand then provides that with everyone acting in their own interest, society's interests are met also.

Capitalism, in effect, means economic freedom and as argued in Milton Friedman's famous booklet, *Capitalism and Freedom*, it goes hand in hand with personal freedom. Capitalism thus emerged in the 17<sup>th</sup> and 18<sup>th</sup> Century in countries where democracy emerged, spreading to other countries covering most of the world as they also developed democratic institutions.

## What went wrong with capitalism?

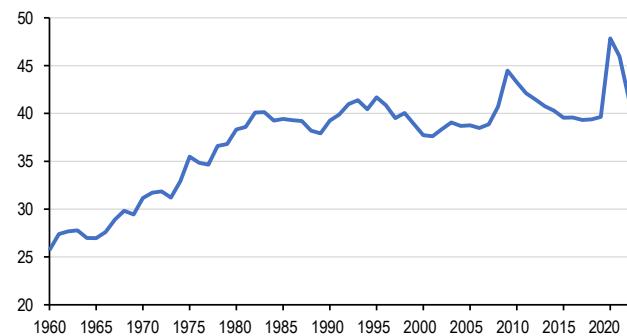
There are many ways in which one could argue that Capitalism has gone wrong. Laissez faire capitalism, where the government lets the private sector do what it wants without intervention, was never applied in full but late 19<sup>th</sup> Century Capitalism probably came closest. It did produce a lot of growth and wealth but was very prone to boom/bust and led to huge inequality, monopolization, and exploitation of labor.

As countries became more democratic by expanding voting rights, people voted against excessive corporate power and for labor and consumer protection and income redistribution. From the depth of the 1930s Great Depression, that was seen as resulting from too much Laissez Faire, governments were made responsible for macro-economic stabilization with Keynesian anti-cyclical monetary and fiscal policies. A few decades later, the steady growth of government spending and regulation eventually elicited a "[Neoliberal](#)" countermove-

ment, spearheaded by the Chicago School of Economics.<sup>1</sup> The Carter Administration started the ball rolling with deregulation in the late 1970s, and Ronald Reagan in the US and Margaret Thatcher in the UK put their names on the return of market capitalism. Ronald Reagan famously claimed in his 1981 [Inaugural](#) address "... government is not the solution to our problem. Government is the problem."

The Reagan/Thatcher free-market revolution was followed by widespread privatization, a dramatic decline in tax rates but only a modest decline in government spending among OECD countries during the 1980s after the massive run-up over the previous 20 years (Figure 1). They were unable to start a new downward trend in spending as each new crisis led to demands for government to spend us out of trouble.

Figure 1: DM government spending as a share of GDP  
%, 1960-2022, annual. General government, including state and local.



Source: J.P. Morgan, IMF.

The Reagan/Thatcher revolution did succeed in **exporting the free-market doctrine to most EM countries**, as well as **greatly liberating the movement of goods, services, capital, and money across borders across the globe**.

At this point, one would expect another book criticizing world capitalism to focus on the inequalities in income and wealth it produced within countries, even though it reduced such inequalities across countries. You would expect to read about how the rise in capitalism led to the destruction of biodiversity and the steady rise in carbon in our atmosphere that is changing our climate with possible catastrophic implications for life on earth.

**No. Instead of arguing that we have too much capitalism in the world, Ruchir is arguing that we have *too little*.**

1. For an excellent review of this shift in thinking and policy, see [The rise and fall of the neoliberal order](#), Gary Gerstle, Oxford UP, 2022.

**A capitalist economy is dynamic and full of Creative Destruction**, a term coined by Austrian Economist Joseph Schumpeter in his 1942 [Capitalism, Socialism, and Democracy](#). A capitalist economy is never in equilibrium, and grows by leaps and bounds as new ideas, technologies, markets and companies emerge that destroy and replace old ones, thus freeing resources needed to fund the new companies and technologies. The profit motive and free competition create the right environment for budding entrepreneurs to constantly try out new products and services. If it sells, they will do well. If it does not sell, they go bankrupt. Creative destruction is the force that creates growth and wealth for the economy.

Ruchir finds that **creative destruction** in much of the so-called capitalist world is **fading with each successive macro bailout cycle**. Fewer new businesses are being created and fewer die off. Weak companies no longer die but are kept “on the vine” through public support and ultra-low interest rates. These so-called zombie companies do not generate enough profit to cover the interest on their debt but remain alive. The number of zombie firms has been rising steadily since the 1980s and in particular post-GFC. A BIS study across 14 DM countries found that zombies are less productive, invest less and crowd out better-performing companies, thus lowering overall economic growth and raising the costs of production.<sup>2</sup>

Ruchir blames what we would call the **Economic Stability and Bailout Culture**. The arguments for government to pursue economic stability are actually quite appealing and convincing. Economic theory states that a reduction in economic uncertainty should lower risk premia and boost capital spending. Economic volatility, and in particular economic contractions, aka recessions, create long-term deadweight losses, hysteresis, and uncertainty. They make workers and companies more averse to taking risk, thus raising the cost of funding. In addition, each time a worker is out of a job for a year or longer, their knowledge and skills will atrophy. Multiplied by the millions who lose their job during a recession, this lowers overall productivity growth. Similarly, each company that goes bankrupt produces deadweight losses in bankruptcy and in transferring its workers, managers, and operating systems to others part of the economy.

It thus made ultimate sense for **economic policymakers to avoid the wild booms and busts that free-market capitalist economies** used to go through in the 19<sup>th</sup> Century and pre-WWII. Central banks were created to reduce, if not eliminate, the risk of bank runs and financial crises. Keynesian fiscal policy was squarely aimed at leaning against the wind, expanding when the private sector contracts and pulling back

2. See, e.g., [The rise of zombie firms: causes and consequences](#), Banerjee and Hofmann, BIS Quarterly Review, September 2018.

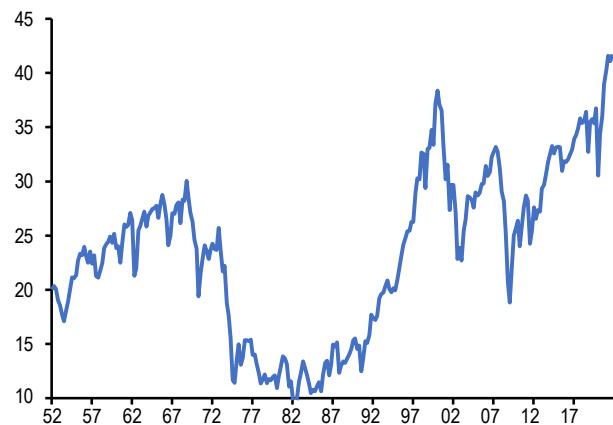
during economic booms. Facing the failure of large financial or manufacturing companies that could pull down communities, cities and large sets of suppliers and workers, pretty much every government in the world decided to bail out such companies to reduce the negative impact of their failure.

The calls on **governments to do what it takes** to prevent economic and financial downdrafts have only grown louder in recent decades with **larger bailouts, even of smaller companies and banks, zero-interest rate policies, quantitative easing, and large fiscal stimulus**.

The rise of the Stability Culture, with large scale bailouts and ZIRP/QE monetary policies have produced ever more zombies. But **if zombies are bad for growth, why did they not prevent a massive equity bull market in the US** that has arguably become most addicted to these stability policies. We can see **two reasons** why markets have rallied, seemingly ignoring the long-term economic cost of these bailouts. For one, lower macro volatility and the implicit policy backstopping the economy and its large companies have lowered the required financial risk premium on large company stocks and induced American investors to raise their equity allocations to all-time highs. Figure 2 shows how Americans have quadrupled the share of equities in their financial assets ever since the beginning of the Stability Culture set off the Great Moderation in the mid-1980s.<sup>3</sup>

Figure 2: Equity allocations of US households

%, Q1/1952-Q4/2024. Sum of equities held directly or via mutual fund shares or via Defined Contribution plans divided by total financial assets. Q4/2024 model imputed as of December 31, 2024.



Source: J.P. Morgan, Federal Reserve Bank of Philadelphia, Board of Governors of the Federal Reserve System, Bureau of Labor Statistics, Bureau of Economic Analysis, Robert Shiller, Refinitiv, S&P, Bloomberg Finance L.P.

3. See our [Inflation, markets and the end of the Great Moderation](#), September 27, 2021.

**Macro stability policies** did, indeed, lower long-term economic uncertainty, but this did not lead to more capital investment by companies. It instead led to more investment in financial assets where risk premia have been steadily coming down.

Second is that the ever-increasing costs of meeting government regulations gave large companies a competitive advantage as they could spread the fixed costs of meeting these regulations more easily than smaller ones. **Regulations have become a barrier to entry**, allowing large-cap earnings to grow much faster than mid- or small-cap ones.

In short, Ruchir argues convincingly that the seemingly rational policy of reducing economic uncertainty and volatility in an effort to boost growth and stability had the **unintended negative impact of actually reducing economic and capex growth by keeping alive too many weak companies** that in turn took breathing space away from new and smaller companies.

To make matters worse, once you start with the medicine of bailing out companies and the overall macro economy, both the **marginal stimulus required each time keeps ratcheting up while the demand for it widens out to every part of the economy**. “If the big boys got bailed out last time, what about me this time?” And the greater the number of vulnerable zombies and over-levered economic agents in the economy, the more reluctant policymakers become to let a crisis run its course and perform the needed cleanup of the economy’s “underbrush.” With each successive crisis, interest rates needed to be brought to lower and lower levels and once the zero bound was reached, negative rates and ever larger amount of quantitative easing were applied across a widening set of countries. **A bailout monster was created**.

Ruchir compares the bailout culture with **pain medicine**: well-intended for what it is trying to do, but requiring more and more usage that eventually leaves the patient badly addicted. It is a form of **short-termism**: the immediate benefits of reducing risk are clear, but the long-term moral hazard costs are unclear and far in the future.

Some of Ruchir’s cycle of ever-widening reliance on stimulus and bailouts is similar to the **Minsky cycles** where “*stability begets its own instability*”. Hyman Minsky’s [Instability Hypothesis](#) argued that risk perceptions are adaptive and that the longer market participants operate in a stable environment, the more their risk perceptions will fall. This will make them more willing to take on risks they would have shunned before and thus sets them up badly for when a new unexpected shock hit the market, creating more volatility than otherwise.

## My take

**At the core, we think Ruchir's argument is right.** Just like our offspring, an economy needs “hard love” from time to time. The more you protect it against the vicissitudes of Creative Destruction, the softer and weaker it becomes, and more support it needs each time it gets buffeted by new shocks.

But how far should we go in reducing the ever-greater government socialization of all risk in an economy? Ruchir states that we should not go back to 19<sup>th</sup> Century laissez faire but is less clear about where exactly the right balance between growth and stability is, who should decide this, and how we get to the right balance.

The **trade-off between growth and stability** is very familiar to anybody in markets. Finance teaches us that faster growth/return of our portfolios requires us to accept higher volatility and risk. There is no single right balance between the two as it is a function of personal preferences and conditions of wealth and age.

Similarly at the economic level, and as Ruchir argues, faster growth requires us to accept more economic volatility and risk, as Creative Destruction can be quite volatile. But here also, we would argue that there is no single right balance between growth and stability as it is a function of what society and voters desire.

A recent analysis of surveys across 13 DM countries by the ECB and other economists finds that **households are, on average, willing to sacrifice 5-6% of lifetime consumption to eliminate business cycle fluctuations**.<sup>4</sup> A similar result was found for a willingness to pay to eliminate inflation, although the surveys were conducted right in the midst of the Covid inflation spike. **Government actions to reduce macro-economic volatility are thus very much a response to voter demands** and their willingness to accept lower economic growth for greater stability.

A valid retort along Minsky lines ought to be that **government efforts to reduce macro volatility are ultimately doomed** as they simply make economic agents less cautious and thus make the economy more vulnerable to the next shock hitting it. Witness the 2008-09 Great Financial Crisis after 20 years with only two shallow recessions in the US.

Still, politicians know the drill and recognize that a recession or run-up in inflation are likely to push them out of office.

4. [How costly are business cycle volatility and inflation? A vox populi approach](#), Dimitris Georgarakos et al., *NBER Working Paper #33476*, February 2025.

28 February 2025

Even if they recognize Ruchir's point that the economy needs some form of "hard love" in order to toughen it up and be more resilient when adversity hits, voters will not like that message. As European Commission President Jean-Claude Juncker once said: "We all know what to do; we just don't know how to get re-elected after we have done it."

Capitalism emerged together with democracy, but it is voters in democratic countries saying they do not want the volatility, boom/bust, and creative destruction of pure capitalism. This is why we see most countries in the world, and not just the democratic ones, making efforts to achieve economic stability, even at a cost of reduced growth. Ruchir points to three countries that have achieved a better balance between growth and stability: Switzerland, Vietnam, and Taiwan. Are these the examples that the US and EU should follow? Vietnam and Taiwan are at earlier stages of development than the US and EU and are still growing fast. Switzerland has had higher real per capita income growth than the US over the past 50 years, but is not innocent as it was as willing as the US to go the QE route, went even further in moving to negative interest rates and was equally unwilling to let its largest banks go under. Hence, we do not think there are easy examples of DM countries that did not follow the consensus Stability & Bailout Culture.

### What should or will policymakers do?

The point where I can agree with Ruchir is that even when voters clearly do not like economic volatility and say they are willing to pay for greater stability in jobs and incomes, it is probably the case that the **costs of stabilizing our economies and markets have steadily risen over the past decade**. More and more is spent with each crisis just to bring the economy back to par. It may seem that the strong performance of the US economy post-Covid, partly if not mostly as a result of massive and immediate fiscal stimulus and QE, has made these measures now the automatic go-to policy during the next crisis. We feel, though, that a form of **bailout fatigue** is setting in given the politically bad image of "socialism for the rich" and ever larger central bank balance sheets. This should make policymakers more reluctant and economical in spending with fiscal or monetary spending policies during the next recession or financial crisis.

Our guess is that we must ultimately rely on the **market forcing governments' hands** when it reacts negatively, through higher interest rates, higher inflation break-evens, and/or a weaker currency and equity market during the next crisis if investors then feel that the money spent to support the system is a waste, without much success in reversing adverse conditions.

The US, where Ruchir has been most concerned about "bailout overreach" is probably not yet at the point where it has lost its fiscal space. But the steady rise in real bond yields as US federal government debt races to 100% of GDP and beyond is a warning that the US is getting closer to losing fiscal maneuvering space.

Instead, we would hope that policymakers recognize that they can get many of the benefits of creative destruction by making markets more competitive and that this can be done much more cheaply through a tightening of **antitrust** rules and implementation, the **opening of markets and reduction of barriers of entry within and across borders**, and a **reduction of regulatory costs** that have become a major barrier to entry for smaller companies. An antitrust and competition policy that succeeds in reducing market concentration should also **reduce the number of companies that are too big to fail**.

### Implications for investors

We would expect that when the next crisis hits, voters and businesspeople will still scream for government support and will not care about any future moral hazard or bad precedent this will set, as the benefits of support will be immediate and obvious while the long-term costs of action will be unclear and far in the future. But it is a question of time, and interest rate levels, before markets will start putting a limit to how much governments can spend on fiscal/monetary support and bailouts.

Hence, we think it remains advisable to expect that there are greater odds in coming years of higher real bond yields in DM countries, in particular the larger countries still most likely to pursue such support measures. At the same time, investors should probably continue to favor the large companies that governments believe most crucial for economic and national security, especially in banking, infrastructure, transportation, and medicine.

## The Long-term Strategist

### The de-dollarization risk scenario

- The risk of de-dollarization – a periodically recurrent theme through post-war history – has returned into focus with geopolitical and geostrategic shifts. In the medium to long term, the renminbi is typically identified as the clearest alternative, as China has the ambition and motivation.
- De-dollarization is not a clear reality today and is generally seen as only a risk scenario over the course of decades.
- The dollar share of global FX has been declining over the past 20 years. However, countries with excess savings are increasingly investing their foreign assets in bonds and equities, which offer a superior return, frequently through sovereign wealth funds. Combining FX reserves and SWF holdings shows stable allocations to the US dollar over the past 15 years.
- We consider risks that de-dollarization will be faster or deeper than anticipated, and the implications for long-term investors. While marginal de-dollarization is to be expected, rapid de-dollarization is not our modal view for the coming 5-10 years. In any case, its severe impact requires investors to consider the possibility and prepare accordingly.
- Events which pose a risk to the dominant status of the dollar and US markets could broadly take two forms: (1) adverse events which undermine the perceived safety and stability of the dollar, and the standing of the US as the world's leading economic, political and military power, that are dramatically worse than seen since WWII; and (2) positive developments outside the US which enhance the credibility of alternative currencies.
- While network effects tend to make a currency – as a medium of exchange, unit of account, and store of value – a natural monopoly, strategic competition could lead to the rise of regionalism that creates distinct economic and financial spheres of influence in which different currencies and markets assume central roles.
- The direct impact of any de-dollarization would be a depreciation of US assets, outright and versus others. The dramatic adverse events that affect the relative standing of the US would likely do even more damage to US asset values. They would likely produce higher bond yields, lower equity multiples, and a weaker USD. De-dollarization per se probably has little impact on growth and inflation, but the adverse events which could catalyze de-dollarization would probably worsen both.

### Long-term Strategy

**Alexander Wise** AC  
(1-212) 622-6205  
alexander.c.wise@jpmchase.com

**Jan Loeys**  
(1-917) 602-9440  
jan.loeys@jpmorgan.com  
J.P. Morgan Securities LLC



The US dollar plays an outsized role in the functioning of the global economy, with widespread use in financial and trade transactions around the world. In light of perceived geopolitical and geo-economic shifts, the risk of ‘de-dollarization’ – a periodically recurrent theme through post-war history – has returned into focus.

## What is de-dollarization?

**De-dollarization would entail a significant reduction in the use of dollars in world trade and financial transactions,** reducing national, institutional, and corporate demand for dollars. It would also mean the weakening of the dominance of the dollar-denominated global capital market in which borrowers and lenders from around the world transact in dollars. It could also entail declining US shares in global investment portfolios, both through valuation and active allocation effects. Any significant reduction in dollar dominance would have profound implications for investors, as would the events which catalyze that transition.

**Full de-dollarization is not our view or forecast for the next 5-10 years and should be seen as an extreme tail risk.** **Partial de-dollarization**, with the RMB partially assuming some of the current functions of the dollar among non-aligned countries and China’s trading partners is more likely. As investors, we need to consider any risk that can make market returns deviate meaningfully from those we should expect given current pricing. That is what we aim to do in this note.

## Why the concern?

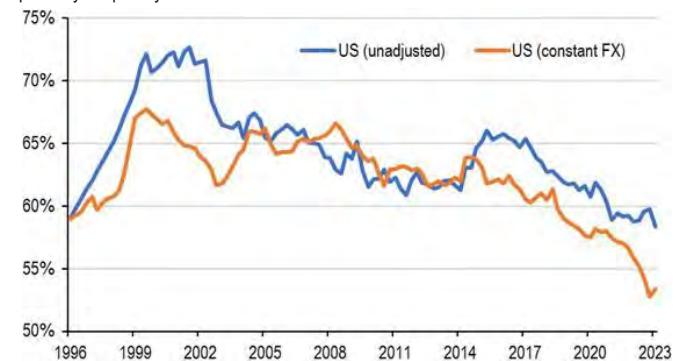
In our view, **the current consensus accepts that there is a risk of partial de-dollarization, but that it is decades away.**<sup>1</sup> With China’s growing centrality in global commerce, one might naturally expect the renminbi to assume a greater role in the global economy over time. However, it is commonly understood that this transition would occur over the course of decades, potentially contingent upon the relaxation of capital controls in China. There is precedent for this view of glacial change. While the US surpassed Great Britain as the world’s largest economy in the latter part of the 19th century, the US dollar is commonly perceived to have overtaken the British pound as the world’s foremost reserve currency only by the end of WWII. Historical experience thus suggests that if China were to overtake the US as the world’s

largest economy around 2030, dollar dominance may persist even into the second half of the 21st century.

The consensus view that there is a risk of slowly waning dollar dominance is arguably reflected in **some observable trends**, though the evidence to date is far from conclusive.<sup>2</sup> One commonly analyzed barometer of dollar dominance is the **composition of foreign exchange reserves**. Based on IMF COFER data, the US dollar share of allocated foreign exchange reserves grew sharply from 59% in 1996 to a high of 73% in 2001, before declining steadily over time to 58% by the end of 2022. This decline is largely accounted for by increases in shares of other DM currencies, though the renminbi share grew by ~2.5% pts. While the dollar share has trended steadily down for around the last 20 years, **de-dollarization is not entirely clear in these data in the fuller historical context.**

Figure 1: US dollar share of foreign exchange reserves as reported and with adjustment for exchange rate dynamics

%, quarterly, Q4/1995-Q4/2022. Constant FX assumes exchange rates are counterfactually fixed at Q4/1995 levels. US Dollar Index (DXY) is used for reserves held in ‘other currencies’. Annual data from 1995 to 1998 are interpolated to quarterly frequency



Source: J.P. Morgan, IMF, Bloomberg Finance L.P.

These reserve dynamics **reflect both changes in exchange rates and active portfolio reallocations**. Figure 1 plots the US dollar share of allocated reserves as reported and at constant (Q4/1995) exchange rates. From the latter perspective, the US dollar share of reserves has declined more appreciably, with potential acceleration after 2014. Overall, these measures are evidence that there has been a **degree of reserve diversification away from the US dollar since 2000**.

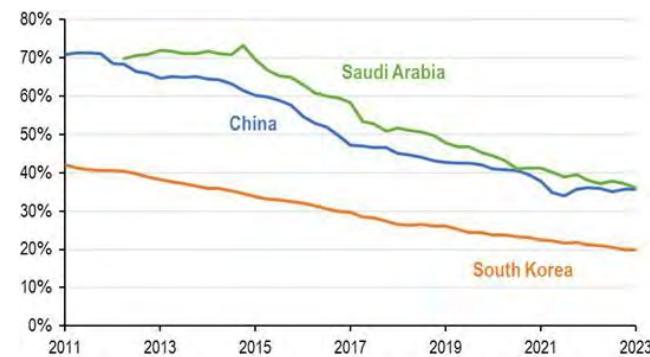
1. US Treasury Secretary, Janet Yellen, in testimony before Congress a few days ago (June 13), stated “We should expect over time a gradually increased share of other assets in reserve holdings of country – a natural desire to diversify. But the dollar is far and away the dominant reserve asset... I would say there is virtually no meaningful workaround for most countries for using the dollar as a reserve currency.”

2. For additional analysis of various indicators, see *Deciphering de-dollarization: Unfolding slowly but USD should maintain dominance*, Meera Chandan and Octavia Popescu, Jun 5; *Eye on the Market: Oh, The Places We Could Go*, Michael Cembalest, Apr 26; and *The RMB challenge to USD hegemony*, Daniel Hui, Jan 31, 2019, pp. 45-49.

However, FX reserve allocations offer an incomplete picture of foreign asset accumulation. As observed by our colleagues in EM Fixed Income Research, FX reserve holdings have become a steadily smaller share of total foreign assets for many EM countries, likely reflecting the judgment that sufficiently large self-insurance buffers have been accumulated, and the fact that returns on reserves are low relative to other assets ([EM Fixed Income Focus: Facts and fiction of FX reserves diversification](#), Goulden, Siddiqui and Padilha, Apr 27). This trend is depicted for a selection of countries in Figure 2.

Figure 2: Reserves as a share of international investment position assets for China, South Korea and Saudi Arabia

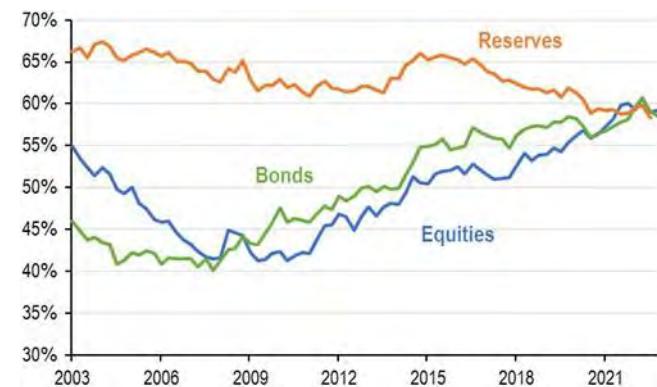
%, quarterly, Q4/2010-Q4/2022. Reserves include gold at market price.



Source: J.P. Morgan, IMF.

Figure 3: US dollar share of allocated reserves, and Global Bonds and Equities (GABI and MSCI ACWI)

%, quarterly, Q2/2003-Q1/2023. USD share of GABI is based on market value. USD share of MSCI ACWI is based on market capitalization.



Source: J.P. Morgan, IMF, MSCI, Bloomberg Finance L.P.

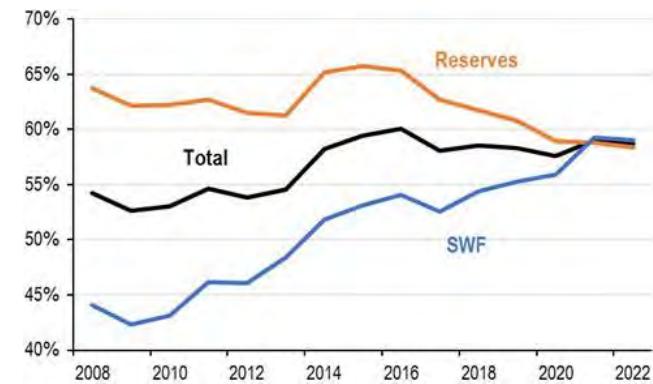
For China, for example, the FX reserve share of total foreign assets fell from 71% in 2011 to 36% in 2022. This suggests that foreign asset accumulation of countries maintaining persistent current account surpluses is occurring to some degree through other investment vehicles, such as **sovereign wealth funds**, which hold higher-returning assets than central banks.

Based on reference portfolios, these funds typically invest in global equities and bonds, of which US markets are a large share.<sup>3</sup> In fact, Figure 3 shows that the US share of global equity and bond markets has been steadily rising over the last 15 years.

To assess this different dimension of foreign asset accumulation, we consider the combined US dollar share of reserves and sovereign wealth fund assets. To do so, we source annual measures of AUM for sovereign wealth funds between 2008 and 2022 from Statista. We assume that sovereign wealth funds invest in a 70-30 portfolio of global equities and bonds, with US shares equal to their share in the MSCI AC and GABI indices respectively. Figure 4 plots the implied dollar shares for sovereign wealth funds, along with the previously depicted dollar share of allocated reserves, and a combined dollar share of reserve and sovereign wealth fund holdings.

Figure 4: US dollar share of allocated reserves, sovereign wealth fund assets and combined total

%, annual, 2008-2022. Reserves are the Q4 numbers in each specified year. USD share of GABI is based on market value. USD share of MSCI ACWI is based on market capitalization. Sovereign wealth fund shares are estimated assuming a 70-30 allocation to global equities and bonds. Total combines reserve and sovereign wealth fund holdings.



Source: J.P. Morgan, IMF, MSCI, Statista, Bloomberg Finance L.P.

The increasing estimated dollar share of sovereign wealth fund holdings reflects the general increase in dollar shares of global equity and bond outstanding (in MSCI AC and GABI) since 2008. Over this period, the **increasing estimated sovereign wealth fund dollar share** more than offset the declining reserve dollar share, leading to a small increase in the combined dollar share. While we do not have data on sovereign wealth fund AUM prior to 2008, Figure 3 shows that

3. In equities, US equities currently account for ~60% of MSCI AC by market capitalization. In fixed income, the market value of the JPM GABI US is currently ~59% of the market value of the JPM GABI. In private markets, North America accounts for ~56% of assets under management (BIS, [The rise of private markets](#), 2021).

the dollar share in equities and bonds was falling prior to 2008. Thus, we view the dollar share of combined foreign asset holdings over the last two decades as fluctuating in a relatively tight range. Taking this broader view, **de-dollarization is clearly not evident in foreign asset holdings.**

## What could induce the world to de-dollarize?

The function of money is to provide a **medium of exchange, a store of value, and a unit of account**. Since these functions bring considerable network advantages, there must be compelling reasons, and a viable alternative, for agents to shift to an alternative form of money. Events which pose a risk to the dominant status of the dollar and US markets could broadly take two forms: (1) **adverse events which undermine the perceived safety and stability of the dollar, and the standing of the US as the world's leading economic, political and military power, that are dramatically worse than seen since WWII;** and (2) **positive developments outside the US which enhance the credibility of an alternative currency.**

Historically, it is typically the currency of the **most powerful country – economically, politically and militarily** – which circulates most widely. While important, economic size in and of itself is not enough, as demonstrated by the long-lived status of the pound and London's financial markets decades after the US economy surpassed the UK economy in size. A candidate reserve currency must also be perceived as safe and stable, and must provide a source of liquidity, which is sufficient to meet growing global demand. Per the [Triffin dilemma](#), the need to supply currency in sufficient quantity outside its borders would also require a country to tolerate sustained current account deficits to the potential detriment of domestic priorities.

Currently, only **China** appears eager to supplant the role of the US and the dollar in the global economy in the long term. Its economy is expected by many to surpass that of the US approximately a decade from now, and it evidently harbors ambition to be not only an Asian power, but also a global one at least on par with the US.

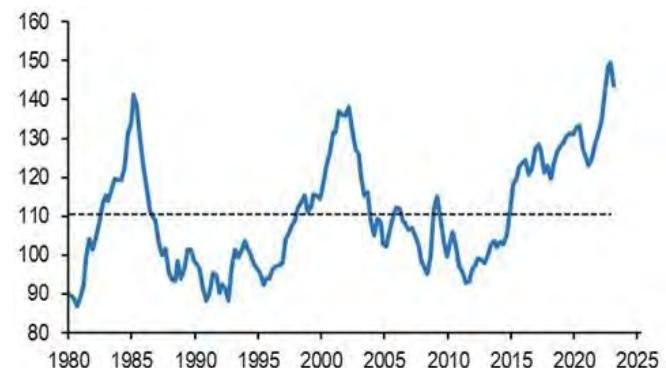
## On the US side ...

It would take a **serious adverse shock, which disproportionately affects the US**, to catalyze a transition away from the dollar. That shock would also need to be significantly **worse than we have observed since WWII**. Since WWII, the US has debased its currency, by delinking it from gold in 1972; lost wars; seen significant moves up and down versus other currencies (Figure 5); seen significant inflation, political dysfunction and full-fledged financial crises, **without ever losing its global status.**

Importantly, over this time, no other currency offered to be freely convertible into gold, and other countries experienced substantial volatility, financial crises, political crises, and inflation. While the US has lost wars, none have jeopardized its territorial integrity or its status as the world's preeminent military power. While growth of the US economy has slowed in recent decades, this broadly reflects a trend among most large economies, so the US share of world GDP has [remained roughly stable at around one quarter over the past 30 years](#).

Figure 5: Real US exchange rates against DM currencies

Q1/1980 – Q1/2023. Dashed line indicates average since Q1/1980. Equal weighted portfolio of Australia, Canada, Euro/ECU, Japan, Sweden, Switzerland, and the UK.



Source: J.P. Morgan, IMF, Bloomberg Finance L.P.

In some respects, the US appears better positioned than many other large economies. **Technologically**, it remains at the frontier of global science and innovation, backed by a highly educated workforce strengthened by generations of high-skill immigration. **Demographically**, the [US is in better shape](#) (life expectancy excepted) than most other countries across DM, higher income Asia, and China. Dramatic worsening of the **climate and adverse weather events** are a threat to the whole world, though the US is arguably less vulnerable with its comparatively favorable geography, and self-sufficiency in food, energy and water. It also possesses greater means to adapt to the effects of climate change than many other countries.

From today's vantage point, **some of the most acute risks appear to be political in nature**. Broadly speaking, dramatic political dysfunction or deterioration of governance could lead to destabilizing political acts or omissions, with adverse effects on growth, government finances, education, health, equal opportunity, and national security, amongst others.

**Political polarization and dysfunction in the US** may continue to grow as a result of economic dislocation and marginalization or growing inequality. There is, for example, a growing body of evidence that exposure to Chinese import

16 June 2023

competition – with its adverse labor market effects – was a cause of growing political polarization in the US.<sup>4</sup> As highlighted by the January 6 riot at the US Capitol, it is not inconceivable that this disharmony could be a destabilizing force. This could jeopardize the actual and perceived stability and predictability of governance in the US that underpins its role as a global safe haven. In an extreme case, Ray Dalio has even argued that there is a serious risk of political conflict and even worse widespread violence, leading to a decline of the US vis-à-vis China. This resonates closely with a long-held Chinese view that the US is in the midst inevitable political and economic decline.<sup>5</sup>

**Deteriorating governance would stymy efforts to restrain the rapid growth in the national debt.** The Congressional Budget Office currently projecting that US Federal debt-to-GDP will increase by ~20% pts over the coming decade.<sup>6</sup> In fact, there is a reasonable prospect that the realized path of debt will be even worse than forecast, given the CBO projection assumes some tax cuts under the Tax Cuts and Jobs Act of 2017 expire in 2025 as legislated, and that there are no crises which impose additional fiscal costs. Based purely on economic factors, among DM countries, the path to fiscal sustainability is among the most onerous in the US by some measures (see [Up, up and away: Assessing government debt sustainability](#), Joseph Lupton and Alexander Wise, February 22, 2023).

**As it stands, fiscal reform is already extremely politically contentious in the US**, with apparent bipartisan opposition to entitlement reform, and one end of the political spectrum emphasizing that there is a role for higher taxes – such as increasing the top marginal income tax rate back to 39.6% or partially reversing cuts to the corporate tax rate – which is unremittingly opposed at the other end of the spectrum. The practical consequences of this discord are further accentuated by the strong separation of powers in the US government, and institutional features like the Senate filibuster.

It could be argued that, historically, **deteriorating public finances in the US have not weakened the preeminence of the dollar to date**. If, however, fiscal circumstances were to

deteriorate to a much greater degree in the US than elsewhere – due to these political considerations or otherwise – there is a risk that the dollar preeminence could be harmed, especially given the current elevated debt burden in the US in both absolute and relative terms.

While the risk of default can never truly be ruled out, the effects of an unsustainable rise in US public debt on the international status of the dollar are more likely to manifest themselves through other channels. Higher debt and higher interest rates can **reduce the fiscal capacity of the government**, preventing it from taking stabilizing actions during a time of crisis, as it did during the GFC and the Covid pandemic. Without an effective fiscal response, any such crisis may have catastrophic effects. Relatedly, there is a risk of **fiscal dominance**, with the level of public indebtedness imposing *de facto* constraints on the ability of the Federal Reserve to pursue its inflation target.

Economic dislocation or growing inequality may also drive a **backlash against globalization in the US that leads to the adoption of isolationist policies**, which undermine the central role of the US in the global economy. In the US, there is empirical evidence that economic dislocation is causally associated with isolationist and anti-trade sentiment, and political positioning and congressional voting on issues related to globalization.<sup>7</sup> Related to this, political impetus for change could also stem from a growing intolerance of sustained current account deficits per the **Triffin dilemma**. This backlash may manifest itself in diminishing support for, or active opposition to, multilateral institutions such as the WTO, and lead to the rise of **regionalism that creates distinct economic and financial spheres of influence** in which different currencies and markets assume central roles. It is arguable, for example, that the withdrawal of the US from the TPP will increasingly be seen in the Asia-Pacific region as an irreversible abandonment of meaningful economic engagement, opening the door for greater integration with China.

It is also plausible that a **failure to quickly control elevated inflation in the US** could undermine the status of the dollar and US markets in the global economy. While it could be countered that this did not occur during the inflationary epi-

4. See David Autor, David Dorn, Gordon Hanson and Kaveh Majlesi, [Importing Political Polarization? The Electoral Consequences of Rising Trade Exposure](#) (2020) 110(10) *American Economic Review* 3139-3183.

5. Ray Dalio, [Principles for Dealing with the Changing World Order: Why Nations Succeed and Fail](#) (2021).

6. See [An Update to the Budget Outlook: 2023 to 2033](#). See also [CBO's Estimate of the Budgetary Effects of H.R. 3746, the Fiscal Responsibility Act of 2023](#) and [Fast rising debt with debt limit likely breached this summer](#), Joyce Chang et al., March 31, 2023.

7. See, e.g., James Feigenbaum and Andrew Hall, [How Legislators Respond to Localized Economic Shocks: Evidence from Chinese Import Competition](#) (2015) 77(4) *Journal of Political Economy* 1012-1030; Jiwon Choi, Ilyana Kuziemko, Ebonya Washington and Gavin Wright, [Local Economic and Political Effects of Trade Deals: Evidence from NAFTA](#) (2021) *NBER Working Paper* #29525; and Aycan Katitas, [Politicizing Trade: How Economic Discontent and Identity Politics Shape Anti-Trade Campaign Appeals](#) (2023) Working Paper.

sode beginning in the 1970s, this was a period of elevated inflation in most large economies around the world, including in Japan, which was at the time seen as an ascendant economy threatening to displace the US and the dollar, much in the same way as China is now seen. In Japan, inflation peaked at 23.5% on an over a year ago basis in 1974, rising again after a period of disinflation to a high of 8.1% in 1980. By contrast, inflation in China has remained low in the present global inflationary episode, even during a period of economic resurgence after reopening from Covid lockdowns. If sustained, this dichotomy could shift perceptions about the economic stability of the US relative to China.<sup>8</sup>

**Geopolitical conflict or escalating geopolitical tensions could also lead to the emergence of a bipolar world** and motivate efforts to reduce integration with the US or the West. For example, the Russian invasion of Ukraine and the subsequent Western freezing of reserves in concert has potentially raised concerns about weaponization of reserves against non-aligned countries, undermining perceptions about the safety of these assets. While Russian reserves are currently frozen, future appropriation of those reserves for use in the reconstruction of Ukraine or as a punitive measure would substantially intensify the chilling effect of Western actions. **Geopolitical conflict could also directly undermine the relative power of the US, though the outcome of any such conflict is highly uncertain and could instead strengthen the relative power of the US.**

### **... and on the Chinese side**

The discussion thus far has largely focused on US actions or omissions which would undermine its unique status in the global economy. Given the risks facing the US, and the Chinese perception that the US is on a trajectory of decline, there is an argument that China will exercise strategic patience in accordance with Deng Xiaoping's prescript to 'hide your strength, bide your time'. There are, however, some positive actions that could accelerate any de-dollarization.

**Firstly, de-dollarization could be accelerated by meaningful economic, financial and political reform in China,** which is not on the horizon in the consensus view. Amongst other actions, relaxing capital controls, opening markets, implementing measures to promote market liquidity, bolstering the rule of law, reducing appropriation and regulatory risk, and promoting Chinese government bonds as an alternative safe asset could all cement China and the renminbi as a credible alternative to the US and the dollar. This latter change would be critical in a truly bipolar world, as the West

8. As we discussed in [Inflation, markets and the end of the Great Moderation](#), Sep 27, 2021.

currently has a virtual monopoly on safe assets.

While reform in China may accelerate de-dollarization, the consensus may also be overestimating the necessity of reform for the renminbi to play a more prominent role as a global currency. Eichengreen et al. (2022) argue that the renminbi can increasingly serve as an important reserve currency through increased processing of cross-border transactions and trade in renminbi, in conjunction with a proliferation of swap lines and offshore renminbi markets.<sup>9</sup> In recent years, progress has been made in each of these respects. For example, our colleagues in Global Commodities Research have recently highlighted the growth of invoicing of commodities trade in yuan, and the issuance of bonds in yuan by Russian commodity producers ([Commodities maps redrawn: shifting trade flows, de-dollarization, and surge in gold reserves](#), Natasha Kaneva et al., May 31, 2023).

In support of their claim, Eichengreen et al. (2022) argue that the ratio of renminbi reserves to trade invoiced in renminbi is comparable to that of the euro, in spite of the existence of capital controls. They also note that the renminbi now is in some respects comparable to the dollar in the 1950s and 1960s, when dollar dominance became entrenched. At that point, dollars and gold were imperfectly convertible under the Bretton Woods system due to restrictions under US law, leading to the creation of an offshore gold market in London. In short, they argue that, **even without full liberalization, the renminbi can play a more important role.**

Additionally, in an era of **strategic competition between the US and China**, substantial resources are being expended in a battle for influence among non-aligned countries in the 'Global South'. An intensification of these efforts by China has the potential to further diminish the relative global status of the US, and in turn economic engagement with the US, especially given a perception that the US cannot marshal sufficient resources to compete with Chinese initiatives like the Belt and Road Initiative.

However, from a Chinese perspective, there is a risk of being caught in the so-called '[Middle Income Trap](#)', undermining its global relative strength. In a 2021 [study](#), our economists estimated that China's potential growth will gradually slow down from 6% to 5% in 2020-2025, from 5% to 4% in 2026-2030 and from 4% to 2.5% in 2031-2035. While initiatives to drive productivity growth through investment in technology and innovation – such as the Made in China 2025 and Vision 2035 plans – appear calculated to forestall the risk of stagna-

9. Barry Eichengreen, Camille Macaire, Arnaud Mehl, Eric Monnet and Alain Naef, [The renminbi's unconventional route to reserve currency status](#) (2022) Centre for Economic Policy Research.

tion, there is risk that excessive dirigisme could stifle private sector innovation as an engine of growth.

## Partial de-dollarization more likely

In our view, the risk of **full de-dollarization** – the broad-based abandonment of the US dollar – appears to be a **very remote tail risk**, especially given the considerable network advantages that accrue to a ubiquitous currency, and the fact that the US has a long-standing global network of alliances and partnerships. The possibility of **partial de-dollarization**, with somewhat greater centrality of the renminbi than present at the expense of the dollar, is a **more likely possibility**, especially in an environment of **strategic competition**.

This strategic competition could lead to **the rise of regionalism that creates distinct economic and financial spheres of influence in which different currencies and markets assume central roles**. As a student of history, China likely recognizes that it will be stronger if it can build its own bloc of aligned countries – perhaps a so-called ‘Eastern Alliance’. China has already leveraged development finance initiatives to gain international support around the world for some time, though the results appear to have been somewhat mixed. Recent developments, such as China’s ‘no limits’ partnership with Russia, and attempts to develop trade relationships and invoice trade in renminbi, are likely the preliminary signs that efforts to coalesce a bloc of aligned countries are underway. In the current geopolitical environment, it appears very likely that these efforts will continue.

## Consequences of any de-dollarization

De-dollarization would likely have many implications for long-term investors, largely coming down to **a broad depreciation and underperformance of US financial assets versus the rest of the world**. The impact would be broadly **commensurate with the speed and magnitude** of de-dollarization.

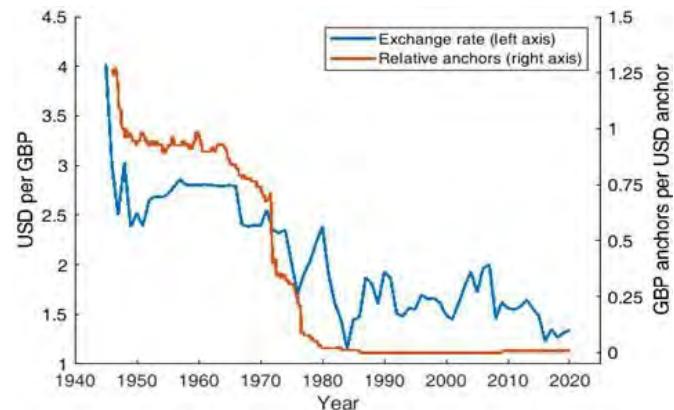
**In addition to the highly probable direct effects on equity, bond and currency markets, there may be indirect effects intermediated by the macroeconomic effects of de-dollarization, such as on real yields or inflation.** To a degree, these effects of de-dollarization are inseparable from the effects of the events which precipitate it, so we also broadly include the implications of a loss of confidence in the dollar or US markets due to events of the kind described above.

**Currencies:** First, it is very likely that **de-dollarization would adversely affect the value of the dollar** – over and

above mean reversion<sup>10</sup> from currently elevated levels – given the current strength of institutional, investor and corporate demand for dollars due to their dominance as a means of transaction. There has been only one transition between dominant currencies in the modern era – from the pound to the dollar – so there is limited evidence to empirically discipline our bias towards an adverse effect on the value of the dollar. We can, however, examine changes in the value of the pound relative to the dollar during the previous transition period. To do so, we source the GBP-USD exchange rate from 1945 from the Macrohistory Database, which contains long histories of macroeconomic data.<sup>11</sup> While these data span different currency regimes, these valuations are still instructive. We also source data detailing the currencies<sup>12</sup> for which the dollar and pound are -anchor- or -reference- currencies from Ilzetski et al. (2019).<sup>13</sup>

Figure 6: GBP-USD exchange rate and the number of currencies for which the GBP is an anchor or reference currency relative to the number of currencies for which the USD is an anchor or reference currency

Annual (exchange rate) and monthly (currency anchors), 1945-2020 and 1/1946-12/2019. Anchor or reference currencies are as determined by Ilzetski et al. (2019).



Source: J.P. Morgan, Jordà et al. (2023), Ilzetski et al. (2019).

10. We discussed this approach to long-term FX forecasting in [Long-Term FX forecasts](#), Dec 14, 2021.

11. Óscar Jordà, Moritz Schularick and Alan Taylor, [Macrofinancial History and The New Business Cycle Facts](#) (2017) 31 *NBER Macroeconomics Annual*. Data are updated after initial publication.

12. For a complete description of the methodology to classify -anchor- or -reference- currencies, see [Ilzetski](#) et al. (2019), which builds on a literature of exchange rate classification. This is not simply a documentation of currency pegs. This process involves consideration of a variety of factors, including exchange rate variability, invoicing of foreign trade, external debt denomination, and reserve holdings.

13. Ethan Ilzetski, Carmen Reinhart and Ken Rogoff, [Exchange Arrangements Entering the 21st Century: Which Anchor Will Hold?](#) (2019) 134(2) *Quarterly Journal of Economics* 599-646; Ethan

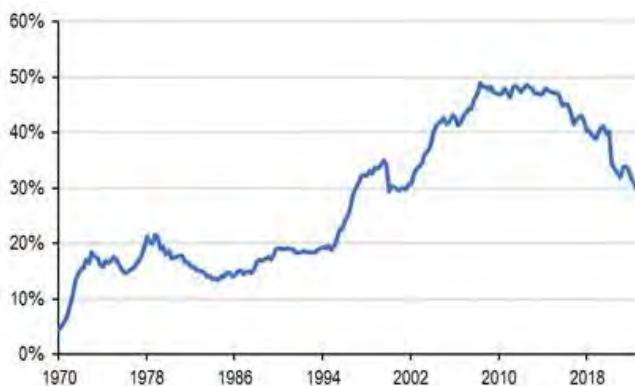
Figure 6 plots the nominal GBP-USD exchange rate along with the number of currencies for which the pound is the anchor or reference currency relative to the number of currencies for which the dollar is the anchor or reference country. Over time, the valuation of the pound broadly reflected its relative status as an anchor or reference currency – declining as dollar dominance grew.

Given the RMB is the most plausible long-term alternative to the dollar, dollar weakness should go together with **RMB strength**.

**Interest rates:** As we have argued earlier, **de-dollarization would likely put upward pressure on US real yields** ([Long-term forces point to higher US bond yields](#), April 4, 2022). This de-dollarization could come in the form of partial divestment of US fixed income by investors, or diversification or reduction of international reserve allocations, which are heavily invested in government-issued securities.

Figure 7: Share of US federal debt held by the public which is held by foreign and international investors

% quarterly, Q1/1970-Q4/2022.



Source: J.P. Morgan, US Treasury Department.

As depicted in Figure 7, US federal debt held by foreign and international investors as a share of debt held by the public has already declined from a peak of 49% in 2008 to 30% by 2022, most of which occurred after 2015. This trend would be exacerbated by de-dollarization, putting upward pressure on US real interest rates. As we have previously discussed, recent research by Ahmed and Rebucci (2022) suggests that foreign official sales of US Treasuries may have relatively

large effects on yields.<sup>14</sup> They estimate that a \$100bn foreign official sale of US Treasuries increases 5yr, 10yr and 30yr yields by more than 100bp *on impact*, with these effects partially fading over time. While there is material variation in estimates of the effects of foreign official sales – with these most recent estimates approximately twice as large as previous benchmark estimates in the literature – it is reasonably clear that de-dollarization would have appreciable effects on US yields.

Reductions in the foreign holdings of US public debt and the resultant effect on US interest rates would also have **important implications for debt sustainability**. In the CBO's most recent long-term fiscal outlook, net interest expenses on the federal debt were forecast to rise from 1.9% of GDP in 2022 to 3.7% of GDP by 2033, contributing substantially to the widening deficit and the 20 percentage point increase in debt-to-GDP over the coming decade.<sup>15</sup> The CBO's sensitivity analysis indicates that a 1 percentage point higher interest rates over the course of the next decade would raise debt-to-GDP by an additional 8 percentage points by 2033.<sup>16</sup> In a de-dollarizing scenario, **unstable feedback loops** present a risk. Increases in interest rates and the resultant deterioration in fiscal sustainability – which were catalyzed by de-dollarization – could lead to yet faster de-dollarization as the perceptions of the stability and safety of the US are continually revised down.

**Inflation and growth:** De-dollarization *by itself* probably will have only limited, if any, impact on long-term growth and inflation in the US. **More worrying should be the impact of political dysfunction** and other adverse conditions in the US that might induce the world to shift away from the dollar to any degree.

In principle, a weakening dollar could create inflationary pressure in the US by raising the cost of imported goods and services. There is an extensive literature on so-called 'exchange rate pass-through', though benchmark estimates suggest these effects may be **relatively small**, and that these effects are likely to be even smaller for the US than other developed open economies. For example, a benchmark estimate is that a 10% appreciation of the dollar causes a short-

14. Rashad Ahmed and Alessandro Rebucci, [Dollar Reserves and US Yields: Identifying the Price Impact of Official Flows](#) (2022) NBER Working Paper #30476.

15. CBO, [An Update to the Budget Outlook: 2023 to 2033](#).

16. For a workbook to conduct analysis of sensitivity of estimates to economic assumptions, see [Workbook for How Changes in Economic Conditions Might Affect the Federal Budget: 2023 to 2033](#).

16 June 2023

run 0.5% fall in core PCE prices.<sup>17</sup> In the longer run, the more salient question in our view is the determination of the Federal Reserve to maintain inflation at its 2% target. If the Fed were to remain steadfastly fixed to its inflation target, **it is difficult to envision an exchange rate effect on long-run realized inflation.**

Therefore, the question naturally turns to whether **de-dollarization could create pressures which would lead to a shift in the Fed's objective function**. In our view, the clearest mechanism by which this could occur is through the effect of de-dollarization on interest rates, debt sustainability and financial stability. As discussed above, de-dollarization could raise interest rates and raise concerns about debt sustainability. In such circumstances, it is conceivable that the Fed may be more reluctant to raise interest rates as required to achieve its inflation target. However, this likelihood is tempered by the fact that higher expected inflation has little long-term effect on debt-to-GDP, since higher expected inflation brings higher revenues and costs due to partial indexation, but also higher interest rates. Reluctance to raise rates may also stem from concerns about financial stability, especially after a prolonged period of depressed interest rates post-GFC. On balance, while plausible, we regard structurally **higher inflation as an unlikely outcome of de-dollarization per se.**

**The effect of de-dollarization on growth is highly uncertain.** On one hand, a structurally depressed dollar could in fact raise US competitiveness. On the other hand, de-dollarization could directly lower foreign investment in the US economy, and indirectly lower investment through the crowding out effects of structurally higher interest rates. Further, any crises flowing from de-dollarization of the kind discussed above would almost certainly adversely affect growth. Balancing these considerations, it appears more likely than not that de-dollarization would adversely affect growth, though the magnitude of this effect is highly uncertain and likely inestimable.

**Equities: In US equities, outright and relative returns versus the rest of the world would be negatively impacted by divestment or reallocation away from US markets and a severe loss in confidence** which would come with any of the adverse events discussed above. Just as de-dollarization would imply structurally higher real yields, it could also bring structurally higher equity yields (lower PE multiples). To add to this, relative returns on US equities would also be **negatively affected by the likely depreciation of the dollar.**

17. For a discussion, see Stanley Fischer, [The Transmission of Exchange Rate Changes to Output and Inflation](#) (2015) Speech at the Monetary Policy Implementation and Transmission in the Post-Crisis Period research conference.

Within the overall equity market, there are likely to be different effects on sectors and styles. Higher interest rates in the past have allowed the **Financial sector** to outperform. However, if higher rates are the result of de-dollarization, then larger banks and asset managers will suffer as a substantial share of their business comes from the rest of the world. need to hold and transact in dollars. Domestic banks should outperform those with global business. We have also previously documented that **excess returns of Health Care equities appear robust to higher real yields but that excess returns of Technology equities may be adversely affected by higher real yields** (see [Where are we in Regime Change? Macro volatility, deglobalization, and secular rise in yields](#), Nov 8, 2022). We also documented that, **over a strategic investment horizon, value has tended to outperform growth in a rising real yield environment.**

**Fixed income:** We have previously documented that the **starting yield is a good forecast of the 10yr ahead return on bond indices with a duration of around 5-6 years**, since capital losses or gains are approximately offset over time by income gains or losses respectively.<sup>18</sup> While there are some factors which produce an error term – such as changes in index duration or issuing patterns, defaults or non-smooth yield trends – these have empirically given relatively small forecast errors on net. It is conceivable that some of these error factors may become more important in a de-dollarizing world than during the period in which the historical performance of these forecasts has been assessed. In particular, some of the risk events discussed above could lead to very sharp interest rate increases. That said, we consider the more likely risk scenario to be a steady de-dollarization, as was the case with the pound.<sup>19</sup> This leads us to the view that the starting yield on an index with 5-6 year duration should remain a good indicator of the decade-ahead return. This would clearly not be the case in the unlikely event of a US default. If US interest rates trend higher as we have argued, the entry point for a bond index investor with a 10-year horizon would improve over time. Note, however, that **relative returns on US fixed income would be adversely affected by dollar depreciation.**

In previous analysis, we argued that the real yield curve a decade from now is likely to be higher than on average in the 2000s and 2010s, but lower than on average in the 1980s and 1990s, as depicted in Figure 8 ([Real yields along the US curve: Long-term forecasts](#), Mar 13, 2023). De-dollarization

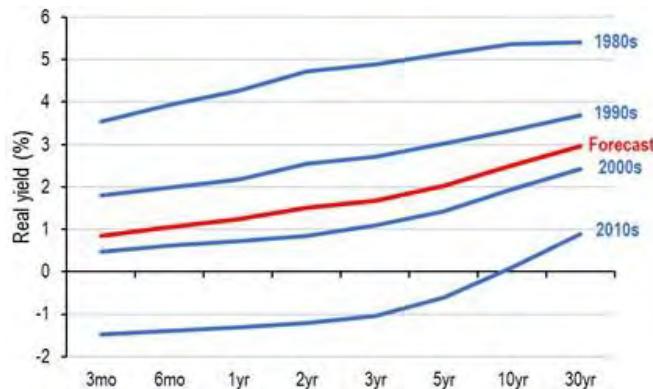
18. See [Inflation, markets and the end of the Great Moderation](#), Jan Loeys, Sep 27, 2021.

19. See Catherine Schenk, [The Retirement of Sterling as a Reserve Currency after 1945: Lessons for the US Dollar?](#) (2009) *Working Paper*.

would contribute to this structural shift.

Figure 8: Forecast real yield curve and average real yield curves in decades since 1980s

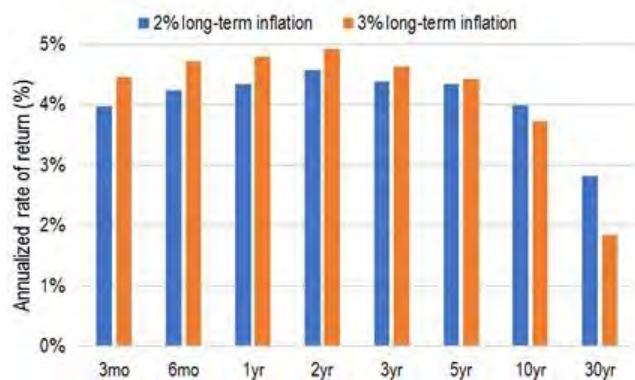
%. Real yield curves constructed as the average across 10yr periods. Real yield forecasts are based on the weighting framework previously constructed.



Source: J.P. Morgan, FRB of Philadelphia, Board of Governors of the Federal Reserve System, Bloomberg Finance L.P.

Figure 9: Expected return 10 years out on different maturities under two long-term inflation scenarios

% pa. Notes and bonds with a maturity longer than a year are sold each year, with the proceeds reinvested in a newly-issued note or bond of the specified maturity. Bills are rolled over at maturity. Notes and bonds are issued at par. Assumes linear progression of nominal yields from current levels (as of 3/8/2023) to projected levels over the course of 10 years.



Source: J.P. Morgan, FRB of Philadelphia, Board of Governors of the Federal Reserve System, Bloomberg Finance L.P.

Under two scenarios for long-term inflation expectations – 2% and 3% – we assessed the decade-ahead return for an investor at each point along the nominal yield curve if yields converged to our targets over the course of a decade. As shown in Figure 9, the highest returns under both inflation scenarios are predicted at the 2yr maturity, while the lowest returns are predicted at the 30-yr maturity, where capital losses weigh heavily on total returns. The drop-off in returns at longer durations is particularly acute under the higher inflation expectations scenario, which we regard as more likely for

reasons unrelated to de-dollarization.

Since we do not see higher long-term inflation in the US as a likely outcome of de-dollarization, the implications of higher or more volatile inflation for long-term investors are not reported in this note. Readers interested in these implications should refer to [Inflation, markets and the end of the Great Moderation](#), Sep 27, 2021.

## Hedging de-dollarization risk

Appropriate hedges for faster or deeper de-dollarization risk follow naturally from the implications discussed above.

Below, we summarize **deviations from a benchmark portfolio which invests in global equities and global bonds** for a strategic investor seeking to hedge de-dollarization risk.

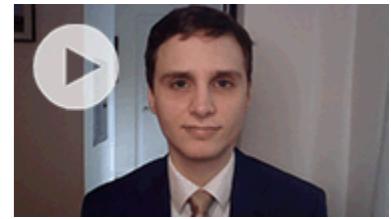
In equities, de-dollarization risks motivate a **strategic underweight on US equities**, due to the likelihood of adverse effects on the local currency equity returns, and of dollar depreciation over and above reversion to the mean. Within US equities, de-dollarization would likely have a **relatively less negative impact on Value**, though consideration should be given to sector biases of different styles given the effects of de-dollarization are likely to differ across sectors. Specifically, **de-dollarization should adversely affect large Financials**, and any coincident rise in interest rates could **adversely affect performance of long-duration Technology**. By contrast, historical long-term **outperformance of Health Care appears robust to higher interest rates**.

In fixed income, the current yield on a bond index with a duration of 5-6 years should remain a good forecast of the 10yr return, absent any extreme de-dollarization scenarios due to an event like a US default. Relative returns on US fixed income would be adversely affected by a likely depreciation of the dollar due to de-dollarization. However, future US entry points for long-term investors may be relatively more attractive due to rising yields, though dollar depreciation will remain a risk. Rising rates along the length of the yield curve should **motivate a strategic investor to approach their duration management from the short/underweight side on average**.

Putting together these distinct pieces, a global strategic investor with a desire to hedge de-dollarization risks should **underweight the dollar and US markets**. De-dollarization would likely **adversely affect returns in the US both in absolute terms, and relative to other markets**. The size of the underweight should be disciplined by assessments of the likelihood of **faster or deeper de-dollarization, which we regard as a small but still non-trivial risk**.

## The Long-term Strategist

Industrial policy, deglobalization and strategic asset allocation



- Industrial policies have become more prevalent globally since the GFC, with particularly rapid growth since 2017 as governments seek to reduce dependence on foreign suppliers by boosting domestic production. This trend is likely to continue in an era of resurgent strategic competition.
- The most common forms of industrial policy are trade finance measures, state loans, and financial grants. Industrial policy is globally concentrated, and more prevalent in higher-income countries. Tariffs are no longer the principal instrument of industrial policy. Industrial policy is most commonly used in heavy and high-tech industries.
- Empirical evidence suggests that it will probably increase aggregate employment, investment, R&D, innovation, and output. There is no evidence of effects on margins, so increases in revenues translate into increases in earnings. Pecuniary benefits also directly raise profits.
- In an era of resurgent strategic competition, industrial policies are likely to be pursued competitively by countries. Thus, it is most likely to be effective in countries with large economic mass, fiscal capacity, and effective governance. Competitiveness will be harmed in countries without this capacity.
- Based on these criteria, the US, China, and the EU are most likely to effectively pursue industrial policy. However, industrial policy in China is pursued to a large degree through state-owned enterprises, with probable adverse impacts on private enterprise. EM ex-China is unlikely to be able to effectively marshal sufficient resources to compete.
- Any global resurgence in industrial policy has implications for strategic asset allocators in several dimensions. It should affect sector allocations, country allocations, and allocations to small versus large caps.
- Industrial policy is likely to benefit Information Technology, Industrials, Energy and Basic Materials. This is *one motivation* for a strategic equity overweight on these sectors in the US and the EU, but an underweight on these sectors in competing EM countries. This is also an argument for a strategic overweight on the US and the EU.
- The largest benefits of industrial policy should accrue to small-cap equities, since it can alleviate financial constraints, which more frequently affect smaller companies. Large caps are also more likely to incur costs associated with countervailing duties or market access restrictions.

---

**Long-term Strategy**

**Alexander Wise** AC

(1-212) 622-6205

alexander.c.wise@jpmchase.com

**Jan Loeys**

(1-917) 602-9440

jan.loeys@jpmorgan.com

J.P. Morgan Securities LLC

---

In recent reports, we have [argued](#) that deglobalization is not yet a reality, but rather a risk grounded in growing government wariness of dependence upon other non-aligned countries for critical goods and services. This wariness is motivating governments to enact industrial policies aimed at stimulating the domestic innovation and production of these strategic goods and services. In the US, the recent passage of legislation that provides considerable support to sectors perceived to be of national strategic significance, such as the Inflation Reduction Act and the CHIPS and Science Act, suggests it is likely that there will be resurgence of industrial policy in an era of **intensifying strategic competition**. As the Inflation Reduction Act reveals, industrial policy is also motivated by a desire to support innovation to mitigate climate change.

Historically, industrial policy has primarily been used as a macroeconomic tool to promote development or to preserve economic activity in moribund industries. While there are notable instances of successful use as a development strategy, such as in South Korea, industrial policy came to be seen as an inefficient tool of supporting inviable industries. The renaissance of industrial policy, however, is not motivated by a desire to preserve declining industries.

In this paper, we consider the implications of a resurgence of industrial policy for a strategic asset allocator. Based on empirical evidence, industrial policy is likely to affect asset allocation decisions along several dimensions. Firstly, industrial policy is skewed towards certain industries, and thus influences sector selection. Secondly, industrial policy has demonstrable aggregate consequences, thereby influencing country selection. Thirdly, industrial policy likely has heterogeneous effects on firms of different size, with implications for allocations to small versus large caps.

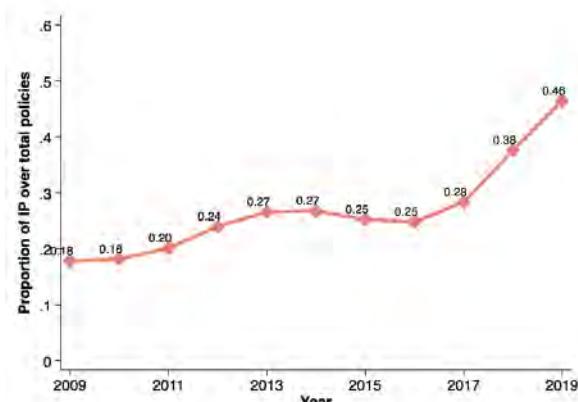
## Landscape of industrial policy

While geostrategic competition is perceived to have intensified in recent years, there is evidence that industrial policy has been **globally resurgent since the Global Financial Crisis**. Juhász, et al. (2022) classify commercial policies recorded in a large global policy database using text analysis techniques and find that the share of commercial policies that constitute industrial policy increased from 18% in 2009 to 46% in 2019, with the most dramatic increases occurring since 2017.<sup>1</sup>

Different forms of industrial policy are likely to have different implications for an investor. For instance, **industry nationalization** almost certainly has adverse implications for private enterprise. This approach has fallen into relative disfavor in developed economies with waves of economic liberalization and privatization since the 1980s. More recently, industrial policy more commonly entails the provision of **R&D subsidies, investment grants, low interest loans, loan guarantees, tax exemptions or holidays, and trade protection**. Juhász et al. (2022) show that, in recent years, overwhelmingly the most common forms of industrial policy have been trade finance measures, state loans, and financial grants. While the US-China trade war has highlighted the possible role of **tariffs**, they no longer represent the principal instrument of industrial policy.

**Figure 1: Proportion of commercial policies classified as industrial policy**

Annual, 2009-2019.



Source: Juhász, Lane, Oehlsen and Pérez (2022).

Juhász et al. (2022) also find that the use of industrial policy is heavily concentrated across countries and is more common in more developed countries. This is consistent with an argument that “implementing many of the most common forms of IP will almost surely require high levels of fiscal and administrative capacity” (p. 23).

Industrial policy is also typically used in a relatively small number of sectors, mostly in **heavy and high-technology industries**. For example, Juhász et al. (2022) find that steel, electrical machinery and equipment, vehicles, chemicals, and raw materials are among the most commonly targeted sectors. If geostrategic competition drives the proliferation of industrial policies into the future, it is very likely that this sectoral bias will persist.

<sup>1</sup> Réka Juhász, Nathan Lane, Emily Oehlsen and Verónica Pérez, [The Who, What, When, and How of Industrial Policy: A Text-Based Approach](#) (2022) Working Paper.

To whom industrial support is provided varies. Some industrial policies entail the provision of support to particular firms within industries, while others entail the wholesale support of entire industries regarded as strategically significant. In the former case, government support likely provides a competitive advantage to the detriment of competitors of the recipient, with the implication that investors may be compelled to “pick winners.” To date, the majority of industrial policies have been **directed towards specific firms** (Juhász et al., 2022). However, since the probable resurgence in industrial policy is motivated first and foremost by national strategic priorities, it is more likely that forthcoming support will be **directed towards domestic industries broadly**, rather than specific companies within those industries. While specific firms may avail themselves of some benefits like R&D grants, it is reasonable to expect that all domestic producers in an industry would be eligible for such support. The structuring of recently adopted policies in the US appears broadly consistent with this argument.

## Effects of industrial policy

The effects of these policies are debatable. However, we consider it a reasonable presumption that some forms of industrial support – including the most common instruments, such as grants and concessional loans – **ought to directly benefit a recipient**. For our purposes, we focus on the costs or benefits of industrial policy from the perspective of an investor, rather than the aggregate economic efficiency of these measures.

Here, we assess the **most recent empirical evidence** on the effects of various forms of industrial policy. To distinguish between barriers to trade and other instruments of industrial policy, we shall refer to industrial policy which specifically confers some pecuniary benefit as “*pecuniary industrial policy*.”

The balance of the evidence suggests that **direct or indirect subsidies can increase aggregate employment, investment, R&D, innovation, and output, though evidence is more mixed with respect to productivity.**<sup>2</sup> In some cases, these outcomes persist only for so long as policy support is maintained, but some targeted interventions can yield long-term effects if

<sup>2</sup> See, for example, Chiara Criscuolo, Ralf Martin, Henry Overman and John Van Reenen, [Some Causal Effects of an Industrial Policy](#) (2019) 109(1) *American Economic Review* 48-85; Philippe Aghion, Jing Cai, Mathias Dewatripont, Luosha Du, Ann Harrison and Patrick Legros, [Industrial Policy and Competition](#) (2015) 7(4) *American Economic Journal: Macroeconomics* 1-32.

they allow the realization of a latent comparative advantage, as is argued with respect to South Korea’s Heavy-Chemical Industry (HCI) Drive.<sup>3</sup>

While research establishes that pecuniary industrial policy can have aggregate effects, there is evidence that these **effects are strongest in smaller firms** with more binding financial constraints.<sup>4</sup> For example, research suggests that Small Business Innovation Research (SBIR) grants from the US Department of Energy have positive causal effects on small firm patenting, revenue, the likelihood of successful capital-raising, and survival rates, especially in emerging high-tech sectors.<sup>5</sup> Large firms appear less responsive to policy incentives as they are relatively less likely to be bound by financial constraints.

There is less evidence about the effect of industrial policy on **industry competitiveness and profit margins**. On one hand, if policies disproportionately benefit small enterprises, they may have pro-competitive effects, plausibly reducing margins for larger incumbents. On the other hand, if supportive policies were targeted towards large incumbents, their effect would likely be anti-competitive. Empirically, there is evidence that South Korea’s HCI Drive had no statistical effect on margins (Choi and Levchenko, 2022). If margins are unaffected by broad industry-wide policy support, increases in revenue imply increases in corporate profits. Moreover, financial transfers, such as grants and targeted tax cuts, ought to have a direct positive effect on profitability, even if they are otherwise ineffective.

On the margin, the evidence surveyed above suggests that **pecuniary industrial policy is very likely to have a positive effect on recipient firms**. This does not necessarily imply that industrial policy has positive aggregate effects on an industry, or corporates at the economy more broadly, since industrial support may be wasteful or worsen distortions, leading to the misallocation of capital towards firms or industries

<sup>3</sup> See, for example, Jaedo Choi and Andrei Levchenko, [The Long-Term Effects of Industrial Policy](#) (2022) *NBER Working Paper* #29263; Minho Kim, Munseob Lee and Yeongseok Shin, [The Plant-Level View of an Industrial Policy: The Korean Heavy Industry Drive of 1973](#) (2021) *NBER Working Paper* #29252.

<sup>4</sup> See, for example, Raffaello Bronzini and Eleonora Iachini, [Are Incentives for R&D Effective? Evidence from a Regression Discontinuity Approach](#) (2014) 6(4) *American Economic Journal: Economic Policy* 100-134.

<sup>5</sup> Sabrina Howell, [Financing Innovation: Evidence from R&D Grants](#) (2017) 107(4) *American Economic Review* 1136-1164.

producing a low return to capital. However, it is likely that the most productive firms will retain a competitive advantage over unproductive firms, and therefore remain capable of maintaining or growing market share, when industrial support is broadly targeted at an industry. Thus, the weight of the evidence suggests, in our view, that **industrial policy is likely beneficial to both recipient firms and industries.**

Special consideration must be given to industrial policy implemented by raising barriers to trade, such as tariffs. While raising barriers to trade is typically regarded as beneficial for protected industries, empirical evidence indicates that it adversely affects other industries reliant upon inputs produced by the protected industry. There is no evidence to suggest this is the case with pecuniary industrial policy. Thus, in our view, **pecuniary industrial policy is more likely to be beneficial to corporates in general at the country level than trade protection.**

The discussion thus far has considered the first-order effects of more aggressive pursuit of domestic industrial policy. In practice, **other countries will likely feel compelled to pursue their own industrial policies in an attempt to preserve domestic competitiveness** – as is evidenced by recent US and Chinese actions in support of semiconductor development and manufacturing. To the extent that this intensifies foreign competition, this could partially or even wholly neutralize the presumptive positive effects of industrial policy for domestic producers.

Thus, industrial policies are most likely to be beneficial for industries in countries with the greatest absolute capacity to pursue those policies. In all likelihood, this capacity will be governed by economic mass and fiscal capacity. By these criteria, **industrial policy is most likely to be effective in the US, China, and the European Union.** However, industrial policy in China is pursued to a large degree through state-owned enterprises, with the implication that intensification of industrial policy is more likely to adversely affect private enterprises, to the detriment of investors. While Japan is a large economy, it has diminished fiscal capacity due to the level of public debt. Outside of China, many EM countries are unlikely to be able to marshal sufficient resources to compete in this domain. Furthermore, effective implementation of industrial policy may depend on administrative capacity and effective governance. Based on the World Bank's *Worldwide Governance Indicators*, governance effectiveness, regulatory quality, the rule of law and control of corruption are weaker on average in EM countries.

Additionally, industrial policy is most likely to be vigorously pursued in countries or blocs with the strongest abiding interests in preserving strategic autonomy, such as the US, China, and the European Union. It is conceivable that this may be a weaker priority in non-aligned countries not directly involved in geostrategic competition. Finally, as recent consultation on the Inflation Reduction Act reveals, there is a prospect that the US and the EU may seek to reduce the degree to which their industrial policies adversely affect one another given perceived strategic alignment, reinforcing the argument that they may be best positioned to realize benefits from the perspective of an investor.

## Implications for strategic asset allocation

Based on this empirical evidence, we now consider the likely effects of a resurgence of industrial policy on various strategic asset allocation decisions. We discuss overweights and underweights *motivated by industrial policy* from an international CAPM baseline in which an asset allocator invests in the whole market in all countries. As discussed above, countries have different capacities and inclinations to pursue competing industrial policies. Thus, as we discuss below, the effects of global industrial policy growth on asset allocation ought in general to differ across countries.

### Sector allocations

Sectoral biases in industrial policy are likely to persist as countries seek to support industries perceived to be of strategic significance in light of renewed geostrategic competition. Based on the sectoral composition of industrial policy reported by Juhász et al. (2022) and revealed policy priorities, this is likely to include the Information Technology, Industrials, Energy, and Basic Materials sectors. All else being equal, intensifying industrial support within a country is more likely than not to support earnings growth and equity returns in these sectors, conditional upon that support being provided to private enterprise, which is less likely in China.

In some countries, this is one force motivating a strategic overweight of these sectors relative to an investor's benchmark. As discussed above, these effects are likely to be concentrated in economies with the greatest capacity and inclination to provide effective support – likely the US and the EU. In countries with less capacity, particularly in EM, any growth in industrial policy at a global level is likely to *adversely affect* returns in these sectors in particular, as domestic industries struggle to

compete with international competitors receiving increasing support. Thus, the sectoral implications of industrial policy are likely to differ across countries, even if they share comparable objectives. These arguments are summarized in the first row of Table 1.

For the avoidance of doubt, note that this discussion relates to the effect of industrial policy on sector relative performance. These effects do not necessarily imply that portfolios should have strategic overweights on targeted sectors once all other considerations are taken into account. For example, we have [argued](#) in the past for a strategic overweight on Health Care on the basis of sustained outperformance of that sector. In our view, this overweight is warranted regardless of the prevalence or effects of industrial policy.

### Country allocations

Industrial policy may plausibly affect local currency and USD returns on both equities and bonds. As was argued above, it is necessary to distinguish between various forms of industrial policy. Pecuniary industrial policy is likely to be beneficial for the equity market of a country since there are very likely positive effects on recipients, but adverse effects on non-recipient industries are likely to be limited. However, raising barriers to trade may adversely affect the equity market in general due to spillover effects of higher input prices. Broadly construed, industrial policy is more likely than not to benefit the equity markets of countries with the capacity and inclination to pursue these policies (ex-China) given the general policy bias towards pecuniary support measures. In our view, there is little reason to anticipate that industrial policy would affect local currency returns on bonds.

These benefits would likely come at the expense of competitiveness, and consequently equities, in countries with less fiscal and administrative capacity. Further, there is good reason to think that more aggressive pursuit of industrial policies in developed markets may adversely affect growth prospects in EM ex-China. Typically, heavy and high-tech industries grow as a share of economic activity up to relatively high levels of development, unlike lighter industries such as textiles or food processing (Wise, 2021).<sup>6</sup> Due to the relatively high rate of productivity growth in these higher-end industries, this hierarchical process of industrialization is an engine of growth for developing countries. An inability to effectively pursue industrial policy would

<sup>6</sup> Alexander Wise, Manufacturing Hierarchies and the Concentration of Industrial Activity (2021) *Working Paper*.

likely weigh on this hierarchical industrialization in developing countries, plausibly aggravating the middle-income trap. As it stands, production in these high productivity growth industries is already globally concentrated in a small number of countries. To conclude, as summarized in Table 1, a global proliferation of industrial policy is likely to benefit equities as a whole in the US and the EU, with adverse effects in EM.

The other relevant consideration for country selection is the effect of industrial policy on currencies. In our judgment, industrial policy is unlikely to have first-order effects on exchange rates. As we have previously observed, the most reliable predictive signal for long-run changes in exchange rates is the real exchange rate.<sup>7</sup> While there may be growth effects of industrial policy, as discussed above, differences in economic growth do not generally help predicting exchange rate changes over a long horizon. Thus, any resurgence of industrial policy does not warrant adjustment of our exchange rate predictions recently published ([see Long-term forecasts: Update January 2023](#), Alexander Wise and Jan Loeys, January 6, 2023).

### Style allocations

Based on empirical evidence presented above, it is likely that broadly targeted industrial policy is relatively more advantageous for small caps than large caps. While firms of all sizes may avail themselves of benefits, these benefits are more likely to alleviate financing constraints that likely particularly limit the growth of smaller firms.<sup>8</sup> Moreover, more trade-exposed large caps are more likely to incur costs associated with countervailing duties or market access restrictions. Along this dimension, the qualitative effect of industrial policy is likely to be uniform across countries, even in EM countries with less capacity to effectively implement industrial policy. The magnitude of those effects, however, will vary in accordance with that capacity.

<sup>7</sup> See Alexander Wise and Jan Loeys, [Long-Term FX Forecasts](#), December 14, 2021.

<sup>8</sup> See, for example, Raffaello Bronzini and Eleonora Iachini, [Are Incentives for R&D Effective? Evidence from a Regression Discontinuity Approach](#) (2014) 6(4) *American Economic Journal: Economic Policy* 100-134; Chiara Criscuolo, Ralf Martin, Henry Overman and John Van Reenen, [Some Causal Effects of an Industrial Policy](#) (2019) 109(1) *American Economic Review* 48-85.

## Figure 2: Effects of global resurgence in industrial policy on strategic portfolios

Overweights and underweights are based only on the effects of resurgence in industrial policy, without regard to other considerations.

Allocation decision	Overweight	Underweight
<i>Sector allocations</i>	Information Technology, Industrials, Energy, Basic Materials equities in US and Europe	Information Technology, Industrials, Energy, Basic Materials equities in EM
<i>Country allocations</i>	US and Europe	EM
<i>Style allocations</i>	Small-cap equities	Large-cap equities

Sources: J.P. Morgan.

Since there is a sectoral bias in industrial policy, it is important to consider whether there are differences in the sectoral composition of small versus large caps. For example, if the targeted sectors constituted a larger capitalization share of large caps than of small caps, this could implicitly reverse the relative benefit accruing to small caps. To that end, we assess the sector market capitalization shares of the S&P 500 and the Russell 2000 indices. Summing across the Information Technology, Industrials, Energy, and Basic Materials sectors, the market capitalization share is 43% in the S&P 500 and 39% in the Russell 2000. Given these shares can vary materially even on a daily basis, we regard these shares as comparable. Consequently, it remains likely that benefits of industrial policy will accrue disproportionately to small caps.

## Conclusion

Industrial policies have become more prevalent globally since the GFC, with particularly rapid growth since 2017. This trend is likely to continue in an era of resurgent strategic competition. The most common forms of industrial policy are trade finance measures, state loans, and financial grants, while tariffs are no longer the principal instrument of industrial policy. Industrial policy of this form is globally concentrated, more prevalent in higher-income countries, and most commonly used in heavy and high-tech industries.

Any global resurgence in industrial policy is likely to affect strategic asset allocation along several dimensions – sector allocations, country allocations, and small-cap allocations. Since industrial policy is globally competitive, the effects are likely to vary across countries based upon differences in their fiscal and administrative capacity to effectively implement such policies. Based on these criteria, the US, China, and the EU are most likely to effectively pursue industrial policy.

However, industrial policy in China is pursued to a large degree through state-owned enterprises, with probable adverse impacts on private enterprise. EM ex-China is unlikely to be able to effectively marshal sufficient resources to compete.

Industrial policy is likely to benefit the Information Technology, Industrials, Energy and Basic Materials sectors. This is one motivation for a strategic equity overweight on these sectors in the US and the EU, but an underweight on these sectors in competing EM countries. This is also an argument for a strategic overweight on the US and the EU. The largest benefits of industrial policy should accrue to small-cap equities, since it can alleviate financial constraints, which more frequently affect smaller companies. Large caps are also more likely to incur costs associated with countervailing duties or market access restrictions.



## The Long-term Strategist

### Inflation, markets and the end of the Great Moderation

- **The Great Moderation and Liberalization of the past four decades brought us low inflation and macro volatility, and massive returns to investors. But they also came with weaker growth, worsened inequality, and now un-investable interest rates.**
- **New macro policies to boost growth and reverse inequality significantly raise the risk in our mind that we have entered a world of higher inflation, bigger deficits, greater macro volatility, and faster moving business cycles. The US is the most likely country to lead us into this new world, and to entice others to follow.**
- **Macro volatility is not easily diversified and thus should raise risk premia. Against expectations, higher inflation and macro risk should actually have little impact on nominal long-term returns on bond or equities as initial losses from falling asset prices should be offset by higher income from coupons, earnings and dividends. Equities should still easily beat bonds this coming decade, and with lower overall real returns, investors will likely move further into risk assets, deciding to hold even more equities.**
- **Within equities and fixed income, investors should select those where income can rise more with inflation, and asset prices fall less. That means holding more shorter-duration and inflation-linked assets, Health Care and Financials, EM FX, Commodities (ex Gold) and market-neutral hedge funds, while reducing strategic holdings of the dollar, Consumer Discretionary and Industrials.**

- [Video](#)

Central banks are proud of their accomplishments over the past four decades, having pulled the world economy from the volatile and high inflation conditions of the 1970s towards lower inflation and more stable growth over the past 35 years, a period and regime known as the **Great Moderation**. Many, including this analyst, now think there is a serious risk that this period is over and will be replaced with one of greater macroeconomic volatility and inflation. We might as well call this new regime the “**Great Instability**”.

In this note, we briefly review how the world was able to end the macro instability of the 1970s and early 1980s, then consider what in turn could make it exit this Great Moderation, what it would do to markets, and how investors can prepare for it. We will focus our analysis on the **US**, as it is the largest economy and market, and in our mind a likely trendsetter for a new direction in economic policy making. The other large economy, **China**, is also changing its policy objectives, but choosing its own direction. We believe that when the largest economies in the world set new policy directions, they can provide coverage and inspiration for other countries to follow suit.

## Our model of change

Our model of change is one of evolution rather than revolution where economic agents constantly **learn from new experiences and adapt behavior accordingly**. The system is thus never fully in equilibrium, or even stationary, and the parameters that describe our world model are subject to constant, steady change. This approach is an application of the well-known **Lucas Critique** in econometrics. Accordingly, policy makers choose optimal policy rules on the basis of past experience when these rules may not have been in place yet. When the rules change, economic behavior adapts to it, and the new rules may no longer be optimal. When policy makers recognize this, they re-optimize and chose a new set of rules, which after a while will again turn out to be suboptimal. A variation to this is known as the **Goodhart Law**: whatever the central bank tries to control will eventually become unstable in its relation to the policymaker's ultimate objective.

During major unexpected events, such as recessions or crises, this learning process of policy makers and economic agents can accelerate and lead to faster behavioral changes that one can call regime changes, or paradigm shifts<sup>1</sup>. We would argue that there is significant risk that we are currently at the beginning of such a regime shift in US economic policy that will reverberate across the world and will induce some other countries to follow the US lead, especially if it is successful<sup>2</sup>.

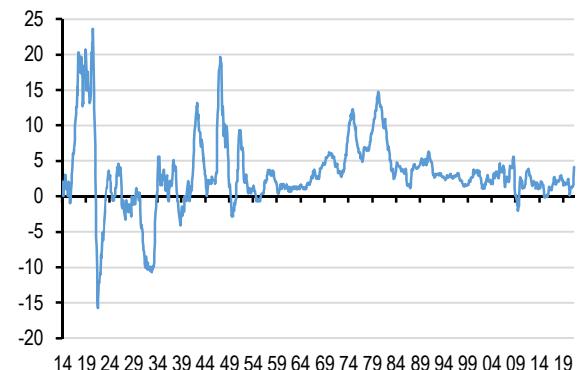
## How did we enter the Great Moderation?

The Great Moderation is generally defined as the period since 1984 when we saw lower US and global inflation rates, lower growth and inflation volatility, longer expansions and shallower recessions (Fig 1-2). There is a debate whether the GFC ended the Great Moderation, but the long expansion since -- a new US record -- and an only 2-month Covid-19 recession leave the profession thinking the Great Moderation is not over yet<sup>3</sup>.

There is a large literature<sup>4</sup> on what brought us the Great Moderation that can be concisely summarized as **Good Luck; Good Practices; and Good Policy**. Volatility is ultimately a question of the supply of shocks/surprises and the vulnerability of economies and markets to these shocks<sup>5</sup>. In this context, **Good Luck** means a reduced supply of shocks after the 1970s which saw two massive oil price shocks. **Good Practices** refers to improved inventory management, the growth of the more stable service industry relative to manufacturing, and less regulated economies that improved the flexibility of production and credit supply and their ability to absorb economic shocks.

Figure 1: CPI Inflation in the US

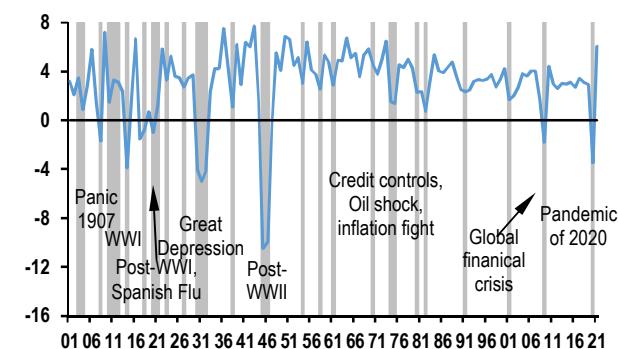
%, monthly oya, Jan 1914- Apr 2021



Source: Bureau of Labor Statistics.

Figure 2 Real global growth since 1900

%, annual



Source: J.P. Morgan, Angus Maddison data.

**Good Policy** – the focus of our note -- refers to **stability-oriented monetary and fiscal policy**, as well as

<sup>1</sup> See two recent issues on such paradigm shifts: Joyce Chang et al., [Paradigm Shifts: What lies ahead?](#), April 5, 2019, and [Pandemic Accelerates Paradigm Shifts](#), July 8, 2020.

<sup>2</sup> Without implicating them, we find our global economists wrote an earlier argument in the same spirit: Kasman and Lupton, [Keep it simple: Inflation is a policy choice](#), May 13.

<sup>3</sup> See, e.g., [The Two Greatest: Great Moderation vs The great Financial Crisis](#), Gadea et al., FRB of San Francisco, Aug 2014 and [The Great Moderation. Federal Reserve History](#), Craig Hakkio, FRB of Kansas City, November 2013.

<sup>4</sup> A good survey can be found in [The Great Moderation: Causes and Conditions](#), David Hutton, March 2016, wp #101, Victoria University of Wellington.

<sup>5</sup> As discussed in more detail in [Volatility, Leverage and returns](#), Loeys and Panigirtzoglou, Oct 19, 2005.

**economic liberalization.** Good policy included moving away from traditional stop-go policies, which reduced the supply of policy shocks, and active counter-cyclical macro policies – leaning against the wind -- that helped counteract and absorb shocks to the economy. In monetary policy, this included setting clearer targets for instruments and objectives, regular communication on its thinking and strategy, using well-signalized rules on how it will react to incoming information (such as the Taylor Rule), and being allowed to become more independent from the shorter-term electoral cycle.

Good policy also consisted of market **liberalization** across and within borders, through deregulation, globalization and a less strict attitude towards antitrust. Among other effects, it allowed domestic economic shocks more easily to be absorbed by domestic and foreign suppliers and by a more elastic supply of credit.

## What could end the Great Moderation?

As discussed, our model of change is based on **learning by economic agents** from their own experiences. People and institutions learn faster when things are not working out. **Increasing dissatisfaction** by both policy makers, workers, companies, and voters **with what the Great Moderation and Liberalization have delivered** is to us the most important catalyst for change.

## People's gripes

First, on the **public's dissatisfaction** side, governments pursued both Stability and Liberalization because economic theory and logic told them they would both boost the productive capacity of the economy and thus growth and jobs. Greater economic and price **stability** reduces systematic risk and thus makes it easier for households, workers, companies, banks, insurers, and governments to plan for the future, facilitating greater and longer-term investment in human and physical capital and R&D. **Liberalization**, through the removal of artificial restrictions, regulations and barriers to entry should similarly boost economic activity.

The last three decades saw very strong economic growth in EM, but **slowing growth in DM**. Probably more important, it also saw worsening income and wealth **inequality** within countries, **worsening financial instability** and a fast gathering **climate crisis**. There is a large literature on the many developments what brought us these problems. Not all of these can be blamed on Stability and Liberalization, but some of it can be. Also, **it happened on their watch**. At a political level, correlation is frequently the same as causation as voters

and politicians need to find a culprit in their search for a solution. Let us look at each of these four sources of dissatisfaction.

**First, climate change** is hard to pin on the Stability Culture but Economic Liberalization probably played a supporting role. Climate Change must be the greatest externality the world has ever seen, requiring global collective action that has been hard to come by in a world where many have been told for the past 40 years that big government is bad for growth<sup>6</sup>.

**Second, on lower growth**, recessions were fewer and shallower during the Great Moderation pre GFC, but recoveries were also less buoyant, in particular in the first year, most likely as fiscal policy was not used aggressively, relying on monetary policy to “carry the ball”. Weak recoveries keep those who lost their job during the recession out of the labor market for longer, making them lose important skills and connectivities<sup>7</sup>.

**Third, income and wealth inequality** worsened also during the past few decades and more dramatically than overall growth. There are clear linkages here to Globalization, which sent many low- to mid-paying jobs from DM to EM, and to Economic Liberalization which allowed more productive labor to gain a large share of national income. Weaker antitrust and globalization in turn permitted US corporates to earn higher margins and to double their share of national income since the mid-1980s<sup>8</sup>. Shareholders -- mostly higher net-wealth households -- were thus similarly able to raise their share of total income.

One should probably not blame worsening wealth **inequality** fully on the Great Moderation, but it probably contributed. The fall in risk premia engendered by improved economic stability did boost asset prices that benefited most those with already ample financial assets.

<sup>6</sup> See some of the papers we have written on Climate Change. [Climate change investing](#), May 30, 2019. Chang et al., J.P.

Morgan Perspectives, [Climate changes ESG Investing](#), Part II, Dec 10, 2019, and [Climate changes everything](#), May 30, 2019.

<sup>7</sup> Alternatively, it could easily be lower growth that is driving macro volatility down. It is an empirical regularity in economics and markets that **slower and lower** growth rates, yield or returns are usually also **more stable while faster and higher** is generally **more volatile**. We showed this most [recently](#) in the case of interest rates where the standard deviation of the returns on the US AGG falls one-for-one -- actually same number -- as the yield on the US AGG.

<sup>8</sup> See [Business Concentration](#), Sep 30, 2020 and [De-globalization](#), Apr 5, 2019

Similarly, the increasingly desperate efforts by central banks to use rate cuts and quantitative easing have over the past few decades pushed global interest rates to near zero, and in some DM countries to negative, and have created a massive rally in asset prices, multiples more than the rise in incomes, thus again benefiting those with the most financial assets to start with.

**Fourth, financial instability:** Economic stability was supposed to make financial markets also more stable as markets ought to reflect the present value of future cash flows with a discount rate consisting of a risk premium on top of a risk-free rate driven by the supply and demand for capital. And with a steady rise in the number of countries all pursuing the same stability and liberalization policies, exchange rates should have also become less volatile.

Quite a few of these financial volatility implications of the Great Moderation did come through, as day-to-day market volatility did come down from the volatile 70s and 80s, but not all. Foremost, periods of low volatility eventually broke up into extreme market moves, such as during the dot-com boom in the 1990s, followed by the Great Financial Crisis 8 years later.

## Policy makers -- what they have learned and the risk of mission creep

We have argued so far that there is increasing dissatisfaction among many with the conditions fostered by the Stability and market Liberalizing policies pursued by a broad set of countries over the past four decades. Central banks are in the crosshairs here, not necessarily because one can show them to have been responsible for what has gone wrong the last few decades, but more likely because they are seen as the most powerful and agile policy maker. There is thus in our mind increasing pressure on central banks to look beyond price stability and to help also improve job growth, equality, financial stability, government funding, and energy transition.

That is, we see significant risk of **mission creep** for central banks. Changing the mandate of the central banks is the prerogative of parliaments in a democracy. But giving it multiple objectives is problematic as it breaks the old **Tinbergen Rule**. Jan Tinbergen, the first winner of the Nobel Prize for Economics, stated that a policy maker with multiple objectives needs to have at least one tool for each objective. Most central banks have at best two tools: their balance sheet, which become interest rate changes and QE, and macro-prudential regulations.

**Adding more objectives** than there are policy tools has two impacts: it **dilutes the weight on the existing low inflation and financial stability objectives**, and it creates **greater uncertainty** about the outcomes on each of these objectives as the policy maker cannot achieve all at the same time.

Applying these thoughts to the **US Federal Reserve**, one has to recognize that the Fed always had more objectives than tools. From the 1913 Federal Reserve Act that created it on, the Fed has been operating with a **dual mandate** of maximizing employment and keeping prices stable<sup>9</sup>. Subsequent amendments to this Act have used different wordings but always confirmed this dual mandate.

The Fed's extensive research departments are constantly updating their understanding of the relationship between jobs and prices to see how the Fed can come as close as possible to realizing its dual mandate. This constant learning leads it to systematically update its ideas on what max employment and price stability mean concretely, what information to focus on, how to achieve these objectives, what instruments to use, how to project the impact of its actions on its ultimate goals, and over what time horizon it should try to achieve them. We will not go over the history of how US monetary history has changed over the past 100+ years since its founding, despite virtually no change to its mandate, as this would fill many tomes. But we do need to investigate how the **Fed's more recent learning** could affect monetary policy over the next few years and in particular macroeconomic volatility. This is this analyst's speculation and not gospel.

**What lessons could the Fed have learned on its policy in recent years?** We can think of three most relevant for macro volatility: (1) The Phillips curve relation between jobs and inflation has become flatter and more "wobbly"; (2) hysteresis does long-term damage; and (3) the zero-rate boundary reduces policy flexibility, especially if low rates induce more rather than less saving. Here too, we will chose a concise listing without the deeper analysis each merits while emphasizing our risk bias, accepting that there is not necessarily a consensus on each.

1. The **Philips Curve**, or the empirical relation between unemployment of wage/price inflation has become flatter and harder to use to predict inflation.

<sup>9</sup> See, e.g., [The Federal Reserve's "Dual Mandate": Evolution of an idea](#), Aaron Steelman, Economic Brief, FRB of Richmond, Dec 2011.

In principle, high unemployment should depress wages and thus bring inflation down. The curve should thus be negative sloping. In its early years, it led central banks to think in terms of a trade-off where they simply had to make a choice about which was more important at any time. The rational expectations revolution in the 1970s then showed the curve to be unstable, as wage demands are also a function of expected inflation. It argued then the curve was really vertical in the long run as higher inflation should have no impact on jobs growth over the long term. This led central banks, including the Fed, to focus their long-term goals more on price stability as higher inflation could no longer buy them greater employment.

Over time, as the credibility of keeping inflation low set in, inflation expectation became anchored around the central bank's target and labor market conditions ceased having much impact on inflation. The Phillips curve became quite flat and any remaining fluctuations in inflation became harder to predict with this model<sup>10</sup>.

**Impact on policy:** A move to Flexible Average Inflation Targeting (FAIT)<sup>11</sup>; a reduced reliance on inflation forecasting; a willingness to wait now for actual inflation outcomes before acting; and a willingness to be more aggressive with monetary easing as any inflationary pressure would be much less than before. This means the Fed is willing to be easier for longer and will not fight inflation until it shows up and has proven to be more than temporary. If this bet is right, it will have gotten more jobs without higher inflation. If the bet is wrong, it will be late fighting inflation and risks an early recession. Macro volatility and uncertainty have risen.

## 2. Hysteresis does long-term damage

Many economic models implicitly assume that recessions are just volatility around an unchanged trend growth path that is driven by demographics and long-term productivity growth. However, we do know that the longer workers are out of a job, the more they lose skills and value in the work force, thus doing long-term damage to the economy. The lower growth of the Great Moderation was most obvious in the first year of a recovery. More speculatively, hysteresis is probably most damaging to workers that are already at the lower end of the skill spectrum. Their being pushed out of the labor force worsens inequality, adding one factor that

could explain the increasing voter support for populist parties. Hence, there is an argument that policy makers should get people back to work as fast as possible after the shock that pulls the economy into recession, even if it risks getting the economy faster to overheating.

**Impact of policy:** Faster but also less drawn out recoveries, shortening the overall business cycle. Macro volatility is thus higher again.

3. **Ever lower interest rates** have brought asset price inflation, wealth inequality, and financial instability, and have become **counter-productive** as savers now need to save even more.

With every business cycle, the Fed and other central banks have been pushing interest rates lower and lower, cutting them more in recessions than hiking them during expansions. There is a long literature on why equilibrium rates ( $r^*$  in Fed parlance) have been coming down in recent decades<sup>12</sup>. It is not making monetary policy any easier. It has induced central banks to experiment with various forms of quantitative easing and negative interest rates. There is no reason to assume these have by themselves increased macro volatility. They instead extended the Great Moderation period. However, there is reason to believe they will in the future. For one, Japan and Europe's moves to QE and negative rates over the past decade were unable to raise inflation, pre the pandemic supply disruptions. One reason for this could be that at negative rates, savers have been saving more, quite possibly to protect their target income levels in old age. This makes monetary policy dynamically unstable, with rate cuts inducing more savings, requiring even bigger rate cuts, pushing saving rates higher again.

**Impact on policy:** If the private sector responds "perversely" to rate cuts, then monetary policy needs the fiscal authority to pick up the slack. That is, **monetary and fiscal policy need to "coordinate"** with rate cuts and QE finding larger government spending, putting central bank independence at risk and spurring fears of debt monetization and fiscal dominance.

A greater reliance on fiscal policy is also needed as ever lower interest rates have boosted financial asset prices, which feeds wealth inequality and financial instability, as seen during GFC. Passing on the baton to fiscal policy by itself does not have to raise economic instability, but the electoral cycle forces fiscal authorities to be more short term and less focused on long-term fiscal discipline, each

<sup>10</sup> [The inflation outlook - Thinking outside the triangle](#), Feroli, Silver and Edgerton, Mar 12, 2021.

<sup>11</sup> [FAIT and Fedspeak](#), Feroli, Mar 4, 2021, and [An Overview of the Fed's new framework](#), Feroli, Sep 2, 2020.

<sup>12</sup> We reviewed these most recently in [What if US joins the Zero-Yield World](#), Jul 12, 2019.

of which is more likely to yield stop-go policies and macro volatility than semi-independent organizations like many of today's central banks.

Though not directly the focus of this paper, on the other side of the world, **Chinese policy makers** are also learning from experience. They are also recognizing that the dramatic increase in **inequality** needs to be reversed, but are not intending to do this with demand side policies as is the US, and are focused more on the supply side. Our economists have argued that the addition of the goal of **Common Prosperity** to the previous seemingly exclusive "GDP religion" should **raise macro risks**<sup>13</sup>.

## What would a Great Instability look like? Economies and market pricing

The discussion above of an impending end of the Great Moderation suggests **a world with higher growth and inflation volatility, higher inflation and higher growth, at least initially**. It will likely have started in the US, with a number of other countries following suit if it looks like a success. The UK, Australia and Canada may well be first to follow the US. The EU has to some degree already relaxed its Maastricht fiscal straightjacket, but is quite unlikely to follow the US all the way. Japan has for long been reluctant to raise its high debt ratio even more, but it could well become less cautious if the US shows the way.

**Emerging economies** should similarly see higher volatility and inflation from a return of stop-go policies in DM, in particular those countries dependent on international capital flows. One major exception will likely be China that is now more than before able to choose its own economic destiny.

Order of magnitude, we will **work with a risk scenario of US inflation averaging about 4%** over the decade, and a **business cycle** (expansion plus recession) **shortening to 5-6 years**, instead of the 11 years seen in the last 4 decades.

Macro volatility is not easily diversified and an increase in macro vol should therefore **raise risk premia** across asset classes. One should expect higher term premia (as an inflation risk premium), and higher **credit** spreads. One should also expect higher **equity** risk premia, and thus a lower PE multiple. During the inflation decade of

the 1970s, the SPX multiple averaged close to 10x, compared with well over 20x today.

**US real yields** are currently at all-time lows with the 10-year TIP yield under -1%. With investors continuing to buy TIPS to hedge against inflation risk and the Fed still keeping nominal UST yields low, little prevents real yields from going even lower in the near term. But more medium to longer term, higher growth, larger deficits, higher inflation, greater macro volatility should raise real bond yields, both at the short end and at the long end where higher inflation uncertainty should raise term premia.

## Asset returns: income vs price-to-income changes and inflation

There is a fundamental **tug of war** between two opposing ways that inflation impacts asset returns. They are income and prices. **Inflation raises income, but lowers asset prices relative to that income**. Inflation eventually raises the income that assets return in the form of coupons and dividend/earnings. But higher inflation also raises the rate that investors require to discount these future income streams back to today. I find that for most large financial asset classes, the positive impact on income and negative impact on asset prices will broadly offset each other over a 10-year horizon, producing unchanged nominal returns whether we are considering 2, 4, or 6 inflation. On shorter horizons, the negative price impact will likely dominate, while longer than 10 year out, higher income should dominate. **Real returns will by implication move inversely and one for one down with higher inflation**.

Over **shorter horizons** than our standard 10-year, returns will depend on whether rising income can offset the impact of a lower price-to-income ratio. Our guess is that it will not. Income will be simply a function of delivered inflation while price to income is more a function of expected inflation and volatility, which should move earlier. Hence, in a rising inflation scenario, one should probably expect **returns first to go down in the next few years as markets start pricing in the higher inflation environment before then to rise as income levels catch up**. Part of this pricing in should involve a recession in the next 4-5 years, as inflation rising steadily will then belatedly force the Feds hand<sup>14</sup>. From today to the eve of that recession, USD bonds returns could easily be negative. And from here to that recession, equity returns could also easily be negative.

<sup>13</sup> [China: The Path to Common Prosperity](#), Zhu et al., August 26; and Aziz and Zhu, [China: End of countercyclical industrial policies](#), Aug 5.

<sup>14</sup> For a similar view, see, Michael Feroli on this: [Are we FAIT-ed for a hard landing?](#), July 14, 2021.

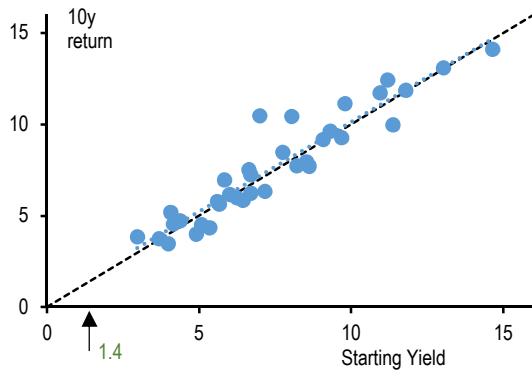
## Bond and equities returns, 10-years out

**Fixed income** returns consist of yield (income), yield changes times duration, and principal losses due to defaults. As discussed in [previous papers](#), over a time horizon of a little less than twice its duration, the total return on a bond portfolio will be its starting yield, plus 20-30bp to account for slide, as over this period, initial capital gains/losses are offset by future changes in income. For corporate bonds, we deduct some 30bp for US HG and 210bp for HY to account for losses due to downgrades and defaults. Many bond indices have a duration in the 5-7 year, implying that some 10 years out, the current yield, plus slide and minus credit losses, will be a very close estimate of the return to be earned over the next 10 years. Portfolios, or indices with longer duration, will take longer than 10 years for income and price effects to offset each other and vice versa for those with shorter duration.

Important for our inflation scenario is that these starting-yield return projections are **little dependent on how much the index yields changes over the coming 10 years**. If they are net unchanged after 10 years, then the current yield (plus slide, minus credit losses) will be the return over the next 10 years. If rising inflation expectations and term premia raise yields over the coming decade, then capital losses will over time be offset by higher coupons on newly issued bonds, with older lower-coupon bonds maturing and exiting the index. Fig 3 below shows the 10-year rolling return on the US Agg (USTs, MBS and HG bonds) is tightly defined by the yield at the start of each such 10 years. Yield pretty much equals future return in the case of relatively safe bonds, irrespective of whether yields went up and down during these 10-year holding periods.

**Figure 3: US Agg 10yr returns vs starting yield**

%, annual, index yield at start of each 10-year period on x-axis, 1976-2020, dotted line is a 45 degree line. Arrow indicates current yield level



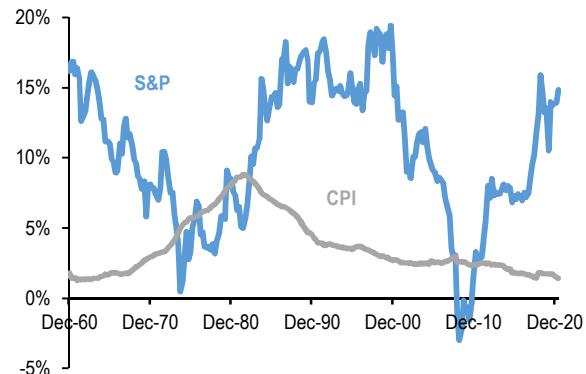
Source: J.P. Morgan, Bloomberg Barclays, Refinitiv.

For **equities**, projecting 10-year out returns is more difficult as there are more moving variables. We discussed these in a recent paper<sup>15</sup>, concluding then that it is best to use an average of different valuation signals as none is very accurate and each can produce very diverging outputs. Each such signal depends on information we have now and thus cannot really answer the question what happens if we enter a new regime.

We thus have to investigate how past inflation cycles affected long-term equity returns. We do this in two ways: first by its impact on total returns and second by its impact on the main components of equity returns -- dividends, earnings and multiples. Figs 4-7 investigate the overall **empirical relation to long-term equity total returns**, showing US CPI inflation and S&P500 total returns since 1950 over our target 10-year investment horizon. The first two charts show there is **no relation between the level of US inflation and nominal equity returns** over 10-year holding periods.

**Figure 4: US equity returns and inflation**

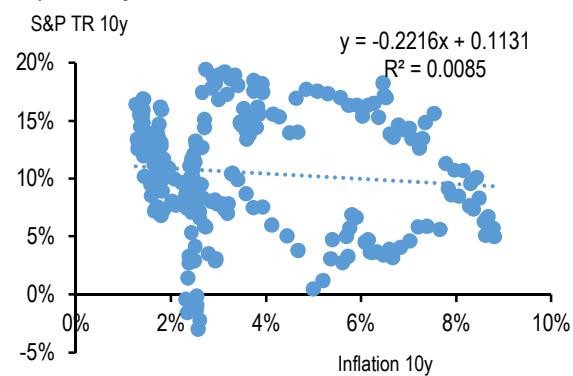
10-year rolling total returns and CPI inflation, Dec 1950- Jun 2021



Source: S&P, US Bureau of Labor Statistics, J.P. Morgan.

**Figure 5: US equity returns and inflation**

10-year rolling total returns and CPI inflation, Dec 1950- Jun 2021

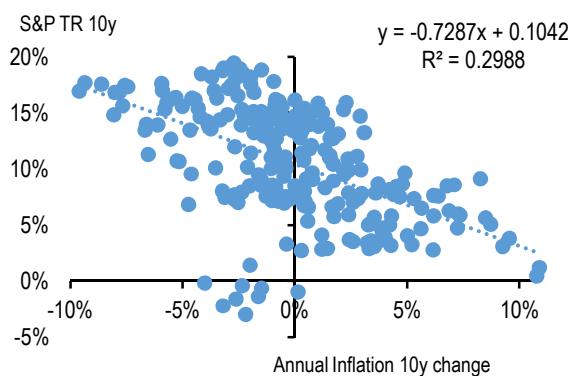


Source: S&P, US Bureau of Labor Statistics, J.P. Morgan.

<sup>15</sup> [Empirical models of long-term US equity returns](#), Mar 1.

Fig 6, however, does reveal a **negative** relation between the **change** in CPI over 10 years (beginning to end) and equity returns over the same 10 years. One can think of the change in inflation over this period as a *surprise* as long-term expectations generally stay close to delivered inflation over the past 5-10 years. A 1% rise in inflation over 10-years has coincided with a 0.7% point fall in equity annual returns over the same 10 years.

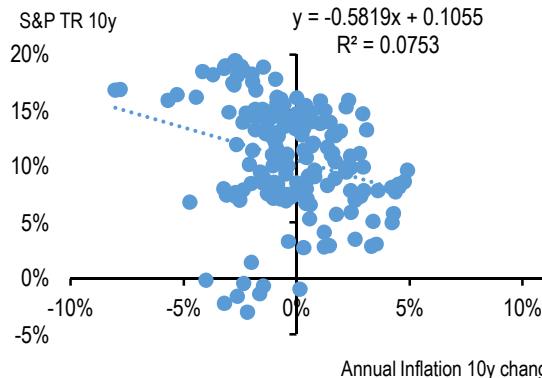
**Figure 6: US equity returns and changes in inflation**  
10-year rolling total returns and changes in 1-year inflation over 10 years ago, Dec 1949- Jun 2021



Source: S&P, US Bureau of Labor Statistics, J.P. Morgan.

Our future inflation risk scenario is one of demand pull (sustained growth in excess of potential) rather than the cost push of the 1970s oil crises that depressed profit margins. Taking out any 10-year periods that includes the 1973-80 years (as in Fig 7) greatly dilutes the impact of rising inflation on 10-year equity returns, keeping us comfortable that the demand pull inflation does not have a meaningful impact on long-term equity returns.

**Figure 7: US equity returns and changes in inflation, ex 1973-80**  
10-year rolling total returns and changes in 1-year inflation over 10 years ago, excluding any 10-year period touching 1973-80.

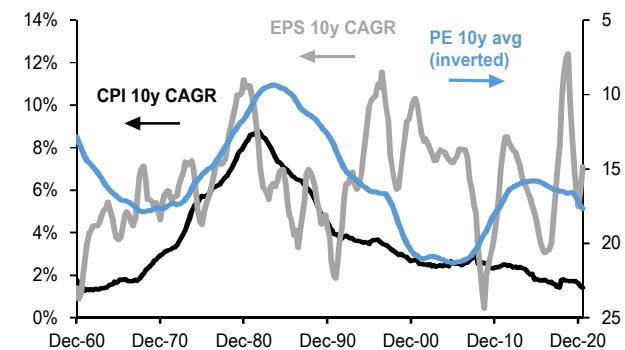


Source: S&P, US Bureau of Labor Statistics, J.P. Morgan.

**This finding goes against a widely shared view that equities are real variables** whose nominal returns should go up with inflation to maintain their real returns.

To understand why this has not happened, we need to understand how inflation affects the main components of equity returns -- dividends, earnings, and multiples. This is generally known as a **building-block approach** to equity return forecasting<sup>16</sup>. We will find that while **higher inflation generally does raise dividends and earnings growth, it comes at the cost of higher volatility that is not easily diversifiable and thus requires a higher risk premium in the form of a lower multiple, eating away the benefit of higher earnings.**

**Figure 8: US CPI inflation SPX EPS growth and PE ratios**  
%, ratios, 10-year rolling averages



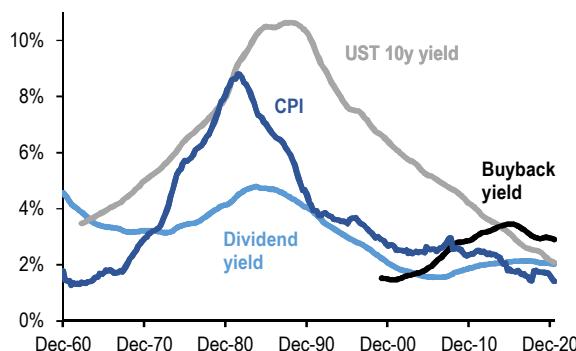
Source: S&P, Refinitiv, US Bureau of Labor Statistics, J.P. Morgan.

Fig 8 above shows 10-year moving averages of US CPI inflation, EPS growth, and the trailing PE multiple since 1950. Until the 1990s, rising inflation indeed went hand in hand with rising earnings growth, offset by falling multiples, and vice versa when inflation was falling. Fig 9 below shows the same 10-year rolling inflation as well as dividend yields, bond yields (as a competitor to equities), and buyback yields (as an alternative to paying dividends). Here also, we see a clean up and down movement of dividend yields with inflation as well as bond yields over 10-year holding periods, **up to the 90s**.

<sup>16</sup> We have used this approach in some of our previous issues, and it has also been used most extensively in the well-known [Long-term Capital Market Assumptions](#) annual publication of our colleagues in J.P. Morgan Asset Management.

**Figure 9: US CPI inflation, SPX dividend yield, buyback rates and 10-year UST yields**

%, 10-year rolling averages and CPI inflation

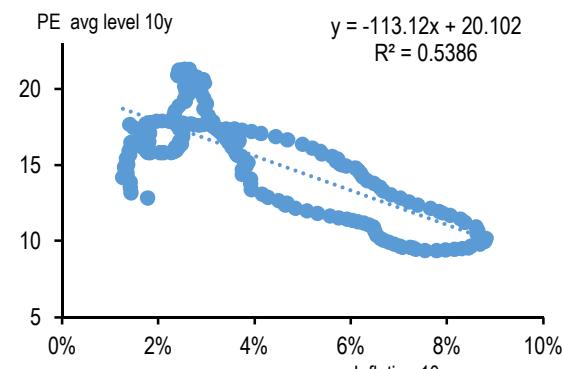


Source: S&P, Refinitiv, US Bureau of Labor Statistics, J.P. Morgan.

Fig 10 below shows more cleanly as a scatter diagram the relationship between US inflation and SPX multiples, each on a rolling 10-year average basis. The multiple falls by 1.1 points for each 1% point rise in inflation over 10-year holding periods.

**Figure 10: US CPI inflation and SPX PE ratios**

%, 10-year rolling average



Source: S&P, Refinitiv, US Bureau of Labor Statistics, J.P. Morgan.

**These longer-term relationships** between inflation on one side and equity returns, earnings, multiples and dividends on the other side are pretty clear from 1960 to the mid-1990s, but then pretty much died off. **Three forces seemed to have killed off the relation since.** First is that the Great Moderation brought both inflation and **inflation volatility down** to the point they were likely no longer important macro drivers of asset returns. Second is that this period saw dramatic market and economic **liberalization**, within borders through deregulation and across border through open trade and globalization. We have argued before that each contributed to significant rises in profit margins allowing

company earnings to rise without any rise in inflation<sup>17</sup>. Third, **interest rates continued to fall**, in both nominal and real terms, lowering corporate borrowing costs and allowing firms to leverage up, both of which boosted profit margins and earnings growth.

**For the next decade**, the annual [Horizon Survey](#) of large asset managers and adviser, just completed, shows an **consensus expected return of 5.78% on US large caps** and 1.1% on USTs 10 years out, with a US inflation rate of 2.1%. In comparison, SPX earned 10.6% pa over the past 30 years, with the same average inflation rate. All long-term forecasters see lower than historic US equity returns 10-year out as the historic record strongly suggests one should assume some form of mean reversion in multiples and profit margins given their relatively high starting points by historic standards. Our own [projection](#) and that of our [JPM AM](#) colleagues are closer to 4%, but our gap with the consensus is not significant given the high volatility of equity returns, even over periods as long as 10 years.

Using the correlations with inflation over 10-year periods that we found above, we are comfortable with a conclusion that **one should not change one's 10-year out equity return forecasts on the basis of different views on inflation**. Put more formally, we cannot reject the hypothesis that **different rates of US inflation will have no impact on delivered US equity returns over the next decade**. More important for equity returns will be any changes in profit margins, as a result of de-globalization, renewed bargaining power of labor, or rising corporate taxation. **Unchanged nominal returns at higher inflation does not prevent lower real returns, though.**

In conclusion, **bonds and equities share an appealing symmetry** in their reaction to inflation over longer holding periods: both should see their **price relative to income fall** as inflation brings more volatility and uncertainty which requires a higher risk premium, but over longer periods, these price falls are **offset by higher nominal income**, through coupons and dividends/earnings.

<sup>17</sup> In short, as the only truly global economic agent, corporates have been able to arbitrage differences in taxation, labor costs, land costs, and regulations across countries. Governments and labor are for the most part local and could thus not prevent this arbitrage, thus losing market shares in national income relative to corporates. See, e.g., our discussions in [De-globalization](#), Apr 5, 2019, and [De-globalization Update 2020](#), April 23, 2020.

## How can investors prepare for an end to the Great Moderation

**The bonds-equity strategic allocation.** Our results imply that a changing view on long-term inflation should not affect one's assumption of nominal returns, outright nor relative, over the next 10 year on bonds and equities. But higher inflation should make one **lower real return expectations** on one's portfolio. Hence, an investor seeking to maintain the real value of their portfolio should consider moving up the risk return trade-off line, which at the first level means increasing one's strategic equity weighting<sup>18</sup>. In previous papers<sup>19</sup>, we have suggested an alternative approach to raise long-term return without the same rise in volatility that a simple bonds-to-equities move implies. This approach entails moving instead to the world in between safe bonds and growth stocks: bond-like equities and equity-like bonds, such as **high yield, equity and mortgage REITs, convertible bonds, preferred shares and Utilities**. These **hybrid asset classes** time diversify (mean revert) much better than the overall equity market without giving up much return and thus produce a higher return to long-term risk.

More important is probably what investors should be doing **within the bond and equity asset classes**. Within **fixed income**, the main choices are on **fixed/floating, duration, convexity, nominal/real, credit quality, and currency denomination**. The objective for investors concerned about inflation risk should be to **protect against price losses from rising yields, while still gaining from rising income**.

Buying **shorter-duration bonds** reduces price risk, but reduces your income. The main US bond index, the so-called "Agg," currently yields 1.4% and has a duration of 6.5 years. The 1-year forward curve is about 25bp higher<sup>20</sup>. Choosing a portfolio with a duration that is 1 year shorter thus provides protection against a rise in yield of barely 4bp (25bp/6.5 year duration) 1 year from now. The 10-year forward is only some 100bp higher than today, making you break even on a bond portfolio

<sup>18</sup> Higher inflation creates higher short-term volatility in asset markets, but we do not have enough 10-year periods under higher inflation to test whether it also raises the volatility of 10-year holding period compound returns. Our prior is that it does not change such long-term return volatility, with greater mean reversion of annual returns.

<sup>19</sup> See [Bonds time diversify much better than you think](#), Feb 14, 2020; [60/40 in a zero-yield world](#), June 30, 2020; and [The International 60/40 problem and US Hybrids](#), Sep 29, 2020.

<sup>20</sup> The forward curve is the high yield levels at which the price loss from a rising yield offsets exactly the yield loss one has by investing in 1-year cash instead of this bond index portfolio.

that is 1 year shorter duration if yields rise only ~15bp. This analyst thinks that the US Agg yield will go well over 4% if inflation starts rising to an average of 4% over the coming decade, making a short duration portfolio an obvious choice, short of not buying any safe bonds.

The choice between nominal and **inflation-linked bonds** (US TIPs) is simply a question of whether you think inflation will average more than the current 2.3% 10-year out breakeven rate (i.e., the yield gap with the 10-year nominal and real UST). Under our 4% assumption, TIPS will clearly outperform.

**Credit** (corporate bonds) spreads over USTs are almost always higher than their long-term downgrade/default experience and thus almost always outperform government bonds with the same duration over a 10-year period, irrespective of inflation. The long-term investor thus almost always prefers credit over government debt. We argued in front, though, that high volatility should raise risk premia, including credit spreads. Over 10-year, this matters little, though, as spread widening will also produce a faster rise in coupon income from newly issued corporate bonds. Greater macro volatility and shorter cycles (more recessions) could indeed raise credit losses, but we have not seen much of a relation between inflation on one side and spread volatility or default losses, possibly as unexpected inflation benefits the debtor over the lender. We will thus assume that **inflation by itself should not alter one's strategic allocation across credit vs safe bonds**, or as to one's allocation across different credit qualities, **holding duration the same**.

One related point on credit quality are **HY bonds and loans**. Our HY bond index has a duration of 3.3 years, much lower than the 8.8 years of our HG index. HY loans are floaters and thus have no duration. Duration and credit quality choices are thus not easily separated. An investor who can only make a choice between funds of different credit quality, but not the duration within them is thus likely to have to choose more HY bonds and loans given their much lower duration.

The **convexity** of a bond portfolio refers to how much its price to yield sensitivity changes with the yield level. This is most relevant for US mortgages where prepayment risk makes prices fall by more when the yield rises than they rise when the yield falls<sup>21</sup>.

<sup>21</sup> This is because borrowers will prepay and refinance a fixed-rate mortgage when the yield falls, reducing its duration and make the mortgage portfolio rise less in price than when borrowers stop prepaying on rising mortgage rates which raises the portfolio duration and thus worsens the negative price impact of the yield rise.

Mortgage-backed securities (MBS) pay a higher yield to compensate for this convexity cost, with the premium a function of yield volatility. If yields become more volatile, the spread of MBS over USTs will rise, creating a loss to investors. The tactical manager can exploit this by underweighting MBS. Here again, a faster rise in MBS than UST yields should not be an issue to the longer-term investor as it simply will create faster rising income, as long as the investor can keep the duration difference with UST relatively stable.

A last choice in fixed income relates to the choice of currency denomination. That is, should one prefer **non-USD bonds**, if the inflation rise emanates largely from the US? Switching FX hedged to non-US government bonds can be a *tactical* opportunity, if timed right, but to us there is **little reason to expect it would add return or reduce risk on a longer-term strategic basis**.

We argued above that the yield on a bond portfolio with a duration near 6 years will be its total return over the next decade with small risk around it. An investor might consider switching from US to Eurobonds on a view that the ECB will remain more committed to controlling inflation and that Euro yields will thus rise a lot less. This is not unreasonable, but we know that yield changes will have little impact on returns over holding period just under twice the duration of a portfolio<sup>22</sup>. And with our EMU Index yielding only 45bp at the moment, it is virtually guaranteed to only earn that much over the next decade. Hedging the currency risk provides a positive return, but only to bring the total return in dollars to about the same level as that on US bonds. The only argument for holding more non-US bonds, FX hedged, is that higher macro volatility and diverging policies with respect to inflation should raise the benefit from cross country **diversification** over short-term holding periods, though not meaningfully for risk around total returns over 10 years.

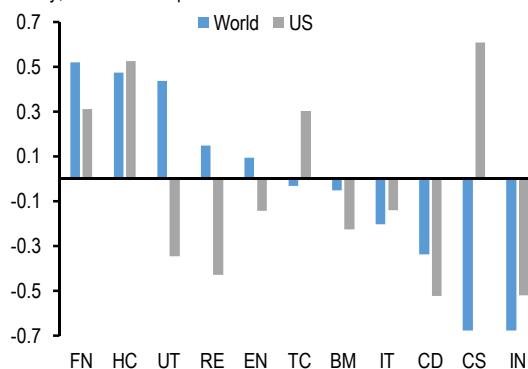
**In short**, bond investors who think inflation will surprise to the upside on a relatively sustained fashion over the coming decade should hold a strategic allocation that has **more inflation-linked bonds and is shorter duration**, but that **otherwise should not be any different** from what they had without such an inflation concern. We repeat this can be quite different from what a short-term tactical investor can consider.

<sup>22</sup> More in detail, bond investors will first consider foreign bonds on a currency-hedged basis, as FX risk is much higher than bond risk. The EMU bond market is much lower in yield than the US, but that then much lower future long-term return will be offset by the positive return from hedging euros back into dollar, by virtue of covered interest parity.

Within **equities** consider an investor who starts with a benchmark equal to global outstandings, such as MSCI. **What sectors, styles and countries** might this investor strategically over- or underweight if they see significant upside on US inflation?

Fig 11 below shows the correlation between US inflation and **sector** excess returns over market over 10-year rolling holding periods. The first correlation is for MSCI World sectors over market and the second for MSCI US. Investors concerned about US inflation should consider strategically **overweighting Financials and Health Care**, while **underweighting Industrial and Consumer Discretionary**. We are a bit wary of the very different correlation for Consumer Staples and Utilities between the US and the global market as we lack a clear explanation for them. The negative correlation for US Real Estate is a disappointment and could be the result of the diverse composition of this sector: some real estate has very long-term fixed rentals, which would not benefit from an unexpected rise in inflation, while others reprice annually, and would thus gain. Inflation concerned real estate investors should thus mimic the advice for fixed income and be relatively short duration. In addition, as with other long duration assets, real estate prices should reflect the present value of the income it is expected to generate in the future. Inflation raises that income, but also raises the rate to be used to discount that income stream back to the present. Here again, the income and price effect appear to be offsetting each other when inflation rises.

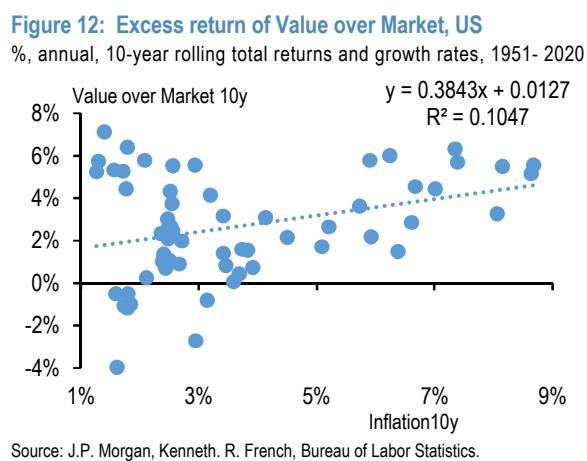
**Fig 11: Correlations of US inflation with excess return on Sectors over Market, World & US, 10 year rolling monthly, Jan 1982 - Apr 2021**



Source: Refinitiv, J.P. Morgan. FN=Financials, HC=Healthcare, UT=Utilities, RE=Real Estate, EN= Energy, TC= Telecommunications, BM= Basic materials, IT=Technology, CD= Consumer discretionary, CS = Consumer staples, IN = Industrials.

On **Styles and Countries**, we found little in long-term correlations with US inflation, aside from a modest positive correlation with the excess return on US **Value** over market, as highlighted in Fig 12 below, which shows 10-year rolling returns since 1951. This suggests

Value performs better at higher inflation rates, but the relation is probably more the result of the longer-term low-beta nature of Value that we observed in our [analysis](#) of 3 years ago. Much of the 5%+ US inflation rates were seen during the 1970s oil crises that depressed stocks. Take these out and the correlation is not there. We are strategically overweight Value as we see only mid-single digit returns on US and global stocks and rising inflation risks does not change this. **Inflation is not a reason to buy Value.** Our outlook on the overall market, which is not affected by inflation, is the real reason to buy Value. We found no long-term relation between US inflation and the excess return on **Small Caps or on EM equities vs DM.**



**Alternative assets:** Besides equities and bonds, many investors consider alternative assets such as **Private Assets, Commodities, Hedge Funds, and Real Estate.** Private Assets can be equity, debt, infrastructure, or real estate.

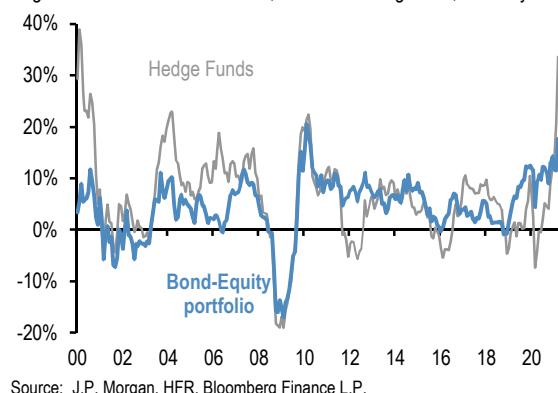
On **Commodities**, our most recent [issue](#) analyzed their value as a hedge against long-term US inflation. It finds a good hedge for Industrial Metals, Agriculture and Life Stock. Energy provided only a good hedge over short holding periods. Against popular perceptions, Precious Metals, such as Gold and Silver, were not useful at all with Gold in recent years rallying more on falling interest rates, as cash was seen as an opportunity cost to Gold. Long term, one should expect cash rates to rise with inflation, which should hurt Gold prices rather than make them rally.

**Hedge funds** are money managers where most of the return is supposed to come from active investing (“alpha”) instead of a simple long exposure to the overall market (“beta” in industry parlance). Alpha requires market volatility and an ability to guess the direction of the market. Our view of an end to the Great Moderation

and a secular rise in macro volatility meets at least one condition of strong hedge fund performance. Early signs are good. Figs 13-14 show the 12-month rolling return on the overall hedge fund asset class (HFRI) and a vol matching portfolio of bonds and equities (about 1/3<sup>rd</sup> equities). Over the past 10 years, the hedge asset class has been largely underperforming, after fees, but it performed very strongly, outright and relative to market over the past 12 months.

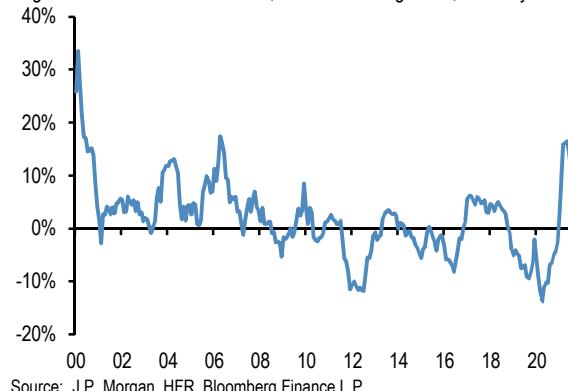
**Figure 13: Returns on Hedge Fund and Global bond/equity portfolios**

% 12-month rolling returns. Bond-equity portfolio with 5-yr rolling weights to give it same vol as HF index; Mar 2000- Aug 2021, monthly



**Figure 14: Hedge Fund excess returns**

% 12-month rolling returns. Bond-equity portfolio with 5-yr rolling weights to give it same vol as HF index; Mar 2000- Aug 2021, monthly



One note of caution is that in a 2005 paper<sup>23</sup>, we found that it was then more the *change* in volatility that allowed hedge funds to outperform, not the *level*, with relatively weak performance in periods of rising risk premia, most likely as a large number of hedge funds are not purely alpha and carry a decent amount of beta exposure with them. The conclusion should be that

<sup>23</sup> [Volatility, leverage and returns](#), Loeys and Panigirtzoglou, 19 Oct 2005.

investors concerned about rising inflation and macro volatility should **focus on hedge funds that are market neutral** and thus in principle have no beta exposure that could be hurt by rising risk premia.

**Private assets** are assets that are not traded in a public market and thus need to be held to maturity, which for much of the asset class matches our 10-year strategic horizon. There is a huge literature on the question whether private assets outperform public ones, with the majority still concluding that the evidence favors private assets<sup>24</sup>. Relevant to us is whether any excess return improves with inflation, or falls. Private assets are generally more levered than public ones. In equities, they are biased to Value and Small- to Midcaps, and in debt they are more on the low-rated side. In principle, inflation benefits the borrower who has locked in long-term debt at low rates. Private equity also has the advantage that it smooths its shorter-term returns, as there is no public market for them, even as that does not give them a longer-term risk advantage<sup>25</sup>. Investors who are adverse to shorter-term drawdowns on public assets, which should be higher with rising macro-economic volatility, have thus one extra reason to prefer private equity. Overall, we can see **several small, marginal reasons to increase one's preference for private assets if inflation rises this coming decade.**

**Are all real assets good inflation hedges?** Many automatically assume that real assets, such as real estate, commodities, equities, farm land, infrastructure, and inflation-linked bonds are all good hedges against rising inflation. Our result suggests **one should be quite selective**. The return on any asset consists of income and price gains. The price will be the present value of the income stream the asset is expected to generate. If inflation increases the income stream on the asset, its price will rise. However, this can be easily undone by any rise in the required discount rate on the asset as inflation will raise interest rates and higher inflation comes with more volatility, which, as argued, should raise the risk premium on risky assets. This is likely why we found no impact of inflation on long-term returns on equities and bonds. It can also explain why REITs did not outperform during higher inflation.

**FX and the dollar.** Short term, pretty much anything can happen with the dollar as inflation rises, as it may weaken on capital outflows from the US given lower prospective real returns, or may rally when the market foresees the Fed having to hike interest rates a lot. But long term, which is what we are looking at, much of the empirical literature broadly supports purchasing power parity implying that higher inflation weakens a currency against those with a lower inflation rate. The dollar is currently already above its long-term average real value against the most other currencies. A scenario where we raise inflation projections in the US by more than elsewhere should thus be a net negative for the dollar, relative to one where we maintain the consensus view of 2% US inflation over the next decade. However, a structural dollar short by itself is not necessarily a good hedge against a rise in US inflation as the latter should also over time lift USD interest rates against the rest of the world. In principle, this high cost of shorting the dollar should broadly offset the gains from dollar depreciation. Empirically, we find in our most recent issue that **foreign currencies do correlate well with long-term US inflation, and especially so for EM currencies.**

<sup>24</sup> A great review can be found in [Food fight: An update on private equity performance vs public equity markets](#), Michael Cembalest, J.P. Morgan Asset Management, June 28, 2021.

<sup>25</sup> Over longer holding periods, such as 10 years, private equity is probably riskier than public equity because it is not possible to buy the full private equity class (of all managers), while it is very cheap to buy an ETF that tracks 1000's of public stocks.

# The Long-term Strategist

## De-globalization Update 2020

- 
- De-globalization remains a serious long-term threat.
  - But it is slow moving, with actual activity data showing only minor deterioration in some places, or none in others.
  - Trade intensity fell modestly last year. Cross-border bank lending, payments, and bond issuance are stable versus global GDP. The number of correspondent banks continues to fall. FDI and cross-border M&A were down vs. GDP but still within their long-term ranges.
  - More threatening are various public policy actions and statements, including the US/China trade war, US/EU tariffs, Brexit, splinternet, tech balkanization, increased CFIUS activity, a weakened WTO, and the EU's drive to Technological Sovereignty.
  - Last year, we speculated on the long-term impact of any de-globalization. While it is too early and not enough has actually happened, we have seen weaker economic growth on trade uncertainty, though not yet lower productivity growth in the data. Trade-sensitive regions like Europe and EM have underperformed the US economically and in equities. Bond yields have fallen, even before the current COVID-19 recession. But small caps have not outperformed yet.
  - If de-globalization continues, then it will over the long run weaken growth, keep safe bond yields low, raise risk premia, weaken equity returns, and paradoxically, by weakening the links between countries, reawaken the value of international diversification.
- 

De-globalization has become one of the main medium-term risk factors that strategic investors are thinking about, both in terms of how bad it will be and how it will impact their portfolios. In this note, we update our analysis from last year ([De-globalization](#), April 5, 2019) with what we have learned since on both these issues.

We look first at measures of de-globalization in trade, markets, and policy, to then draw out the implications for investors.

We define globalization as the fading of national borders and the increasing flow of goods, services, capital, people, companies, and ideas across national borders. Globalization in trade and finance went into hyper-drive in the 1990s, with the creation of the EU's Single Market and the euro, followed by China joining the WTO in 2001. Most measures of trade intensity peaked early in the current decade, and worsening global politics point to a serious risk scenario of a **return of borders, or de-globalization**, over the coming decade.

---

### Long-term Strategy

**Jan Loeyς** AC

(1-212) 834-5874

jan.loeyς@jpmorgan.com

J.P. Morgan Securities LLC

**Shiny Kundu**

(91-22) 6157-3373

shiny.kundu@jpmorgan.com

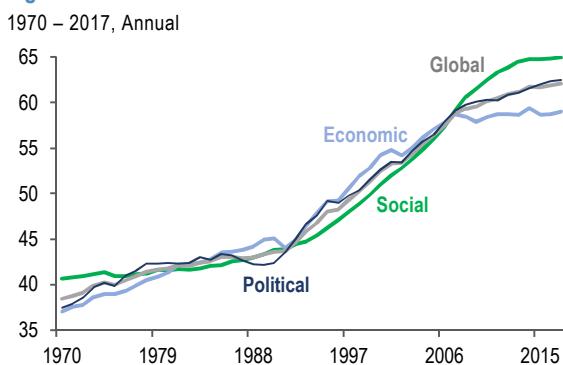
J.P. Morgan India Private Limited

## De-globalization metrics

The most cited index for globalization is the Swiss Institute of Technology [KOF Globalization Index](#).<sup>1</sup> KOF produces indices for the world, regions, and countries on globalization in trade and capital (Economic), people, ideas, and culture (Social), and Political. It produces indices both on an actual *de facto* and a potential *de jure* basis. *De jure* globalization gains occur when policies and conditions are improved to facilitate stronger flows and activities across borders.

The KOF indices are very lagged with even now only 2017 levels available (Figures 1 and 2). There was virtually no improvement from 2016, or even the last two to three years, but neither was there a worsening trend.

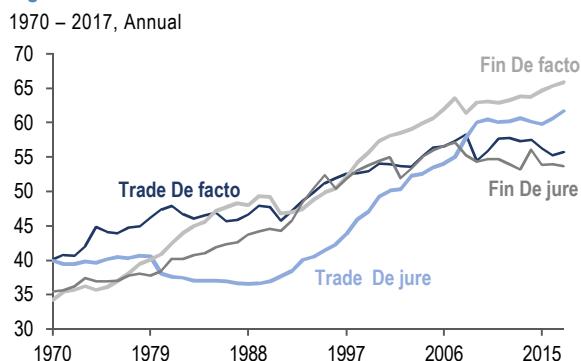
**Figure 1: KOF Globalization Indices**



Source: J.P. Morgan, <https://www.kof.ethz.ch/en>

Given our ultimate interest in asset prices, we will focus henceforth on Economic Globalization. Figure 2 decomposes Economic into Trade and Financial Globalization, both *de facto* and *de jure*. It shows that actual trade in goods and services has been slowing relative to the overall economy through 2017, while cross-border flows of money and capital (Financial) have continued to expand. The widening gap between *de jure* and *de facto* Trade Globalization indicates that at least through 2017, slower trade intensity does not appear to be due to increased tariffs or other restrictions. We use the terms “trade globalization” and “trade intensity” interchangeably in this note.

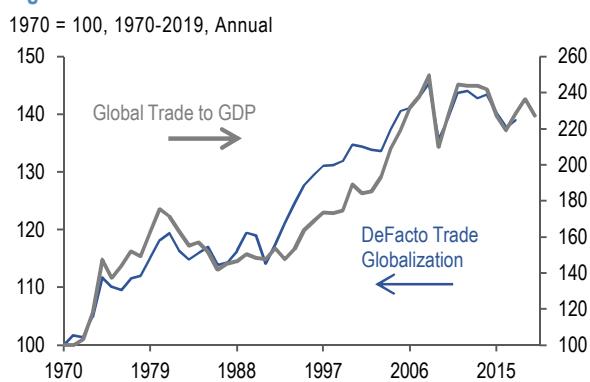
**Figure 2: KOF Trade and Financial Globalization Indices**



Source: J.P. Morgan, <https://www.kof.ethz.ch/en>

More up-to-date data can be obtained from actual export and import data, which have a very high correlation with KOF, as shown in Figure 3. Global trade data are available through 2019, and we will thus use this *trade intensity* metric in further analysis. Trade is measured as the average of global imports and exports of goods and services.

**Figure 3: World Trade/GDP and KOF Trade Globalization Index**



Source: J.P. Morgan, IMF, World Bank, <https://www.kof.ethz.ch/en>

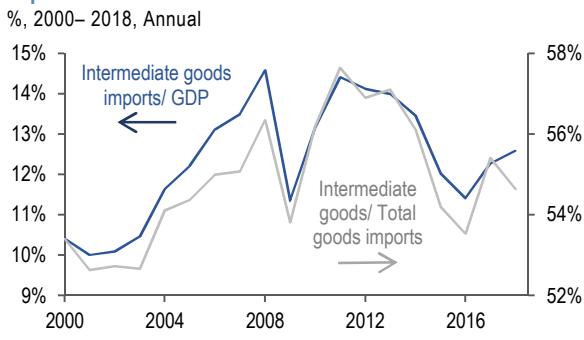
Trade intensity has effectively been in a range over the past 15 years. After the huge run-up since the mid 1980s, it dipped dramatically during the Great Recession as trade is generally “high beta,” given its high content of capital goods. A second fall came during 2015-16 with the slowdown in EM and collapse in oil prices. 2019 saw the third dip, this time likely linked to the US-China trade war and the related collapse in global capex growth. Into 2020, trade is very likely falling fast due to the economic disruption caused by the COVID-19 crisis.

Much attention has also been given to how companies are adjusting their cross-border supply chains due to the US-China conflict and the greater number of weather disruptions brought on by global warming. Figure 4 shows the ratio of intermediate imports of goods to

<sup>1</sup> KOF Globalization Index: <https://www.kof.ethz.ch/en/forecasts-and-indicators/indicators/kof-globalisation-index.html>

global GDP as well as to total goods imports staying quite stable through 2018, which is the last year that we have complete data.<sup>2</sup> Hence, through 2018, a simplification of complex supply chains was not yet a primary cause of weaker cross-border trade flows.

**Figure 4: Global intermediate imports to GDP, and total goods imports**



Source: J.P. Morgan, UNCOM, World Bank.

## Financial globalization – capital flows

In principle, trade and financial globalization should go hand in hand, as finance facilitates trade. Thus, it has been a surprise that the KOF Financial Globalization Indices have continued to show growth, but this could be due to the lagged nature of this index.

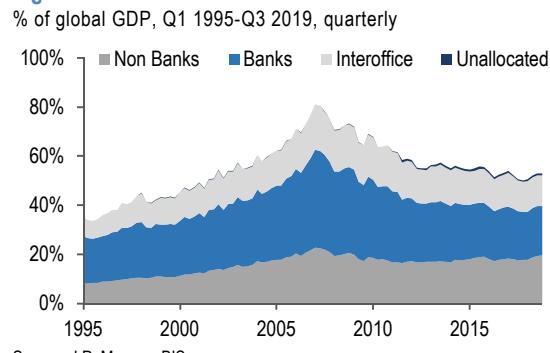
Reviewing some of the major metrics on cross-border financial activity since 2017 and since we published last year gives a more **mixed picture**, with some aspects of financial openness staying flat while others are continuing to come down. We can assess financial globalization by the **flow** of money, assets, and firms across borders and by the **convergence of asset valuations** that should come from financial integration. On the first—the flows—we first look at **banking** activity, then at the **security markets**, and end with real investing through **FDI and M&A flows**.

**Banking.** Starting with **cross-border bank lending** (Figure 5), this has steadily fallen from the 2007 peak relative to global GDP, primarily due to a retrenchment by the European banks. BIS data, our main source on banks' cross-border activity, measure this activity both from a locational point of view (on a balance-of-payments basis, Figure 5) and on a consolidated basis by a bank's HQ location (Figure 6). The BIS prefers the latter consolidated basis, which shows a slower decline

<sup>2</sup> See also a recent study on Global Value Chains by the McKinsey Global Institute, [Globalization in Transition: The Future of Trade and Value Chains](#), January 2019.

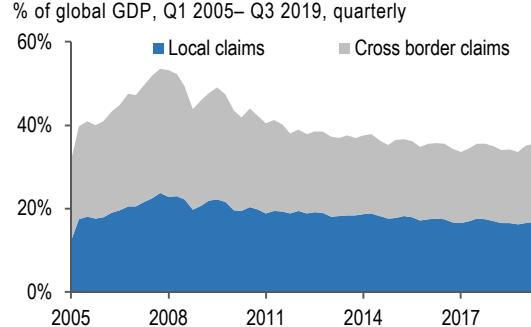
than the locational one. Both show a minor pickup over the past year but should really be read as **stable within a tight range**.

**Figure 5: Locational cross-border bank claims**



Source: J.P. Morgan, BIS.

**Figure 6: Consolidated foreign bank claims**



Source: J.P. Morgan, BIS.

The number of **correspondent banks**, which manage much of the world's cross-border payments, has **fallen by a fifth** over the past decade, likely as greater regulatory scrutiny on AML and sanctions have greatly increased the cost of such services (Figure 7).<sup>3</sup> The value of cross-border payments itself has been more stable relative to world GDP, falling early this decade, picking up later in the cycle, but then falling again over the past two years.

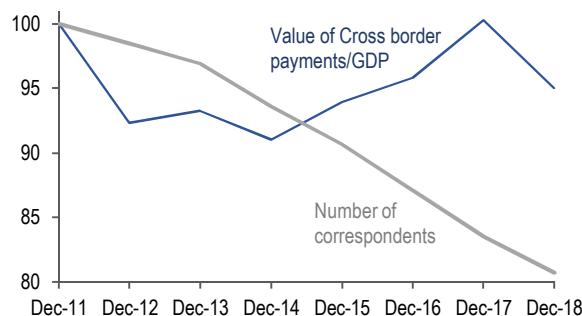
**Securities markets.** One of the main manifestations of financial globalization has been the ability of countries and companies to **list and issue equity and debt across borders**. The main external market in which companies for years have been attracted to list their shares has been the US. That is because the US has the largest equity market in the world, comprising over half of world capitalization for investable stocks, and because it allows

<sup>3</sup> For more details, see [On the global retreat of correspondent banks](#), Tara Rice, Goetz von Peter, Codruta Boar, BIS Quarterly Review, March 2020.

non-US companies to sell their shares at higher prices. The latter is the result of the US market trading consistently at more expensive levels, likely due to its greater liquidity, transparency, governance, and investor protection. This has led to the so-called listing premium, with non-US companies listing on US stock exchanges trading at higher valuation levels than their equivalents at home. **Cross-listing** can be done through ADRs, direct listing, or other means.

**Figure 7: Number of active participants and Value of Cross-Border Payments to GDP**

2011 – 2018, Annual, Dec 2011=100

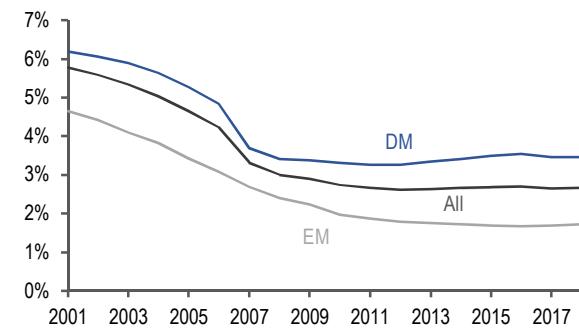


Source: J.P. Morgan, BIS, World Bank.

Figure 8 shows that the share of non-US firms listing on US exchanges has been steadily falling in the 2000s but stabilized in the 2010s. There is probably both push and pull explaining this. On the pull side, as non-US markets developed, they became more liquid and grew more local institutional clients with the capital to buy domestic shares. On the push side, US listing requirements have become increasingly onerous and costly, leading both to a large decline in the number of public US companies, with many preferring to stay private, and a fall in the number of non-US companies listing in the US.

**Figure 8: Share of non-US companies cross listing on US exchanges**

%, non-financial listed firms, \$100mn+ in assets, ex China, 2001 – 18.

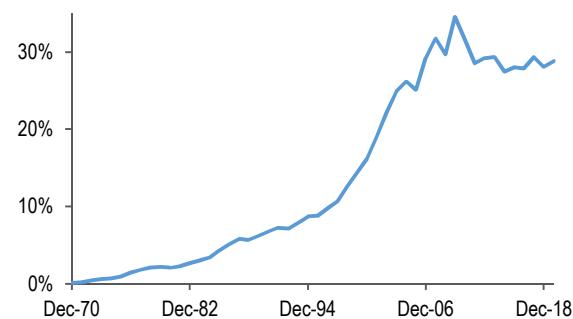


Source: J.P. Morgan, [Is Financial Globalization in Reverse after the 2008 Global Financial Crisis? Evidence from corporate valuations](#), Doige, Karolyi & Stulz, NBER WP, April 2020.

**Cross-border debt issuance** grew very quickly during the heydays of globalization but, like trade, peaked out just before the Global Financial Crisis (GFC), fell during the recession, and has since barely kept up with redemptions, keeping the stock of international debt relatively stable relative to the world economy (Figure 9).

**Figure 9: Stock of Debt Securities to Nominal GDP**

1970 – 2019, Annual

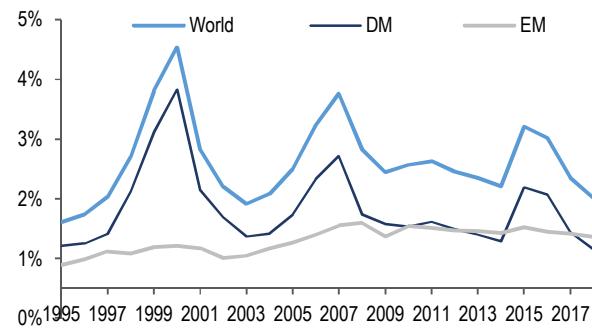


Source: J.P. Morgan, BIS, IMF, World Bank.

**Real Investing. Foreign Direct Investment** is very cyclical and tends to peak right at the end of the cycle, as it did in the last two expansions (Figure 10). But with each cycle, the peaks are lower, and in 2018, the last data point we have, global foreign direct investment (FDI) had fallen to its lowest point in 15 years. Inflows into EM rose from the 90s to a peak early in the last decade, just as trade did, but have since been coming down slightly.

**Figure 10: FDI Inflow to global GDP, by region**

1995 – 2018, Annual



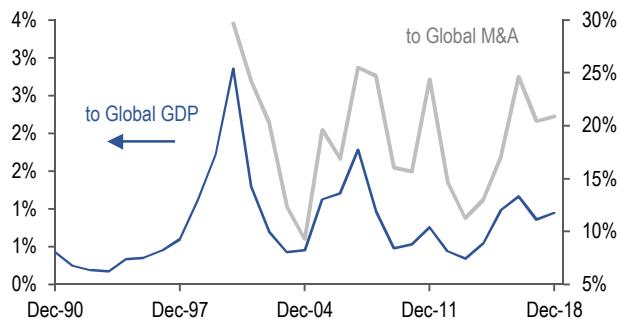
Source: J.P. Morgan, UNCTAD, World Bank.

**Cross-border M&A** is similarly a cyclical activity that accelerates late in the cycle. But as Figure 11 shows, it has evolved similarly to FDI, with lower and lower highs relative to global GDP over the past three cycles. Like FDI, it also weakened over the past three years. At the same time, the lower highs in cross-border M&A since the 1990s are likely a reflection of the overall softness in

global M&A, including domestic activity, as the ratio of cross-border to global M&A has been quite stationary.

**Figure 11: Cross-Border M&A to GDP and to Global M&A**

1990 – 2018, Annual



Source: J.P. Morgan, UNCTAD, World Bank, Bloomberg.

**Overall**, we find that cross-border financial activity is mixed compared to world GDP since the GFC and over the past two years: up in the case of banking claims, flat on cross-border bonds, and down on payments, correspondent banking, FDI, and M&A.

### Financial globalization – price convergence

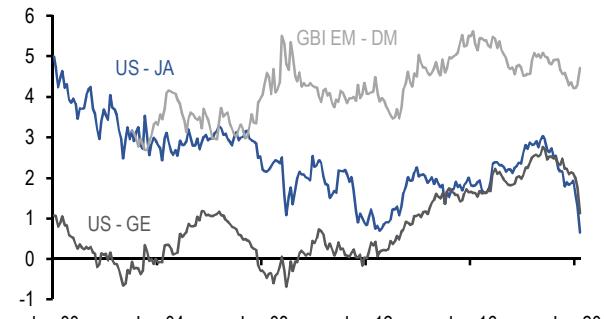
One of the first implications of free capital flows across borders is that it should eliminate asset price differences. That is, cross-border price differences for assets with the same basic risk should be arbitrated away by free flowing capital. It should also increase the correlation in asset prices across countries, in turn reducing the value of international diversification. There is a massive literature in empirical Finance testing these implications.<sup>4</sup> It generally finds that there was a dramatic increase in the co-movement of asset prices across borders from the 1990s to the GFC and some decline afterwards. A full review of this literature is beyond the scope of this note, and we will thus choose only a few to make our points.

Below we look at price difference in bonds and equities and follow these with a look at return correlations. Figure 12 shows the yield gaps between the US and the Euro area and Japan as well as the EM-DM index yield gap since 2003. The US yield gap has been steadily widening in recent years and would have widened a lot more if it had not been for the massive buying flows from the zero-bond yields world of Japan and Europe. See [Global Dimensions of the low domestic r\\*](#), Michael Feroli, July 9, 2019.

<sup>4</sup> For one overview, see Bekaert et al., [Globalization and asset returns](#), Annual Review of Financial Economics, 2016.

But this year's massive fall in UST yields toward zero has narrowed this gap again, even though it remains in place. The EM-DM yield gap has been quite stationary and is currently now far from its historical mean, since inception.

**Figure 12: Yield Gaps, US vs Japan and Germany, GBI EM vs DM**  
%, Jan 2000 – Mar 2020, Monthly

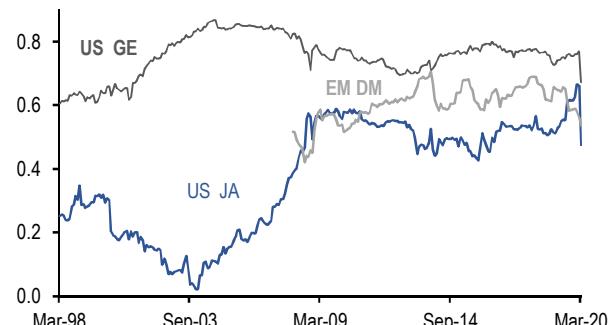


Source: J.P. Morgan, Datastream.

In equities, in a just released paper ([Is Financial Globalization in Reverse after the 2008 Global Financial Crisis? Evidence from corporate valuations](#)), Doidge, Karolyi and Stulz, find that their measure of equity valuation—Tobin's Q, similar to Market to Book—shows a greater gap between US and other DM markets after the GFC but an unchanged one with EM, ex China. They see this as evidence of a reversal of financial globalization over the past decade.

Figures 13-14 show the rolling five-year monthly return correlations across these three countries and EM-DM, in bonds and equities. In bonds the correlations remain quite high, and in equities they have started rising again, thus not improving the case for international diversification.

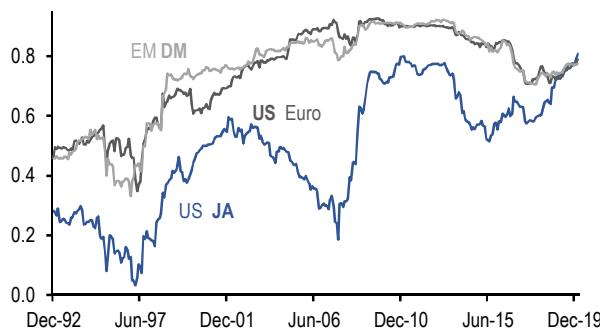
**Figure 13: Five-year rolling correlation between govt. bonds: US vs Germany and Japan - hedged in USD, DM vs EM-unhedged**  
Mar 1998 – Mar 2020, Monthly



Source: J.P. Morgan.

**Figure 14: Five-year rolling correlation across equities among US, Euro and Japan, EM and DM - unhedged**

Dec 92 – Mar 2020, Monthly



Source: J.P. Morgan, MSCI.

## Why did globalization stall in the 2010s?

The pre-GFC rise in trade intensity was initially driven by falling information and transportation costs as well as trade liberalization (such as GATT, followed by the Common Market and WTO). The surge since the mid 1980s in both trade and financial globalization should be seen as simply the cross-border face of the rise of global capitalism, liberalism, and market economies. The stall in trade intensity and decline in financial globalization is likely due to a combination of factors that we will simply list here, without deep analysis:

1. A peaking out of some of the earlier drivers of globalization, such as a reduced DM-EM wage gap, and a plateauing in the number of market economies in the world, with only a handful of countries left that one could truly call socialist or communist.
2. The growing share of services in world GDP and the falling share of goods and capital goods that are traded more across borders than services.
3. Higher capital and other regulatory costs on bank intermediation post-GFC, which reduced the supply of cross-border financing by banks.
4. EM countries getting better at making products for their own domestic markets and developing a domestic middle class willing and able to buy these products.
5. The increasing use of sanctions by the US government and global efforts to combat money laundering and tax avoidance.

## What will drive globalization in the 2020s?

Trade intensity and broad globalization are ultimately driven by the balance between perceived marginal benefits versus costs. On the trade side, the benefits

come largely from arbitraging differences in cost and factor availability. Wage gaps between countries, and in particular between EM and DM, have gradually been narrowing, even as they remain large, and have thus reduced the incentive to increase trade intensity. On the financial side, as just reviewed, the benefits come from exploiting yield and value gaps across countries' bond and equity markets, as well as diversification benefit, much of which is not yet making a strong case for investing widely across countries.

On the cost side, first are the frequency and severity of natural disasters due to climate change and epidemics as witnessed by the current COVID-19 crisis. This could lead companies to bring production closer to the ultimate consumer of their products. Near-shoring is a serious risk to globalization and its virtual opposite but is no forgone conclusion. For one, many companies sell in many different countries and thus do not have a natural domestic market to which to bring production home.

In addition, the optimal response to a higher risk of supply disruption is not to concentrate all production in one single location. Consider a company that sources its final product from 10 different locations, each making a different part in a just-in-time supply chain. The company can increase resiliency by holding greater inventories of each part (i.e., not just-in-time anymore) and by having each part made in more than one location. This would increase globalization. One hears many stories of multinational companies reviewing their supply chains, but we see few signs of dramatic changes, aside from some focusing more on Southeast Asia in response to the US-China trade war.

A second type of increased cost of globalization comes from trade and investment restrictions across countries. Last year's US-China trade war very likely contributed to a slowdown in global capex, local and across borders, as well overall trade in goods and services, relative to global GDP. This trade war is now in pause mode, but with most of the important issues far from resolved, it will likely get hot again next year, after the US elections.

Most important is that the scope of trade frictions in the world has widened over the past year. While the US succeeded in replacing its FTA with Mexico and Canada (NAFTA) with what is now known as the United States-Mexico-Canada Agreement (USMCA),<sup>5</sup> frictions have

<sup>5</sup> [USMCA – An eleventh hour deal](#), Lozano and Ramsey, 10 Dec 2019.

increased with the European Union as the administration is trying to reduce its large bilateral trade deficit with the EU. The US and EU do not have an FTA with each other and thus trade on a WTO most-favored-nation basis. In 2018, the Trump Administration applied tariffs of 25% and 10% on certain imports of steel and aluminum, under the national security-based Section 232 trade law. The EU retaliated with its own tariffs of 25% and 10% on about \$3 billion of US products.<sup>6</sup> Within Europe, the UK exited the EU last year and is now beginning the difficult negotiations on how to define and organize its trade relations with the EU, with both starting from very divergent positions.<sup>7</sup>

Probably more damaging to trade globalization than a few tariff hikes is the intensifying **Global Technology War**, in which countries no longer trust each other's technology and each want to become **technologically self-sufficient**. The challenge started as part of the US-China great-nation conflict with China's plan to become the world's pre-eminent leader in 10 priority technology sectors (see *Made in China 2025*<sup>8</sup>). The US decision last year not to use China's 5G telecommunications system and pressure its allies to do the same then upped the ante. This creates a serious risk of **cross-country technology incompatibilities**, bringing us back to the days when one could not use one's mobile in Japan.

A related aspect of **technological fragmentation** is the increasing number of countries that are imposing restrictions on what access their citizens can have to the internet. Witness China's Great Firewall and Russia's Internet Sovereignty law. **The worldwide web is thus at risk of ceasing to be truly worldwide** and instead being balkanized into a set of national webs, a phenomenon also known as "**splinternet**".

Another aspect of technological sovereignty is greater **scrutiny of foreign takeovers of tech companies**. Given the US's leadership in technology, it has been especially strident in keeping an eye on losing its edge through

foreign takeovers. This control is managed through the Committee on Foreign Investments in the US, or **CFIUS**.

CFIUS was first established by President Ford in 1975 during the heydays of petro-dollar inflows to study foreign investments. In 1988, it acquired the ability, through the president, to reject certain deals, although over the following 20 years it never investigated more than 10 deals a year. Under President Obama, CFIUS investigated on average 55 deals a year, which rose to 165 during the first two years of the Trump Administration.

In 2018, President Donald Trump signed the Foreign Investment Risk Review Modernization Act (FIRRMA), which gave CFIUS new resources and new powers over particular types of FDI that mainly concern Chinese investors. These include real estate, minority investments, and US-Chinese joint ventures.

The EU is currently also working on rules, to be released in June, to give them greater powers to prevent takeovers by foreign state-backed companies that distort competition.<sup>9</sup> While intended to help protect competition within the EU, it does boost de-globalization.

Hopes that this technology conflict would be limited to the US and China were challenged late last year when the EU Commission's new president, Ursula von der Leyen, pledged in turn to pursue "**Technological Sovereignty**" for Europe. Despite being the largest economy in the world, the EU is feeling vulnerable due to the dominance of the US and Asian (China and South Korea) tech giants. On February 19, the Commission issued proposals for a **European Digital and Data Strategy** focused on rule-making and investing in European data spaces.<sup>10</sup> Europe's success with its Global Data Protection Regulations (GDPR), which many other countries have taken on, is giving it confidence that it can similarly sway the way global tech companies operate and in the process nurture a European digital ecosystem.

**Is Europe's drive to Technological Sovereignty anti-global?** The Commission is pledging it is not and that it is simply the "capability that Europe must have to make its own choices, based on its own values, respecting its own rules." It is focused on becoming a first mover in

<sup>6</sup> For more details, see e.g., [U.S.-EU Trade and Economic Issues](#), In Focus, Congressional Research Service, 28 Aug 2019.

<sup>7</sup> For regular updates on EU-UK trade negotiations, see research notes by Malcom Barr on [J.P. Morgan Markets](#), including [Brexit: Round one, and implementing the Irish protocol](#), 6 March

<sup>8</sup> We wrote on this last year in Joyce Chang et al., [Made in China 2025, A New World Order?](#), J.P. Morgan Perspectives, 31 Jan 2019, which includes "Potential impact of constant cyber competition," James Sullivan et al., pp. 35-36.

<sup>9</sup> [Vestager urges stake building to block Chinese takeovers](#), Financial Times, April 12, 2020.

<sup>10</sup> [Shaping Europe's digital future: Commission presents strategies for data and Artificial Intelligence](#), European Commission, 19 Feb 2020.

digital rule-making and claims it is wide open to international dialogue on these rules. But the many references in Brussels to the low market share of EU technology companies suggest that industrial policy is probably part of its digital strategy. Increasing strains in the cross-Atlantic relationship do raise the risk that Europe will want to go its own way in technology and not be a simple taker and user of Asian or US technology products and standards. On net, this **seems on the margin anti-global.**

More broadly, the Trump Administration's more unilateral and, at times, transactional approach to trade relationships, as opposed to the longstanding rule-based system imbedded into the WTO, and its practice of blocking new appointees to the WTO's appellate body, which manages its Dispute Settlement process, are surely raising uncertainty about the conditions under which companies will be able to trade across borders in the future.

How will the current **COVID-19** global recession affect globalization? As discussed in our last issue ([Some longer-term consequences of the COVID-19 crisis](#), April 9), the virus respects no borders and is thus the globalization nobody wants. To fight it effectively, countries need to work together. A common threat has long been the one force that can bring communities together. Scientists are indeed working well across borders, but that has always been the case. Countries, in contrast, seem more apt to each go their own way. One needs to be worried about the lack of solidarity that the northern EU is currently showing with the Southern members that are getting hit harder by the virus.

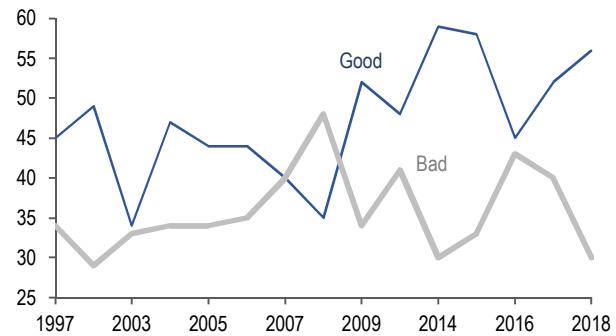
Countries that are monitoring their citizens more closely are likely better able to fight the virus than more liberal ones, quite possibly exacerbating the great-nation conflict between the US and China. Many borders have been closed and will not fully re-open until countries can check whether travelers are bringing along dangerous viruses. That said, many were quite pessimistic about air travel after 9/11, but airlines were soon able to absorb the added security cost through greater efficiencies, allowing air travel to grow even faster afterward. Overall, **COVID-19 seems more likely to reinforce de-globalization than reverse it**, in this analyst's mind.

In the midst of many governments and populist politicians seemingly trying to bring back borders, one must not lose sight of the fact that **voters and consumers are not really turning against globalization**. In a Pew Center Survey of American on free trade in 2018, just after the first set of tariffs were imposed by the Trump

Administration, a majority of 65% said free trade was a "good thing" for the country, while 30% said it was a "bad thing." The 30% response for "bad thing" was the lowest in 10 years (Figure 15).

**Figure 15: Percentage of US adults who think Free Trade Agreements are good/bad**

1997- 2018, Annual as per availability



Source: J.P. Morgan, <https://assets.pewresearch.org/>

## Monitoring the impact of de-globalization

The last section of our [De-globalization](#) paper from April last year presented our thoughts on how this risk scenario would impact global economies and markets over the longer term. **How are we doing so far?** One year is surely not enough to fully judge these ideas that are anyway currently overwhelmed by the global COVID-19 recession raging on. But even before the market crash of the past month, we feel that most of these ideas are working out, though not all.

**In short, we argued** that de-globalization would be a negative for productivity, and thus for economic growth, especially for trade-dependent economies like many in EM, making their currencies and equities underperform. It should be a negative for oil, on lower economic growth. We saw it possibly unleashing centrifugal forces in the European Union, with Brexit as the most immediate risk, and implying Euro equity underperformance versus the US. We foresaw lower profit margins, which together with lower economic growth would give us lower long-term returns on equities and lower bond yields. Trade-dependent multinationals should underperform domestic companies, which are generally smaller.

A return of borders should bring back some form of national control/sovereignty over one's own economy and policy, as well as improve the negotiation position of labor. In combination, these should reduce economic and market correlations across countries, improving the benefit of international diversification while steepening the Phillips curve.

**How are we doing on these longer-term projections?**  
 Figure 16 updates our chart on global trade intensity and productivity growth. Trade weakened last year, but productivity growth remained the same: still a dismal 0.8%, ex China and India. Economic growth in 2019 fell to a below-potential 2.1% (Q4/Q4) on weaker capital spending, brought on by trade uncertainty, but this has not yet shown up in weaker productivity growth.

**Figure 16: Global productivity and global trade to GDP**

Q3 1970 – Q4 2019, Percent, Quarterly

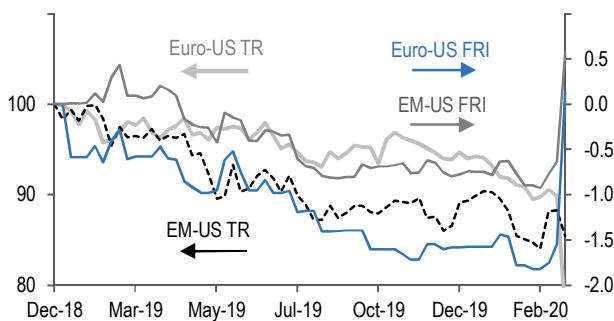


Source: J.P. Morgan, US Bureau of Economic Analysis, IMF, WB.

Over the past year, up to the eve of the COVID-19 recession, we saw disappointing activity data for the Euro area and EM, but not for the US, leading to growth downgrades for the first two and equity market underperformance. Figure 17 shows the widening gap between our US growth forecast changes and those for EM and the Euro area, as well as how their respective equity markets are moving in line with these worsened economic outlooks, through end-February, and right before the March crash in stocks.

**Figure 17: FRI and Equity total return ratio, Euro and EM vs US**

28 Dec 2018 = 100, 28 Dec 2018 – 13 Mar 2020, Weekly



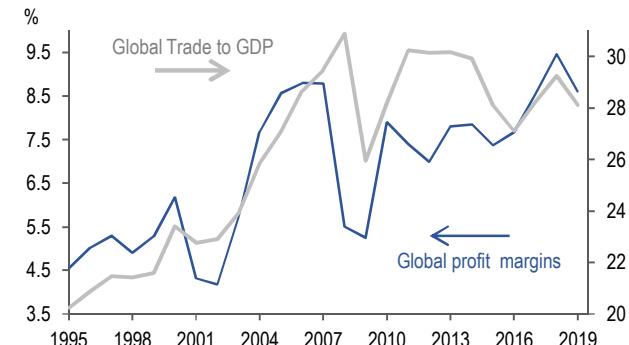
Source: J.P. Morgan, MSCI.

It is way too early to say whether cross-country economic and market correlations are falling, both because we need longer-term data to assess this but also because in a crisis, as we are in today, all these

correlations spike up. As to the Phillips curve, we have seen rising wages in DM in response to tighter labor markets, but this has not translated into higher inflation. Instead, higher wages are being paid out of profits, and thus contributed to lower profit margins (Figure 18). The latter was our projection under de-globalization but was this last year probably more driven by higher wages than weaker trade.

**Figure 18: Globalization and global profit margins**

1995 – 2019, Annual



Source: J.P. Morgan, MSCI, IMF.

We had expected that de-globalization would benefit domestic companies, which are typically smaller, versus multinationals, which are usually larger. Hence, our preference for **small over large caps**. This has not happened yet, with small caps continuing to underperform in the US, probably as a tighter labor market has pushed up their wage costs more than that of larger companies.

**Overall**, it is still very early to detect the full impact of de-globalization on markets and economies, both because whatever evidence we are seeing of de-globalization is taking place slowly and very unevenly and because over as short a period as one year many other forces have impacted markets and economies.

### Implications of worsening de-globalization

Continued de-globalization is not pre-ordained. It is in our collective ability to reverse it. But the evidence suggests strongly that it has started. Investors should thus consider the implications. In very broad terms, we think continued de-globalization would make the world less economically efficient, with lower growth, higher risk premia, initially low-for-longer safe bond yield yields, eventually somewhat higher inflation, and lower equity returns. But paradoxically, by weakening the links between different economies and markets, it would bring back the advantage of and need for international diversification.



# Retirement

## The Long-term Strategist

Should saving for old age be mandatory?

- Retirement savings systems where there is no outright requirement for workers and employers to contribute find that many people end up not saving enough, or not at all, creating an economic and social crisis when they approach the end of their working life.
- Societies can handle this in different ways. Some would argue it is each citizen's own responsibility to save for old age and if they have not, it is their own fault, not producing an obligation on more frugal citizens to share the fruit of their work.
- This is the morale of the classic Aesop fable of the ant and the grasshopper.
- Most societies do recognize that bad luck, ill health, job losses, or other tragedies or disadvantages are equally responsible for a lack of old age savings.
- Countries where most workers have sufficient savings going into retirement almost all achieve this by requiring both workers and employers to contribute a significant share of income from a young age on.
- In the US, we have not yet seen a move to making retirement savings mandatory, outside of Social Security. All efforts have come down to *nudging* people into making contributions, by making the process easier and cheaper. Nudges help, but the most recent evidence supports a conclusion that their long-run impact is much less than the initial increase in saving rates as it is hard to change deeply ingrained behavioral patterns.
- In our view, it will likely require eventually moving to greater *mandatory* contributions, such as by raising Social Security payroll taxes, known as FICA, before the Social Security Trust funds run out of money 10 years from now.
- With most efforts focused on raising saving rates, whether through nudges or mandate, rather than just providing greater government transfers to people without sufficient savings in old age, the net impact for the long-term investors is a boost to asset prices and downward pressure on bonds yields, all else constant.
- This is our last weekly of the year. We are taking a break over the holidays and will return on January 10 with new ideas on how to invest over the long term. Wishing you a joyful and relaxing end of the year and a great start in the New Year.

### Long-term Strategy

**Jan Loeys** <sup>AC</sup>

(1-917) 602-9440

jan.loeys@jpmorgan.com

**Alexander Wise**

(1-212) 622-6205

alexander.c.wise@jpmchase.com

J.P. Morgan Securities LLC

One of the big issues that societies with “sub-optimal” retirement systems face is that **many workers, especially those on lower incomes, will not have saved much to afford a decent retirement.** In the US, [nearly half the population](#) between 55 and 64 have no personal retirement savings, beyond what they will receive from government-managed Social Security. What will happen to these people? How should and hopefully will governments improve their retirement savings systems to assure that a greater number of workers save and are thus better able to afford a decent retirement? And how does this affect the long-term investor?

**One possible outcome** is that people, voters, and politicians simply decide that it is everyone’s moral and individual responsibility to put money aside for a rainy day and old age. They would argue that if you fail this responsibility, then this is your own fault and society does not owe you any obligation to make up for your irresponsible behavior. People with little or no savings will just have to cope and rely on charity and family.

This is an age-old question told well in the [Aesop fable of the Ant and the Grasshopper](#) where the grasshopper does not have a worry in the world and sings and dances all summer. Meanwhile, the ant works hard to squirrel away food for the winter. By winter, the grasshopper goes hungry, and begs the ant for food, but is denied. The grasshopper dies of hunger. The moral of the story is that the ant is right, and the grasshopper’s hunger is his own fault.

One could even argue that helping out in their old days those who did not save in their young years creates a **bad example** and produces **moral hazard**. It is argued that, if people see that spending all you earn plus more on credit cards leaves you destitute in old age, they will be better motivated to live frugally and start saving early. The magic of compound interest and returns teaches you that the earlier you start to save, the easier it is to become financially safe in old age.

**An alternative belief to this harsh view** is that ending up without savings in old age is more likely not your own fault and that society needs to help you, by either saving for you through general taxation, or by *forcing* you to save, by making retirement contributions mandatory from early working age on. This view is based on a recognition that not everyone is equally capable, rational, fully informed, and financially literate.

Any worker can at any time be affected by bad luck, ill health, or sudden changes in the economy or their sector that leave them with the wrong qualifications to get a job in a different sector or occupation. Lack of education or parental guidance or just adverse social conditions leave **many ill prepared to set aside money for old age**.

When it is up to each one of us to decide how much to put aside from our monthly paycheck, we find that too many times **shorter-term considerations, temptations, and emergencies will intervene** and prevail over the need to provide for oneself some 30-40 years in the future. **Procrastination** is normal.

It is an issue we run into a lot in economics. Our model of the rational economic optimizer implies that more freedom, flexibility, and optionality can only have positive value for people. We find many instances where this is not the case. Having more options to trade one’s portfolio, for example, leads the average individual investor to buy high, when the market has rallied, and to sell low, after the market has fallen a lot.

We thus find that in many cases, such as in Europe, Canada, and Australia, societies have found it best to **require workers to save** from the moment they start working by requiring all to contribute to public or company/profession-based pension systems, funded or pay-as-you-go. This should leave the average person in these countries in a better position upon retirement than in countries with limited or no requirements.

**What happens now?** Countries that have sub-optimal retirement funding systems, such as the US which relies a lot on defined contributions that we discussed [earlier this year](#), have several choices. They can ignore the problem (“it is your fault”); start forcing or just nudging workers to save more; getting people to save “better”; require workers to work longer, thus reducing the ultimate benefit; or provide more financial support for retirees below or near the poverty line.

Most countries are taking actions along the lines of the middle three of these five. Most OECD countries have been raising the age at which workers can receive full state pensions. The US, which has a particularly serious problem in a lack of retirement savings among lower-income workers, has passed two federal laws in recent years – [SECURE 1.0](#) in 2019 and [SECURE 2.0](#) in 2022 (*Setting Every Community Up for Retirement Enhancement*) – that make it easier for small companies to set up defined-contribution plans for their employees, widen coverage to part-time workers, require auto-enrollment of new employees, and raise catch-up contributions by middle-aged workers who have not saved much until then. Both laws increased the age at which workers are required to take minimum withdrawals from their accounts. At the same time, the laws have been making it easier for participants to make emergency withdrawals from their savings, which make it less likely they will have enough in their accounts when they retire.

**Nudges help but are not enough**, a point made by David Laibson, Professor of Economics at Harvard, at the 2020

AEA/AFA annual meetings.<sup>1</sup> Laibson argued that the long-run effects of nudges such as auto-enrollment are smaller than their initial effects, as it is hard to change deeply ingrained behavior with simple nudges. More recent empirical evidence supports this view, finding that workers newly pulled into an employer-sponsored pension system do initially put in money, but this does not last and spending and saving behavior tends to revert to old patterns after some time.<sup>2</sup>

**Nudging people to save is indeed not the same as actually forcing them.** The [Annual Mercer CFA Institute Global Pension Index](#), which checks countries' pension systems for their integrity, sustainability and adequacy, broadly recommends that countries reduce leakage, such as from allowing early withdrawals, and increase coverage, *recognizing that many individuals will not save without an element of compulsion or automatic enrollment.*

Hence, as the US faces the prospect that the trust funds behind Social Security and Medicare will run dry [in 10 years](#), pressure will build to either cut benefits, outright or through a later full-benefit age, or to raise contributions. Our guess is that, recognizing that large numbers of people rely only on Social Security in retirement and that this is for many barely enough to live on, Congress is much more likely to legislate for higher contribution rates on people still working.

At the US state level, [7 states so far](#) – California, Colorado, Connecticut, Illinois, Maryland, Oregon and Virginia – now require certain companies to offer a workplace retirement plan or facilitate payroll contributions into a state-sponsored IRA. More than 800,000 workers have signed up and have put in [over \\$1bn so far](#). Other states are planning to follow.

The **impact** on long-term investors of any government actions to address the lack of pension savings among lower-income workers depends on the balance between actions to force and/or nudge workers to save more and retire later versus actions to provide greater financial support of the elderly in need. The first boosts asset prices and puts downward pressure on yields and the latter pushes interest rates up due to large government borrowing, or by reducing private saving if funded by higher taxes. On balance, we see more actions to boost saving and extend working life which should act as a boost to asset prices, everything else constant.

---

1. [ASSA AEA/AFA Joint Luncheon](#), January 3, 2020.

2. This evidence and other findings on the impact of different design or defined contribution pension plans can be find in an excellent literature survey by Jonathan Reuter, Plan design and participant behavior in defined contribution plans: Past, Present, and Future, [NBER Working Paper #32653](#), July 2024.

## The Long-term Strategist

### Rules of thumb for managing retirement savings

- We bring together our analyses of this past year on how one should manage one's retirement savings into a number of simple rules of thumb.
- We calculate optimal annual wealth withdrawal rates, maximized under the constraint to keep the risk of running out of money before one passes away to < 1/20. Each optimization is the result of 10,000 simulations across equity returns, bond returns, and mortality risk. Our expected compound returns are 4.8% on US bonds and 8% on US equities over the next 20 years. These imply 5.0% and 9.3% expected annual arithmetic returns.
- We start with the standard case of a couple retiring at 65, based on US 2019 pre-Covid mortality tables with trend improvements in mortality rates. Our simulations suggest an optimal allocation of 40/60 equity/bonds, rebalanced annually, and that they can withdraw and spend 5.2% of their starting wealth while keeping the risk of running out of money prematurely under 5%. From this 5.2%, we deduct or add depending on the particular circumstances and expectations of who is retiring.
- Not rebalancing to 40/60 equities and bonds will over time raise your equity allocation and thus force you to lower your spending by 0.1%-points of starting wealth given the higher risk, but it may be worth not rebalancing if the cost of doing this exceeds 10bp pa.
- A single male or female will have a higher spending pace of 5.6% and 5.4%, respectively, as the life expectancy of the last-to-die partner will be significantly higher than that of a single person.
- You need to deduct 0.1% points of starting wealth from annual spending for each year of retiring earlier or expecting to live longer than average, or for each 0.2% lower expected returns, or for each 1% lower risk of running out of money. And you can add 0.1% spending of initial wealth for the reverse of these.
- Taking more risk by allocating 10%-points more in equities actually would force you to lower your spending by 0.05%-points out of initial wealth. Putting 10%-points less in equities also would push down your optimal spending pace slightly, making 40/60 the right allocation to us.
- Protecting your spending in retirement against inflation would require you to lower your spending pace by 1.6%-points of starting wealth.
- Buying an annuity would allow you to raise spending to ~7% of starting wealth and would protect you against market risk and living longer than planned for but leaves you with little flexibility to leave money to any heirs. Your allocation to an annuity depends on how long you expect to live and how much you care about leaving money behind.

#### Long-term Strategy

Jan Loeys <sup>AC</sup>

(1-917) 602-9440

jan.loeys@jpmorgan.com

Alexander Wise

(1-212) 622-6205

alexander.c.wise@jpmchase.com

J.P. Morgan Securities LLC

In this note, we bring together our ideas on how you should manage your retirement savings, based on the papers we have written on this subject this year.<sup>1</sup> We aim to do this as concisely as possible in the form of a set of simple **rules of thumb**. Where relevant, we update our results to today's market pricing. We start with Americans who will be spending in US dollars, and then follow these with adjustments for other countries and currencies with different life expectancies, tax codes, and local bond yields.

Your retirement financial planning should clearly begin the moment you start working as the earlier you begin to save, the more your assets will grow. We have not done a detailed analysis of **how much you should save** on an annual basis during your ~40 years of working life as this depends on so many factors, such as the expected growth rate and volatility of your income, the availability of any defined-benefit pension income, expected market returns, and taxation. But order of magnitude, with some assumptions on average wage growth, asset returns, taxation and state pensions, we think about 12-15% annual saving out of pre-tax income from age 25 to 65 will probably allow you to retire at age 65 with enough savings to maintain your standard of living in old age.<sup>2</sup>

Once you come closer to retirement, you should be able to come up with an estimate of how much money you will have once you stop working and need to live off your savings, on top of any defined-benefit pension income from the government or your employer. The below rules of thumb can then give you an idea what you can spend from your accumulated savings. If that is not enough for you, you should aim to increase your savings rate and/or work longer, in order to have a better chance at being able to maintain your standard of living in old age.

The next thing you need to do is to **calculate how much money you have to spend by taking out any taxes** you have to pay when you withdraw from your retirement savings, as most DM countries allow people to contribute money on a pre-tax basis to retirement funds, for these cumulated funds then to be finally taxed once you withdraw from them in or close to retirement.

1. [How much can you spend out of retirement savings](#), July 12, 2024; [Life expectancy and retirement spending](#), July 19, 2024; [Are annuities a good retirement investment?](#), July 26, 2024; [Inflation and retirement finances](#), Sep 6, 2024; [Taxes, bequests and couple spending in retirement](#), Oct 28, 2024.

2. See also [How much should people save?](#) Alicia Munnell et al., Center for Retirement Research, Jun 2014, or [Planning for a more expensive retirement](#), Blanchett et al., Journal of Financial Planning, March 2017.

We will start with the **standard case** of a 65-year-old couple that needs to decide how much of their starting savings can be spent each year, in fixed nominal terms, keeping the risk of running out of money before both have passed away to only ~5%.

You then need two **major inputs**: what **returns** can you expect on bonds and equities over the long term, and how long can you reasonably **expect to live**, plus risks on returns and life expectancy. Our [models](#) currently point to an expected *compound* return of 4.8% on the US Aggregate Bond market and 8% on US equities over the next 20 years.<sup>3</sup>

As to **life expectancy**, we use the official [US 2019 mortality tables](#) just before Covid. The most up-to-date mortality tables for the US are based on 2021 mortalities, which were still quite high due to Covid. We thus use 2019 mortality tables and assume that the preceding secular trend decline in mortality will continue after Covid. This is in line with the conclusion of an in-depth study by the OECD according to which:

*"Given that the impact of COVID-19 on mortality can be expected to be limited, the mortality experience during the peak of the pandemic should be adjusted or excluded from any calibration of mortality assumptions, as their inclusion would significantly increase the current level of mortality and distort the expected trend going forward. Nevertheless, while mortality should return to its prior trajectory over the next few years, it will likely be rather volatile in the near- and long-term uncertainty in the trend remains."*<sup>4</sup>

The US 2019 mortality table is our starting point, but we need to adjust them for the long-term **trend improvement in longevity**. That is because the chance that an individual aged 65 in 2019 will die 10 years later in 2029 will be defined by the mortality rate of people aged 75 in 2029, not of those aged 75 in 2019. Mortality rates have generally declined over time, so an individual can reasonably expect to live longer than implied by the current set of age-specific mortality rates. In the SSA data, the life expectancy of men aged 65 increased by 1.42 years between 2004 and 2019 (~1 month per year) while the life expectancy of women aged 65 increased 1.20 years over these 15 years. We use the trend mortality decline for each age cohort to project future mortality rates and thus life expectancy in our simulations of how much retirees can spend safely.

3. One adjustment we have had to make from our earlier papers is to run our simulations – generally 10,000 for each case – with a distribution of annual returns that must have a higher arithmetic mean of 5.0% for bonds and 9.3% for equities to still produce an average compound return over 20 years of 4.8% and 8.0%, respectively.

4. [Mortality and the provision of retirement income](#), OECD, 2023, p. 46.

To calculate how much you can spend, we argue that **risk** should not be measured by the volatility of returns but by the risk that you will outlast your savings, either due to poor long-term asset returns or to living longer than you had counted on. We use our IRR-based models to project future returns on US bonds and equities and generally draw 10,000 simulations of your portfolio based on historic volatilities and correlations of these returns. Our optimal spending rate will have only ~5% of simulations, leaving you with zero savings before you pass away. We chose the equity/bond allocation, rebalanced each year that gives us the highest spending rate. For our 65-year-old couple, with mortality risk based on US mortality tables adjusted for trend mortality declines, these simulations at current 20-year out expected compound returns of 8.0% on US equities and 4.8% on the Aggregate US bond market produce a 5.2% optimal spend/withdrawal rate, with a 40/60 allocation to equities and bonds, rebalanced annually.<sup>5</sup>

Obviously, **each person has to adjust this simple result for their own circumstances**, such as life expectancy, retirement age, or availability of defined-benefit pension income that could allow them to run a higher risk of running out of retirement savings. In the following, we show in concise form approximately how much to lower, or raise our standard 5.2% optimal spending rate depending on one's own conditions.

Table 1 starts with our benchmark case of a 65-year-old couple and then shows how to add or deduct from this – our betas – depending on whether they want their spending to increase with inflation, whether they expect to live longer or not, whether they are bullish or bearish versus our expected long-term returns, whether they would like to take more risk by having more equities, what tax bracket they fall in, and so on. Our numbers are all explained more in detail in the papers we have written on this topic, listed in footnote 1.

Our adjustment factors apply for small-to-moderate deviations from our base case but not to large ones as our **betas are not linear for each deviation**. That is, we can calculate how expecting to live say 1 year longer than your cohort should change your optimal spending pace, but you cannot simply assume you need to multiply this by 6 if you expect to live 6 years longer. There is unfortunately no simple rule to apply, but our betas will still give you a decent order of magnitude impact.

5. In our previous papers, we have found 30/70 was marginally better because in those simulations we have not yet adjusted for the large gap between compound and arithmetic returns on equities compared with only a narrow one for bonds. The difference in spending rates with these two allocations remains marginal.

Table 1: Optimal spending/withdrawal rates of retirement savings

% of starting wealth, pa. Baseline is a 65-year-old couple, with trend longevity gains relative to US 2019 official mortality tables. Calibrated to keep risk of running out of money to 5%.

Expected compound (arithmetic) 20-year return:	
US bonds: 4.8% (5.0%)	US equities: 8.0% (9.3%)
5.2%	for a couple
+ 0.2%	for surviving partner spending 25% less
+ 0.2%	for single female
+ 0.4%	for single male
+ 0.1%	for each year later retirement
+ 0.5%	for each 1% higher expected asset return
+ 0.1%	for each 1% higher risk of running out
- 0.1%	for each 1 year longer life expectancy
- 1.6%	to keep spending fixed in real terms
- 0.1%	to not rebalance portfolio
- 0.05%	for a 10% higher equity allocation

Source: J.P. Morgan.

### 1. You are single.

We find that a single 65-year-old male should be able to spend **5.6%** of starting savings, while a single female should be able to spend **5.4%**. These are each higher than that for a couple as the life expectancy of a single person will be shorter than that of a couple.<sup>6</sup> A single male can spend more than a single female as female life expectancy at age 65 is 2.6 years longer than that of an average US male.

### 2. You expect to live longer than average.

For each year you expect to live longer than the average of your cohort, you will have to cut your spending by **0.1%-points** of your starting wealth. We find that people with investable retirement savings do indeed tend to live longer than those without such capital.

### 3. You want to retire earlier, or later.

For every year you plan to work longer and retire later than 65, you can add **0.1%-points** of your starting wealth to your annual spending pace, and you will have to deduct that for every year you want to retire earlier than age 65.

### 4. Your partner is older, or younger.

6. Our simulations for a couple make the simplifying assumption that the probability distribution of a couple's remaining life is the same as that of the joint distribution of two unrelated people. We thus ignore any marriage effect, where married people on average live ~2 years longer than unmarried people, and any widow/widower "curse," when a surviving spouse may not have the same will to live longer after losing a life-long partner.

Starting with our 5.2% spending pace if each of you are the same age and both retire at 65, if instead one of you is younger, you need to reduce your spending pace by **~0.05%-points** for each year he/she is younger. And you can raise it by the same amount for each year he or she is older than 65.

#### 5. Surviving partner does not need to spend that much.

Our 5.2% pa spending rate for a couple allows for spending to be maintained at the same rate until the second partner dies. It is quite possible that the surviving partner does not need as much as they would when both were still alive. They could plan, e.g., to allow spending to fall by 25% after the first partner passes away. This will allow them to start their retirement spending **0.2%-points** more, or 5.4% pa of their starting wealth, instead of 5.2%.

#### 6. You want to raise your spending in line with inflation to keep it stable in real terms.

Our starting 5.2% optimal spending rate allows you and your partner to spend a constant amount in retirement with quite a small risk of running out of money prematurely. But it does expose you to inflation, that will steadily deflate what you can buy with your retirement income. That is not necessarily a huge problem as we do find that average spending needs do fall with age, especially for those of us passing 80.<sup>7</sup> With central banks still committed to doing what it takes to keep measured inflation around 2%,<sup>8</sup> and assuming you are expecting to gradually need less to live on, it is OK to stay with a plan for a constant spending pace in nominal terms. If you do want to keep spending stable in real terms, with nominal rising in line with inflation, we estimate you should only withdraw **~3.6% pa** from your starting retirement savings.

#### 7. You expect higher returns on your portfolio.

If you have reason to expect a higher return on your portfolio over the next 20 years than the 8% on US equities and 4.8% on US bonds that we project, you can increase your spending rate by **0.5%-points** for each 1%-point higher expected compound return on a 40/60 portfolio.

#### 8. You want to have more equities in your portfolio, or less.

---

7. An analysis by J.P. Morgan Asset Management in their [Guide to Retirement](#) shows that spending by households with \$250-\$750k in investable wealth falls on average 25% between age 65 and 85, as declines on transportation and food, *inter alia*, more than offset the increase in spending on healthcare.

8. We use the term “measured” inflation here as price indices of typical consumption baskets do not consider that you will rationally adjust your consumption over time toward goods and services whose prices have fallen or risen less than other goods or services that have become more expensive. Measured inflation thus overestimates the loss of your spending power, which is one reason why central banks do not target a zero rate of measured inflation, but one close to 2%.

A higher equity allocation will on average increase your return but will also make your retirement portfolio more volatile and thus increases the risk your savings will be gone before you are. Near the optimal allocation, the impact is not huge. For a 10% point higher or lower equity allocation, your optimal spending rate **falls ~0.05%-points pa**.

#### 9. You do not plan to rebalance your portfolio.

If you do not rebalance each year to our optimal 40/60 equity/bond allocation, the on average higher return on equity will make your portfolio drift towards a higher equity share that will in turn make your portfolio more volatile and thus raise the risk of running out of money prematurely. To keep this risk to ~5%, you should thus **lower** your spending rate by **~0.1%-points pa**. That said, it may make sense not to rebalance if you find that annual rebalancing costs you over 0.1% of your portfolio each year due to transaction costs, and earlier realization of capital gains.

#### 10. You expect a 1%-point higher excess return of equities over bonds than the 3.2% we forecast or live in a country with a higher equity risk premium.

In our estimates, over the next 20 years, US equities should beat the US aggregate bond market by 3.2% pa, lower than the ~5.5% it averaged since 1976. If you live in a country where the bond market is much more expensive and you thus have reason to expect a higher equity risk premium, or if your entry point shifts a lot (say in a recession where bonds rally and equities sell off a lot), then you should allocate more to equities than our 40% recommendation at age 65. If the expected excess return on equities to bonds over a 20-year period rises by 1% point, without a significant change in the overall expected return on your savings 20 years out, we estimate that the optimal allocation to equities shifts **~10%-points**.

#### 11. You expect to have to pay tax on investment income and capital gains.

Depending on your income and what country you live in, a decent share of your investment returns can be lost due to taxation. Our 5.2% optimal spending pace above assumes no such taxes. We already argued above that you need to start calculating the size of your retirement portfolio by taking out withdrawal taxes from any part of your savings that was initially funded with pre-tax income in retirement vehicles that many countries offer to stimulate saving. But even after you have done this and invest in say our preferred portfolio of 40/60 equities and bonds, you will still have to pay tax on coupons, dividends and realized capital gains, depending on your state, country, and tax bracket. Paying taxes on investment returns **does not change your optimal withdrawal rate** from your starting wealth level, based on the objective to minimize the risk of running out of money. What changes is how much you can spend from the money you withdraw from your savings each year, as you now have to pay taxes on

interest, dividends, and realized capital gains.

## 12. You are willing to run a higher risk of running out of your retirement savings.

This could be because you have sufficient pension income from other sources, such as a state or corporate defined-benefit pension, or an annuity you bought that would sufficiently soften the blow of running out of your own retirement savings portfolio. For each 5% higher odds of running out of your own retirement savings before you pass away, you can add **0.5%-points** to your annual spending pace out of initial wealth.

## 13. You are considering buying an annuity instead.

The biggest problem with a “DIY” pension is that you need to be careful about how much you spend as markets might not be as friendly as you hoped, and you might need to stretch your savings for a lot longer than you had counted on. An annuity solves this problem beautifully as it pays you a guaranteed income until you die, decently higher than your DIY pension, and without any worries about market drawdowns or how long you will end up living.

We find that less than 1 out of 10 US retirees hold annuities. What is holding them back? Economists call this the **Annuity Puzzle**. In short, retirees hate losing their capital and control over their hard-earned savings in exchange for annuity income; they want to make sure to have access to their savings in case of emergency; and they are generally baffled by the pricing of annuities and the fees, commissions and complexity involved in buying annuities. Retirees generally have their retirement savings with asset managers who are not eager to lose you as a client by passing you on to the insurance companies that sell annuities. But we do think it makes sense to include annuities in your retirement savings, though not all of it, and probably best by allocating some of your savings into the most plain vanilla single premium immediate annuity. At the margin, **you should put more into an annuity, the longer you expect to live and the less you care about leaving money behind to any heirs.**

## 14. You want to assure your heirs get an inheritance.

If you manage your own retirement savings and spend out of it at a pace that keeps the risk of running out of money to ~5%, then you have, by definition, a 95% probability that your savings will not be exhausted when you die and can thus be passed on to your heirs. But you will not know how much will be passed on, with the inheritance a direct function of how early you die and how well the markets treat you until that point. On average, we find that with our optimal spending, your estate will end up being worth about as much as what you started with at age 65. The only way to make sure, though, that your heirs **do** receive what you want them to is to invest in a separate portfolio for this purpose. This inheritance portfolio can naturally have a higher allocation to risky assets

as its investment horizon should be longer than that of your own retirement portfolio.

### Example of how to apply these betas

Each individual needs to estimate for themselves how much they can spend in retirement out of their accumulated savings. To consider an example, assume you are 70-year-old American, and your partner is 5 years younger. You each expect to live 3 years longer than the average of the country. You have a decent defined-benefit pension coming your way that you can fall back on and are thus willing to run a higher risk – say 10% – of emptying your own savings before both passing away.

You can ask your full-service financial advisor to run your conditions in their simulation mode, or you can use our rules of thumb, ignoring the interactions between these factors to come to the following calculation: Starting at an optimal spending pace of **5.2%** of your starting portfolio, you can **add 0.25%** as one of you is 5 years older when you retire (Rule 4); **deduct 0.3%** as you both expect to live 3 years longer than cohort average (Rule 2); and **add 0.5%** as you are willing to run a 10% risk of depleting your portfolio before passing away (Rule 12). This adds up to allowing you to spend **5.65%** pa of your starting portfolio in retirement.

## The Long-term Strategist

### Inflation and retirement finances

- In our retirement series, we have looked at how much one can spend out of retirement savings, while maintaining a low risk of running out of money. We focused so far only on generating a fixed nominal income in retirement.
- Here, we estimate an optimal withdrawal rate from savings when a retiree wants to raise nominal spending in line with inflation. We combine CPI inflation rates drawn from an econometric model estimated over the Great Moderation period with mortality and asset return draws.
- Based on our current 20yr return projections for US equities and bonds of 8.1% and 4.7% pa, a US male retiree can spend a fixed nominal amount of 5.2% of post-tax savings at retirement, while a US woman should spend slightly less at 5.0% as women tend to live longer than men.
- If they instead want to keep spending in retirement stable in real terms with the same 5% risk of running out of money, a man can initially spend 3.7% of his initial post-tax savings at retirement, and then steadily raise this amount with inflation, while a woman can initially spend 3.5%, some 1.5% lower for each than a fixed nominal spending level.
- Retirees who are worried inflation will be higher should further lower their spending rate by 0.5% of initial retirement savings for each 1%-point pa higher rate of inflation they see during retirement. Vice versa, they can spend 0.5% more if they see 1%-point pa lower inflation.
- If they allow real spending to decline slightly over time as spending needs typically decline with age, a man can initially spend 4.4% of his initial post-tax savings at retirement, while a woman can initially spend 4.2%.
- Whether someone wants to adjust their spending in line with inflation or not, the optimal equity-bond allocation is very similar. Given the expected long-term return of equities has risen relative to bonds over the past month, we now estimate a slightly higher optimal equity share of ~35%.
- The sensitivities (“betas”) of our optimal withdrawal rates with respect to life expectancy, retirement age and asset returns are the same for nominal or real spending targets. For each year you expect to retire later, you can add 0.1% to your annual spending, and for each year you expect to live longer, you should subtract 0.1%. Vice versa for each year shorter or earlier. If you expect asset returns to be 1% higher (lower) over the long term, you can add (deduct) 0.5% to your annual spending.
- Why not hedge inflation with inflation-linked bonds or “real” annuities? Few retirees appear to do this. Our guess is that this requires holding inflation-linked gov’t debt that is lower in yield than the assets most retirees or annuity providers tend to hold. The payout on UK real annuities is currently ~2.7%-points below that on nominal ones, nearly twice as much as our give-up on real withdrawal rates, suggesting that cost is one factor keeping retirees from such inflation hedging strategies.

#### Long-term Strategy

Alexander Wise <sup>AC</sup>

(1-212) 622-6205

alexander.c.wise@jpmchase.com

Jan Loeys

(1-917) 602-9440

jan.loeys@jpmorgan.com

J.P. Morgan Securities LLC

In our retirement series, we have previously looked at what fixed nominal amount you can take out of retirement savings, while keeping the risk of running out of money under 1/20. However, many retirees, if not most, will want to ensure that their spending remains steady in *real* terms, to ensure they can maintain their standard of living.

**Inflation presents a risk to any retiree with nominal income streams.** For a retiree looking to maintain the real value of their spending, inflation requires increasing nominal spending over time. If inflation risks are not well hedged in an individual's portfolio, higher inflation will lead to a faster depletion of retirement savings, raising the risk of running out of money in one's lifetime. Retirees wanting to maintain their real standard of living will thus need a different withdrawal plan to those only trying to keep their nominal spending pace unchanged.

## Modelling long-term inflation

Both the **long-term average level and volatility of inflation** affect the risk of running out of money for an individual concerned with the real value of their withdrawals. Thus, we need to simulate inflation over the long term in an empirically reasonable manner. We run simulations of a simple autoregressive moving-average (ARMA) model of order (1,1) of CPI inflation on an over-a-year-ago basis, initialized with inflation observed to date. This model specification appears reasonable based on the autocorrelation and partial autocorrelation structure of the historical data. The model is estimated using observed inflation between 1990 and the present, which spans the inflation-targeting period that we expect to prevail into the future but omits the period of high inflation in the transition period of the 1980s. It includes the sharp runup and then decline in inflation during and after Covid.

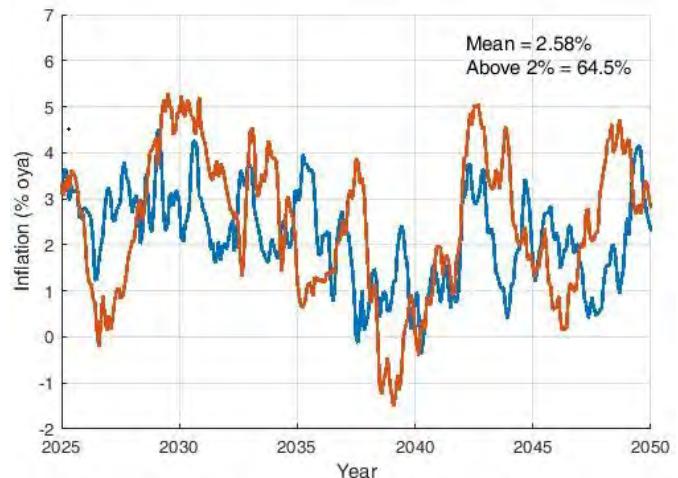
Figure 1 shows two sample inflation simulations from 2025 to 2050 drawn from this model. Across simulations, the **average rate of CPI inflation is 2.58% pa**. This average rate of inflation is very similar to the long-term average of 2.7% pa over the period of time that we used to estimate the econometric model.

Figure 2 shows the distribution of simulated average annual inflation rates over the next 20 years. The standard deviation of 20yr average annual inflation rates is 0.59%, and roughly 95% of 20yr average annual rates are between 1.4% and 3.8% pa. It is worth emphasizing at this point that this is based simply on draws from an **empirically estimated model over the past 34 years**. It thus assumes that the underlying process that generates inflation in the US economy, or the inflation objectives/preferences of the Fed and the public have not changed since. We have argued before that there is a risk that such preferences have changed in the last decade as low and

stable inflation did not boost growth, and coincided with a significant rise in inequality. This could lead policy makers to pay more attention to jobs and equality. So far, though, we must admit there is **little evidence that the Fed, other central banks or the broader population have become more tolerant of inflation**.

Figure 1: Two inflation simulations from 2025-2050

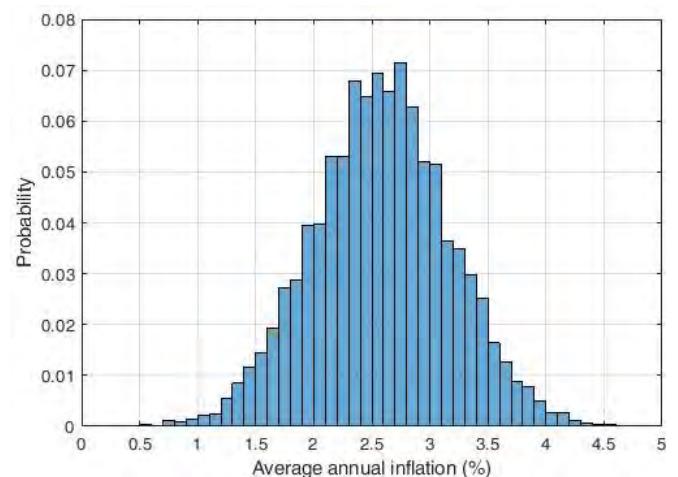
% oya, monthly. Simulations from ARMA(1,1) model estimated on CPI inflation process between 1990 and 2024.



Source: J.P. Morgan, Bureau of Labor Statistics.

Figure 2: Distribution of annual average inflation over the next 20 years

Simulations from ARMA(1,1) model estimated on CPI inflation process between 1990 and 2024.



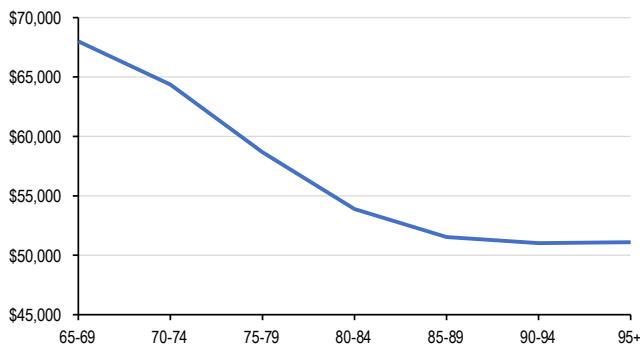
Source: J.P. Morgan, Bureau of Labor Statistics.

## Retirement spending with inflation

In our simulations, we will examine three retirement spending scenarios. In the first, as in our prior analysis, the retiree with-

draws a **fixed nominal amount**. In the second, the amount the retiree withdraws is adjusted through time to account for inflation, giving a **fixed withdrawal in real terms**. In the third, the retiree adjusts withdrawals based on the level of inflation but allows the **withdrawal to decline in real terms** in line with the typical decline in spending needs with age. This third scenario is motivated by the observation that real spending needs decline with age in retirement. For example, analysis by J.P. Morgan Asset Management in their [Guide to Retirement](#) shows that spending declines on transportation and food, amongst other things, more than offsetting the increase in spending on healthcare. Figure 3 shows their estimates of retirement spending by age. This snapshot in spending across ages in a period of time provides an estimated trajectory of real spending needs by age, which we factor into the third retirement spending scenario.

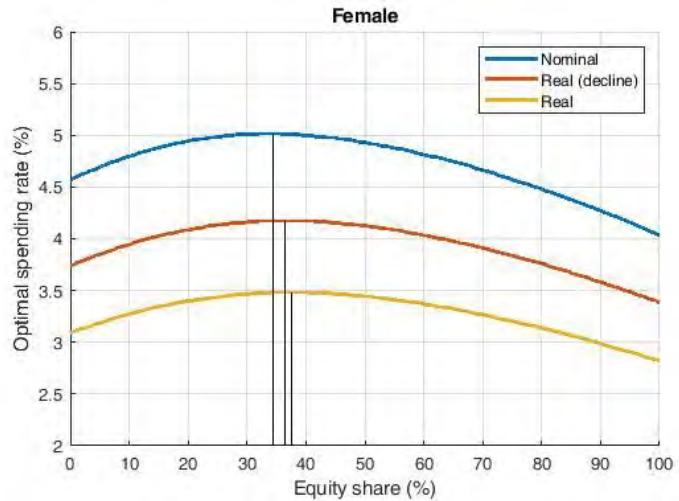
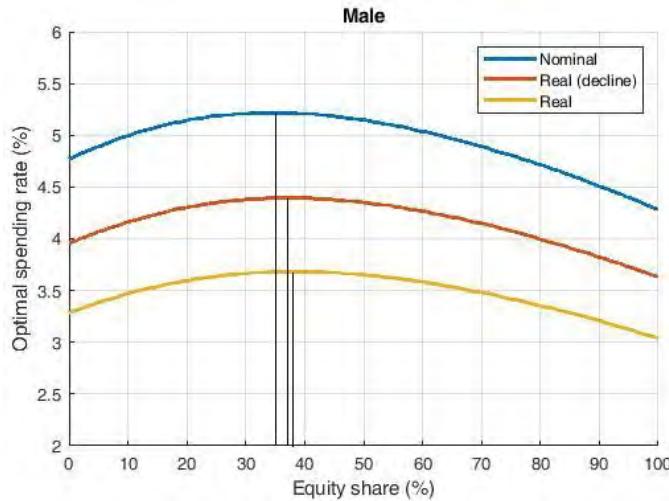
**Figure 3: Average annual household spending in retirement by age \$.** Based on analysis in J.P. Morgan Asset Management's [Guide to Retirement](#). Households with \$250-750k investible wealth.



Source: J.P. Morgan, Bureau of Labor Statistics, IXI.

**Figure 4: Optimal spending rates based on portfolio equity share in three spending scenarios**

%. Optimal spending rate is initial withdrawal that gives ~95% chance that savings are sufficient. Nominal has constant withdrawal in nominal terms. Real has constant withdrawal in real terms. Real (decline) has declining withdrawal in real terms based on age trends in real spending.



Source: J.P. Morgan, US Social Security Administration, Board of Governors of the Federal Reserve System, Bureau of Labor Statistics, Bureau of Economic Analysis, Robert Shiller, Refinitiv, S&P, Bloomberg Finance L.P.

In our analysis, we follow the same general approach as we have in previous analysis on retirement spending, running simulations using age-specific mortality rates and empirical distributions of long-term asset returns centered on our long-term return forecasts.<sup>1</sup> Throughout, we consider an equity-bond portfolio invested in the S&P500 and the US Aggregate Bond Index. Reflecting the last month of market moves, we adjust our 20yr return expectations on the S&P500 from 8.0% to 8.1% pa, and on the US Aggregate Bond Index from 5.0% to 4.7% pa.<sup>2</sup>

Relative to that previous analysis, inflation is one new dimension. Throughout, we assume that **nominal returns on bonds and equities are unrelated to realized inflation over the long term**. Regressing 1yr returns on bonds and equities on 1yr inflation since 1976 reveals that inflation accounts for an extremely small amount of variation in bond returns, while there is no statistically significant relationship with equity returns. In [previous analysis](#), we have shown that there has been no relationship between 10yr inflation and nominal equity returns as lower valuations tend to offset higher earnings growth. For bonds, the starting yield on an index generally provides a good indication of the 10yr nominal return regardless of inflation. Higher inflation expectations in the

1. For previous notes where we implemented this approach, see [here](#), [here](#) and [here](#). Specifically, we use the improving-longevity benchmark.
2. The S&P500 projected return comes up slightly as Q2 EPS came out 13% higher than Q2 for 2023, lowering the trailing multiple which raises the long-term return as the entry point became cheaper. In contrast, the rally in US bonds lowered the likely long-term return on bonds from this now more expensive entry point.

future could raise future interest rates, which would affect expected bond returns beyond the next 10 years, though we note that our very long-term return forecasts currently assume long-term inflation expectations of 2.5% in the future, which turns out to be almost precisely equal to the long-term average inflation in our inflation simulations above. Further, a central bank inflation target should prevent long-term inflation expectations deviating too widely even if realized inflation is volatile, as has been the case in the present inflationary episode. For these reasons, we believe this assumption provides a reasonable benchmark.

Turning to the results of the simulations, Figure 4 plots the **highest initial spending rates that are consistent with a ~95% chance that savings are sufficient** in the three retirement spending scenarios for portfolios with varying equity shares. Note here that the **spending rate is defined as the annual withdrawal as a share of initial wealth**. In the two inflation-adjusted scenarios, subsequent withdrawals will vary depending on the path of inflation, and in line with real spending needs in the case of the third scenario.

In the scenario with **fixed nominal withdrawals**, a US male can annually withdraw 5.2% of their post-tax retirement savings, while a woman can annually withdraw 5.0%. These numbers have changed marginally relative to previous analysis as a consequence of the updated long-term return expectations, falling slightly due to lower bond return expectations. These spending shares are achieved with a portfolio equity share of around 35%, which has increased slightly from previous analysis due to the widening of the equity risk premium as bond yields have fallen.

In the scenario with **constant withdrawals in real terms**, a US male can withdraw only 3.7% of his post-tax retirement savings in the first year of retirement, with withdrawals rising by the inflation rate each year thereafter, while a woman can withdraw 3.5%. For both, **this is ~1.5% lower than in the constant nominal withdrawal scenario**. Incidentally, these withdrawal rates are now **marginally below the classical 4% Rule**, which likewise assumes that spending rises in line with inflation over time. While many factors could be behind this difference, one notable possibility is the fact that our very long-term return expectations are *now* at the low end of the spectrum of historical returns due to current market pricing, as we recently observed. Amongst other things, it could also be that our long-term inflation expectations are relatively higher, or that we have a lower risk tolerance.

Why does the constant real spending objective require an individual to spend less out of their retirement savings? This is primarily due to the **escalating spending requirements** in later years given inflation is typically positive. Note, though,

that the cut in spending is less than the inflation rate. A cut-back from 5.2% to 3.7% in the first year of retirement is not a 1.5% reduction, but almost a 30% cut. This allows the retiree to grow their retirement savings relative to the ~5% withdrawal rate to make sure they will be able to steadily raise their nominal spending in later years in line with the eventual decline in the real value of their savings.

While the **additional uncertainty surrounding inflation** matters in principle, the **effect is quite small**. We can see this by comparing our 3.7% and 3.5% withdrawal rates with ones that would prevail if inflation were fixed each year at 2.58%. In that scenario, sustainable withdrawal rates are only marginally higher, indicating that inflation uncertainty plays only a secondary role.

In this fixed real spending rate scenario, the highest spending rates are achieved with a **marginally higher portfolio equity** share of 38%, three percentage points higher. Still, as shown in Figure 4, sustainable spending rates are very similar with equity shares in the 30-40% range, so this change is of little practical consequence.

In the scenario with **inflation-adjusted withdrawals that account for declining spending needs as people age**, a US male can withdraw 4.4% of his post-tax retirement savings in the first year of retirement, while a woman can withdraw 4.2%. For both, this is 0.8% lower than in the constant nominal withdrawal scenario. Obviously, this scenario allows a **higher initial spending rate than the constant real withdrawal scenario** as the declining real spending requirement with age reduces future withdrawals relative to that scenario.

## Factors affecting spending rates

In line with our previous analysis, we can test how an individual's spending rate should **vary depending on their life expectancy, retirement age, and long-term return expectations** in scenarios where they want to preserve some or all of the real value of their withdrawals. To add to this, we can now also explore the effects of a change in the long-term **level of inflation**, or the **volatility of inflation**.

Starting with the effect of longer life expectancy, we previously found that, with fixed nominal withdrawals, a retiree needed to **reduce their spending rate by 0.1% for each additional year of life expectancy**. In both of the inflation-adjusted scenarios, we find that **the same rule of thumb holds**.

In the fixed nominal withdrawal scenario, we also previously found that an **individual who delays their retirement one year from age 65 to 66 can spend 0.1% more out of their retirement savings**, with slightly larger incremental increases

possible with each additional year of waiting. Again, we find that this **rule of thumb holds** in both of the inflation-adjusted scenarios.

With each 1%-point increase in long-term expected returns, we find that an individual can **increase their spending rate by 0.5%** in both of the inflation-adjusted spending scenarios, comparable to our finding with fixed nominal withdrawals.

Above, we briefly discussed the distinct effects of **higher inflation** and **more volatile inflation** on an individual's spending. To assess these effects separately, we can estimate how sustainable spending rates change when inflation is more volatile but unchanged on average, and when inflation is higher on average but no more or less volatile. As alluded to above, the **level of inflation appears quantitatively more significant than the volatility of inflation**. For instance, increasing the average rate of inflation by 0.5% pa, while keeping inflation volatility constant, reduces sustainable spending rates in the two inflation-adjusted scenarios by 0.25%. Increasing model volatility such that the standard deviation of annual inflation rises from 1.6% to 1.9%, while keeping the same average level of inflation, reduces sustainable spending rates in the two inflation-adjusted scenarios by just 0.03%. Thus, within the realm of what we believe to be plausible long-term inflation outcomes, the long-term level of inflation seems to be more important.

## Annuities and inflation

Our lowered withdrawal rates help retirees protect their real spending in retirement, but inflation remains a risk and something they need to deal with. Can this not be better managed with an **inflation-protected annuity**, or by **holding inflation-linked bonds** in one's retirement savings?

We have not yet done our simulations with inflation-linked returns and their correlations with delivered inflation, and do not have a lot of data on inflation-protected annuities, but can already see one major challenge for both, namely that inflation-linked bonds consist entirely of government debt that will generally have a lower return than our 30-70 equity-bond portfolio, or the higher yielding corporate bonds that most insurers hold. This suggests to us for the moment that **inflation hedging in retirement through linkers or real annuities is not going to be a cheap option**. For instance, a real annuity for an individual aged 65 in the UK recently offered a yield of 4.80%, some 2.75% below the yield on an annuity

offering a fixed nominal payment.<sup>3</sup> Our results above indicated that, when spending out of their own retirement savings, an individual looking to maintain the real value of their withdrawals should reduce their initial spending rate by a lesser 1.5% relative to a scenario with fixed nominal withdrawals.

Further, we have shown above that it is the average *level* of inflation that has the greatest effect on sustainable spending rates, while inflation *volatility* has only small effects. This is largely because we judge risk in terms of whether the retiree is meeting their ultimate objective of maintaining their standard of living for the rest of their life instead of the more common metric of the volatility of one's portfolio. We have made a case before that the long-term investors should pay less attention to market volatility and more to whether they can achieve their ultimate goals.

That being the case, one would expect a small difference between the yield on a real annuity and the yield on annuity with payments that escalate at a rate roughly comparable to expected long-term inflation. In the UK, recent pricing for this individual aged 65 indicates a yield of 5.4% for an annuity with a 3% escalator, which exceeds the average rate of inflation observed there between 1990 and 2023 of 2.77%.<sup>4</sup> Even with payments that escalate at a rate higher than observed inflation in recent decades, there is a **relatively large yield difference between escalating annuities and real annuities**.

In our view, given the expensiveness of inflation protection when buying annuities, the **case for spending out of one's own retirement savings is stronger when inflation is a more significant issue**, whether due to the macroeconomic environment, personal preference or otherwise. In the future, we will consider whether investing one's retirement savings in **inflation-protected bonds** allows a higher rate of spending.

3. Retirement Line, '[What are the latest UK annuity rates?](#)'. Note that, as we discussed [recently](#), the yield on an annuity is *not* the same as its internal rate of return (IRR). We previously compared spending out of one's own savings and buying an annuity by comparing their IRRs.

4. Based on CPI reported by the IMF International Financial Statistics database from Q1/1990 to Q4/2023.

## The Long-term Strategist

Are annuities a good retirement investment?

- We discussed last month how the move from defined-benefit to defined-contribution pension saving shifted market and longevity risk to workers, who have become quite concerned they may outlive their savings.
- But not all is lost as workers can buy lifetime income annuities that shift these risks onto life insurers that can more easily manage them within a large pool of annuitants.
- Despite the advantages of annuities, it is a puzzle why so few workers across the world buy them into retirement.
- Many retirees seem to consider annuities expensive versus spending out of their own equity-bond portfolio. We investigate what conditions can make annuities a more expensive retirement solution, or a cheaper one. We do this by comparing the IRRs of both strategies.
- Given the uncertain annuity payout length, their IRR needs to be calculated from the PV of each possible end point times the probability of the annuitant dying that year. The resulting IRRs follow the overall bond yield level very closely as life insurers that produce them need to fund them with bonds.
- Annuities are cheaper relative to investing out of your own 30-70 equity-bond portfolio the lower the expected excess return of equities over bonds, the more volatile asset markets are, the longer you expect to live, and the less value you put on leaving any leftover savings from your portfolio to any heirs.
- At current pricing of bonds, equities, and annuities in the US market, a 65-year-old US female should find a single premium immediate lifetime annuity of equal value to investing from her own portfolio if she believes she will live 3 years longer than her age cohort, and values any leftover dollar of inheritance at only two-thirds of a dollar spent on herself in retirement. For every year she sees herself living longer, she needs to value any leftover estate ~5% more to remain indifferent between the two strategies.
- If she expects to live longer or sees less value in leaving money to her heirs, she will find annuities a cheaper option than spending from her own savings, and vice versa.

### Long-term Strategy

**Jan Loeys** <sup>AC</sup>

(1-917) 602-9440

jan.loeys@jpmorgan.com

**Alexander Wise**

(1-212) 622-6205

alexander.c.wise@jpmchase.com

J.P. Morgan Securities LLC

## Why don't people buy more annuities into retirement?

Workers saving for retirement through defined-contribution plans face serious risks and uncertainties that we discussed most recently in [The defined-contribution problem](#). One is not knowing how many years of retirement they need to plan for, and another is not knowing what the value of their savings will be when they retire and afterwards when they need to live off them.

The uncertainty on the number of years of income in retirement you need to plan for is both about how long you will be willing and able to work and about how long you can expect to live. The second uncertainty about not knowing how much you will be able to spend is driven by market volatility and how much your lifestyle will cost. **Both uncertainties can be greatly reduced, if not eliminated, by buying an inflation-protected annuity** that pays you each month a fixed income indexed to inflation as long as you live. Defined-benefit pensions do exactly this, although not all are indexed to the cost of living. Most government pensions, such as US Social Security and UK State Pension, are inflation indexed.

The most basic annuity – a single-premium immediate annuity (SPIA) – asks you to pay a single amount of money upfront – the premium – and in exchange it pays you a fixed income, usually monthly, for as long as you live. The UK has a decent offering of inflation-indexed annuities, but in the US, there are almost none left. Annuities are some of the oldest financial instruments in existence, with the first recorded in [Roman times](#). Nowadays, they are offered in a nearly unlimited number of variations with bells and whistles to suit the particular needs of individual savers.

Here, we will just consider the simplest plain-vanilla version of a single premium paid up front in exchange for monthly fixed payments until death. These are called single-premium immediate annuities (SPIAs).

Given the obvious benefits that annuities provide, it is **surprising that so few people buy them**. [Surveys](#) show only ~12% of US households nearing retirement with investable assets hold commercial annuities. US life insurance companies had \$2tr in fixed annuities outstanding and \$2.2tr in variable ones at the end of last year. Variable annuities are generally linked to market performance – typically equities – and are frequently used more for investment purposes. This compares with \$31tr in total US household pension entitlements (ex. Social Security) and \$113tr in total financial assets

by US households.<sup>1</sup> Economists call this the **Annuity Puzzle**. Why is that? What makes annuities a good or not so good investment asset for retirees?

### The issues holding back annuity ownership

**Locked in.** Surveys on why savers with investable assets do not all hold annuities and instead more often just spend a regular part of these assets to fund their spending in retirement show that people generally prefer to **keep control** of their life-time savings and the **flexibility** to use them in times of need without being held back to only spend a fixed amount per month.

**There go my savings.** One of the most common reasons given by consumers for not purchasing life annuities is that they perceive themselves as having incurred a loss should they die soon after purchase.<sup>2</sup> This is obviously what creates the value of the longevity insurance provided by annuities as the “leftover” premium of those passing away early pays for those living longer than average. Objecting to this is like feeling bad that one has lost the premium paid for life insurance by not having died or paid for home insurance when your home has not burned down.

**My asset manager does not sell annuities.** A third issue that has been holding back retirement savers in defined-contribution plans from buying annuities is that these plans are almost always held with asset managers that do not sell annuities as these can only be price-effectively produced by life insurers. The asset manager is understandably loath to lose their customers and may thus not market the annuity option.

Annuities are produced and sold by life insurers as their accrual accounting and issuance of life insurance make them much more able to issue annuities. **Accrual accounting** allows them to smooth the return on the assets that back the products they sell. Also, life insurance itself has the opposite exposure to longevity risk as annuities and thus provides a good hedge. If its customers live longer than anticipated, the insurer loses money on its annuities but makes it on its life insurance, and vice versa if its customers are dying earlier. There have been efforts in the past to create a market to trade and transfer longevity/mortality risk, but this did not take off, making it hard for non-insurers to offer annuities competitively.<sup>3</sup>

1. [US Financial Accounts, Life insurance companies](#), June 7, 2024, p. 94, Table L.116.g line 29 and L.116.s, line 21.

2. [National Annuity Markets: Features and implications](#), Rob Rusconi, OECD, Sep 1, 2008.

3. See, e.g., our own writing on this in [Longevity: A market in the making](#), Loeyς, Panigirtzoglou, and Ribeiro, July 2, 2007.

26 July 2024

**How do I know the price is right?** Seemingly simple in their most basic forms, annuities are complex assets that are not easy to value and thus leave potential buyers uncertain what their true value is and whether they are paying a fair price for them. They are offered with a single price – the so-called premium – but are really a tie-in of quite a few different services and options that are not each priced separately. Even the simplest single life immediate annuity is **both an investment and an insurance product**.

In addition, most advisors and annuity salespeople tend to pitch foremost the **more complex annuities** with multiple provisions providing coverage for surviving partners, participation in equity rallies, withdrawal options, and guaranteed payment lengths that are all attractive but that come **at a price of a much lower payout yield**. It does not help that there tends to be quite a lot of variety and dispersion in the pricing of even identical annuity products among different providers and across time, making selecting the best provider more complicated than it should be.<sup>4</sup>

**No free lunch.** Finally, and relatedly, there is a perception among many potential buyers that annuities are **expensive**. Almost all are sold through financial advisors, brokers and dealers<sup>5</sup> that require a commission to pay for their efforts. The insurance company itself has to cover its operating costs and risks that annuitants will live longer than expected, partly due to adverse selection,<sup>6</sup> partly because they are subject to changes in mortality rates that have been trending down at varying rates over the past few decades and century. The **low yields** earned by insurers on their bond holdings over the past 15 years further added to this concern.

## What should you do then? Which strategy is a better-value investment for retirees? An annuity or an equity-bond portfolio?

A lot will depend on your particular needs, such as to have access to emergency funds. Here, we will **only look at which is a better retirement investment** and how one can assess that.

We have found little in the finance literature that provides a simple, straightforward valuation comparison of the two. However, we should be able to rely on the standard way to

assess asset classes and investment strategies in finance, which is to compare them on a **return-to-risk basis**, outright and within the context of one's total portfolio. As a first attempt, we will simply consider an **either/or comparison**, whether to buy an annuity with one's retirement savings, or to rely solely on withdrawing each month a fixed amount from one's equity and bond portfolio.

Specifically, we will focus on a 65-year-old US female who has the choice of an immediate annuity currently paying her 7.14% pa on a monthly basis for the rest of her life, or of investing the same amount 30% in US equities and 70% in the US Aggregate bond market.<sup>7</sup> On the second option, we found last week she could spend ~5.1% pa of that investment with ~5% risk that she will outlive her savings. Any unspent part of her portfolio – on average close to its starting level at 65 – would pass to her heirs.

We do not yet consider here whether one should do both, or buy products with features of both, such as variable annuities indexed to the broad equity market with the ability to draw down principal, or of more dynamic portfolio withdrawal strategies.

**What are the risks and returns** of these strategies? **Risk** on this single life immediate income annuity is just the credit exposure to the insurer selling the annuity. Most are highly rated, so the risk is low, though not zero. As to her equity-bond portfolio, the ~5.1% optimal spend out of that has by our simulations only a ~1/20 probability of leaving her without any funds before she dies, beyond family support and/or Social Security.<sup>8</sup> The risk of default by the insurer is likely well below 1/20, but both this risk and the risk of running out of your own savings seem both low enough to us that we can spend all our attention on **the expected return, or internal rate of return (IRR) of these strategies**.

An internal rate of return is the discount rate that equates the present discounted value of the cash flows coming from an asset to its current price. **To estimate the IRR of an annuity, we need to start with its payout yield**, which is its monthly payment, times 12 to annualize, divided by the premium you pay in to purchase the annuity.

4. See, e.g., [How competitive are income annuity providers over time?](#), Blanchet, Finke and Nikolic, April 2021.

5. Insurance Information Institute, [Facts + Statistics: Annuities](#).

6. Adverse selection means here that an insurer should expect that the average life expectancy of its annuitants will be higher than the overall population as people with reason to believe they will have a shorter lifespan are less likely to buy an annuity.

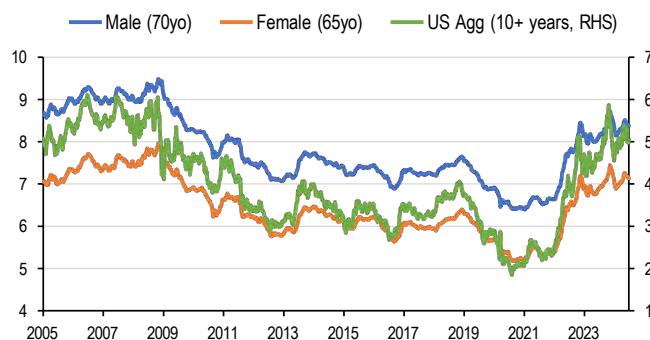
7. Based on data from [CANNEX Financial Exchanges Ltd](#).

8. We only consider risk to her annual spending until she dies as our measure of risk and not the volatility of the portfolio out of which she spends as she should only care about maintaining her lifestyle. Those objecting to this view should consider that the present value of any remaining monthly distributions on an annuity will also vary over time.

Figure 1 shows the only time series we have found of US fixed annuity payout yields. They have been collected by CANNEX, a pricing and analytics provider, from the top 10 carriers by income annuity sales over the previous quarter. They are for 70-year males and 65-year females, both single life annuities. Each has a 5-year guaranteed payout, continuing the payments to beneficiaries until the 5<sup>th</sup> anniversary if the annuitant passes away earlier. This lowers the payout slightly from annuities without this guarantee. For comparison, the chart includes the yield on the **US Aggregate bond market** (10+ years maturity) consisting of US Treasuries, mortgage-backed securities and agencies, and high-grade corporate bonds. The “Agg” is the standard benchmark for US fixed income.

Figure 1: CANNEX Payout Annuity Yield (PAY) Index

%, 1/5/2005-6/26/2024, weekly. US Agg is 10+ years maturity.



Source: J.P. Morgan, [CANNEX Financial Exchanges Ltd.](#), Bloomberg Finance L.P.

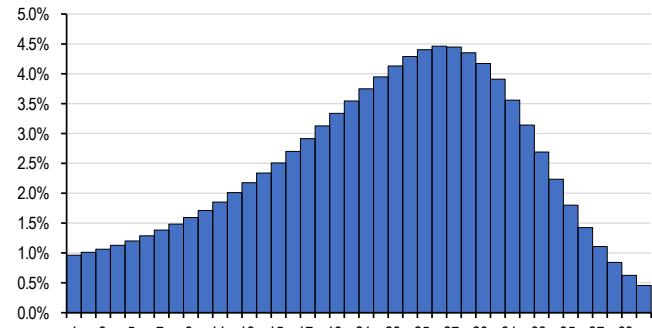
Note that **annuity payout rates or yields are not their IRR and they are not interest rates or bond yields**. To calculate the discount rate that makes the discounted value of future annuity payments equal its current price, or premium, we need to consider that the maturity of these payments depends on when the annuitant will die. **The IRR of an annuity is thus the rate that equates the premium paid with the present values of all the possible end points of the income streams, weighted by the probability that that will be your end point.** Insurers set the premium based on how long they expect annuity buyers of your age and gender to live.

Take for example the recent 7.14% payout offered to 65-year-old US females. The last pre-covid Social Security US life table gives this woman an average remaining life expectancy of 20.7 year, based on the mortality rates of each old age cohort that year. As discussed last [week](#), this likely underestimates her real life expectancy as mortality rates have been declining for decades around the world. This means that as she grows older, she will likely see lower mortality risk than those of people that age in 2019. Adjusting mortality rates based on the observed rate of decline in the past 15 years gives us a slightly longer (mean) life expectancy for this 65-

year-old female of 21.7 with a distribution shown in Fig 2. It is not a normal distribution but skewed to later with a mode 3 years later than the median.

Figure 2: Probability of a 65yo woman dying in a given year from her 65<sup>th</sup> birthday

%, Based on annual rate of age-specific mortality rate improvement from 2004 to 2019 Social Security Administration [Actuarial Tables](#).



Source: J.P. Morgan, US Social Security Administration.

**The discount rate (or IRR) needed to make the premium on this annuity equal the present values of each of the annuity payouts up to each potential end point of the annuity, weighted by the risk of dying that year for the average US 65-year-old female, then is 4.1% for this 7.14% payout yield.**

The 4.1% IRR for this annuity needs to be compared with the alternative strategy of spending out of your own equity-bond portfolio that we analyzed last week. Our models give us an **expected return of 5.9% on our optimal portfolio of 30% in SPX and 70% in the US Aggregate Bond market**. We consider this expected return the IRR on the value of this portfolio across its full probability distribution, including what this 65-year-old will use for her own spending **and** what she leaves behind to her heirs. Part of our reasoning is that the IRR of an asset is the future return one should expect on it and part is that we base our longer-term return projections almost exclusively on the IRR of these assets. In the case of fixed income, 10-years out, the yield/IRR of a bond portfolio is the best estimate of its future return as we discussed a number of times [before](#). In the case of equities, we use different versions of multiples to generate our long-term return forecasts.

At this point, the **5.9% on an 30-70 equity-bond portfolio thus beats the 4.1% IRR of the annuity** paying out 7.14% pa to a the 65-year-old female for the rest of her life. But this does **not end the story and is just the starting point**. For one, these **prices and IRRs will not stay constant and change each week or month**. In addition, our IRR calculations depend heavily on **how long the retiree expects to live and how they assess the value of the “unused” part of their**

### **equity-bond portfolio that is left in their estate.**

On the first issue of **changing market prices**, the variable that can foremost change the relative value of an annuity versus an equity-bond portfolio will be the expected long-term excess return of equities over bonds, known as the **equity risk premium**. Figure 1 showed annuity payouts follows the overall bond market quite closely. Converting the IRR of this annuity at the life expectancy of the *average* US 65-year-old woman, we find it averages about **1% below the US Agg (10+ years maturity) yield, within a tight ±20bp spread**. As discussed below, if insurers expect life expectancy for its annuitants to be ~4 years higher than average for the cohort, the annuity IRR will be about equal to the Agg yield.

The **expected return on the competing 30-70 equity-bond portfolio will consist of this same Agg bond yield plus 0.3 times the expected equity risk premium**. This premium has come down dramatically over the past 2 years due to a persistent fall in bond prices and a rise in equity prices, depressing the future return on equities against bonds. The higher this future equity risk premium, the better an equity-bond portfolio is valued against an annuity.

The **second set of variables that can greatly change our IRR calculus** and thus the choice on how best to provide for a steady income in retirement is **how long you personally expect to live and how important or not it is to you to leave an inheritance**.

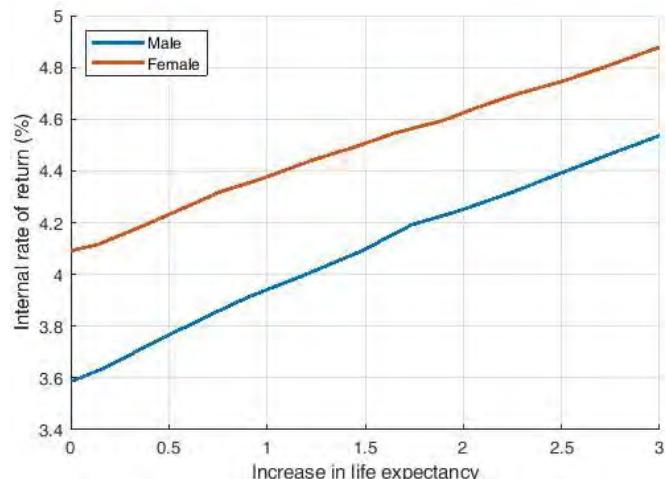
As to your **life expectancy**, the individual considering an annuity as well as the insurers setting the annuity payout recognize that our above annuity IRR calculation is only for the *average* 65-year-old women. The insurer knows that people buying their annuity will likely be of higher income, which correlates with higher life expectancy, as discussed last week.<sup>9</sup> The buyer, in turn, knows even more of her specific condition and thus needs to assess her own life expectancy, such as by consulting some of the many longevity calculators available on the web to assess the value of this 7.14% annuity rate. It is not relevant to her what the insurer assumes her life expectancy to be.

Figure 3 shows how the IRR of this 7.14% annuity rises initially by **~0.3% for each year the annuitant thinks she will live longer** than her cohort mean, but the impact decreases steadily for each additional year. As shown by the Figure 2

9. Raj Chetty et al. found that a 40-year old woman in the 80th percentile income bracket could expect to live to ~87, compared to 85 for a woman at median income in [The Association Between Income and Life Expectancy in the United States, 2001-2014](#) (2016) 315(16) *Journal of the American Medical Association* 1750-1766.

remaining life distribution chart, a 6-year higher life expectancy than the cohort mean is quite within the realm of possibility. Given the declining impact of each additional year of life expectancy on the IRR of the annuity, you have to believe you will live well over 10 years longer than the cohort mean (into your high-90s) for the annuity IRR to reach that of the equity-bond portfolio. Also, higher annuity payouts generate higher IRRs for the same life expectancy. An annuity that pays out 0.5% pa more will see a ~0.75% higher IRR, and vice versa for a lower payout rate.

Figure 3: Annuity IRRs with increases in remaining life expectancy %.



Source: J.P. Morgan, US Social Security Administration, [CANEX Financial Exchanges Ltd](#).

As to the IRR of an equity-bond portfolio, **our calculation assumes the retiree values any part of her portfolio that she ends up not spending on herself and leaves to any heirs the same, dollar for dollar, as what she spends on herself**. The big argument for annuities is that **they do not leave you with any “wasted” unspent wealth**. If you indeed do not care much about leaving unspent savings to any heirs, annuities make a lot of sense. In the case you have nobody dear you want to leave money for, the annuity option is superior as shown by the 7.14% of wealth that our 65-year-old female receives each year until she dies, compared with just barely 5.1% she could spend out of your savings while making sure she does not run any meaningful risk of running out of money.

There is indeed evidence that **not everybody cares in the same way about leaving money to heirs**. In the US 2022 [Survey of Consumer Finances](#), 60% of respondents indicated that leaving an inheritance was ‘very important’ or ‘important’ to them, while only 15% indicated it was ‘not important’. This is a personal decision and depends on how close you are to relatives, whether you have any at all and whether you have enough savings to be able to reduce your consump-

tion in order to make money available for your heirs.

Our colleague Joe Lupton estimated some 20 years ago that roughly three quarters of US households 70 years and over have a bequest motive that makes them spend ~25% less on their own consumption, allowing them to bequeath about four-fifths of their net worth.<sup>10</sup>

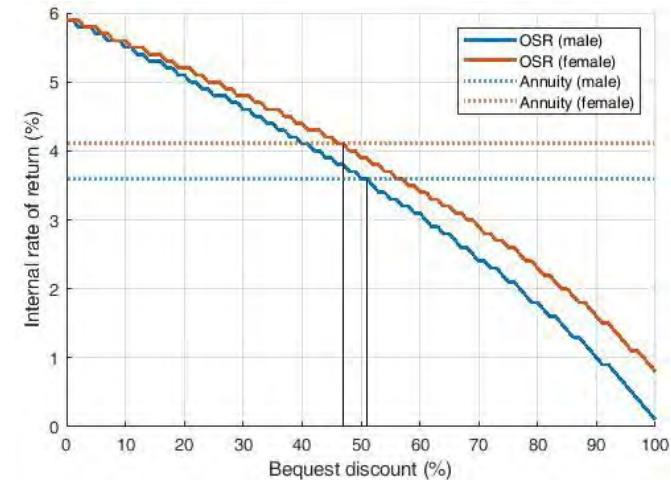
Hence, we find that if you see no value from any unspent leftover savings going to any heirs, an annuity makes most sense. If instead you value a dollar going to heirs as much as a dollar spent on yourself in retirement, it makes more sense to spend out of your own savings, even as this lowers your monthly income to ~5/7<sup>th</sup> of potential annuity payouts, in our example. This is very close to the 25% reduction in consumption found by Joe Lupton in his study.

**Where is the cutoff in how much you care about a bequest to make you indifferent between the two?** To estimate what this threshold bequest valuation should be, we calculate what the expected return on spending from your portfolio will be under different levels of an inheritance/estate tax. Somebody who does not care about leaving an inheritance thus thinks of such leftover wealth as of no value and thus acts as if there is a 100% tax on their estate. If you think an unused dollar passed on to any heirs as worth to you only half of a dollar of spending it on your own, you will act as if there is a 50% estate tax.

Figure 4 shows the expected return/IRR on our 30-70 equity-bond portfolio that we expect to produce a 5.9% return under different assumptions about this imagined estate tax. If our 65-year-old US female sees no value in leaving money behind, equivalent to a 100% estate tax, the expected return to what she should expect to be able to spend out of this portfolio with our optimal spending rate of ~5.1% becomes 0.8%, well below the 4.1% if she had bought instead an annuity with a 7.14% payout yield. At a ~50% imaginary estate tax, which stands for valuing a bequeathed dollar at only ~50 cents versus a dollar spent on yourself, the IRR of this optimal spending rate is equal to that of buying an annuity with the same principal. At that point, you ought to be indifferent between an annuity and spending out of your own equity-bond portfolio.

Figure 4: IRR on equity-bond portfolio and annuity for different bequest preferences

Bequest discount of 0% means valued equally to own spending, and at 100% means no desire for a bequest. OSR is optimal spend rate for equity-bond portfolio.



Source: J.P. Morgan, US Social Security Administration, CANNEX Financial Exchanges Ltd, Board of Governors of the Federal Reserve System, Bureau of Labor Statistics, Bureau of Economic Analysis, Robert Shiller, Refinitiv, S&P, Bloomberg Finance L.P.

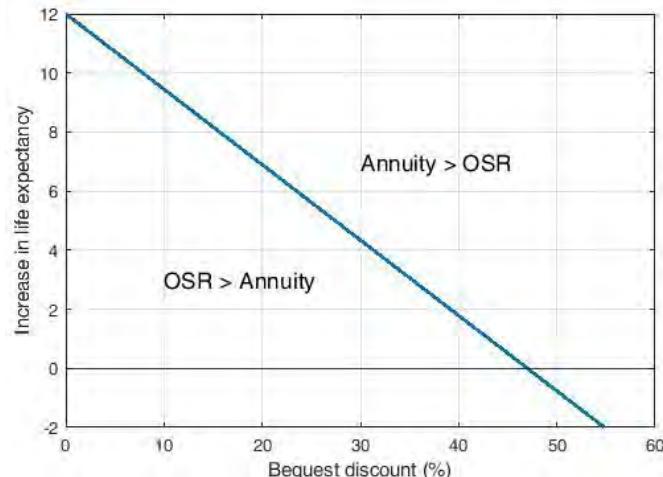
Figure 5 brings together both the two variables that determine whether an annuity has better value than spending a fixed amount out of a 30-70 equity-bond portfolio for a 65-year-old US female: how long does she expect to live and how much does she value leaving money behind as a bequest to her heirs. Think of this as an indifference curve along life expectancy and how you value any leftover inheritance, across which the annuity and your equity-bond portfolio give you the same IRR.

Taking one point along this indifference curve, at a life expectancy of say 3 years longer than her cohort mean, this 65-year-old would need to value any leftover inheritance at about two-thirds of a dollar of her own spending to be indifferent – same IRR – between buying an annuity and spending off her own 30-70 equity-bond portfolio. At higher life expectancy and/or a lower appreciation of the value of an inheritance, she will prefer buying an annuity, and vice versa.

10. [To leave or not to leave: The distribution of bequest motives](#), Kopczuk and Lupton, Review of Economic Studies, 2007.

Figure 5: Annuity vs portfolio spending IRR by life expectancy and bequest preference

Life expectancy in excess of cohort mean. Bequest discount of 0% means valued equally to own spending, and at 100% means no desire for a bequest. OSR is optimal spend rate for equity-bond portfolio.



Source: J.P. Morgan, US Social Security Administration, [CANNEX Financial Exchanges Ltd.](#), Board of Governors of the Federal Reserve System, Bureau of Labor Statistics, Bureau of Economic Analysis, Robert Shiller, Refinitiv, S&P, Bloomberg Finance L.P.

## Why not do both and include an annuity into an equity-bond portfolio?

Nothing prevents you from doing a bit of both and incorporating an annuity into your broader asset portfolio. And indeed, most annuity buyers do not pour all their retirement savings into it. The finance literature has produced quite a few papers showing that under wide-ranging conditions, it is **optimal to incorporate annuities into a broader retirement strategy**.<sup>11</sup>

A simple way to show this in our basic comparison between the value of an annuity and spending a fixed amount out of your retirement savings goes as follows. The annuity for our 65-year female pays 7.14% pa for the rest of her life, with only the very low risk that the annuity provider defaults. We compared this with a do-it-yourself strategy where she spends each year ~5.1% of the same accumulated savings she used to buy an annuity.

Instead of either of these two options, she can also simply buy a smaller annuity for ~5/7th of her wealth, that then pays only ~5.1% in annual income for the remainder of her life, the same as the optimal spend out of an equity-bond portfolio, use the remaining ~2/7th as a portfolio meant for her heirs. If she lives to the average extra 20 years of the average 65-year-

11. See, e.g., Anthony Webb, [What lessons, if any, can practitioners apply from academic economists about the role of annuities in post-retirement asset decumulation?](#) Alliance for Lifetime Income, Retirement Income Institute, Feb 2001.

old American woman, this portfolio should grow given today's equity and bond prices to quite close to her starting wealth 20 years from now. If she is less bent on reducing her own income to leave money behind for her heirs, she can spend more on an annuity and leave less for her heirs, and vice versa.

Another way to achieve the advantages of the longevity insurance that annuities provide and the better returns that one should be able to earn in the broad equity and bond markets is to hold **more hybrid annuities** that link payouts to equity returns, allow emergency withdrawals, and leave money for heirs.

## Conclusion

**In short**, ignoring the value of flexibility provided by spending out of your own portfolio, the choice between buying an annuity or spending out of your portfolio should depend on the expected excess return of equities over bonds, how you judge your own life expectancy,<sup>12</sup> and how much you value leaving money behind to any heirs. The above calculations show you the trade-offs between each of these variables, suggesting for many it can indeed make sense to have some form of longevity insurance in your retirement portfolio. The latter can come from an annuity and/or any defined-benefit pension you receive, such as a state pension, or government pensions in most countries.

A few **caveats** are in order before closing off. It is **important not to rely solely on your own hopes, or fears about what your chances are of living long, or not**. People approaching retirement tend to underestimate how long they could live, while people in their 70s and older tend to overestimate their longevity.<sup>13</sup> It is better to review a number of life expectancy calculators available for free on the web to guide one on this input into retirement finances. Second, to be analyzed in the next few months, we still need to investigate the impact of **inflation, taxation, and needing to provide for two people in a single household** on retirement spending rates and annuity considerations.

12. Arapakis and Wettstein find that "A one-year rise in objective life expectancy increases the probability of buying an annuity product by 0.20 percentage points, ...", in [What matters for annuity demand: objective life expectancy and subjective survival pessimism](#), Center for Retirement Research at Boston College, Jan 2023.

13. [What matters for annuity demand: objective life expectancy and subjective survival pessimism](#), Arapakis and Wettstein, Center for Retirement Research at Boston College, Jan 2023

## The Long-term Strategist

### Life expectancy and retirement spending

- Last week, we started an analysis of how much an individual can sustainably spend out of their retirement savings. The reverse of these spending rates tells you how much after-tax wealth you need to fund a desired level of spending in retirement, in excess of any state pensions, such as Social Security.
- This week, we extend this analysis to see how the answer to this question depends on life expectancy and retirement age.
- First, we assess how our estimates change when we allow the probability of dying at any given age to trend down over time, instead of assuming it is constant at current levels. This new benchmark scenario suggests US men annually spend ~5.4% of their retirement savings, while US women spend ~5.2%. This is ~0.15% and ~0.1% respectively lower than last estimated.
- We develop three rules of thumb that allow someone to estimate a sustainable spending rate for individuals with different life expectancies, return expectations, and retirement ages.
- Life expectancy varies substantially across individuals, depending on genetics, lifestyle and environment, and also across countries. For each additional year of life expectancy, you need to lower your annual spending rate out of initial savings by ~0.1%.
- For each 1% pa increase in long-term expected returns, optimal spending rates rise by ~0.6%.
- In recent decades, many people are choosing to retire later. Delaying retirement one year from 65 to 66 allows people to annually spend ~0.1% more out of their retirement savings. The positive effect of delaying retirement for another year increases with age.
- These rules of thumb can be used to estimate spending rates in other countries, with different life expectancies, and different long-term return expectations due to a preference to hold domestic assets and the effect of currency movements.
- Increasing life expectancy does not change our previous result that a 30-70 equity-bond portfolio is roughly optimal given current long-term return expectations on the US Agg and the S&P500 of 5% and 8% pa respectively.

#### Long-term Strategy

Alexander Wise <sup>AC</sup>

(1-212) 622-6205

alexander.c.wise@jpmchase.com

Jan Loeys

(1-917) 602-9440

jan.loeys@jpmorgan.com

J.P. Morgan Securities LLC

Three weeks ago, we [started](#) a series on the **Global Retirement Challenge**, analyzing the decisions and challenges facing individuals saving for retirement or spending in retirement, institutions that invest on their behalf, and governments that want to ensure people maintain an acceptable standard of living in retirement. Last week, we [started](#) an analysis of how much an individual can sustainably spend out of their retirement savings. To start, we considered how much a US individual retiring at 65 could spend out of their savings based on recent US mortality data. That analysis abstracted from a series of complications, including the fact that life expectancy generally increases over time, that individuals may have very different expectations about their longevity due to their particular circumstances, and that individuals retire at different ages. In this note, we incorporate these facts into our analysis. In doing so, we estimate rules of thumb to allow our analysis to be extended to other countries with different life expectancies and long-term asset return expectations.

As we did in our analysis last week, we will examine these questions by running simulations using age-specific mortality rates and empirical distributions of asset returns. We will continue to consider an equity-bond portfolio invested in the S&P500 and the US Aggregate Bond Index.

## Rising life expectancy

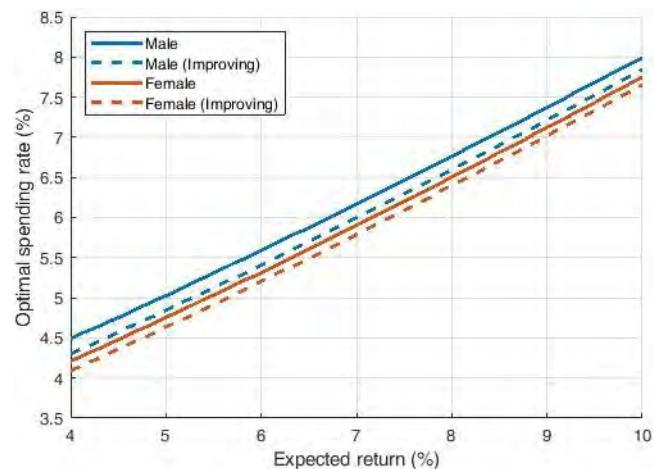
Our initial analysis was based on the latest pre-pandemic [mortality data](#) from the US Social Security Administration. In that data, mortality rates for each given age are based on the fraction of people of that age who died in the specified year. Our analysis assumed that the chance that an individual would die at each age was defined by these static mortality rates. Of course, because mortality rates change over time, the chance that an individual will die at a certain age in the future will be different from the present likelihood of dying at that age. For example, the chance that an individual aged 65 in 2019 will die 10 years later in 2029 will be defined by the mortality rate of people aged 75 in 2029, not of those aged 75 in 2019. In practice, as mortality rates have generally declined over time, an individual can reasonably expect to live longer than implied by the current sequence of age-specific mortality rates. In the SSA data, the life expectancy of men aged 65 increased by 1.42 years between 2004 and 2019, while the life expectancy of women aged 65 increased 1.20 years.

To incorporate this in our simulations, we now use age-specific mortality rates that decline over time at the annualized

rate of decline at each age between 2004 and 2019.<sup>1</sup> These declines in age-specific mortality rates will accumulate over time. Hence, the chance that an individual who retires at age 65 will die that same year will be defined by the initial observed mortality rate for people aged 65, but the chance that they will die 10 years later will be defined by the projected mortality rate for people aged 75 in 10 years' time based on the observed trend between 2004 and 2019, and so on.

Figure 1: Optimal spending rates achievable in scenarios with constant versus improving mortality rates

% Optimal spending rate gives ~95% chance that savings are sufficient. Mortality rates decline at annualized rate observed between 2004 and 2019. Uses empirical volatility of annual 30-70 equity-bond portfolio returns.



Source: J.P. Morgan, US Social Security Administration, S&P, Bloomberg Finance L.P.

Figure 1 plots the highest spending rates for men and women retiring at age 65 that are consistent with an estimated ~95% chance that one's retirement savings last for life in two scenarios: (1) age-specific mortality rates remain constant at their 2019 level, and (2) age-specific mortality rates decline over time at the annualized rate observed between 2004 and 2019. On average, the **optimal spending rate (OSR)** for men is ~17bp lower in the scenario with declining mortality rates, while the OSR for women is ~11bp lower.<sup>2</sup> As both men and women are expected to live longer than implied by current mortality rates, they must spend at a lower rate to maintain the same likelihood that their savings last for life. With an expected return of 5.9% pa – our 20yr [expected return](#) on a

- If a mortality rate at a given age decreased 15% over the 15 years, we assume that mortality rate will continue to decline at a rate of 1% pa. We allow each age-specific mortality rate to decline at a unique rate to account for the fact that the decline has not been uniform across all ages.
- The different effect of this change on the OSRs of men and women reflects sex differences in the trends of age-specific mortality rates.

30-70 equity-bond portfolio – this gives **OSRs of ~5.4% for men and ~5.2% for women**. Henceforth, we will use this improving-mortality scenario as the new baseline for our analysis.

## But how long will you live?

Our analysis to this point has been based on average mortality rates in the US population. However, we know that life expectancy is correlated with a number of factors, and also differs across countries. Individuals may have very different life expectancies based on their genetics, lifestyles, and environments. A study of more than 700,000 US veterans showed that men who were physically active, did not smoke, were free from opioid addiction and did not consume alcohol excessively, effectively managed stress, maintained a good diet and sleep hygiene, and had positive social relationships by age 40 could expect to live 24 years longer on average than men who met none of these criteria, while women could expect to live 21 years longer on average.<sup>3</sup>

**Many of these drivers of life expectancy, aside from genetics, correlate positively with income.** For instance, Chetty et al. (2016) found that the gap in life expectancy between the highest and lowest 1% by household income was 14.6 years for men, and 10.1 years for women in the US.<sup>4</sup> At age 40, an American man with household income in the 80<sup>th</sup> percentile could expect to live to almost 85, compared to around 82 for a man with median household income. Correspondingly, a woman with household income in the 80<sup>th</sup> percentile could expect to live to around 87, compared to 85 for a woman with median household income. Many governments, insurers and medical service providers offer “**life expectancy calculators**” which can be used to estimate one’s own life expectancy given their particular circumstances and determine what can be done to raise it.

There is also meaningful **cross-country variation** in life expectancy, even within the set of highly developed countries. In 2022, life expectancy at birth was 84.0 in Japan, 82.2 in France, 80.7 in Germany, and 77.4 in the US.<sup>5</sup> This variation means that the optimal spending rate for the average person will differ between countries, even if expected returns were the same.

3. American Society for Nutrition, [These eight habits could lengthen your life by decades](#) (2023).

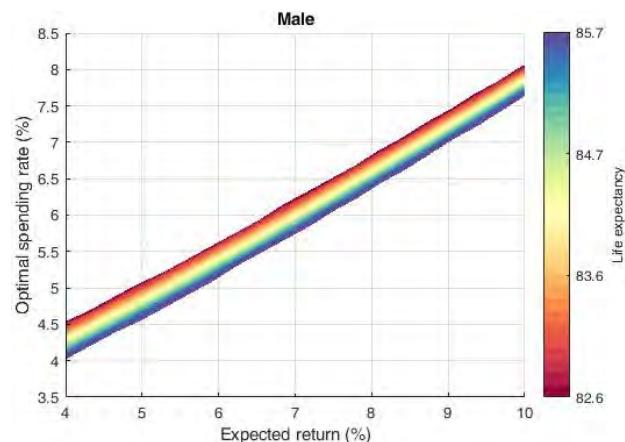
4. Raj Chetty, Michael Stepner, Sarah Abraham, Shelby Lin, Benjamin Scuderi, Nicholas Turner, Augustin Bergeron, David Cutler, [The Association Between Income and Life Expectancy in the United States, 2001-2014](#) (2016) 315(16) *Journal of the American Medical Association* 1750-1766.

5. World Bank, [Life expectancy at birth](#).

These differences in life expectancy across individuals and countries motivate us to estimate how much OSRs change as life expectancy at retirement changes. To do so, we start with the baseline scenario with time-varying mortality presented in Figure 1, and then proportionately scale up the rate at which age-specific mortality rates decline over time, thereby raising life expectancy. Figure 2 plots OSRs for men and women along a spectrum of life expectancy. To save space, we present the figures for US males throughout the main text of this note, given the results are broadly similar for females. Figures for US females are presented in the appendix. Based on our estimates, **the OSR for a man falls by ~13bp for each additional year of life expectancy, while the OSR for a woman falls by ~11bp**.

Figure 2: Optimal spending rates based on expected returns for different life expectancies of males at age 65

% Optimal spending rate gives ~95% chance that savings are sufficient. Mortality rates decline in proportion to the annualized rate observed between 2004 and 2019. Uses empirical volatility of annual 30-70 equity-bond portfolio returns.



Source: J.P. Morgan, US Social Security Administration, S&P, Bloomberg Finance L.P.

In addition to showing how OSRs change with life expectancy, Figure 2 also shows the relationship between expected returns and OSRs. For both men and women, the **OSR increases by ~60bp for each 1% pa increase in expected returns**. Using this rule of thumb allows us to extend our estimates to other countries, where expected long-term returns are likely to be different due to home bias in asset holdings, and the effect of currency movements. Compared to other DM economies, bond yields are relatively high in the US and we expect that this will remain the case in the long term. Given the starting yield on an aggregate bond index generally provides a good indication of 10yr expected returns, this points to higher returns on the bond component of a retiree’s portfolio in the US. Over the past four decades, US equities have substantially outperformed the rest of DM, though we have recently highlighted some reasons why this outperformance may not continue, so we do not have a strong expectation of superior performance on the equity component

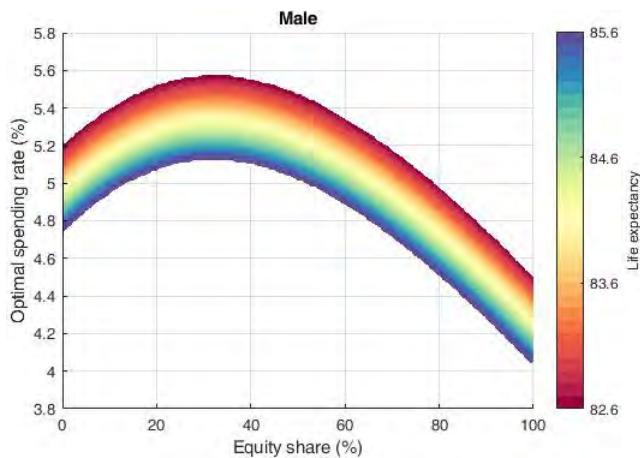
of a retiree's portfolio in the US.

Importantly, the relationship between OSRs and expected returns is roughly the same along the spectrum of life expectancies. This means that one can construct an estimate of OSRs for men and women in different countries by simply adjusting the OSRs for US men (~5.4%) and women (~5.2%) additively using the two **rules of thumb**. The first is that **each additional year of life expectancy reduces one's OSR by ~11-13bp**. The second is that **each additional 1% pa in expected long-term returns raises one's OSR by ~60bp**. For example, suppose life expectancy at age 65 in another country were 3 years longer than in the US, but expected long-term returns were 2% pa lower. Applying these two rules of thumb would yield an OSR which is ~155bp lower than in the US.

Our analysis above was based on a 30-70 equity-bond portfolio, as our analysis [last week](#) indicated that this was roughly optimal for a retiree at age 65. It is conceivable that this result may depend on life expectancy. To assess whether this is the case, we estimate the OSR achievable with a range of equity shares for individuals with different life expectancies. The results presented for men in Figure 3 indicate that the **optimal equity share is roughly unchanged around 30% as life expectancy changes**, taking as given our long-term expected returns of 5% pa on the US Agg and 8% pa on the S&P500. As shown in the appendix, this result also holds for women.

[Figure 3: Optimal spending rates based on portfolio equity shares for different life expectancies of males at age 65](#)

%. Optimal spending rate gives ~95% chance that savings are sufficient. Mortality rates decline in proportion to the annualized rate observed between 2004 and 2019. Uses empirical covariance matrix for annual bond and equity returns. Based on 20yr return expectations on US Aggregate Bond Index and S&P500.



Source: J.P. Morgan, US Social Security Administration, Board of Governors of the Federal Reserve System, Bureau of Labor Statistics, Bureau of Economic Analysis, Robert Shiller, Refinitiv, S&P, Bloomberg Finance L.P.

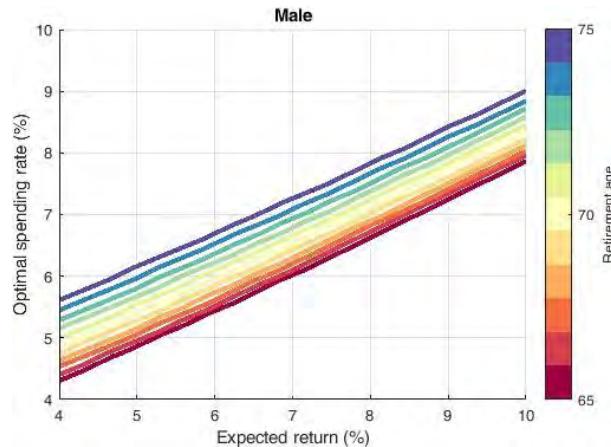
## And when will you retire?

This above analysis relates to an individual who retires at age 65. Now, we will assess how much more one can spend out of their retirement savings by retiring later than 65, as people are increasingly choosing to do.<sup>6</sup> To do so, we estimate OSRs for people using our new benchmark assumption that mortality rates decline over time (shown in Figure 1) if they retire later than 65, with the results shown for men in Figure 4. **Delaying retirement for an additional year to 66 allows both men and women to annually spend ~10bp more of their retirement savings.** Note, however, that the marginal effect of delaying retirement by an additional year on the OSR increases slightly with age. For instance, delaying retirement for an additional year from 74 to 75 increases the OSR by ~15bp for both men and women. One can use these results as a third rule of thumb. Jointly, the three rules of thumb developed in this note allow us to estimate an OSR for individuals with different return expectations, life expectancies, and retirement ages.

In addition to being able to spend a larger share of their initial retirement savings annually, an individual who retires later should be able to spend more in nominal terms if they are able to save for an additional year or experience an additional year of positive returns on their existing retirement savings. In practice, this may raise the sustainable rate of spending quite meaningfully in nominal terms.

[Figure 4: Optimal spending rates based on expected returns for different retirement ages of males](#)

%. Optimal spending rate gives ~95% chance that savings are sufficient. Mortality rates decline at annualized rate observed between 2004 and 2019. Uses empirical volatility of annual 30-70 equity-bond portfolio returns.



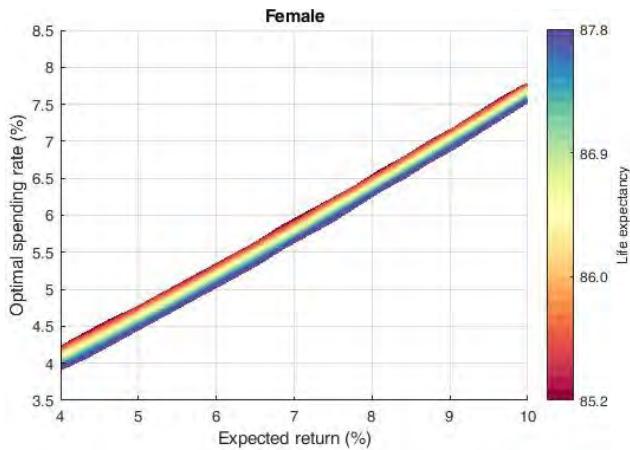
Source: J.P. Morgan, US Social Security Administration, S&P, Bloomberg Finance L.P.

6. See changes in [Effective age of labor market exit \(OECD\)](#).

## Appendix — Additional figures

Figure 5: Optimal spending rates based on expected returns for different life expectancies of females at age 65

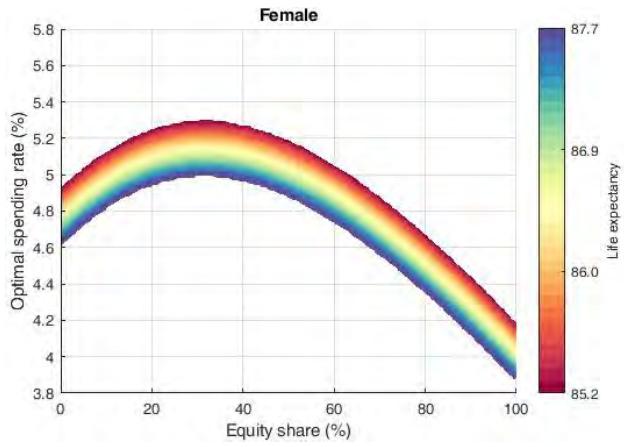
%. Optimal spending rate gives ~95% chance that savings are sufficient. Mortality rates decline in proportion to the annualized rate observed between 2004 and 2019. Uses empirical volatility of annual 30-70 equity-bond portfolio returns.



Source: J.P. Morgan, US Social Security Administration, S&P, Bloomberg Finance L.P.

Figure 6: Optimal spending rates based on portfolio equity shares for different life expectancies of females at age 65

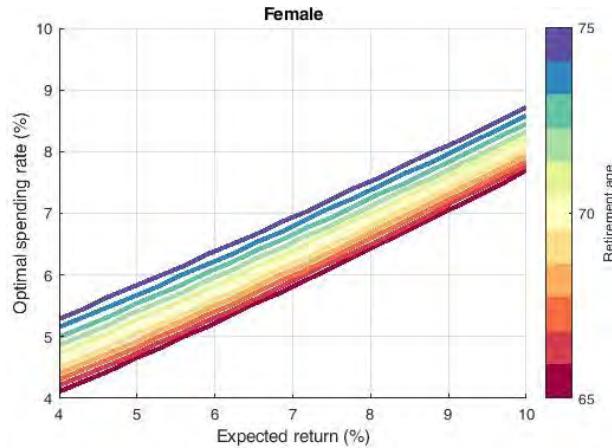
%. Optimal spending rate gives ~95% chance that savings are sufficient. Mortality rates decline in proportion to the annualized rate observed between 2004 and 2019. Uses empirical covariance matrix for annual bond and equity returns. Based on 20yr return expectations on US Aggregate Bond Index and S&P500.



Source: J.P. Morgan, US Social Security Administration, Board of Governors of the Federal Reserve System, Bureau of Labor Statistics, Bureau of Economic Analysis, Robert Shiller, Refinitiv, S&P, Bloomberg Finance L.P.

Figure 7: Optimal spending rates based on expected returns for different retirement ages of females

%. Optimal spending rate gives ~95% chance that savings are sufficient. Mortality rates decline at annualized rate observed between 2004 and 2019. Uses empirical volatility of 30-70 equity-bond portfolio returns.



Source: J.P. Morgan, US Social Security Administration, S&P, Bloomberg Finance L.P.

## The Long-term Strategist

How much can you spend out of retirement savings?

- How much can someone safely spend in retirement, and what asset allocation allows the highest sustainable rate of spending? We start exploring these questions in this issue of our series on the Global Retirement Challenge.
- The main objective of most retirees is to achieve a stable and safe income for the rest of their life. Deciding how to first invest and then spend are complex decisions, with a lot of uncertainty about how long they will live and what the return on their savings will be. The rise of defined-contribution plans shifted these risks to workers and retirees.
- Risk is usually defined as market volatility, but saving for retirement and dissaving when retired also needs to consider longevity risk. We combine these two sources of risk into a single probability of running out of money. Both more volatile assets and longer lives raise this risk.
- Given our expected 20yr returns on US bonds and equities of 5% and 8%, US men retiring at 65 should have a ~95% chance that their savings will last for life if they annually spend ~5.6% of their initial after-tax wealth. For women, this level is slightly lower at ~5.3%, as they tend to live longer. Both spending rates exceed the ‘4% Rule’, which we find too conservative.
- This implies that US males should have 18.0x their annual spending goal in after-tax wealth if they retire at age 65, while females should have 19.0x their annual spending goal. For people who also have a lifetime pension or annuity income, think of these numbers as multiples of spending in excess of pension/annuity income.
- People with reason to believe their portfolio will generate higher returns can raise their spending rate by ~1/2% of starting wealth for each 1% higher expected return, and vice versa.
- If you want to spend ~1.5% pa more of starting wealth, at ~7.0% for men and ~6.5% for women, you have to accept a higher ~20% risk of running out of money. One could run this risk if they can call on family support or could dip into separate savings that were intended as bequests to children.
- The highest spending rates consistent with a ~95% chance that savings last for life are achieved with an equity share of ~30% given current long-term return expectations. This is roughly consistent with the ‘Rule of 100’ and the allocations of many target-date funds in withdrawal phase. Higher equity shares produce a higher risk of running out of money.
- Many people like to leave an inheritance. On average, this asset allocation and rate of spending should leave an inheritance roughly equal to an individual’s initial after-tax wealth at age 65.
- In coming issues, we will fine-tune our results to deal with two-person households, inflation, taxation, annuity income, different retirement ages, different life expectancies, and improvements in longevity, among other issues.

### Long-term Strategy

Alexander Wise <sup>AC</sup>

(1-212) 622-6205

alexander.c.wise@jpmchase.com

Jan Loeys

(1-917) 602-9440

jan.loeys@jpmorgan.com

J.P. Morgan Securities LLC

Following up on the first issue on the **Global Retirement Challenge** [two weeks ago](#), when we analyzed the problems created by the secular move from defined-benefit to defined-contribution retirement saving, we look here into what somebody starting retirement can safely expect to spend out of their accumulated savings. This is a complex question with many relevant dimensions.

In this first issue, we assess the rate at which one can spend such that their savings are very likely to last their lifetime given current long-term return expectations, the implied after-tax wealth required at retirement to deliver one's spending needs, the trade-off between risk tolerance and spending ability, and the portfolio allocations that deliver the highest long-term spending rate that is consistent with an individual's tolerable level of risk of outliving their savings. We aim to deal in coming weeks with other complications such as inflation, bequests, time-varying spending needs, taxation, access to government pensions, retirement age, rising or different life expectancy, incorporating annuities, and joint finances for couples.

The main objective of most retirees is to achieve **a stable and safe income stream which lasts for their remaining life**. The primary risks they face are the uncertainty about how long they will live, and about what returns they can expect on their accumulated savings.

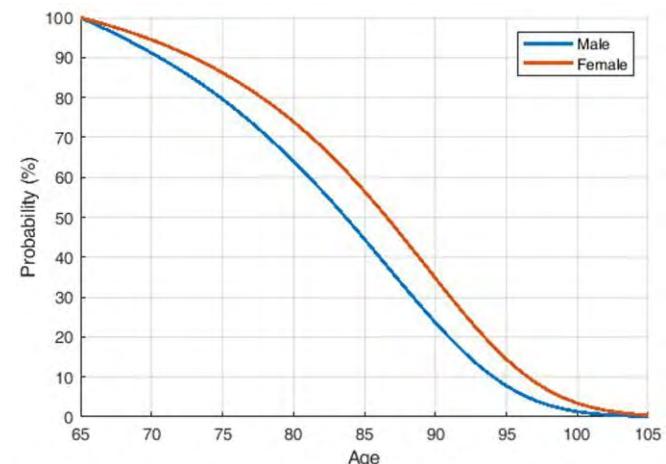
**Risk** is usually defined in terms of market volatility. But somebody saving for retirement and dissaving when retired also needs to consider longevity risk. **We combine these two sources of risk into a single probability of running out of money**, as this is a function both of how volatile your assets are and how long you will live. Lower asset returns and longer lives increase the risk you will run out of money, and vice versa. Implicitly, we assume the retiree is indifferent, or should be indifferent, as to the volatility of their savings as their main concern should be stability of income. Your portfolio is only the means to an end – safe and stable income in old age – and not the end itself.

Figure 1 plots the probability that American men and women will survive to a specific age, conditional on reaching age 65, based on the latest pre-pandemic [actuarial life table](#) from the US Social Security Administration (2019). Most retirees will want to be confident that their savings are very likely to last their lifetime. Hence, as a benchmark, we consider spending rates which deliver a ~95% chance that one's savings will last, though we will also consider how spending and asset allocation decisions vary with an individual's risk tolerance. Throughout this paper, we refer to the highest spending rate

that achieves this as the '**optimal spending rate**' (**OSR**).<sup>1</sup> Based on these US mortality rates, there is a ~5% chance that a man presently aged 65 will live beyond 96, or that a woman will live beyond 99. These gender differences in mortality rates produce different optimal spending rates and asset allocations in our analysis. The longer you expect to live, the longer your savings need to last and the less you can thus spend out of your starting wealth.

Figure 1: Probability of being alive by age in the US, conditional on reaching age 65

% Based on US Social Security Administration [actuarial tables](#).



Source: J.P. Morgan, US Social Security Administration.

To find how much one can spend in retirement, we run simulations using age-specific mortality rates and empirical distributions of asset returns. Throughout, we consider an equity-bond portfolio invested in the S&P500 and the US Aggregate Bond Index. In our analysis, we consider constant annual spending rates, expressed as a share of initial wealth at retirement. We do not consider time-varying spending in these exercises, but note that there are offsetting effects of inflation, which raises spending needs, and declining real consumption as individuals age. Simple calculations suggest these two factors are roughly offsetting, suggesting the constant nominal spending rate is a reasonable starting point.<sup>2</sup>

Your spending rate should depend on what returns you expect to make on your retirement portfolio. Figure 2 plots the OSR for men and women with a 40-60 equity-bond portfolio with

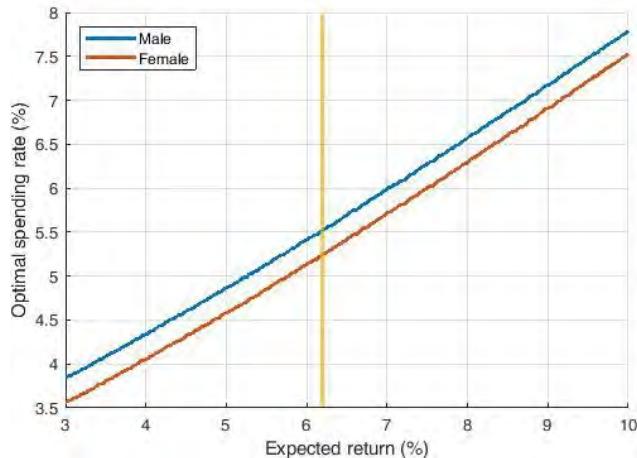
1. There is no consensus in the retirement literature on what to call this rate. It is also known as a **withdrawal rate**, as in withdrawing one's savings, or **decumulation rate**, after having spent one's working life accumulating savings for old age.

2. J.P. Morgan Asset Management analysis indicates that average real spending falls by ~1.5% pa between age 65 and 85, and then stabilizes. See JPMAM, [Guide to Retirement](#) (2024).

varying long-term expected rates of return.<sup>3</sup> The relationship between OSRs and expected long-term returns is roughly linear, with a 1 percentage point increase in long-term expected returns raising the OSR by ~55bp. Given their longer life expectancy, women need to spend at a slower pace than men, around ~30bp less pa. The yellow vertical line indicates our current 20yr return expectations on a 40-60 equity-bond portfolio based on our forecasting models.<sup>4</sup> Our expectation of a 6.2% pa return on a 40-60 portfolio gives OSRs of ~5.5% for men, and ~5.2% for women.

Figure 2: Optimal spending rates based on expected long-term rates of return

%. Optimal spending rate gives ~95% chance that savings are sufficient. Yellow line indicates current 20yr return expectations on US equities and bonds based on forecasting models.



Source: J.P. Morgan, US Social Security Administration, Board of Governors of the Federal Reserve System, BLS, BEA, Robert Shiller, Refinitiv, S&P, Bloomberg Finance L.P.

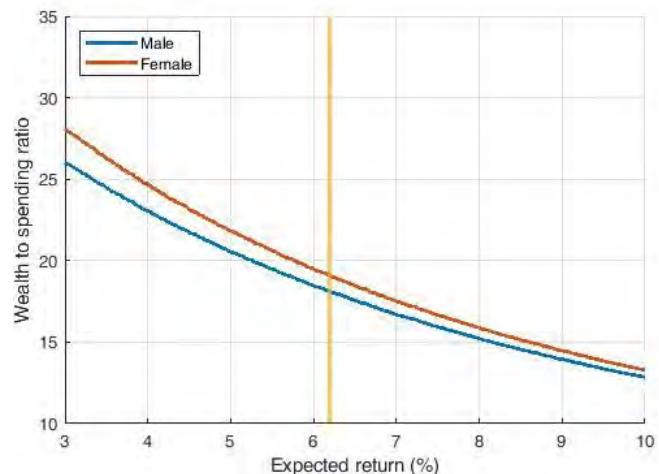
These estimates can be converted into estimates of **after-tax wealth required to deliver any desired level of long-term spending**. Figure 3 shows the after-tax wealth-to-spending ratio required at age 65 at varying long-term expected returns. At our long-term return expectation of 6.2% pa on a 40-60 portfolio, men need after-tax wealth equal to 18.1x their

- 
3. Annual portfolio returns are drawn from a normal distribution with the specified mean, and variance defined by the 1yr volatility of 40-60 portfolio returns since 1976.
  4. For the US Agg, we rely on our observation that the starting yield on the US Agg is a good forecast of the return over the subsequent 10 years. Thus, a 20yr return forecast can be constructed simply as the average between the current yield and our decade-ahead real yield forecast for the US Agg plus a long-term inflation expectation of 2.5%. This gives us a 20yr return expectation of 5.0% pa on the US Agg. For the S&P500, we use a long-term forecasting model like we previously used for 10yr returns, estimated here to forecast 20yr returns. This gives us a 20yr return expectation of 8.0% pa on the S&P500. Combining these forecasts gives an expected return of 6.2% pa on a 40-60 equity-bond portfolio.

spending target, while women need 19.1x. For people who also have a lifetime pensions or annuities, think of these numbers as multiples of your spending in excess of that income.

Figure 3: After-tax wealth required at age 65 to finance desired spending based on expected long-term rates of return

Ratio of wealth to desired spending. Optimal spending rate gives ~95% chance that savings are sufficient. Yellow line indicates current 20yr return expectations on US equities and bonds based on forecasting models.



Source: J.P. Morgan, US Social Security Administration, Board of Governors of the Federal Reserve System, BLS, BEA, Robert Shiller, Refinitiv, S&P, Bloomberg Finance L.P.

The analysis above considered how to spend one's savings if they invest in a 40-60 equity-bond portfolio and want a ~95% chance that their savings last for life. Now, we consider how OSRs change if one can **choose their equity-bond allocation or accept a different level of risk** that their savings will last. Figure 4 plots OSRs based on the share of equity in a portfolio and risk tolerance, taking as given our long-term expectations of an 8.0% pa return on the S&P500 and a 5.0% pa return on the US Agg.<sup>5</sup> We consider risk tolerances ranging from a ~95% likelihood (blue) that an individual's savings are sufficient to an ~80% likelihood (red).

For individuals who want a **~95% chance that their savings last their lifetime**, the highest spending rate can be achieved with a portfolio consisting of roughly **30% equities and 70% bonds** given current long-term return expectations. This should allow a spending rate of ~5.6% for men, and ~5.3% for women. These are higher than the classic '**4% Rule**' frequently used as a simple rule of thumb for withdrawing funds out of retirement savings. This allocation is broadly consistent with the 'Rule of 100', according to which one has an

- 
5. Annual returns on equities and bonds are drawn from a multivariate normal distribution with means based on our long-term return expectations and covariance structure based on data since 1976.

equity share equal to 100 minus their age, and also the [rough allocations of many target date funds in the withdrawal phase](#).

If individuals are prepared to accept more risk about the sustainability of their spending, optimal portfolio equity shares predictably increase. For example, if an individual wanted only an **~80% chance that their savings would last the rest of their life**, the optimal portfolio would consist of **50-60% equities**, and the remainder bonds. Reducing one's risk tolerance from a ~95% chance of savings sufficiency to an ~80% chance would allow men to increase their OSR from 5.6% to 7.0%, and women to increase their OSR from 5.3% to 6.5%.

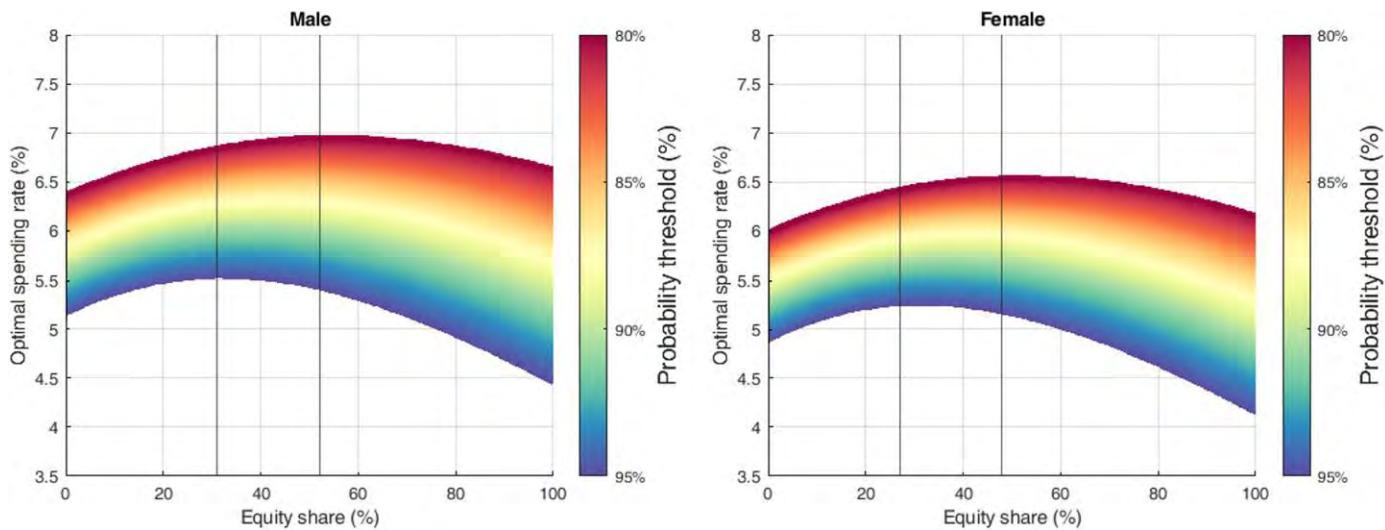
**For most retirees, leaving an inheritance to their heirs is also an important objective.** In the 2022 *Survey of Consumer Finances*, leaving an inheritance was identified as ‘very important’ or ‘important’ to 59.7% of respondents, while only 14.5% of respondents indicated that it was ‘not important’.<sup>6</sup> In our initial approach, a bequest is just what is left over if you pass away before running out of savings.

Figure 5 shows the expected bequest for an individual invested in a 30-70 equity-bond portfolio depending on actual (cf. optimal) spending rate. The size of the bequest is expressed as a percent of initial wealth at age 65. We focus on a 30-70 equity-bond portfolio here as our analysis above showed that this was roughly the optimal portfolio for an individual who wants a ~95% chance that their savings last for the rest of their life given current long-term return expectations. Predictably, the average bequest declines as spending rates increase,

6. Board of Governors of the Federal Reserve System, [Survey of Consumer Finances](#) (2022).

Figure 4: Optimal spending rates achievable based on risk tolerance and equity portfolio share

%: Risk tolerance is likelihood that savings will be sufficient. Vertical black lines indicate optimal equity allocations at ~95% and ~80% risk tolerance levels.

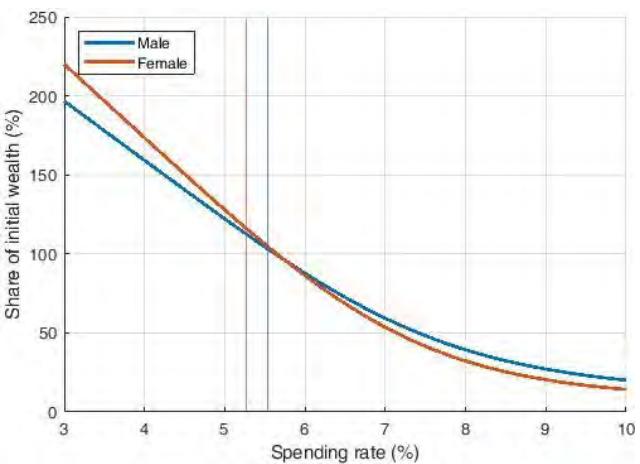


Source: J.P. Morgan, US Social Security Administration, Board of Governors of the Federal Reserve System, BLS, BEA, Robert Shiller, Refinitiv, S&P, Bloomberg Finance L.P.

both because one is less likely to leave a bequest, and because any non-zero bequest is likely to be smaller. The blue and red vertical lines in Figure 5 respectively correspond to the OSR for a man and woman with a 30-70 portfolio who wants a ~95% chance that their savings last. On average, an **individual who spends at the optimal rate should leave a bequest comparable in size to their initial wealth at age 65**. By construction, ~95% of people would leave a non-zero bequest.

Figure 5: Expected bequest based on actual spending rates

% of initial wealth at age 65. Red (blue) vertical line indicates optimal spending rate with 30-70 equity-bond portfolio for females (males).



Source: J.P. Morgan, US Social Security Administration, Board of Governors of the Federal Reserve System, BLS, BEA, Robert Shiller, Refinitiv, S&P, Bloomberg Finance L.P.

## The Long-term Strategist

### The defined-contribution problem

- With this issue, we are starting a series of discussions – spread over the next three months – on the many challenges that face people saving for retirement.
- There are many signs that the world is facing a retirement crisis as aging and falling birth rates are creating an imbalance between retirement money coming in and going out, while globalization has turned the employer-worker relation to a more transactional one, forcing workers increasingly to take care of their own retirement saving.
- The resulting wholesale move from defined-benefit (DB) pensions, where the employer took care of it all, to a DIY system of defined-contribution (DC) pension saving, where workers take all the risk, has now left many people quite worried about whether they will have enough to maintain their living standard in old age.
- A DC system should in theory produce the same outcomes, but in reality, we find that a DC system that does not require workers to save can leave many without any retirement savings. In addition, DC systems do not smoothly convert accumulated savings into safe, lifetime income, forcing workers to save much more than a DB system and to hold riskier investments to have some chance of not running out of money in old age.
- Governments, asset managers and employers have started to recognize that not all is good in DC country and that a reliable and stable pension is one of the most important “asks” of voters and employees. New regulations and laws are creating better incentives to lower the costs of retirement saving to workers and employers, providing better information, with companies and asset managers creating better ways to move from accumulation to decumulation in retirement, by converting savings into stable lifetime incomes.
- One of the clearest impacts on markets, in our view, is that this should increase the demand for lifetime annuities, generally sold by life insurers, that can now offer much better payouts as they need to fund annuities with bonds, typically credit, that are now much better priced. This will be one factor, in addition to relative pricing, that should induce investors to reduce some of their equity holdings in favor of credit.

#### Long-term Strategy

**Jan Loeys** <sup>AC</sup>

(1-917) 602-9440

jan.loeys@jpmorgan.com

**Alexander Wise**

(1-212) 622-6205

alexander.c.wise@jpmchase.com

J.P. Morgan Securities LLC

## Issues and challenges with saving for old age

The main reasons people save and invest are (1) to have liquid assets available in times of need, (2) to have income in old age, and (3) to provide for the next generation. Those last two make us long-term investors.

**We will focus here on the second objective – saving and investing for retirement.** There have been dramatic changes in many countries in the way we save and invest for old age. Up to the late 1800s, saving for old age was an individual's responsibility. But by around 1900, government and companies in the major developed countries increasingly saw it as their duty to provide income for the elderly, mostly in the form of guaranteed lifetime income. The emergence of the welfare state saw such pensions broaden out steadily in coverage and across countries with many emerging countries introducing nationwide pension provisions.

But problems have started to arise in recent decades, many brought on by the secular forces of globalization and demographics that we have been discussing in past issues. **Globalization** made the relation between employer and worker much more transactional and less paternalistic. And changing **demographics**, in particular **rising longevity and falling birth rates**, increased the cost of providing for retirees while lowering contributions from people still working. This was true in spades for pay-as-you-go (PAYG) pensions where pensions are paid directly from current worker contributions. But at the macro level, it is also a problem for funded pension systems as consumption of goods and services by the elderly needs to be produced by people still working.

**In this and following issues**, we will investigate a set of challenges around today's retirement savings systems and what they mean for long-term investors, especially those saving and investing for their own retirement or taking care of such obligations. The questions we aim to address include, inter alia:

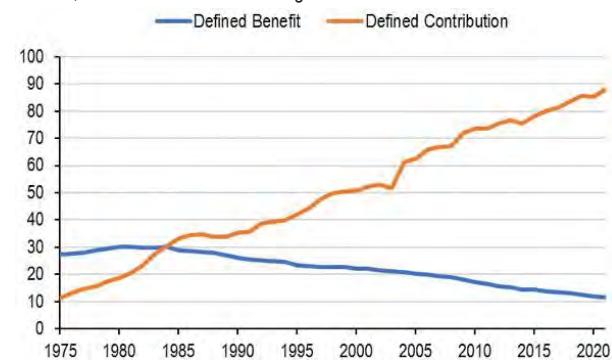
1. What has the impact been of the massive switch from defined-benefit (DB) to defined-contribution (DC) pensions?
2. How should somebody retiring convert accumulated savings into a reliable stream of income in retirement?
3. Why is there so little demand for lifetime annuities?
4. How does retiring affect the asset allocation between bonds and equities?
5. How does inflation affect asset allocation and income strategies in retirement?

6. How much do you need to retire?
7. What is the impact of underfunding of government DB pensions?

## The switch from defined-benefit to defined-contribution plans

We start today by analyzing the **impact of the wholesale switch from defined-benefit (DB) to defined-contribution (DC) retirement savings plans** by companies in much of the US and by many governments (Fig 1). Much of our focus will be on the US, which faces more challenges than other major economies.

Figure 1: Number of active participants, US DB and DC pension plans Millions, 1975-2021. Data revised higher in 2004.



Source: J.P. Morgan, US Department of Labor.

In a **defined-benefit pension** plan, the employer promises to pay employees a fixed income in retirement, typically a function of their final salary and the number of years of employment, and sometimes indexed to inflation. In the US, this typically means the number of years worked times 2% of the average salary in the last 3-5 years. State pension plans, such as US Social Security or UK State Pension, are mostly DB, but have looser links with years and salary levels, with lower-income workers getting a higher return on their contributions.

In a **defined-contribution pension** plan, an employee contributes what they want to, frequently a certain percent of their salary, usually pre-tax and part matched by the employer, into a chosen portfolio of investment funds, which becomes available to them when they retire. In DC, the employee decides how much to save, carries the full investment risk, and is usually on their own converting accumulated savings into a regular income stream in retirement. DC retirement savings are backstopped, or funded, by what you put in it. In DB, you have a promise of a future income stream that may not be fully funded, and sometimes not funded at all (PAYG) by your employer.

**In theory, DB and DC should be able to produce the same retirement income at the same cost.** In DB, the employer should put money aside, proportional to their employees' salaries, and invests this over the years to produce enough capital to fund a stream of lifetime income to their retiring employees. In DC, the employee needs to put the same amount away each year and similarly invest this to buy a lifetime income annuity from an insurer on retirement.

In a competitive market, the worker considers the total value of wages and benefits, including their DB pension, to decide where to work. If the employer moves to a DC pension plan, then the worker will demand a higher wage for the amount they need to put into their new DC pension to arrive at the same capital on retirement as the DB plan would have. The employer should not care whether they pay their workers wage income or DB contributions. If the worker invests their DC in the same way the employer would have in a DB plan and can buy an annuity at the same cost that it takes the DB employer to produce lifetime income, then DB and DC costs are the same for both employer and employee.

## Why the switch to DC?

**If DB and DC are, or can be financially equivalent, why did so many employers then switch to DC?** The reason must be found in what we economists would call real-life frictions, regulations, market imperfections, information costs, and other inefficiencies. Many private sector employers surely felt that running a DB pension plan for their workers had become quite costly, created risks to their earnings and balance sheet that had nothing to do with their real business and may have hoped that they could lower their pension contributions without having to raise wages.

The higher costs of running a DB pension plan came from a steady rise in the number of well-intended government regulations (starting in the US with [ERISA](#) in 1974) to protect workers and government pension insurance schemes that raised administrative burdens.<sup>1</sup> This was especially hard on smaller companies. The steady rise in longevity also raised liabilities more than employers had planned on. The 2007 FASB rules requiring fair value accounting on DB plans forced companies to disclose and report the gap between their DB plan's assets and the PV of future liabilities on their balance sheet and fluctuations on their income statement. The volatility of this deficit/surplus, much caused by changes in the bond yield used to discount future pension liabilities, caused quite some unwelcome surprises to shareholders.

1. [The shift from defined-benefit plans to defined-contribution plans](#), Samuel Estreicher and Laurence Gold, *1 Lewis & Clark Law Review* 331 (2007).

There were even quips about some airlines with large DB plans looking more like pension plans masquerading as airlines.

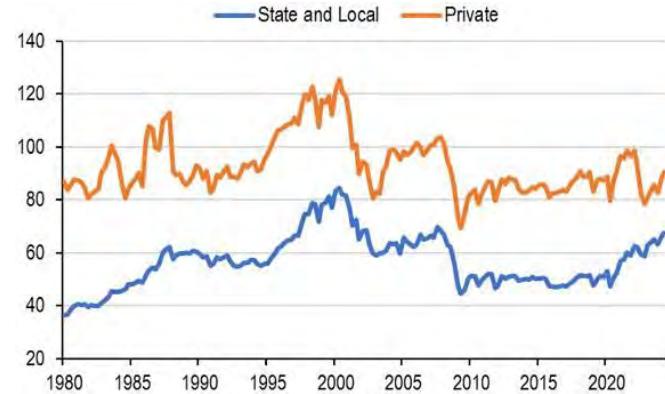
**Workers and society initially did not object greatly to the move to DC.** Many workers appreciated the **tangibility** and **transparency** of seeing their own retirement savings grow, and the ability to manage their own finances while **reducing exposure to the financial condition of their employer**.

Worker losses on their DB plans from failing employers, such as the Robert Maxwell scandal in the UK, or Detroit City workers receiving only pennies on their DB dollars when Detroit went bankrupt, likely further consolidated acceptance of the new 401(k) corporate DC pension standard in the US and elsewhere.

Fig 2 shows that **both US private and State & Local DB plans have been significantly underfunded for most of their history**, permitting many workers to believe they are better off taking care of their own retirement savings.

Figure 2: Funding status of US private and State & Local defined benefit pension programs

%, Q4/1979-Q1/2024, quarterly.



Source: J.P. Morgan, Board of Governors of the Federal Reserve System.

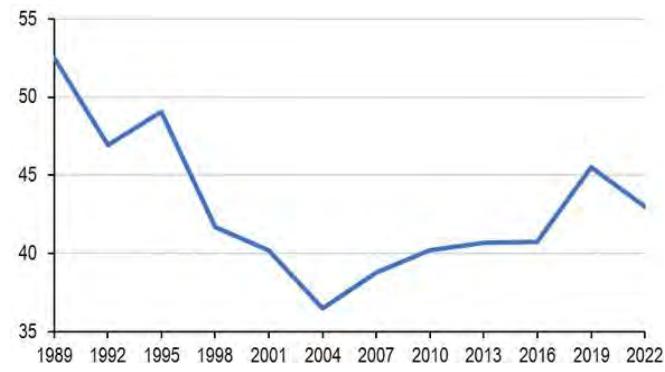
Many workers also greatly appreciated the new **portability** of DC plans when switching jobs. Assets held in a US 401(k) can simply be switched from one employer to another and a US IRA (Individual Retirement Account) or UK ISA always remain with the worker. Final-salary pension plans organized by the employer stay with the employer when you leave. A better system is clearly for employer to outsource the DB plan to an outside specialized pension manager to which changing employers make contributions covering the same worker. Many countries with well-functioning DB pension systems and US federal and local governments use such collective pension systems that allow workers to stay in the same system when they change jobs.

## But DC has its own problems, especially in the US

Over time, however, it has become clear that **DC is no panacea** and that for a large part of the population it has led to **poorer financial outcomes in retirement than the old DB plans**. At the core, there are two inefficiencies with many DC systems relative to DB, each driven by how workers are using the new freedom and flexibility that DC plans are offering them. These disadvantages of DC vs DB are in our mind: (1) **no mandatory saving** and (2) **no automatic conversion of savings into stable, inflation-protected lifetime income in retirement**, leaving retirees open to the risk they outlive their savings.<sup>2</sup> **The second requires workers to save much more than they would need to under DB, while the first results in many not saving at all.**

Economics typically assumes that people act rationally and will only do what is in their interest. Reality can be quite different. For one, we find that, unlike DB plans, DC plans only give you the option to save, but not the requirement. When US workers leave or lose their job, their accumulated 401(k) is paid out to them, which they can then roll over into a personal IRA or into a new 401(k) when they join another company. A large number of these rollovers stay in cash for many years, if they are reinvested at all.<sup>3</sup> Given daily pressures and the fact the retirement for many is decades away, we find that nearly half the US population between 55 and 64 have no personal retirement savings, beyond what they will receive from government managed Social Security (Fig. 3).

Figure 3: Percent of Americans aged 55-64 with no retirement savings %, 1989-2022, triennial. Based on Survey of Consumer Finances.



Source: J.P. Morgan, Board of Governors of the Federal Reserve System.

2. [A better bang for the buck 3.0: post-retirement experience drives pension cost advantage](#), National Institute on Retirement Security, Jan 2022.

3. [The next frontier of retirement plan design: 4 big ideas](#), Fiona Greig, Vanguard, March 27, 2024.

A second inefficiency is that DC focuses on building wealth in retirement, leaving it to retirees to convert this into stable lifetime income, which is what they need. A DB plan does this automatically. Not all workers have the financial literacy to make the **wealth-to-income conversion** or understand the many different types of annuity solutions offered by insurance companies. Insurers are the natural provider of annuities as they have balance sheet regulations based on accrual accounting and also sell life insurance where mortality risk hedges out that on annuities, making them able to manage longevity risk at lower cost than other possible providers. On the downside, they must sell annuities out of their general accounts that can really only invest in bonds. This made them unable to offer an attractive yield on annuities in the 15 years post GFC when bond yields had fallen to near zero in real terms.

## Impact and solutions

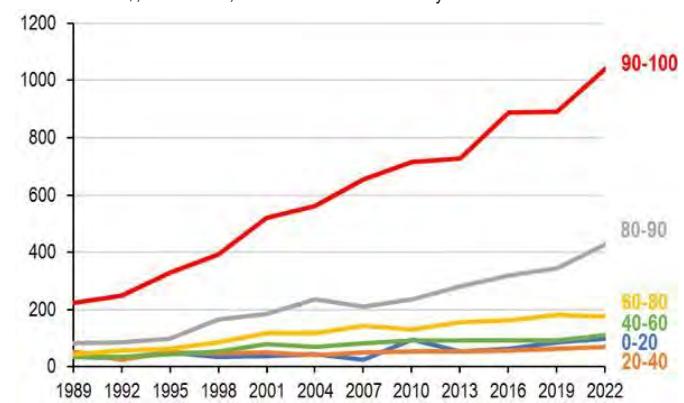
How are **workers, retirees, employers, institutions, government, and markets reacting** to the growing awareness of the “DC” problem?

### 1. Inequality worsens

Government DB pension systems, such as US Social Security, are generally **progressive** in that they pay higher benefits to lower-income workers relative to what they contributed. That is, they reduce inequality. DC systems that do not require all workers to contribute, such as US 401(k) and IRAs, have had the opposite impact, primarily because lower-income workers are more likely to forgo saving or tend to use their pension nest egg in times of emergency. Fig 4 shows how the gap between the US retirement account balance of the top 20 percentiles in income has steadily widened relative to the bottom 40 percent.

Figure 4: Mean US retirement account value by income percentile

Thousands of \$, 1989-2022, triennial. Based on Survey of Consumer Finances.



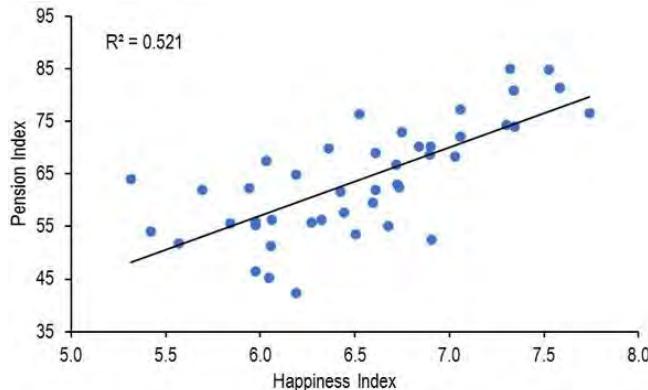
Source: J.P. Morgan, Board of Governors of the Federal Reserve System.

## 2. Wellbeing suffers

With a DB pension, people know what they will get, frequently in real terms when payouts are inflation indexed, are not subject to the vagaries of the financial markets and are assured that they will get this pension for the rest of their life, even if they live a lot longer than expected. In DB, you have these certainties which should affect people's sense of wellbeing and general "happiness". In the US, surveys continue to show that a majority of Americans are worried that they will not be able to achieve a secure retirement and that the country faces a retirement crisis.<sup>4</sup> In contrast, countries that have well-functioning pension systems, that are properly funded, that are considered fair, where pensions rise with the cost of living, and that are guaranteed for the rest of their life generally score much better in surveys of wellbeing and happiness.

Fig 5 shows a strong positive relation between countries' scores in the [World Happiness Report](#), and the overall quality of their pension systems assessed by Mercer in its annual [Global Pension Index](#).<sup>5</sup> People in Scandinavia, the Netherlands, Israel, Australia, and New Zealand have access to the most solid pension systems in the world and are also considered to be among the happiest people in the world.

Figure 5: Country happiness indices versus Mercer pension Index



Source: J.P. Morgan, Mercer, World Happiness Report.

## 3. Need to save more and smarter

DC pension systems are in effect **DIY (Do-It-Yourself) pensions**. Relative to DB, your pension savings will go up and down with the markets and need to be large enough to mini-

4. [Retirement Insecurity 2024, American views of retirement](#), National Institute on Retirement Security, Feb 2024.

5. The [Mercer CFA Institute Global Pension Index 2023](#) assesses the quality of pension system in 47 countries based on their adequacy, sustainability and integrity, or, in plain English "is it enough, will it last, and can it be trusted".

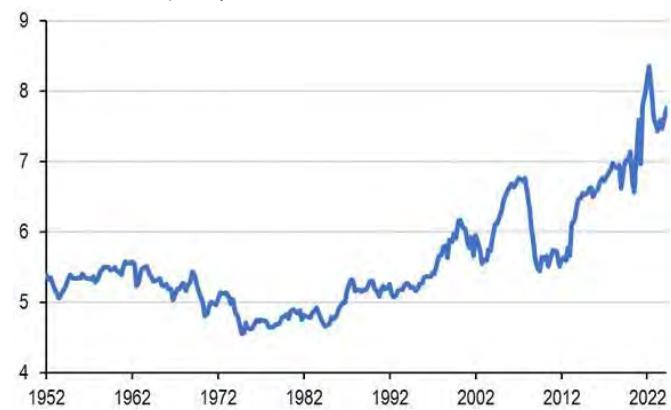
mize the risk you will outlive your savings, unless you are among the few who are able to buy deferred or immediate annuities that offer lifetime income.

That means a **DC saver needs more money when they retire**. A DB pension system only needs enough capital to pay for the average life-expectancy of its workers as it funds the pensions of those living longer with those that have passed away earlier. If a DC DIY pension saver had saved the same and invested the same way as a DB system would have, they would have 50/50 likelihood that they would run out of money before passing away. A US 65-year male, for example, with an official life expectancy of 17 more years (to age 82) needs to have enough savings to last until they hit 95, or an extra 13 years, if they want to reduce the risk of outliving their savings to something like 1/20.

The **DC worker thus needs to save more, or save more "smartly"**, meaning that they should put their savings into higher-return investments than a DB system would have. Fig 6 shows that indeed Americans have over the past 30 years significantly built up their savings relative to their income, after having kept this ratio in a stable range over the previous 40 years.<sup>6</sup> Fig 7 shows also that US defined-contribution retirement savings generally include more equities than private sector defined-benefit pensions.

Figure 6: Net worth of US households divided by disposable personal income

Q4/1951-Q1/2024, quarterly.

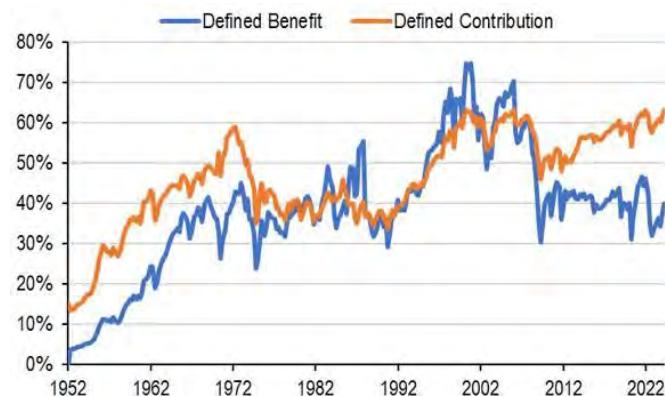


Source: J.P. Morgan, Board of Governors of the Federal Reserve System.

6. Net worth includes real estate in Fig 4. Including only financial assets in their net worth shows the same trend.

Figure 7: Equity share of financial assets of US private defined benefit and defined contribution plans

%, Q4/1951-Q1/2024, quarterly. Indirect holdings of equities through mutual funds are imputed based on equity shares of mutual funds.



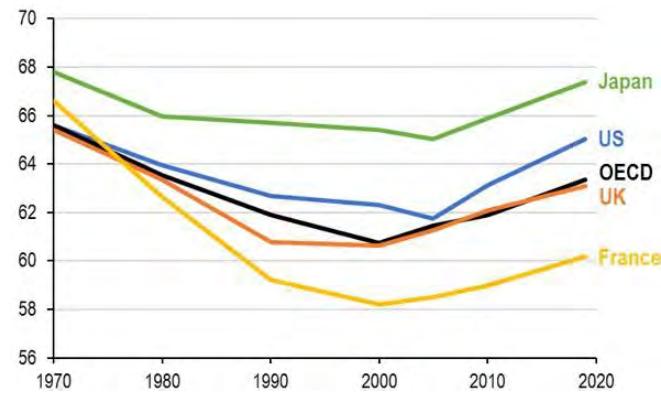
Source: J.P. Morgan, Board of Governors of the Federal Reserve System.

#### 4. Need to work longer and retire later

After many years of retiring earlier, workers in DM countries have been under pressure to work longer, with the effective retirement age across the OECD having risen by ~3.5 years since 2000 (Fig 8). Not all of this is due to the lack of pension savings or the higher risk of outliving one's retirement savings brought on by the switch to DC pensions. Government PAYG DB pensions are also under pressure due to longer life expectancy and greater old-age dependency due to falling birth rates. Most governments have thus steadily been raising the official retirement age at which they pay workers a full DB pension.

Figure 8: Effective average age at retirement across OECD, US, UK, France, and Japan

1970-2019. Age at retirement.



Source: J.P. Morgan, OECD.

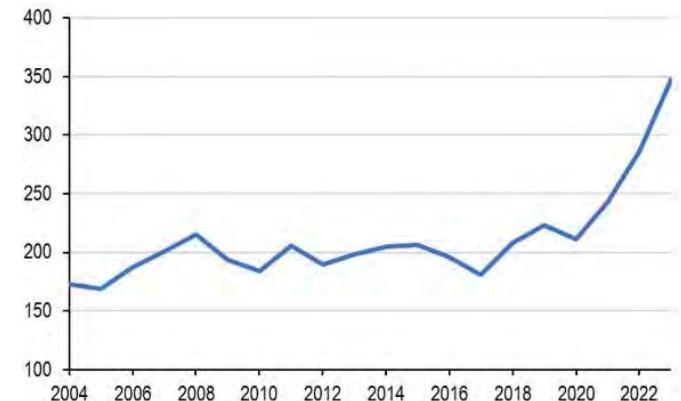
#### 5. New products and regulations

As the deficiencies of DC pensions have become more apparent, **legislators and the industry have been fine-tuning rules and offerings to induce greater DC participation, more appropriate asset allocations and easier conduits into lifetime annuities.** These included auto-enrollment of employees in 401(k)s, introducing target-date funds and then designating them as the default investment option, lower costs to setting up 401(k)s, and providing a greater offering of low-fee tracker funds. Some of these showed up in the SECURE 1.0 and 2.0 Acts (*Setting Every Community Up for Retirement Enhancement*) that US Congress passed in 2019 and 2022. Among others, the acts require that DC plans prominently display the amount of retirement income that can be purchased with simple single-premium annuities at current market prices. Managers of DC funds are now also starting to offer ways to effortlessly convert DC balances into lifetime annuities through partner life insurance companies.<sup>7</sup> And one large tech company has reopened its cash balance pension account, which is a hybrid DB plan.

Sales for **annuities** have indeed **increased significantly** in the last two years in the US, after languishing over the previous 15 years, helped by higher bond yields. Note, though, that only \$140bn of 2023 US annuity sales were fixed annuities, which still pales in comparison with over \$31 trillion in US retirement savings.

Figure 9: Individual annuity considerations in the US

Billions of \$, 2004-2023, annual.



Source: J.P. Morgan, S&P Global.

7. J.P. Morgan Asset Management has included this option within its suite of target date funds since 2022. Related, see David Kelly, Annuities: An essential slice of the retirement pie, JPM AM, Aug 2023. Blackrock also recently introduced such a product, LifePath Paycheck, highlighted in its Chairman's annual letter to investors.

## Conclusion

The secular shift from DB to DC retirement saving, seen foremost in the US, but also other countries, was initially welcomed by many. Employers were able to reduce costs and risks from an activity in which they had no special expertise, and workers welcomed reducing their financial exposure to their employer and the increased transparency, flexibility and control they gained on their own savings.

But over time, the darker side of DC has become more obvious. Flexibility and freedom to save when and what you want sound good in principle, but for many US lower-income workers, it meant that they could end up with no retirement savings at all. Other countries where DC contributions were mandatory fared better.

An equally big problem emerged as it became obvious that when you have to take care of your own retirement funding, you need to have more capital to minimize the risk you will outlive your savings, a problem not encountered in DB pensions, or when people buy lifetime annuities.

These two problems brought on by DC savings systems have left workers quite concerned, forced to work longer and to save more and in riskier asset classes, uncertain and unhappy, while people in countries that force people to save enough and that offer stable lifetime income in old age confess to feeling much better in life.

The pressure is thus on to nudge, motivate, if not force every worker to save enough and start early, and to come up with better, cheaper, and easier solutions to convert accumulated savings into stable lifetime income in old age. DC systems are being fine-tuned and asset managers are finding ways to help those entering their retirement years to convert their savings into life annuities.

We thus expect to see a secular rise in the demand for simple lifetime annuities, indexed to inflation, that will boost the demand for credit, inflation-linked bonds products that backstop these annuities. This should be one factor, in addition to the now very tight expected long-term return gap between credit and equities, that is likely to induce US end investors to reduce some of their record-high allocations to equities.



# Strategic investing

## The Long-term Strategist

Total portfolio approach versus SAA

- The standard approach to managing money is to separate investment decisions into Strategic Asset Allocation, and Tactical Asset Allocation – SAA and TAA, beta and alpha.
- The Strategic Allocation is optimized to achieve one's investment goals and is based on the most objective long-term expected returns and risks. TAA takes zero-sum deviations from SAA to exploit shorter-term market opportunities or risks. TAA can be managed by different internal or external managers who may operate quite independently from each other.
- A small number of larger pensions and SWFs have for some years successfully followed a more integrated Total Portfolio Approach (TPA) that merges alpha and beta and selects assets from a wide variety of sources to meet a long-term return target without a given SAA benchmark.
- TPA manages risk not as tracking error versus benchmark but reviews the total portfolio against its exposure to different risk premia and the ultimate risks emanating from inflation, growth, climate, and geopolitics, *inter alia*.
- Centralization of risk-taking for the full portfolio under the CIO allows the fund to respond more rapidly and coherently on emerging risks and opportunities than SAA funds.
- Potential downside comes from a lack of diversification in tactical risk-taking that is much easier under SAA, and the risk that the CIO may have to chase riskier assets in a rallying market when the market IRR has fallen below the fund's target.
- TPA requires a clear mandate for the fund, a strong CIO with a good track record and a team with cross-asset expertise, all focused on the same return objective.
- TPA is thus not for everybody but is more suitable when the fund has a single owner of the capital, a clear objective, a CIO with a strong track record, a cross-asset team and a culture of teamwork.
- SAA and TPA are at extremes, with many managers taking elements from both. In SAA, a CIO can, e.g., use an overlay fund to respond more dynamically to change the overall fund's exposure without requiring the dedicated asset class teams to change their strategy.

### Long-term Strategy

**Jan Loeys** <sup>AC</sup>  
(1-917) 602-9440  
[jan.loeys@jpmorgan.com](mailto:jan.loeys@jpmorgan.com)

**Alexander Wise**  
(1-212) 622-6205  
[alexander.c.wise@jpmchase.com](mailto:alexander.c.wise@jpmchase.com)  
J.P. Morgan Securities LLC

A number of large asset managers have been moving from the **Strategic Asset Allocation (SAA)** approach to managing money, the long-time standard for the industry, towards a more integrated **Total Portfolio Approach (TPA)**.<sup>1</sup> In this note, we review what the differences are between these two and some of the pros and cons of both that should have a big impact on managers' decisions of which is best for them.

## The classic SAA model

The classic approach to managing money consists of two elements: **The Strategic Asset Allocation, or long-term benchmark, and the Tactical Asset Allocation (TAA), consisting of zero-sum deviations from the SAA**. The ultimate owners of the money, or their representatives, first decide on a target long-term SAA that best meets their long-term objectives, circumstances and risk tolerance and is based on objective long-term return assumptions, volatilities, and correlations across asset classes. In the Theory of Finance, the SAA is selected from an efficient frontier of asset class weights that maximize returns for any given level of risk, through quadratic optimization. Under the Global Capital Asset Pricing Model (Global CAPM), the eligible assets are selected from global tradeable equities and bonds and all their country, sector and style sub-components. These asset classes are represented by total return indices that provide consistent past return and volatility data needed for in-depth analysis and optimization.

This SAA across asset classes serves as an **anchor** from which the investor, or the asset manager they select, can deviate for some time with different positions to exploit shorter-term return opportunities or risk perceptions. The objective of the strategic anchor is to make sure you or your asset manager do not forget about your long-term objectives while chasing down shorter-term market movements. We call these shorter-term deviations **Tactical Asset Allocation (TAA)** via zero-sum over- and underweights of differ parts of the portfolio. Many asset managers operate with limits on such TAA – tracking errors – to make sure they do not deviate too far from their SAA.

A whole industry and modus operandi have grown around the SAA/TAA model of managing money. Owners of money, such as family offices, foundations, or the boards of pensions, SWFs or central banks, decide on their SAA and usually hire specialist “active” managers to do the TAA for them at the portfolio or individual asset class level. SAA is beta risk,

while TAA is alpha. Funds or portfolios that stick with an unchanged SAA and do not do any TAA are called passive, while those adding TAA are called active. Active managers can operate within the organization, or externally, and are judged only on the performance of TAA, not SAA. Consultants advise on SAA, while sell-side researchers advise mostly on TAA. Index providers design and calculate the return indices for all potential asset classes that produce all the data for long-term return and risk analysis and that become the benchmarks against which active managers' performance is judged. **Everybody has their specialized role within SAA with a clearly defined division of labor.**

The SAA model has been quite successful over the years and is widely followed precisely because it makes it clear what everyone's function and performance metric is. But this **SAA-TAA division of labor also has its weaknesses**. The main one, one we have struggled with ourselves, is that your strategic allocation as your long-term anchor should only be changed every few years or so, but the main inputs into your SAA, expected long-term returns across asset classes, are highly dependent on their starting IRR, which can change from day to day.

An asset class's price today and its IRR will dictate what return it will likely earn over the next decade. Your SAA choices based on today's IRR can thus quickly become out of date. In principle, your TAA should be able to adjust for this, but the long-term signal of far-out returns tells you very little about what markets will do over coming months or quarters, and is thus not relevant for TAA.

## What is the Total Portfolio Approach and how does it differ from SAA?

One of the first evolutions away from CAPM-based SAA was arguably the **Endowment Model**, popularized by the late David Swensen at the Yale Endowment that moved quite successfully beyond tradeable stocks into private equity and related alternative investments. University endowments manage funds and assets donated to the university with an objective to provide stable funding to cover part of the university's operating costs, typically 5% pa of its assets. The endowment model, in effect, merges SAA and TAA and constantly looks for long-term assets that earn at least 5%.

The **Total Portfolio Approach** builds on how endowments have merged SAA and TAA decisions by integrating investment decisions in a single team led by the CIO. The funds following it are large pension and sovereign wealth funds whose boards have given them a total-return mandate instead of a SAA benchmark. In TPA, the CIO integrates investment decisions around a single integrated team that judges all

1. For a broader discussion of Total Portfolio Approach, see [Total Portfolio Approach](#), New Thinking Institute, Willis Towers Watson, 2019; [The Rise of Total Portfolio Approach](#), CAIA Association, May 20, 2024; [Practical Considerations for a total portfolio approach](#), Schroders, Aug 18, 2024.

major investing opportunities on whether they meet the long-term return target or help reduce portfolio risk.

The valuation signal on asset classes, which dominates long-term SAA decisions, is now integrated with shorter-term signals into real-time decision-making by the CIO and team. In the language used often to describe TPA, the CIO can now react in a dynamic and agile fashion to new opportunities, price developments and risks. Funds operating under SAA typically have separate equity and fixed income divisions, each with their own benchmark to beat with tactical and relative value positions. The two groups do not have to operate from the same market assumptions.

A TPA fund is not beholden to the standard global bond and equity market indices used as benchmarks for SAA but can freely roam across a variety of alternative and illiquid asset classes, judging each on how they boost the total portfolio return and lower risk. The “Total” in Total Portfolio Approach means exactly that the CIO and team look at how any asset benefits the total portfolio, instead of just managing one part of it on its own, disregarding how that part interacts with other parts of the portfolio.

TPA allows the CIO team to look at risk beyond tracking errors versus benchmark and apply elements of **factor analysis**, such as analyzing the full portfolio by its exposure to different risk premia (term, credit, equity, ...) as well as to the ultimate source of risk from inflation, growth, climate, and geopolitics. Each of these can be levered up or hedged against.

TPA on the surface sounds superior to SAA, but it also has its own issues that make it not for everyone, with some funds taking elements of both. To work well, TPA needs a single ultimate owner of the money and a clear mandate that allows the CIO to focus squarely on this objective. Meeting the needs of many different ultimate owners of the money, as is the case for most external asset managers, requires a greater division of labor, making the SAA approach more suitable.

To us, one of the biggest challenges and risks to following a TPA model is that **so much depends on the CIO having the right view of the market**. If the CIO has a good sense of market direction, then the portfolio greatly benefits from having the CIO view applied across the total portfolio. But the reverse applies when the CIO has the wrong view.

**Hedge funds**, which are the ultimate tactical player in markets, are only too aware of the **dangers of a single CIO making the majority of market calls**. To reduce the risk of concentrated risk-taking, hedge funds typically work hard to diversify tactical positions by allocating risk capital to a set of

different trading books, managed by individual traders that do not work from a single integrated view of the market. At the extreme, such traders in the same hedge fund simply do not talk to each other, focus on different parts of the market or different investment styles (technical, RV, fundamentals, event driven, ...). That is, **hedge funds will generally do the opposite of TPA**. Hedge funds achieve high returns to risk, not by having high success rates in market calls, but more by diversifying their sources of alpha through different investment styles and building information walls between them to keep their various positions as uncorrelated as possible.

A second major challenge to TPA is the change from being mandated a target strategic asset allocation to a **given target rate of return**. A strategic allocation is in principle chosen from an efficient frontier across eligible asset classes that shows what expected returns are feasible for any given level of risk. A particular SAA therefore does imply a particular level of expected return. If the owner of the money or the pension fund's board does not like that return, they can change the strategic allocation towards higher-return asset classes. Under TPA, the board leaves asset allocation, both short and long run, to the CIO team, but mandates them to choose one that achieves over time the given target rate of return. One would hope that when they set this target return, it is feasible with the set of asset classes the CIO is allowed to invest in.

**What happens, though, when all markets rally and the IRR of the chosen portfolio falls well below the return target?** The CIO has two options: they can decide that markets are expensive and go defensive into a lower-risk allocation and thus lower-return assets on the expectation that markets are due to fall, and their IRRs will rise in due time. Or the CIO can decide that in order to meet their return target, they need to raise the weight of higher-risk assets.

The first response runs the risk that it takes a long time for markets to reprice lower with the portfolio underperforming the market and peers over a prolonged period. Even worse if it turns out that the market has indefinitely moved to lower real bond and equity yields and the fund's long-run return target is no longer feasible, without taking excessive risk.

The second response, adding risk when future returns have fallen, risks buying high and selling low, underperforming a more stable SAA approach. In comparison, an SAA portfolio that regularly rebalances towards target weights has the advantage that it sells asset classes that have outperformed and thus have a lowered future return and buys assets that have underperformed, but now have a relatively higher future return.

Avoiding both traps requires having a CIO who can “beat the market” and who is strong enough to convince the board it needs a target return reset if the current return target is no longer long-term feasible.

## Is TPA the future, or only for a select few?

Both SAA and TPA should be seen as **extremes** on a continuum, with most funds taking from both the elements that best suit their conditions and capabilities. Conditions that allow a fund to move towards TPA in our mind include:

- A CIO with a strong track record and supported with a professional cross-asset team.
- An integrated investment team that can analyze all types of assets, standard and alternative, within a consistent valuation framework.
- Clear objectives for what the fund and its capital are supposed to achieve over time.
- Trust and frequent communication between board and CIO.
- A single owner of the funds, represented by the board.

External managers who manage the **funds of many different clients** with varying objectives, base currencies, taxation and risk preferences cannot operate on pure TPA as each of these customers will require different strategic allocations.

One midway position between SAA and TPA is where a fund has a target allocation to bonds and equities and has each of these managed separately and independently, while the CIO may use an **overlay fund** to take on broad macro positions or hedges that allow them to change the overall exposure of the fund quite rapidly when the need arises without having to ask Board permission to change the SAA.

Board asset allocations are also increasingly going well beyond the classic public equity and bond markets for which daily return indices exist towards **strategic allocations to a variety of alternative investments** such as hedge funds, private assets, infrastructure, and commodities.

Retaining some form of uncorrelated risk-taking within a single firm remains to us quite important. It is great when you have a CIO with a “hot hand” but the history of risk-taking does not give one confidence that a good track record of past performance is a guarantee for the future. The funds that are to us most focused on achieving high trading returns to risk know this well and go to extreme effort to keep different sources of risk-taking in their funds uncorrelated.

## The Long-term Strategist

### The attraction of illiquidity

- Liquid assets are assumed to have more value than illiquid ones and thus frequently earn a lower IRR, known as a liquidity premium.
- More liquidity is thought to be better than less. We see evidence, though, that more liquidity can also have downsides and that there are circumstances where it makes sense to allocate a significant part of your portfolio to less liquid assets.
- The first circumstance of liquidity premia being large relative to only modest needs for liquidity is when you have well known spending needs or liabilities that are far out into the future.
- This is one reason we have no government debt and only spread product in the fixed income part of our Strategic Asset Allocation, as there is a hefty liquidity premium on Treasuries. Corporate debt and other spread products such as municipals are a lot less liquid, higher yielding, and have no higher long-term risk for the same duration.
- A second reason for allocating to less liquid holdings is that many investors do not always make good use of liquidity. There is strong evidence that the average individual investor (these analysts included) and many institutional ones tend to buy late in a rally and sell late in a bear market. “Greed and fear” tend to drive many of our actions, and we thus frequently end up buying high and selling low.
- The best way to self-protect against overtrading and mistiming is to not have the means to do so by allocating a significant part of savings to less liquid assets, by holding them in a less liquid form, or holding them at arm’s length, through an external manager.
- ETFs are growing dramatically, partly because of their variety, but also because they provide intra-day liquidity, which regular mutual funds do not. If you want to reduce the temptation of liquidity, it makes sense to hold a decent number of your funds as simple mutual funds.
- The most popular investments in recent years have been so-called alternatives, including private equity, private credit, real estate, hedge funds and infrastructure. They have in common that they lack a functioning secondary market and are thus mostly buy-and-hold and thus relatively illiquid.
- We do consider alternatives part of a strategic diversified portfolio, not for any extra return reasons – on which we are not convinced – but more because they allow the end investor to make a long-term commitment to an asset class without the temptation to exit when markets turn.

### Long-term Strategy

#### Alexander Wise <sup>AC</sup>

(1-212) 622-6205  
alexander.c.wise@jpmchase.com

#### Jan Loeys

(1-917) 602-9440  
jan.loeys@jpmorgan.com  
J.P. Morgan Securities LLC

It is typically assumed in finance and economics that **liquidity is a positive attribute** and cannot be a bad one, just as optionality cannot have negative value. **Liquid securities** are those that **can be bought or sold for cash efficiently and easily without affecting their price** – hence the presumption that, for the same price, it is always better to be in liquid than illiquid investments and that you need to be paid an extra return to give up this liquidity.

This is what economics teaches us, and we find plenty of evidence for it, as liquid securities almost always sell for a higher price than illiquid ones, just as options do not sell at a negative price. The implicit **assumption in much of economics is that economic agents are rational and that you will thus use options and liquidity only to your own benefit**. But this is where things start going awry, as there is plenty of evidence that people, and especially groups of people, frequently do not act as rationally as assumed by economic theory.

This implies to us that there are indeed **circumstances where it makes sense to allocate part of one's portfolio to illiquid holdings, even when there are no extra illiquidity premia to capture**. What are those circumstances and conditions?

## The problem with liquidity

The case for liquidity in your investment portfolio, whether in the form of cash or other relatively liquid assets, is that you can make use of this liquidity in case of emergency or to seize opportunities that the market throws at you from time to time. Having some liquidity for a “rainy day” makes sense to us, and we will not disparage this point. But we do find that **it is not in everyone’s ability to make profitable use of changing market conditions**. The old dictum is that the average investor cannot beat the market, as the market is held collectively by this same average investor. Some will perform better than average, and they are the most talented and experienced ones, or maybe just the luckiest ones. Their gains, however, must come from the losses incurred by those not as talented or as lucky.

The empirical evidence supports our premise, as we find that market participants most focused and specialized in trading – hedge funds – do on average beat the market after costs and fees, while individual “retail” investors generally do worse than those passively holding the market. In between these extremes are fund managers, where there is long-standing evidence that mutual fund managers on average underperform passive funds, while institutional managers probably sit in between.

[Morningstar Active/Passive Barometer](#) twice per year measures the performance of active funds against passive peers in their respective categories. The report spans ~8,326 unique

funds with ~\$21tr in assets, or about 72% of the US fund market. It finds that of the **US active funds** it monitors, only ~29% “survived and beat their average indexed peer over the decade through June 2024. Success rates were generally higher among foreign-stock, real estate, and bond funds and lowest among US large-cap strategies.” Low-fee funds had higher success rates (survive and beat the market) than more expensive ones. One ought to assume that most of the funds that did not survive (closed or merged) did so because they were not performing well.

Morningstar also reports regularly in its [Mind the Gap](#) reports on the returns actually earned by investors in US mutual and exchange-traded fund, including how they moved in and out of these funds, relative to what they could have earned if they never changed around their holdings. These mostly **retail investors earned on average 1.1% pa less over the past decade** than somebody who would have simply held each of these funds over these 10 years without switching around. This amounts to cumulatively 15% over this period. The authors attribute the shortfall to the buying and selling of fund shares over these years.

The shortfall between the average dollar’s return by investors who do make use of the ability to enter and exit funds at will and the buy-and-hold strategy was especially acute during the wild swings in the market at the onset of Covid in 2020. This tells us that individual investors at the margin are more likely to buy high and sell low.

At the other extreme are hedge funds that in principle focus on “alpha” while hedging out their exposure to market direction, which is known as “beta.” We have discussed frequently that we see the hedge fund asset class as the best way to earn a return from market volatility and trading. And we have found that when taking out residual market directionality (about 1/3 equity and 2/3 fixed income), hedge funds over time provide positive alpha<sup>1</sup>.

In short, liquidity, in the form of cash or easily tradable investments, should in principle only have positive value, but in the “wrong” hands, liquidity can easily lead to overtrading and mistiming of the market. In the hands of the most professional tactical market participant, liquidity is a necessity and a condition to be able to add value to one’s portfolio.

Beyond the world of finance and markets, there is plenty of evidence that it is not always good to have more options. It is well known that the secret to losing weight is to not have fattening food around, as the option to eat anything we want will

1. Most recently updated in [Hedge fund “alpha” returns, Flows & Liquidity](#), Panigirtzoglou et al., Jan 19, 2025.

be abused by most of us to our own detriment. Commitments and contracts, which at the core limit one's options to easily move around or change direction, can limit longer-term losses.

## How much liquidity should you have?

This should depend on the volatility and uncertainty of the amount and timing of your spending needs and your ability to use liquidity profitably, relative to the cost of holding more liquid assets.

When you do not know when you will need access to your savings or how much you will need, you must hold more cash and liquid assets. If instead you have long-term predictable liabilities or spending needs, such is the case for many pension funds and insurance companies, you do not need much liquidity.

If you believe you have superior ability to time the markets, then you will need to hold a decent part of your assets in liquid form. The problem here is that the average investor seems to believe that they have better-than-average timing in the market and seizing its opportunities. With the exception of investors whose full-time job is to try and beat the market, it is wise for regular investors to hold a decent part of their savings in less liquid form in order to reduce the temptation to overtrade.

In this context, we think it makes sense for governments to impose taxes and fees to reduce excessive trading, whether in financial assets or in real estate. In the US, short-term capital gains are taxed at a higher rate than long-term gains, which helps to reduce overtrading.

## What and where to focus illiquidity on?

We see two prime reasons to hold less liquid assets – to earn an **illiquidity premium** where they exist and to **reduce the temptation to overtrade** and time the market. We know liquidity premia on liquid issues are plenty in the fixed income world. Benchmark on-the-run issues will generally have a lower yield than less liquid off-the-run issues. J.P. Morgan's US Treasury Benchmark Index has earned interest income of 4.34% pa since inception at the end 1986, while its Traded Index, which has all the bonds that we cover, earned an average coupon income of 4.92% pa, 58bp more – despite the fact that our benchmark index was nearly a year longer in average duration over this period.

More broadly, we have made the point a number of times (see SAA in Appendix) that USD investment-grade **corporate bonds** are systematically cheap versus US Treasuries, as the spread on USD corporates has been much wider than the

long-term default and downgrade losses on these corporates. Part of that excess return is because of the much lower liquidity of corporate bonds. Over the 12 months through June last year, daily turnover on USD high-grade corporate bonds in the secondary market averaged 0.33% of outstandings<sup>2</sup>, while daily turnover US Treasuries stood at 4.3% of outstandings, more than 10 times as much.

Many investors have now hold their bonds and equities through mutual funds and in particular exchange-traded funds (ETFs). ETFs allow you to buy or sell anytime during exchange hours, while with mutual funds you can only do this at end-of-day closing prices. ETFs thus provide more liquidity. Smaller ETFs are less liquid than larger ones, which comes at a cost of wider bid-ask spreads, but otherwise there is no indication that they are cheaper. Similarly, we have not seen evidence that the higher liquidity of ETFs comes at a cost of a lower return. If you can control your urge to overtrade, there does not seem to be a reason to prefer mutual funds over ETFs.

One major difference in liquidity is between the world of publicly quoted stocks and bonds that trade on an exchange or over the counter among market makers and the world of Alternative Investments, such as **private equity and credit**, infrastructure, real estate, and hedge funds, for which there are not ready secondary markets.

The illiquidity of private equity, e.g., was the original explanation for why private equity has been able to produce a higher return than publicly quoted and exchange-traded stocks. [Cliff Asness at QQR](#) challenged this view and argued that private equity investors actually like the illiquidity of the asset class. He wondered "*What if many investors actually realize that this accurate and timely [market] information will make them worse investors as they'll use this liquidity to panic and redeem at the worst time?*" He thus argued that there is an "illiquidity discount" on private equity.

We will not go into the issue of whether private assets should be expected to earn a higher or lower return than public assets, but instead support the notion that private equity and credit and the broad Alternative Investment world should be considered part of a globally diversified portfolio. Private equity is issued by different companies than public ones, frequently at an earlier stage of a company's development, and they thus complete the market. In addition, their illiquidity does have the benefit of commitment. The investor is locked in and thus will not have the ability to exit easily during difficult times. And the equity-issuing company will have stable

2. [US Credit Market Liquidity: 1H24 Update](#), Eric Beinstein et al., Aug 1, 2024.

funding and should thus be less focused on meeting shorter earnings targets.

That said, we think private equity makes most sense for those with long-term and stable funding. There is currently a trend and effort to make private assets available to retail investors, who are more likely to overtrade. It could thus be argued that retail will benefit from holding a long-term illiquid asset like private equity and credit. We would be rather cautious with such a recommendation, as retail investors are used to liquid ETFs and mutual funds and may have more volatile spending needs than a pension or sovereign wealth fund.

A better way for retail investors to curb the temptation to sell in a downturn and buy after a long rally is to outsource the management of their savings to an external wealth manager with clear instructions to avoid excessive trading.

## The Long-term Strategist

### KISS investing

- KISS investing, on the ***Keep it simple, s...*** principle, means to us holding **just one equity and one bond fund, passively** managed, spanning **all listed world assets**, with **little trading** around them.
- KISS investing has great **benefits** both from **minimizing costs** from fees, fund expenses, trading and the time required to manage savings, and from **maximizing transparency**, which reduces risk.
- KISS investing is **not an absolute** must and there are probably other approaches that could raise returns or reduce risks, but its attraction to us is that we believe it allows one **to achieve the great majority of financial objectives**, especially so for individual savers.
- KISS investing is an **implication of the Efficient Markets Hypothesis** which postulates that all public information should be in the price. Market efficiency should be one's starting hypothesis when investing, but we know there are **exceptions** to it driven by regulatory restrictions on the free flow of capital, taxation differences and behavioral biases such as short-termism.
- We can adapt to some market inefficiencies in our two-fund portfolio without abandoning KISS by restricting global fixed income to **corporate credit** FX hedged, and by including certain **tax-advantaged assets**, such as US Munis or life insurance, for those with high marginal tax rates. Long-term trends from demographics, climate, technology, or geopolitics can lead one to include a few extra funds without overcomplicating one's portfolio.
- Exploiting shorter-term market mispricing requires **active management** where specialized managers, such as hedge funds, are probably most able to add return beyond the fees they charge. But such managers add risk, reduce transparency, and require closer monitoring and time-intensive understanding by the investor, thus not making them a natural part of our KISS portfolio.
- **Alternative investments** such as private equity, credit and infrastructure extend one's reach beyond listed assets into unlisted ones and thus tick the KISS box of global diversification. This adds value to a portfolio but comes with illiquidity, lack of transparency, higher fees, manager risk and higher costs and time of tax reporting and understanding what you own. Alternatives do add diversification but are too complex to be part of a KISS portfolio, in our view.
- KISS investing is our version of both **Occam's Razor** and the **80/20 Rule**. The latter states that 80% of outcomes come from 20% of causes. In our mind, **simplicity gives you 80% of what you want from your portfolio. Added complexity gives you the extra 20%, although we would lean more towards 90/10**. The smaller one's portfolio, the more we think one should stick to KISS.

### Long-term Strategy

#### Jan Loeys AC

(1-917) 602-9440

jan.loeys@jpmorgan.com

#### Alexander Wise

(1-212) 622-6205

alexander.c.wise@jpmchase.com

J.P. Morgan Securities LLC

Last year, we argued in [Strategic investing questions, by the dozen](#) (Sep 26) for the **extraordinary value of keeping it simple**. “Simple portfolios with just a few global trackers and basic valuation and investment rules make it easier to understand one’s risk and lower the cost of managing money, without giving up much return.” Our statement got a lot of attention, motivating us to put more meat on it in this note, adding nuances and some exceptions while addressing counterpoints.

Our main contention is not that KISS investing is absolutely optimal and doing anything else is irrational and/or a bad investment. Our point is instead that **we believe you can achieve most, if not all of your financial objectives** by following our KISS approach. Adding more products or complexity in our mind produces steadily falling extra benefits.

## What is KISS investing?

The KISS Principle—short for “Keep it simple, stupid”—has been around for ages and is just a modern version of [Occam’s Razor](#) in Philosophy, according to which “the simplest explanation is usually the best one”. Modern KISS itself was reportedly coined by [Kelly Johnson](#), an aircraft engineer in the 1930s, who demanded that engineers designing jets had to make them repairable by an average mechanic under combat conditions with a limited set of tools.

**KISS investing to us means holding just two passive globally diversified funds, one in equities and one in bonds**, both in listed securities, tracking market-leading indices, and with large capitalization to assure liquidity. Bonds should be denominated in domestic currency, or FX hedged if denominated in foreign currency. Their relative weights are a function of return needs and ability to absorb drawdowns, but quite stable. The equity share should probably fall slowly over time when/if one approaches the time to spend one’s wealth, with no trading around them aside from any rebalancing from time to time. For individual savers, a target-date fund when one accumulates savings followed by an annuity during retirement/decumulation should fit the bill. In short, **a few simple, transparent products and simple, easy to follow long-term investing rules**.

If markets are for the most part efficiently priced—an assumption for which there is a lot of evidence—then one can’t expect to do better over the long run, in terms of returns and risks, than by simply buying the “world” market, global equities and bonds.

## Does KISS investing raise returns?

KISS investing then helps you **maximize returns by minimizing the costs of investing**. These costs will consist of **entry, exit and maintenance fees** on the products one buys;

**bid-ask spreads** and the market impact of any transaction; taxes on capital gains and transactions; and the **opportunity costs of the time required** to manage one’s portfolio and prepare tax returns.

**Passive funds have much lower expense ratios** than active ones (one third as much) as they trade less, do not have to pay for expensive portfolio managers, and are generally much larger, which allows them to spread their costs more widely.<sup>1</sup> Active funds also have larger **turnover** that does not come for free, even as trading costs in the equity world have come down over time, while those on individual bonds have risen over time post GFC. Higher turnover also realizes more capital gains, and thus **earlier and higher tax payments**.

Finally, one needs to take account of the **time and information costs** required to monitor portfolios with a large number of different funds and/or individual securities. **Tax preparation** costs increase rapidly with any increase in the number of assets owned, the number of accounts held, and the overall complexity of the investments one makes. Private assets in particular can be quite burdensome to monitor and report on. All such tasks can obviously be farmed out to specialist managers, accountants and tax preparers that can do the work more efficiently but none of these come for free.

## Does KISS investing lower risk?

Simpler passive products and strategies are more **transparent** and easier to understand, and when invested in global funds will have longer time series across which to better analyze volatility and long-term risks. **The longer the history** you have on different asset classes, the more confident you should be about its behavior, including its return and volatility. This translates directly into more accurate forecasts of future returns, and thus the ultimate potential downside, or risk. More complex products and strategies will have more components that can surprise, especially as many will be more novel and thus not have much history on which to judge what could go wrong.

Actively managed products, in turn, require you to judge not only the risk on the targeted asset class, but also the strategies pursued to try and beat this asset class benchmark. This **tracking error** should be very specific to the fund’s manager and can only be properly analyzed if both the management team and their strategies for generating alpha have remained stable.

1. ICI ([Trends in the expenses and fees of funds, 2023](#)) reports 0.15% and 0.11% average pa expense ratios for equity and index ETFs, respectively, in 2023, versus 0.43% and 0.35% for their actively managed counterparts in the US market. Index equity mutual funds charge on average only 0.05% expenses in the US.

This issue is particularly important in the case of private equity and credit where it is not possible to buy a globally diversified passive tracker and manager selection risk can be orders of magnitude as large as the risk on the underlying asset class.<sup>2</sup>

**Can manager selection risk be reduced by diversifying across active managers?** One can try, but the more one diversifies across active managers, the more one likely will get a portfolio that tracks the overall market with little alpha as active managers in effect trade against each other.

## Can't we do better with high-Sharpe assets?

To many, KISS investing ignores the many opportunities that global markets offer to do better by identifying assets that lie above the risk-return trade-off line defined by our global bond and equity trackers. All of us market practitioners, whether buy-side asset managers and financial advisors, finance professors, index providers, consultants and sell-side sales and strategists (us included), are in a never-ending search for asset classes, securities, issuers, and trading methods with superior returns to risk. That is our job, so to speak.

It is our experience, though, that once an idea is “out” on what assets or techniques have indeed produced superior returns, many investors with a lot of capital will jump on it, push up its prices and in the process arbitrage the opportunity away. This tends to pull any superior asset back to the market's risk-return trade-off line of our two global trackers and eliminate its superiority. The speed of this arbitraging force has steadily increased over time as information became ubiquitous, everyone read the same new Finance research, trading costs came down, markets and economies globalized, capital controls fell, the Washington consensus became the global benchmark for policy, and global capital and liquidity surged. The lifetime of any new “alpha” ideas has gotten shorter and shorter. This has been our experience as we searched over the past six years for asset types that could still provide superior returns to risk.

That said, there remain some limitations to how fast and how much capital across the world can and will seek to arbitrage away higher returns to risk priced into certain assets. These limitations come mainly from regulatory restrictions and taxation disparities, liquidity needs and investment time horizons. Or they can come from widespread behavioral biases that refuse to go away, such as

overreaction, overconfidence, loss aversion, anchoring, herding, hindsight, and so on. We will look in concise form at what is known here and accept that does create arguments to change or add to our two-fund KISS portfolio. We will distinguish structural from tactical alpha opportunities.

## 1. Structural alpha from market segmentation

First, with respect to regulations, the elephant in the room has to be **Financial Repression** by which governments in the world force or induce insurers, pension funds and central and commercial banks to give preference to their debt, generally by providing capital relief on their debt, or simply prohibiting holding other assets. As a result, we find that government debt in most DMs is structurally expensive relative to other debt, such as that issued by investment-grade companies. As we argued in [Building Strategic Asset Allocation](#) (Oct 10, 2023), US High-Grade (HG) corporate bonds have outperformed US Treasuries over the long run because their yield has been on average ~150bp higher than same maturity USTs over the past 30 years, well in excess of the ~30bp average annual loss from net downgrades into High Yield. Even today, with the spread down to just over 100bp and near its tightest level of the past 15 years, HG should easily beat USTs over the next 10 years. Our IRR-based models indicate better than 8/10 likelihood of US HG earning higher returns than UST over the next decade.

Within our KISS approach, we simply substitute a global corporate bond fund for a global aggregate bond tracker, which includes broad government debt, leaving us still with a two-fund portfolio of a **global equity tracker and a global corporate bond fund**, hedged into one's home currency.

Second, with respect to **taxation**, differences across investors can produce diverging outright and relative after-tax returns for the same gross return that are hard to arbitrage away and imply that certain asset classes will appear superior to some investors, but inferior to others. For example, the **US municipal bond market** with over \$4 trillion outstanding carries coupons most of which are exempt from US taxation.<sup>3</sup> Its yield will thus be below that of taxable bonds of comparable maturity, liquidity, and credit risk. The ratio between the two defines a marginal break-even tax rate. US investors who pay a higher marginal tax rate than this break-even should be heavy buyers of such bonds, while those with lower marginal tax rates as well as international investors not subject to US

2. As we argued most recently in [Ten topics in strategic investing](#), Mar 19, 2024.

3. About ~20% of US Municipal debt, issued by local governments that have reached the non-taxable limit or issued under the Build America program, is taxable.

taxation should have little or nothing at all.<sup>4</sup>

As discussed recently in [Will Americans continue to love equities?](#) (Feb 21, 2024), US high-net-worth investors own little in US Treasuries, but focus their bond allocations to corporate bonds and to US municipals that like corporates have some default risk and, on an after-tax basis, offer them a comparable yield.

Other tax advantages in many countries apply to permanent **life insurance**, making this asset produce higher net returns for the same yields than taxable corporate debt. One other reason why even a KISS investor will hold more than one fixed income fund.

**Third**, with respect to **investment horizons and liquidity preferences**, the main market segmentation will be between what we would call **short-term and long-term investors**. The impact on this on how you invest is largely a function of how you perceive and define risk. As we discussed in [Long-term vs short-term risk](#) (Feb 1, 2022), our industry tends to define and measure risk as the volatility of asset returns, making the assumption that risk over the long run is simply a statistical extrapolation of volatility (standard deviation) of monthly, quarterly, or annual returns. If so, risk on longer-term returns, say 10 years, can then simply be estimated as annual volatility divided by the square root of 10.

This follows if annual returns are identically and independently distributed over time. This is not always the case, with some evidence of mean reversion over long-term periods. In addition, as we [discussed before](#), simply knowing the IRRs of bond and equity portfolios when you buy them gives you a more accurate idea of eventual return 10 years out, than is implied by short-term volatility. The investor with no need to withdraw funds until quite a few years from now and enough assets to tolerate portfolio ‘drawdowns’ on the way to when they need their savings, thus perceives much less risk on volatile assets than those with uncertain cash needs, who need to stay more liquid and less volatile assets.

The implication is that the long-term investors can hold more volatile assets and more illiquid ones, including private assets, not traded daily on a public exchange (see below).

4. In addition, US states, such as NY, also do not tax coupon income from bonds issued by the state itself and municipalities in the state to investors tax domiciled in the state. Other tax advantages in many countries apply to permanent life insurance, making this asset produce higher net returns for the same yields than taxable corporate debt. One other reason why even a KISS investor will hold more than one bond fund.

## 2. Structural alpha from factors and structured products

A second argument for certain asset classes providing superior returns to risk is the many behavioral biases that affect our behavior will make asset returns deviate from those implied by unbiased rationality and market efficiency. The asset/security selection strategies to exploit such inefficiencies are frequently targeted by factor investing such as the classic Fama-French equity factors of Value, Size (small caps) and Momentum,<sup>5</sup> and can be incorporated into structured products that replicate these strategies. We ourselves have written frequently over the past 25 years about these strategies.

These products or approaches can be quite basic and easy to understand. The problem is that the simpler they are, the easier they become to replicate and reproduce, and the more likely it is that their superior returns to risk will be arbitraged eventually away. One thus needs to constantly innovate and exploit the latest research, techniques, and insights to stay ahead of the crowd but this then adds cost, complexity, and a serious time allocation.

Hence, we would say that **KISS and earning market-beating returns do not mix easily**. For the latter, you need to give up the first. **Structured products thus do not really belong in a KISS portfolio**, in our opinion. But see our nuance statement at the end of our note that this does not make it irrational or wrong to own them.

## 3. Tactical alpha

Our starting argument of better returns on two globally diversified passive funds was based on the higher costs of active management. But **can't one argue**, as active managers almost all do, **that active security picking and macro positioning can earn more “alpha” than the expenses of generating it?**

Within the world of retail ‘plain vanilla’ equity funds, significantly less than half beat passive funds on the same market after fees.<sup>6</sup> In fixed income, active US funds beat passive ones after fees just over half the time this past decade. To make sure one does not invest in ‘shadow’ trackers that charge a fee for active management but stay close to the

5. Our Quantitative Equity Research group constantly monitors and analyses a large set of equity factors such as those in our [US Factors Reference Book](#), May 2018.

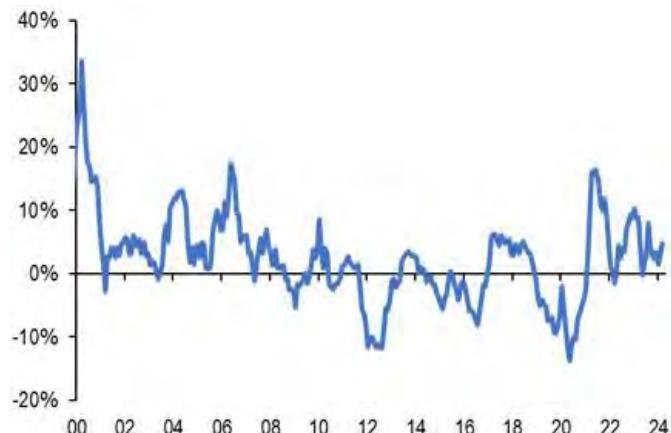
6. [Morningstar's US Active/Passive Monitor](#) (Year-End 2023) analyses the returns on 8,338 funds, with \$18tr AUM, or 55% of the US fund market. It finds that over the past 10 years, only 6% of Global Large Cap equity funds, 13% of US large cap and 25% of US small cap outperformed their passive equivalents. Among corporate bond funds, 58% beat their passive equivalents.

index, one should probably focus on managers that take more active risk, all the way up to index-agnostic hedge funds. But again, no free lunch here, as the more active risk the manager takes, the greater the dispersion of active results relative to passive ones. By itself, this does not automatically raise a fund's volatility as some managers will be betting against the market trend, but adding active (alpha) to passive (beta) risk does add another source of volatility and one that is harder to assess, as we have discussed above.

That said, we have argued in the past few years, that we foresee a **more volatile world**, economic and markets-wise, over the next 10 years that should improve the performance of active managers.<sup>7</sup> This view led us to add Hedge Funds to our Strategic Allocation recommendations, a position that has indeed worked.

**Figure 1: Hedge funds excess returns**

%, 1/2000-3/2024, monthly. HF minus an equity/bond portfolio with weights to give it the same return volatility on a rolling basis.



Source: J.P. Morgan, HFR, Bloomberg Finance L.P.

#### 4. Exploiting long-term trends

Can't we do much better than our simple combo of a global equity and bond tracker by focusing on major long-term trends that should change spending and investment patterns and thus create significant winners and losers among asset classes, countries, and issuers? In principle, such gradually developing trends are well known by all and should thus be in the price, eliminating any upside from investing on them. However, we do find that most market participants are focused on the here-and-now that drive asset prices this month and quarter, as the present value of far-out events easily pales compared with that of the here-and-now. We have thus found it worthwhile to investigate the probability and

potential impact of secular changes in our economies and markets and allocate more to assets set to gain from them, while avoiding those that should lose out. We made a case in our [strategic advice](#) to add an extra allocation, beyond a basis global equities and bonds, to the global Tech, Value and Financials sectors on the ultimate gains from AI, and a demographic-driven secular rise in bond yields.

That said, one popular way to position on global trends is to invest through Thematic funds. Besides climate change and the energy transition, these themes include digitalization, fintech, demographics, EM consumers, and so on. When we [looked](#) at such funds, though, we found they badly underperformed the overall market. Half of this was due to the high fees on such funds. The other half was that investors only really tend to buy such funds on evidence that they are indeed outperforming, which means that by the time they bought them, the assets the funds held were rather expensive and set to produce lower returns from that point on. The lesson here is investing on a widely held view that already has had a measurable impact on asset prices probably means one will be a bit late to the game. Better to start on a theme that is not yet consensus and can only be judged a serious risk rather than a done deal.

**In short, can we do better** than our starting point of investing in just one global bond and one global equity fund? Yes, but we can do this with just a few alterations that will keep us consistent with our KISS approach. The impact of financial repression and tax differences can be incorporated by just holding HG corporate debt, dropping government debt, and adding a tax-exempt product (such as US Munis or life insurance) in the case of investors with high marginal tax rates. Long-term structural change, where not yet fully priced, can be incorporated with a few select ETFs, or choosing say a DM equity fund, dropping EM if it is feared this region could badly underperform if Climate Change accelerates. We are not in principle against including active funds, but feel that this requires investing via quite specialized managers, by style, region, sector or just asset class. That in turn implies multiplying the number of funds one holds, increasing complexity and monitoring costs. Nothing wrong by itself, but in our mind not part of what a KISS portfolio should be.

#### Other challenges and nuances to KISS investing

We have heard and seen quite a few other challenges to our KISS portfolio, some of which can be countered, some of which do have a valid point.

7. First argued in [Inflation, markets and the end of the Great Moderation](#), Sep 27, 2021, and confirmed in later notes.

## 1. Can two ETFs do it for a \$100bn fund?

**Very large public or pension funds** or sovereign wealth funds, such as those with over \$100bn in AUM, will rarely if ever use just a few funds or external managers as they will want to control their exposure to individual counterparties. Putting 70% of this \$100bn in a single global equity fund is not easy as there are not that many funds of this size. This risk could be simply operational and liquidity but could go as far as default risk. Hence, it makes sense for them, when they employ external managers, to use quite a few different ones, even when focused on the same asset class as they will need to diversify counterparty risk across these managers. This does not increase complexity too much, nor monitoring costs.

## 2. Who wants diversification, anyway, if you know what you are doing?

Two of the best long-term investors in the world, Warren Buffett and Charlie Munger, have repeatedly argued against wide diversification, in favor of much more **concentrated positions in individual companies** that they consider best value. They have called **diversification “protection against ignorance”**, and that it makes little sense for anybody that knows what they're doing.

In our view, it made sense and worked for them to hold very concentrated positions in just a few companies that they thought would produce superior returns based on the price they paid for them and the strong competitive positions these companies had in their industries. At the same time, Warren Buffett has frequently also argued that for over 99% of investors it makes more sense to invest in a low-fee SPX tracker and not to trade in and out.

Buffett and Munger at Berkshire Hathaway have had a remarkably superior performance ([10% pa over SPX since 1965](#)) investing in companies on which they did extensive research and made sure to buy them when they were cheap. Quite plausibly, they are just superior minds that very few of us can replicate and the rest of us thus just have to rely on wide diversification to achieve normal market returns to risk.

That said, empirical analysis through 2011 has been able to “explain” Berkshire’s superior return as the result of buying companies with value, stability and quality characteristics, enhanced with cheap leverage from being an insurance company. Since then, though, Berkshire has stopped outperforming, earning a return quite in line with the S&P 500. This supports the view we expressed before that “all alpha has a sell-by date”. That is, Buffet and Munger have been quite open about their approach to investing and have created a global following that produced a plethora of books and analyses of their performance. With their “secret sauce” made public and

so many investors following their approach, it should thus not be totally surprising that their alpha would eventually be arbitraged away. And having fewer opportunities in the market to apply their value approach to may explain why Berkshire Hathaway has held on average [15.5% of its assets in the form of cash since 2011](#).

## 3. Income versus wealth objectives

Much of optimal investing and allocation research makes the implicit assumption that your investment horizon is a single point in future time when you will want to use your savings. This focuses analysis on what return you can expect from now to that future point in time and what could go wrong by the point. In reality, the end-investor, whether an individual saving for retirement, a pension, insurer, endowment, or sovereign wealth fund, almost always needs to plan to be able to use savings over a **future period that can span decades**. That is, the objective is not necessarily to maximize wealth at one particular point in time, but instead a flow of income, or distributions over many years, with the end point uncertain, indefinite, or even forever shifting forward.

In principle, our two-fund KISS portfolio can handle this income objective as, say, a retiree would simply gradually sell of part of these two funds as needed to fund spending in retirement. Much of their portfolio by that time ought to be in fixed income as their investment horizon is no longer long enough to have some confidence that any sudden downfall in equities will be offset in later years, as you may not be around anymore at that time. But even a single bond fund will incur some risk that will create uncertainty about what distributions you can expect and thus what your spending ability will be.

A less risky strategy is a portfolio of bonds each of similar size and each maturing in a staggered fashion over the years when you will need the money: in effect, a **bond “ladder”**. A KISS investor near the point of retirement then likely will find a lifetime **annuity** fitting much better in terms of safety and ease of understanding as it eliminates the risk of outliving one’s savings (the annuity issuer, usually an insurance company, takes on this longevity risk and can diversify much of it away across its full client base). Such annuities allow the KISS investors to go to only one asset class.

## 4. Don't Alternatives add return, and extend the market?

A lot of institutional and high-net-worth investors have been piling into alternative assets, especially private equity, private debt, infrastructure, real estate, and hedge funds. Some of the attraction of alternatives is an expectation of higher returns, and a smoother return pattern as these assets do not have a ready secondary market and are instead valued by the manag-

er on their projected ultimate cash flow.

Within our KISS strategy, there are **pros and cons** with respect to **Alternative Investments**. On the pro side, Alternatives are just a way to extend the market, by not limiting oneself to publicly quoted securities and companies. Alternatives are not just another set of more expensive managers of the same assets that one could otherwise buy with two simple ETFs. **Private equity and credit are not issued by the same companies that have issued debt or equity in the public markets.**<sup>8</sup> They may be similar, but that can be said also of many issuers within the public market.

**Private credit**, in particular, lends to “*middle-market companies deemed too risky or large for commercial banks and too small for public markets...*” and is thus “*outside the realms of either commercial banks or public debt markets*” concludes a recent IMF study on [The rise and risks of private credit, Global Financial Stability report, Ch. 2, April 2024](#). Similarly, private equity does not fund companies that are publicly listed, even as LBOs will tend to acquire public companies, take them private, “clean them up” and then sell them off again the public markets through an IPO. Venture capital, in contrast, funds new business ideas and freshly set up small firms before eventually launching those that survive into the public markets through an IPO.

**Infrastructure** similarly counts as an asset that reaches out beyond the public markets.

Our argument that KISS investing should aim for **max diversification** and own the world market should welcome getting access to non-listed companies through private equity and credit.

**Commodities**, through futures, are considered an Alternative Investment and could also be seen as an asset class not covered by the public markets, aside from the shares and debt issued by miners, agribusiness, and commodity traders. That said, as we [argued](#) before, they are **not in our mind financial assets that belong in one's strategic allocation** as their return consists only of price changes and not income (roll income tends to be more negative than positive) and is not backed by productive investment like bonds and equities are.

The last member of our Alternative family is **hedge funds**. It **does not really belong in KISS Investing**, in our view, as it is the opposite of passive investing, is surely not simple, far from transparent, and not exactly low fee. Hedge funds

8. There are [8.3 million companies](#) in the US that have more than one employee. [Only 3,647 of these](#) can be accessed via the public equity markets.

almost all trade publicly listed assets, and thus do not qualify as an extension of the market that is to us a plus point of private assets. Returns on the overall hedge fund world are in effect beta exposure to the asset classes they trade, plus alpha from their smart trading, minus a high fee for their services. You could go as far as to consider their trading skills an asset class but would be to us stretching the concept too far. We did make a case for hedge funds to be part of our [Strategic Asset Allocation](#) (Oct 10, 2023) on our view of continued high macro volatility in the future and indeed hedge funds have outperformed, after fees, since Covid (Figure 1 above).

On the downside, Alternatives are **costly to hold** in terms of fees, understanding, monitoring, and reporting and are **not transparent**, lacking the public disclosure requirements of publicly listed securities. They are **hard to value** as they are not traded on listed exchanges. Reported values are estimated by their managers and could be quite stale relative to faster moving public markets that will price in all relevant information in real time.

**Risk** is hard to assess on Alternatives, in particular on private assets. In principle, one can use the historic volatility of private assets' returns over their full vintages to judge risk. However, it is very hard, if not impossible, for all but the largest investors in the world to get the same full access to the private asset class as one can get to public markets through a single ETF. In the alternative world, you need to invest with one or a few managers, and there can be a big gap between the return your portfolio will earn and the one of the full private asset or hedge fund market. One needs to consider this **manager selection risk** as an extra source of potential downside when investing in alternative assets.

**Overall**, Alternatives are not really KISS Investing as they are not simple to invest in, to value, to understand, or to monitor. Returns and risks depend on what managers you have chosen. They do, however, tick two boxes that fit with KISS: They extend your reach beyond the public markets and thus provide more overall diversification, and by their illiquidity, they prevent excessive trading and put you more into buy-and-hold we consider part of KISS investing.

## 5. But what happens if we all go KISS?

If everybody follows KISS investing and goes passive, who will do price discovery and assure all available information is in the price? If there are no longer enough active investors, markets likely will no longer be efficiently priced, and the whole argument for the superiority of passive investing can fall apart. Are we there already and will thus destroy our argument for KISS investing? Will self-investing self-destroy, just as the eternal search for superior assets ultimately destroys—or arbitrages away—the excess returns to risk

earned by any such superior assets lying above our global risk return trade-off market line.

We do not think so. Most important, if we already have too many passive investors and not enough active ones making sure all assets incorporate all information, then there would be profitable opportunities to buy underpriced assets, allowing the remaining average active manager to outperform their benchmarks. As discussed above, this is not yet the case. And if it were in some times or markets, this would in turn attract more active managers who would over time again make markets more efficiently priced.<sup>9</sup>

## 6. Does one have to KISS?

No. Our point is not that you must absolutely follow a KISS investment strategy or are doomed if you don't. Far from it. Our point is more that you can achieve most, if not all of your financial objectives by following our KISS approach. If you don't and get involved with more products, trade more frequently, take more concentrated positions, hold more complex alternatives, it is possible you will do better than our KISS ideas, but you will be taking more risk and will have to spend dramatically more on fees, time, and effort to understand, monitor, and report on your investments. If you love this and it is your hobby, go for it, but we would suggest controlling yourself and making sure the non-KISS investing does not endanger your ultimate financial goals or that of those whose savings and wealth you are taking care of.

## Concluding thoughts

**Our industry does seem to love complexity and to abhor simplicity.** The more complex the financial world becomes, the more managers, analysts, traders, consultants, regulators, and risk managers feel they add value and expect to be paid. But we conclude there is a lot of benefit to the ultimate buyers of financial services and products to keep things simple.

For one, one should not buy assets that are too complex to be easily understood as the risk is then that the asset will not be appropriate for one's financial objectives. Second, the fewer the assets one has in one's portfolio, the **easier it is to judge risk** on them, the easier it is to gauge one's exposure, the easier it is to manage one's portfolio and the **less time it takes**.

**Time is indeed money.** And probably the greatest benefit of simpler products is that they are cheaper, in terms of management fees and the costs of buying and selling them. Simpler products that are well understood by everybody will likely also be more liquid. The simplest investing rules, like "buy

and hold" and do not move assets around much, are also easier to follow, save on taxes and other transaction costs and reduce the trap all of us are at risk of falling into, which is to sell when markets have been going down a lot and to buy when they have been going up (i.e., the risk of buying high and selling low). Finally, we have found that the **simplest valuation rules**, like using an asset class IRR, bond yields and equity yields, or mean reversion in real exchange rates, have had a much better record in judging future long-term returns than more complex systems.

Overall, then, we feel that **keeping things simple in finance, fewer assets, simple valuation rules, simple investment rules, is an underrated strategy** and one that too few of us actively pursue as the mainstay of their strategic allocation.

9. We discuss this issue more in depth in our [Ten topics in strategic investing](#), Mar 19, 2024.

## The Long-term Strategist

Ten topics in strategic investing

- We look at **10 different questions on strategic investing and what they mean for you.**
- **How safe is your cash?** Cash may be default free, but to long-term investors, who need to roll over cash at unknown future yields, the eventual return on cash is more uncertain than bonds with maturities that match your spending timing needs. Hold more bonds instead of cash if you like to reduce long-term risk.
- **Was Charlie Munger right in not finding diversification important?** We do not think so as Berkshire's concentrated bets require their supreme selection skills that not many of us have, and either way, their value approach is now so widely known and copied that their returns no longer beat the market.
- **Will the 7-century trend of falling real yields continue in coming decades?** We don't think so. Real yields bottomed already with WWI, with aging and fiscal excesses now more likely to push real yields up the next 10 years.
- **Manager selection risk is an underappreciated risk of private assets,** as it is near impossible to gain as fully diversified an exposure to the global private asset class as one can get cheaply with ETFs on listed bonds and equities.
- **Does liquidity have value?** In principle, yes, as it is an option, which should not have negative value if we behave rationally. But behavioral biases tend to make many of us overtrade, buying high and selling low. Liquidity can become destructive, suggesting we should allocate part of our assets to illiquid ones.
- **How is the rapid rise of target-date funds changing markets?** At \$3.5tr now in the US alone, they bring more passive investing; help stabilize markets as they need to sell into rallies and buy on sell-offs; weaken the Momentum factor; and will move from equities to bonds as the large baby boomer cohort retires.
- **Can markets and capitalism "fix" the climate problem just as they did with the 1972 Limits to Growth warning?** They could, if we dramatically raise the price of carbon (which we are not doing), just as higher oil prices induced more oil exploration and less consumption from the 1970s on.
- **Has passive investing broken markets?** We say no, or not yet. If too much passive investing destroys price discovery, securities will become wrongly priced, providing easy money for active managers, pushing passive investing back. We don't see evidence of there being that much active alpha in markets.
- **Are stocks still best for the long run?** Jeremy Siegel argued so in his *Stocks for the Long Run*, showing US equities beat bonds in 92% of 20-year periods since 1802. Better data now show this was only for the post-WWII period and only for the US. Not a law anymore, and mostly US exceptionalism that is at risk. We stay with a balanced portfolio, including bonds and non-US equities.
- **Why are non-US investors not piling into stocks just as Americans are?** Sustained underperformance vs the US, combined with home bias and lacking the dramatic gains available to Americans in the ease and cost of holding and trading equities are the likely drivers.

### Long-term Strategy

**Jan Loeys** AC

(1-917) 602-9440

jan.loeys@jpmorgan.com

**Alexander Wise**

(1-212) 622-6205

alexander.c.wise@jpmchase.com

J.P. Morgan Securities LLC

## 1. How safe is your cash?

This question is not about whether your cash will disappear, or the issuer will default, but more about whether cash is really the risk-free asset we all assume it is. It is a standard assumption of finance models and valuation metrics that **cash is your safe or risk-free asset** and that all other financial assets are priced at a risk premium over cash that is a function of the riskiness of these assets vis-à-vis cash.

For an investor, cash is virtually always defined as a 1- or 3-month government-guaranteed bank deposit or debt instrument issued by the national government of the country that issues the currency you spend their money in. This assumption, which it is and not a fact, is never really challenged. But it should be.

The great majority of end investors save money for old age or future generations. That is, **almost all of us are long-term investors**, with an investment horizon way beyond the 1- to 3-month maturity of the cash instrument that is supposed to be your safe asset. Safety, and its inverse – risk – are really the risk that your portfolio will fall short of the return you expect it to yield and by how much you could fall short. If you invest in a cash instrument, even one with no risk of default, that has a maturity well short of when you want to start spending it, **you will have to regularly roll it over** at a future interest rate that is not yet known. **Over the past 70 years, the per annum return on 3-month US T-bills over 10-year holding periods has shown a standard deviation, or volatility, of 1.5%.** This may not sound like much and is indeed well below the 2.7% volatility on the compound pa return on the US Aggregate bond market over 10-year holding periods. The difference is due to the much longer duration of bonds (~6 years in the case of the US Agg.), which more than offsets the lower volatility of longer-maturity bond yields.

However, as frequently discussed with you, your long-term investment risk should not be narrowly defined as return volatility but by how confident you can be about your return expectation over your investment horizon. In the case of fixed income, knowing the yield on the bonds you are investing in gives you a very good idea of what return you will earn over a period one to two years short of twice the duration of the bond portfolio you are acquiring.<sup>1</sup> US Agg 10-year compound pa returns have historically ended up two-thirds of the time within 70bp of the yield at the start of each period, a range that is much narrower than what would be implied by the historic volatility of these returns, or of cash returns. In the case of cash, we do not have an obvious manner to project

the future T-bill rates at which cash will need to be rolled over. However, we do know the track record of economists like us making 10-year out forecasts of T-bill rates, and it is not very good.<sup>2</sup> Blue Chip Economic Indicators has surveyed 50-60 economic forecasts at major US banks, insurers, asset managers, government departments, and academia twice a year since 1983 on their views of the development of the 3-month T-bill rate over the next 10 years. Since 1983, the T-bill rate had a volatility or standard deviation of 1.88%, but forecasters had an even larger root-mean-square forecast error of 2.6% for the 10-year out average T-bill rate. This indicates to us that long-term investors need to assume that the return on cash over the next 10 years will have greater uncertainty than that on the overall US bond market.

With bonds generally offering a term premium on top of cash, their long-term return over their long-term risk is thus significantly higher for bonds than for cash. It helps explain that long-term investors will generally have little in cash and much more in bonds.<sup>3</sup>

**Implication for strategic investors:** if you want to reduce risk, you are better off holding bonds that mature around the times you want your money back than in adding cash, as the bonds will generally produce a higher return and there is less downside risk on them than on serially investing in cash over that period.

Watch the video on [jpmm.com](#), or on [LinkedIn](#).

## 2. Was Charlie Munger right in not finding diversification important?

Charlie Munger, Warren Buffett's alter ego at Berkshire Hathaway, died a few months ago just short of reaching 100 years of age. Munger was a much-admired investment thinker, and many of us have learned a lot from his sayings and writings. But that does not mean we agree with everything he said. Or better said, some of his wisdoms apply more to himself and are not immediately good advice for the rest of us. One of these issues of contention is the issue of **diversification**. Are **Buffett and Munger right on diversification being just protection against ignorance**, and that it makes little sense for anybody that knows what they're doing?

In our view, it made sense and worked for them to hold very concentrated positions in just a few companies that they thought would produce superior returns based on the price they paid for them and the strong competitive positions these companies had in their industries. At the same time, Warren

1. See [Long-term forecasts: Update January 2023](#), Jan 6, 2023.

2. See [How good are long-term forecasts?](#), June 14, 2022.

3. [Will Americans continue to love equities?](#) Feb 21, 2024.

Buffett has frequently also argued that for over 99% of investors it makes more sense to invest in a low-fee SPX tracker and not to trade in and out.

Buffett and Munger at Berkshire Hathaway have had a remarkably superior performance ([10% pa over SPX since 1965](#)) investing in companies on which they did extensive research and made sure to buy them when they were cheap. Quite plausibly, they are just superior minds that very few of us can replicate, and the rest of us thus just have to rely on wide diversification to achieve normal market returns to risk.

That said, empirical analysis<sup>4</sup> through 2011 has been able to “explain” Berkshire’s superior return as the result of buying companies with value, stability, and quality characteristics, enhanced with cheap leverage from being an insurance company. Since then, though, Berkshire has stopped outperforming, earning a return quite in line with the S&P 500. This supports the view we expressed before that “all alpha has a sell-by date.”<sup>5</sup> That is, Buffet and Munger have been quite open about their approach to investing and have created a global following that produced a plethora of books and analyses of their performance. With their “secret sauce” made public and so many investors following their approach it should thus not be totally surprising that their alpha would eventually be arbitrated away. And having fewer opportunities in the market to apply their value approach may explain why Berkshire Hathaway has held on average [15.5% of its assets in the form of cash since 2011](#).

**Implication for strategic investors:** In conclusion, we feel comfortable with our view and recommendation that long-term investors should start off with a globally diversified portfolio and only deviate from such a strategic allocation on the basis of strong views and objective information.

Watch the video on [jpmm.com](#), or on [LinkedIn](#).

### 3. Do seven centuries of falling real bond yields indicate further drops in bond yields in coming decades?

Ken Rogoff, Barbara Rossi and Paul Schmelzing wrote a paper this past summer on Paul’s database on real interest rates going back seven centuries.<sup>6</sup> Yes, seven centuries, not decades. They find that real bond yields have been trend-declining since 1400, issuing a clear warning to people

4. [Buffett's alpha](#), Frazzini, Kabiller and Pedersen, NBER working paper 19681, Nov 2013.

5. [Long-run trends in long-maturity real rates: 1311-2022](#), NBER working paper 30475, July 2023.

6. [What have I learned so far on strategic investing?](#), Dec 5, 2023.

like us who have been [arguing](#) that the trend decline in real bond yields over the past 40 years is over and that we will likely see somewhat higher real bond yields over the next decade.

Rogoff and his co-authors do not attempt to explain why real yields have been declining for so long, leaving that to future research, but they do briefly mention that this may reflect a steady decline in the risk of default on sovereign bonds. We think that is the real reason. There were barely any sovereign states with stable tax revenues six or seven centuries ago with the new emerging banking houses of the Medici and Fuggers taking a lot of risk by lending to the wars of their local princes that would only be repaid if they won that war and kept their head in the process.

By the beginning of the last century, the major developed sovereign states acquired the right to collect taxes on income and founded central banks, both of which dramatically lowered their risk of default. And indeed by that time, [since WW1, real bond yields have actually been rising on average](#). Rogoff and co-authors also found that major deviations of real yields from this trend decline were always quickly reversed. By their work, real bond yields in the developed world are now below where they see this new upward trend and if anything point to a bit higher levels than the [2 1/4% we think is the long-term average](#) for US Treasury real yield in this coming decade.

**Implication for strategic investors:** We feel comfortable that both the seven-century long slide in real bond yields and the more “recent” four-decade slide are over, at least for the next decade, largely because of the rise of the dis-saving elderly cohorts and rising fiscal pressures. We do not want to extend this prognosis much further into the future as there is simply too much uncertainty that far out.

Watch the video on [jpmm.com](#), or on [LinkedIn](#).

### 4. Manager selection risk is the hidden risk of buying alternatives

A lot of institutional and high-net worth investors have been piling into alternative assets, especially private equity, private debt, infrastructure real estate, and hedge funds. Some of the attraction of alternatives is an expectation of higher returns (not our focus here), or a smoother return pattern as these assets do not have a ready secondary market and are instead valued by the manager on their projected ultimate cash flow. Or investors are simply trying to get exposure to part of the economy that they cannot reach via the public equity and

bond markets.<sup>7</sup> The latter makes sense.

Our main point of contention here is that when assessing the risk on alternatives and comparing this with the risk on exchange-listed stocks and bonds, buyers and marketers of alternatives, by our impression, tend to obscure one important source of risk, which is what we would call **manager selection risk**.

With public equities and bonds, you can gain full and low-cost access to the asset class with a simple ETF or mutual fund, and you can analyze their returns and volatility with plenty of data. Returns will be compared with those on alternative assets, properly adjusted for any survivorship bias. Risk is much harder to assess on unlisted asset classes as the lack of a liquid secondary market means one can only figure out any downside to one's return expectations after a fund has been unwound and any remaining principal and dividends have been paid out to the investor. This problem is well known, and there are ways to produce unsmoothed volatility estimates similar to those on listed asset classes.

One source of risk that we see little debated in discussions on the relative merits of public versus private assets is that it is **very hard, if not impossible, for all but the largest investors in the world to get the same full access to the private asset class as one can get to public markets through a single ETF**. In the alternative world, you need to invest with one or a few managers, and there can be a big gap between the return your portfolio will earn and the one of the full private asset or hedge fund market. One needs to consider this "manager selection risk" as an extra source of potential downside when investing in alternative assets. Alternatives are no panacea. Caveat emptor.

**Implication for strategic investors:** When making a choice between public and private asset classes, one should judge private-asset risk not simply by the long-term return volatility of the two asset classes, adjusted for smoothing, but one needs to account also for the "extra tracking error," or "manager selection" risk, on the private asset funds one invests in.

Watch the video on [jpmm.com](#), or on [LinkedIn](#).

## 5. Does liquidity have value?

Yes, and no. Liquid securities have generally lower yields than less liquid ones as trading-oriented investors and those with quite uncertain spending needs will prefer them. Liquidi-

7. There are [8.3 million companies](#) in the US that have more than one employee. [Only 3,647 of these](#) can be accessed via the public equity markets.

ty clearly has value for tactical investors and **traders**, and is a necessity to them, as they are trying to produce returns from exploiting shorter-term movements in markets.

But is this ability to go in and out of markets at low cost of that much **value to long-term investors, many of which should be considered "buy-and-hold" investors**? Most individuals save for old age, decades from now, while sovereign wealth funds invest for the next generation or longer.

In principle, liquidity gives you the option to trade, but not the requirement. **In Finance, it is considered self-evident that all options have value** as there is no requirement to exercise them if it would lead to a loss. Their value will be close to zero if it has a short time remaining to exercise and is quite far out of the money. But they will not have negative value.

This argument, however, **assumes we all behave rationally**. There is enough evidence in Behavioral Finance that many of us do not always behave rationally and are liable to such biases as anchoring, loss aversion, regret, and overconfidence, the latter in particular with respect to our ability to time the market. As a result, in our mind, many individual investors tend to "abuse" liquidity by trying market momentum, in the process **buying high in a bull market and selling low in a bear market**.

**Implication for strategic investors:** Having liquidity is a bit like working at home and having a fully loaded fridge nearby. The ability to snack or to trade at will generally lead to overeating and overtrading. Controlling our overeating and overtrading by limiting our ability to do so, by not having a full fridge nearby, or by **investing in less liquid assets such as private equity or credit, or having it managed by somebody else who is told not to trade, is worth a lot**, in our opinion.

Watch the video on [jpmm.com](#), or on [LinkedIn](#).

## 6. What impact from the rapid rise of target-date funds?

What should we think of the rapid growth in target-date funds in the US and their impact on markets? Target-date funds try to apply the classic Rule of 100 according to which your equity allocation should be 100 minus your age. If you are Jan's age, that means 30% in stocks, 70% in fixed income. If you are Alex's age, reverse these numbers. Instead of you adjusting your portfolio yourself each year that you are a year older, target-date funds do this for you. A target-date fund 2050, for example, will have a glide path with initially a high equity allocation that comes down each year based on your

target retirement year of 2050. Generally, they seem be following more a Rule of 120 than 100.

Such funds have become the **main default of most US employer-sponsored defined-contribution pension plans**, such as 401Ks, since the 2006 Pension Protection Act. They are growing tremendously fast, to \$3.5 trillion today,<sup>8</sup> 4 times what they were under 10 years ago, and making up now 12% of all US household pension savings, which include large defined-benefit plans.<sup>9</sup>

We can see several ways the raging popularity of these funds is impacting markets. One is that it **accelerates the move to passive investing** even as these funds can invest in active mutual funds, as a prime motivation for companies to introduce target-date funds among eligible 401K investments has been to meet pressure (and lawsuits) to reduce expenses to their employees. A second is that it **reduces market volatility** as investing mainly in one well-balanced fund reduces the temptation to chase the market when one holds many different asset types with diverging returns. In addition, target-date funds by mandate need to stay close to their target bond/equity allocation, which means they need to sell stocks into a rallying equity market and buy when stocks fall and underperform bonds. This helps stabilize both bond and equity markets.<sup>10</sup>

A third implication is that this selling on rallies and buying on market weakness implies a **weakening of the Momentum Factor** that quite some active managers still rely on. Finally, the combination of the growing prevalence of target-date funds and the large baby boomer cohort crossing into their 70s rapidly should over the next five to 10 years induce Americans to lower equity allocations from their current all-time highs in favor of fixed income and should be one factor that will keep US equities in single-digit return territory.<sup>11</sup>

**Implication for strategic investors:** Do not over rely on the Momentum factor and maintain a balanced portfolio between bond and equities and US and non-US assets.

Watch the video on [jpmm.com](http://jpmm.com).

8. [The state of the target-date market: 2024](#), Sway Research.

9. 12% is calculated as the ratio of the \$3.5tr Sway Research estimate of the target-date fund market over \$28.8tr US households total pension entitlements estimate by the Fed's [US Financial Accounts](#) (Z1, Table L.101) for Q3 2023.

10 [Retail financial innovation and stock market dynamics: The case of target-date funds](#), Parker, Schoar and Sun, NBER working paper #28028, August 2022.

11. We discussed this more extensively in [Will Americans continue to love equities?](#) Feb 21, 2024.

## 7. Will free-market capitalism solve the Climate Change problem just as it did with the dire warnings of “*Limits to Growth*” by the 1972 Club of Rome?

We keep hearing the argument that we should be more relaxed about the dire warnings of scientists about the end of the world coming, at least for humans, when climate change hits tipping points. People of Jan's generation recite to him how the dire warnings, over 50 years ago, by scientists in so-called [Club of Rome](#) turned out to be completely wrong.

These scientists and economists used MIT simulations to project a significant fall in economic growth and living standards as the world would soon run out of resources and especially oil, given what they knew at the time of world reserves of these resources. Soon after the report's release in 1972, two oil crises pushed oil prices up by a factor of six, and suddenly oil companies had plenty of reason to prospect for and to find more oil, and consumers found it worthwhile to conserve on energy, such as by driving smaller, more fuel-efficient cars. **The free market, via its price mechanism, took care of the problem.**

**Can't then a free market again take care of the next big problem – global warming – and find technologies to replace fossil fuels, pull carbon out of the air, and get us to net zero by 2050?**

**In principle, this might be possible, but for that we need to see a significant price movement that incentivizes the world to de-carbonize rapidly.** We need a dramatically higher price, meaning a tax, on carbon emissions, which imply a much higher price on oil and gasoline. That is **not happening today**. And the growth of sustainable funds and some bankers no longer funding fossil fuels are unlikely to push fossil fuel prices up sufficiently versus renewable energy, in our mind. In short, the moral of the free markets beating the dire forecasts of the Club of Rome is not that we can again rely on capitalism to prevent the worst of Climate Change, but that we need a proper negative price – a tax – to get markets and entrepreneurs to help us adapt to global warming and mitigate its worst impacts. This price is not here today.

**Implication for strategic investors:** Climate change, global warming, and ever more extreme weather are to us realities that will likely become worse than the modal forecasts of scientists. Many investors have been positioning on this by buying into renewable energy, rare earths, and carbon capture technologies, among others, while excluding fossil fuels, but returns have not been impressive. We think they should also consider becoming more selective about the location of the assets they are holding as extreme weather makes relatively immobile assets, such as real estate and infrastructure, located

closer to the equator or to the shore more vulnerable to extreme weather events.<sup>12</sup>

Watch the video on [jpmm.com](#).

## 8. Is the rise of passive investing killing price discovery and capitalism?

Has passive investing indeed fundamentally broken markets, as David Einhorn, founder of value investor Greenlight Capital, has recently [argued](#). That at least was the headline. More precisely, Einhorn said that the dominance of passive investing has forced him to change his value investing approach as he no longer can simply rely on other investors pushing up the price of the underpriced stocks he bought. But there is indeed a valid question: who exactly will make sure that stock prices incorporate all known information about the company's future earnings if everybody passively invests in stocks and thus does not check what they are really buying. **Who will do the price discovery?** Will markets become very inefficient, or even random?

Einhorn commented that about half of stocks traded in the public market are owned by passive investment vehicles that are not doing the work of trying to properly price the assets they own. Quite possible, but do you really need millions of investors to do the same pricing work? We are not that worried, because if there are not enough active investors properly pricing the assets, there should be more mispricings, which increase the return value of value investing, and thus ought to bring in more active investing capital. We have not yet seen such evidence of higher stock picking alpha. Over the past few decades, the falling number of active equity managers beating the overall US large cap-market tells us, if anything, there were too many active managers and not enough passive ones. Hence, **we think we are far from having too many passive equity investors.**

Passive investing has also been blamed for **many other market "maladies,"** such as the **enormous concentration (Magnificent Seven), market bubbles, and momentum buying.** We do not agree. Passive investors by definition do not make bets on certain sector or individual stocks. They are passive. They will hold more of the sector or stocks that outperform simply because their prices go up after other, more active investors buy these sectors or stocks.

Einhorn also argued that flows into passive funds make them buy more of the stocks with the largest capitalizations than

12.We discussed this more extensively in [Climate and extreme weather risk is not priced into US residential real estate](#), Feb 26, 2024.

the smaller ones, seemingly implying that the latter fit more into the value category that he covets. Still, passive funds will need to buy the same percentage of the outstanding capitalization of each stock to remain passive, and to us it is not clear why this would push up prices of the larger caps by more than those of the smaller cap stocks.

The main accusation one might throw at passive funds is that by making it cheaper to own equities, they have probably contributed to the overall rise in equity multiples over recent decades. That does not, in our view, make passive investing responsible for market momentum or the emergence of bubbles.

Einhorn finally argued that the Value industry has been completely annihilated as money is steadily flowing into passive funds instead. To us, the weak performance of the Value factor in equities is more the result of a combination high fees in Value funds, economies of scale, and network effects in Tech that have greatly boosted Growth stocks and increased market efficiency and ubiquitousness of relevant information that has reduced the advantage of Value investors.

**Implication for strategic investors:** We do not think that markets are broken now but are functioning even better than before. Investors should not avoid passive funds, especially not among large caps as active managers do not have much left in terms of information advantages.

Watch the video on [jpmm.com](#).

## 9. Are Stocks indeed best for the Long Run?

Are stocks still best for the long run? We are obviously referring to Jeremy Siegel's runaway best seller [Stocks for the Long Run](#), first published in 1994 and now in its sixth edition. Siegel has repeatedly and consistently made the point that since 1802 US equities have beaten bonds 61% of the time in any particular year, but 92% in any 20-year period. The longer-term investor, which is almost all of us saving for old age, should thus be primarily invested in stocks. Since the first publication of Siegel's book in 1994, US households and non-profits have followed his advice and have doubled the share of their assets allocated to stocks.<sup>13</sup>

In the last few years, though, economists have sought out more and better data on bond and equity returns pre-WWI

13.As discussed recently in our [Will Americans continue to love equities?](#) Feb 21, 2024.

that raised returns on bonds and lowered equity returns.<sup>14</sup> These now show a near equal frequency of equities beating bonds and vice versa pre-WWII over 20-year holding periods. And similarly, more data for the rest of the world since 1900 have shown there also now more even frequency of higher bond or equity returns over 20-year holding periods. Hence, the equities-always-beat-bonds paradigm now appears more like **US exceptional for the post-WWII period**.

That said, it is not unreasonable to argue that today's equity markets and economies are quite different from pre-WWII ones and that the last 80 years of equity outperformance are more telling about the future than the pre-WWII period experience. Still, we think we are now **no longer talking about an economic "law" applying to all times and countries**.

Jeremy Siegel did not do that either, but many have interpreted it that way. To us, one should probably think more in terms of, say, 3 out of 4 odds of equities beating bonds over the next 20 years. By our models, from today's entry points, 10 years out, not 20, US equities have roughly two-thirds odds of beating US corporate bonds, with our expected returns of 5.7% on SPX and 5.2% on credit.

**Implication for strategic investors:** A good reason in our mind to hold a balanced portfolio of bonds and equities with the weights mostly a function of your age is the ability to absorb drawdowns. We do not think it is a good idea to be 100% in stocks, as some are arguing now.<sup>15</sup> That relies too much on equity multiples and profit margins rising a lot further, both from already quite elevated levels. And we think it is similarly a good idea not to put all of one's eggs into the US and holding non-US equities near market weights.<sup>16</sup>

Watch the video on [jpmm.com](#), or on [LinkedIn](#).

14 Edward F. McQuarrie, [\*Stocks for the long run? Sometimes yes, sometimes no.\*](#) Financial Analyst Journal, Nov 2023; [\*The US Bond Market before 1926: Investor Total Return from 1793, Comparing Federal, Municipal and Corporate Bonds Part II: 1857 to 1926\*](#), March 2021, and [\*A Re-Examination of Stock Market Returns from 1871 - 1897: Did Cowles Get It Right?\*](#), March 2021.

15 [\*Beyond the status quo: A critical reassessment of the life cycle investment advice\*](#), Anakulova et al., Oct 2023.

16 Our latest strategic allocations can be found in [\*Top Ten Strategic Investment Themes for 2024 and beyond: It is all about the US\*](#), Joyce Chang et al., Jan 9, 2024, and [\*Building Strategic Asset Allocation\*](#), Oct 10, 2023.

## 10. Why is it that only Americans have fallen in love with stocks, and not those in other countries?

Why it is American investors have piled so much into stocks, while the rest of the world has not? Thirty years ago, in the early 90s, US, German, French, and Japanese investors each held some 10-20% of their financial assets in equities. Since then, US investors close to tripled their equity allocation, while the rest of the world did not change them, keeping allocations much lower than where the US households and non-profits are now. Why was that? Simply saying that Europeans and Japanese are culturally more risk averse does not do it for us as we doubt such cultural aspects would have changed that much over this time.

We can see three forces that pushed US equity allocation up versus the rest of the world: **Superior equity returns combined with home bias and huge improvements in the ease and cost of holding equities in the US that were not matched elsewhere**.

On the first two, arguing that this is all because the US equity market has produced double the return of non-US ones over the past three decades on its own does not cut it as nothing prevented European investors buying US stocks. But these higher US returns are likely part of the story, when combined with the reality that most investors have a significant **home bias**, favoring domestic companies that they know instead of being fully diversified into companies on the other side of the world that they may have never heard of. Today, US investors have some 82% of their shares in US companies.

With many investors not having precise views of what equity allocation they should have, the ~5% higher returns on US equities over US bonds then automatically raised their equity allocation, something that did not happen elsewhere given their much lower equity returns. With most people's return expectations driven by past performance, US investors would have become steadily more confident in their own markets, leading them to buy more and pushing up their equity multiples almost non-stop versus those in the rest of the world.

The second force is the **massive size, economies of scale, innovativeness, and utter competitiveness of the US financial market** that have relentlessly driven down the expense of owning shares and made it so much easier. One can now trade virtually for free and invest through ETFs with expense ratios of just a few basis points. The only other investable market of comparable size in the world is the Euro area, but its money management industry remains balkanized despite decades of efforts to create a single market in finance. As a result, the average European UCIT is 1/7th the size of the average US

equity mutual fund and is thus much less able to spread its costs around.

Other local factors like taxation and regulations are probably part of the story, but from a top-down point of view, we think home bias plus superior US returns and a much more competitive asset management market are our prime explanation of why US investors have piled so much more into equities than those in the rest of the world.

**Implication for strategic investors:** US equities have outperformed the rest of the world in both the last 15 and 35 years to the point that the US now makes up two-thirds of the world market cap. Part of this outperformance is the 35-year long rise in US multiples against MSCI World ex US, which is in part explained by US investors dramatically raising the equity allocations over those years, especially to their own stock market, while households in the rest of the world did not do this. We resist strategically overweighting the US as we think an aging US baby boomer is set to reduce its equity allocation more than those elsewhere, and this should limit any further US outperformance. We are strategically market weight the US.

Watch the video on [jpmm.com](#).

## The Long-term Strategist

What have I learned so far on strategic investing?

- This note follows [one](#) I wrote 6 years ago at the end of my work tactical investing. It reviews where I get ideas from and what I have found to work or not to work in making profitable long-term investments.
- While all analysis needs to start and be informed by theory, it is empirical work – the data – I have found most informative.
- One satisfying result of looking at data is that I found it much easier to forecast long-term returns than shorter-term ones. It is also easier than forecasting long-run economic fundamentals, which fortunately one does not need to do as they show virtually no relation to long-term returns, which are instead defined by their entry IRRs.
- I have learned that longer-term portfolio risk, which is the odds and magnitude of being wrong on your return expectations, is different from and much lower than short-term price volatility. This is because knowing the price you pay for an asset class gives you a clear advantage to gauge its future long-term return and thus lowers the risk of disappointment on the eventual value of your portfolio.
- This in turn provides a great advantage to long-term investors, defined as owners of money who have no immediate need to spend it, are not levered, and are patient enough to absorb shorter term drawdowns. Long-term investors can make higher allocations to high-return, more volatile assets and can “harvest” illiquidity premia as liquidity should be less important to them. They should hold fewer safe assets, little cash and virtually no government debt, focusing instead on credit in their bond holdings.
- I find that the best strategy to invest for old age is to start with just two funds, a global equity fund and a broad credit fund hedged in one’s home currency, stay fully invested with little in-and-out trading, economize on fees, and add just a few strategic overweights.
- Our world is not stationary and is subject to regime shifts and long-term structural trends that can inform over- or underweighting countries, sectors, or other asset types, but one should not wait until these changes have become consensus and thus in the price and instead act when they appear on the horizon as only serious risk scenarios.
- Despite the academic consensus favoring passive investing, most believers in passive funds – me included – are not passive in their asset allocation and too easily buy high and sell low. It makes sense to have one’s SAA managed externally by somebody who uses an active but disciplined approach to allocating across asset classes and does not deviate much from it.
- Other ideas on the need for consistency (overrated); thematic investing (expensive and tends to happen when these assets have become overpriced); ESG (not a fan, but can tolerate impact investing); Alternatives (not that different from plain bonds and equities); and US exceptionalism (surprising given political dysfunction, but not yet fading).

### Long-term Strategy

Jan Loeys AC  
(1-917) 602-9440  
[jan.loeys@jpmorgan.com](mailto:jan.loeys@jpmorgan.com)  
J.P. Morgan Securities LLC

Six years ago, as I transitioned from short-term tactical investment strategy to my current long-term strategist role, I wrote [What have I learned?](#) (10 Nov 2017). Six years later, I have been asked to write about what I have learned so far on strategic investing. As in the earlier note, these are my own thoughts and do not necessarily represent those of my fellow researchers nor an official view of J.P. Morgan Chase. Hence, I will frequently use of the term “I” in this note but will switch back to our habitual “we” when the lessons learned and work done are more a team effort of our *Strategic Research* group, that is headed by Joyce Chang.

## Where to get ideas from?

**Theory or the data?** Where to start from, and what is more important, theory or empirical observations? Do we learn deductively from principles, or inductively from observations? To me, data without a theoretical framework mean nothing and easily give you nonsense correlations. But theory by itself is not enough, and if anything worse, as for every theory on how an event drives markets up, one can frequently build one with the opposite result. The supply of plausible theories in economics and finance is quite elastic and a lot more inexhaustible than the supply of empirical regularities. Hence, we need both theory, to guide us where to look for empirical relationships, and data, to test what theories find empirical support. **I tend to read pretty much only empirical research** in Economics and Finance.

**Learn, and unlearn.** I always thought that learning is *accumulative* in that each lesson would add to my understanding of the world. I hoped to become wiser as I studied, analyzed, and acquired more knowledge. But instead, I find now that for each new insight I gain, I learn that one or more old ones are no longer the case or may never have been fully right. In the end, I am not sure I now know more than when I began, unless I count also all the things I now know are not so. If the beginning of all wisdom is to know what you don't know, then I have surely gained a lot of wisdom.

**Failures and disagreements have taught me more** than any success or people agreeing with me. But this requires one to investigate why some advice did not work out and why other people do not agree with you. Despite its value, this is hard to implement, as we all prefer to forget and be quiet about what went wrong and prefer to talk with those who agree with us rather than with those who disagree. You thus need to push yourself to get out of your comfort zone, listen carefully and do not go immediately into a defensive mode. I have not always done this.

**What to do when you're wrong?** First, get used to it, as it won't be the last time. Even when I thought my logic and empirical support were spot on, there were many times other

factors emerged that I had not foreseen. Second, don't be stubborn or double up until you better understand what went wrong. Similarly, do not double up when you've been right and have reached your target, as overextending can turn a gain into a loss. Finally, spend time understanding why your views were wrong. You learn more from errors than from being right.

When do you give up, or even switch sides? It's hard to put a time stamp on this, and more an issue of when you can explain why it went wrong and whether this factor is a long- or a short-term one. If the forces that you had expected to drive your view or trade arrived and prices did not move the way you expected, take your losses and don't make it worse. If something totally new happened that played interference with your view and you think this new factor will be short lived, stay with your view. If the idea or trade worked in many countries but not in the big one (US) that dominates global markets, you probably want to hold on. Similarly, if the loss is small and future potential quite substantial, as with our too-early view the dollar would gradually weaken over the next 10 years, hold on.

**Do what you preach.** Barring conditions where regulatory conflict-of-interest rules or different circumstances (tax, currency, financial objectives) keep an analyst from owning and trading the securities they analyze and advise on, it is a good idea for a strategist to apply to their own finances the advice they give to their clients. If it is good for your client, why should it not be good for you? You can learn a lot about risk, timing, and sizing, and applying the advice to yourself creates credibility. I frequently say “... and that is what I do”, after having made sure this falls within the rules of permissible investments.

**Everybody has an axe and wants to sell you something.** Before I start writing on a particular question, I try to review what we call “the” literature, as there is no sense in trying to reinvent the wheel. And there is indeed a ton of published research by academic and financial industry researchers on any potential asset class and investment strategy, although not always on the more practical questions I get from clients. But whatever I read, I always ask myself why the author has written this piece, as we all have a purpose when writing investment notes. Financial researchers are not academic professors who are supposed to discover the absolute truth but belong to private organizations that have tasked them to help them make money. This applies to me also. And academic researchers also frequently consult with industry or try to stay true to earlier positions they have taken on. That is, we all try to sell you something. Caveat emptor.

**How can one then find more objective analysis?** One approach is to focus on analysts who have been studying the same field for a long time, as research is a “repeat purpose” business, and not just a single transaction. Analysts who are too much into “sell-mode” will not gather a loyal following and may thus not last very long. A second is to read analysts who do turn negative on their asset class from time to time. And a third is to read opposing views on a topic or asset class and make up your own mind on their relative merit.

**What is risk?** Since [Harry Markowitz](#) invented Modern Portfolio Theory, our industry has defined investment decision making in terms of just three parameters: expected return, risk, and correlation, or  $\mu$ ,  $\sigma$  and  $\rho$ . Risk should be the uncertainty we have around our expectations of future returns.  $\sigma$  should thus be defined by how you estimate  $\mu$ . If markets are efficient, we can't really forecast  $\mu$  except by looking at a long sample of past returns. Risk is then simply estimated as the standard deviation of historic returns, over months, quarters, or years. Our industry then makes the handy “iid” assumption under which returns are assumed to be identically and independently distributed over time. This allows us to gauge risk over longer periods through the square root of time rule as the volatility ( $\sigma$ ) of the average return over  $n$  periods is then  $\sqrt{n} * \sigma$ . If asset returns mean revert over time, then risk over longer periods will be lower than this  $\sqrt{\text{time}}$  rule.

More important, going back to how we should think about risk as the probability and magnitude of being wrong in our return expectation, if markets are more predictable than the random walk hypothesis implies, then we can use current asset class IRRs to project future long-term returns and use the historic forecast errors as a better measure of risk for the buy-and-hold investor. This is a different meaning of risk than the classic volatility that our industry tends to focus on, and for plain bonds and equities, we have found this measure of how much uncertainty there should be on the eventual value of our portfolio will be less than half of what is implied by the  $\sqrt{\text{time}}$  rule. That is why I have [argued](#) that long-term risk is much less than implied by the extrapolation of short-term volatility. It is this finding that allows us to understand why it makes sense for the long-term (and typically younger) investor to hold more risky assets than older investors.

**Isn't the long term too far out** to say anything meaningful about it? Yes, and no. We do [find](#) that when economists (like me) try to forecast growth, inflation, or interest rates 5 to 10 years out, we make large and consistent errors that are larger than would be implied by the  $\sqrt{\text{time}}$  rule discussed earlier. That is, if our long-term forecasts were as good as our short-term forecasting, then our forecast errors for say *average* growth or inflation over the next 10 years should be like that of our 1-year out errors (measured by RMSE) divided by  $\sqrt{10}$ .

It turns out they are significantly larger. But for the more important forecast for the long-term investor, which is future returns, we find the opposite as using the current IRR of plain bonds or equities gives us more information about future long-term returns than those over the next few quarters or year. Economic forecasting is much harder over longer periods, but long-term return forecasting is in my experience easier.

**Consistency is overrated.** As analysts, we feel very much we want to and need to be logical and systematic. Obvious as this seems, it does have its downsides. When in my more over-confident years, I thought I should set up or join a macro hedge fund to put in practice what I had learned, a friend who managed a very large fund advised against it. He warned me that logical analysts like me have not made great tactical investors as we get married with our models and logic and stick too long with them through thick and thin (i.e., major losses). In addition, consistency means that all our investment decisions will be highly correlated, and not produce much diversification. A good thing I followed his advice and stuck to my research knitting. As [George Bernard Shaw](#) said, those who can, do; those who can't, teach.

**What to read?** Aside from the news, I get a lot of insight from the FT, followed by The Economist and Foreign Affairs, focusing most on politics, geopolitics, science, tech, and companies. I do not read our competition, not on any view that it has no value (I assume it does), but if I start reading them, I will start following them, affecting, and informing my own work and I will then no longer offer distinct value to our clients. **Book-wise**, I read some economics and finance, but go mostly for history, geopolitics, physics (dumbed down to my level), paleoanthropology, language, and action-thrillers (when I need a break). I read anything by Kissinger and Harari, and books on how things have gone wrong in markets – so as not to get too overconfident – such as Kindleberger's Manias, Panics, and Crashes (1978), Minsky's Stabilizing an Unstable Economy (1986), Lowenstein's When Genius Failed (on LTCM, 2002) and Geithner's Stress Test (on the GFC, 2014).

## What works and what does not?

I learned a lot here, but unfortunately the list of what I learned not to be the case is longer than new positive insights gained. The market is quick and murderous in arbitraging away high-profit ideas.

**Respect the market.** We should start from the assumption that the market reflects the collective weighted opinion of millions of investors across the world who have much at stake in avoiding being wrong. This is better than to assume that there is a lot of irrationality, emotions, and behavioral biases

in markets. I am sure these are there, but they are not the right starting point to consider what to do in markets. I always start from the assumption the market is right as it reflects the wisdom of the crowds. Only then should one start to probe prices and see whether there are some obvious holes in them. Overconfidence that we know better than the collective wisdom of everyone else has been the downfall of many an asset manager and strategist, and I have felt its brunt many times.

**Most alpha has a sell-by date.** The goal of all active investors is to beat the market, which means earning a better return to risk ( $\alpha$ ) than simply passively holding a broad representation of global market outstandings ( $\beta$ ) which one can do with two passive trackers, one on global equities and one on global bonds. Both as a tactical strategist years ago and more recently as a long-term one, I have been constantly searching through empirical research, both mine and external, academic or professional, for any relationship that gives decent odds of beating the market. Those that we found were ultimately due to either behavioral inefficiencies or structural segmentation that prevents capital from equalizing returns to risk across asset classes.

The problem is that I am not the only one reading or doing this work, and with greater capital mobility in the world and easier access to this research, the lifespan of any such alpha I (and others) discovered has become shorter and shorter. This does not mean that new ones will not keep emerging, but you must be fast with them, expect them not to last long, don't tell others about them, keep looking for new ones, and keep reinventing your systems.

I would say the life span of  $\alpha$  ideas is getting shorter as shorter and information moves faster and more investors focus on the same strategy. Can I put a real sell-by date on it? Probably not. I do not think it is just months or quarters, but I suspect it is much less than 5 years. I would say that if a profitable strategy stops working for a year or so, it is probably time to call it quits.

**KISS (keeping it simple) does work.** KISS in investing means using a simple approach to choose an investing portfolio, starting with basic and clear objectives, holding just a few basic, globally diversified funds – such as an equity and a bond fund – that are easy to value and to judge risk and long-term return on, that are cheap to hold and easy to liquidate, while staying fully invested in them without a lot of trading around them. MIT's Andrew Lo, in his recent [In Pursuit of the Perfect Portfolio](#), with Stephen Foerster, interviews 10 of the greatest thinkers in finance (6 with a Nobel Prize) and pretty much each of them points to holding a few simple, passive, long-term global investments as their perfect portfolio.

**What is the best way to save and invest for a comfortable old age?** Start early, stay fully invested, keep your eye on the long run and don't be distracted by shorter-term volatility, invest primarily in riskier, higher-return assets (equities), keep fees low, don't trade much, and keep it simple, with no strong reason to invest in more than two funds, a global equity funds and an own-currency, or global FX hedged, corporate bond fund. The old Rule of 100, by which your equity allocation should be 100 minus your age, is a good principle, but should probably be more 110 or 120.

**Are Buffett and Munger right on diversification** being just protection against ignorance, and that it makes little sense for anybody that knows what they're doing? Well, I'd say it made sense and worked for them to hold very concentrated positions in just a few companies that they thought would produce superior returns based on the price they paid for them and the strong competitive positions these companies had in their industries. At the same time, Warren Buffett has frequently also argued that for over 99% of investors, it makes more sense to invest in a low-fee SPX tracker and not to trade in and out.

Buffett and Munger at Berkshire Hathaway have had a remarkably superior performance ([10% pa over SPX since 1965](#)) investing in companies on which they did extensive research and making sure to buy them when they were cheap. Quite plausibly, they are just superior minds that very few of us can replicate, and the rest of us thus just have to rely on wide diversification to achieve normal market returns to risk. That said, empirical analysis through 2011 (Frazzini et al., [Buffett's alpha](#)) has been able to "explain" Berkshire's superior return as the result of buying companies with value, stability and quality characteristics, enhanced with cheap leverage from being an insurance company. Since then, though, Berkshire has stopped outperforming, quite possibly as their "secret sauce" was made public.

**Is there really any solid argument for active investing?** I would differentiate two types of active investing: one is security selection within a defined asset class, and another is asset allocation across different types of assets within a broader group. Think of the first as a manager of, say, a Euro area small cap fund while the second could be the banker who manages your wealth across asset types. There is a lot of empirical evidence that active security selection within widely covered asset classes does not add value, but I can see it working on very specific asset classes where information is costly to get and there are not a lot of analysts covering it.

Generating excess return from asset allocation across well-known asset classes should similarly be hard as there is not much privileged information. But this misses two important

points. One is that the passive holder of an index tracker also must pay fees to cover the cost of a fund to track the index. More important to me is that the individual who holds a set of passive trackers on different bond and equity markets, in reality will frequently be switching around, and move in and out in an effort to time the market and move into hot asset classes, many of them thematic, on news that is not always informative on future returns. Believers in passive investing will demand that fund managers they invest in stick closely to their benchmarks but will not tend to apply this to themselves. Morningstar's latest report on [Mind the Gap](#) shows that the average investor in US mutual funds over the 10 years to end-2022 earned 1.7% pa less than the funds generated over the same period. "This shortfall, or gap, stems from poorly timed purchases and sales of fund shares..." That is, mutual and exchange-trade fund investors tend to buy high and sell low. Given this tendency of many a retail investor (like me), it can make sense to hire a professional cross-asset manager who should be more disciplined than we tend to be, but make sure to limit their ability to deviate from your target SAA.

**Does 60/40 still make sense?** Yes, but it is really a personal decision. The classic 60/40 rule keeps 60% in equities and 40% in bonds. The risk reduction benefit from having bonds in your portfolio comes from both diversification due to low correlation with equities, and from the much lower volatility of bonds versus equities. I find the diversification part of the argument somewhat underwhelming, as it "pulls" the risk-return efficient frontier of bonds and equities only about 1/10th to the left (lower risk), whether we consider 1- or 10-year out risk. More important is the reduction in risk due to the lower volatility of bonds versus equities. If you have a lot of money, are not levered, and can absorb significant falls in your savings/wealth, then you should be primarily in equities and not bother too much with bonds. That is, go for 80/20, or 90/10. If, on the other hand, if you are near retirement and your investment horizon has shrunk, and (importantly) bond yields are again competitive with equities, as they are today, then 60/40 or even 50/50 does make sense.

But your equity-bond allocation is not just about risk, but also about return. When real bond yields were negative, up to some two years ago, one could be forgiven for thinking that any bond allocation did not make sense. By now, though, with the US equity market trailing multiple over 20x and its real yields then just below 5%, while the US Agg real yield is over about 2.75%, the equity risk premium is near its very long-term average, and a normal equity bond allocation does make sense now.

**Do macro-economic fundamentals matter?** Long-term investing should be so much more about the fundamentals

than short-term tactical investing where sentiment, flows and positions surely matter a lot also. Or so I thought when I started long-term strategy. Well, that is where the value of testing everything comes in, as I gradually figured out the reality is the opposite of what I thought. When trying to forecast 10-year out returns on US bonds and equities, the only variables that allowed me to make relatively accurate forecasts were their starting yield, or IRR. I could find virtually no correlation with economic growth, inflation, or other macro variables that far out. In addition, we [found](#) that forecasts of such macro variables 10-year out came with much higher forecasts errors than one would expect from economists' ability to project these variables only 1 year out. Changes in views on macro variables 3-6 months out correlate well with asset prices over the short run. Macro is thus much more important in the short term than the long term.

**Cycle versus Structure.** A debate Bruce Kasman, our Chief Economist, and I have had for a very long time. Bruce is the cyclist. I am the structuralist. Are business cycles just volatility around long-term structural trends, to be ignored by the long-term investor, or do the here-and-there of current economic conditions always dominate, while secular forces are just ex-post averages of a number of shorter-term cyclical forces, that after the fact we give a name, as if we would have been able to see them in advance? The debate continues and is entering its 4th decade, which probably means reality is a bit of both.

**Is our world stationary? I do not think so.** Stationarity is jargon for a process whose statistical properties do not change over time. We analysts always hope that what we analyze is stationary, so that over time, we come closer and closer to fully understanding how it truly behaves. If it is not stationary, then we are constantly wondering whether any deviation from its mean level will eventually return to normal, or instead signals a break to a new normal level. I have always been looking at the world as a system that forever changes and is thus not stationary because **we all constantly learn and adapt**. Tomorrow, our behavior can be different from today, because tomorrow we have one data point more, namely what happened today. That was the idea behind the so-called Lucas Critique on which I wrote my dissertation over 40 years ago. Even long-term trends that look like exogenous events, such as demographics and climate change, are ultimately the result of the choices we all make over time, based on our own experience and what we have learned of the world.

**Regime changes and long-term trends** are useful ways to think about structural change. One problem with seeing a non-stationary, forever-changing world without any clear anchor is that it makes it much harder to judge what the future will bring. That is why we instead try to think in terms of lon-

ger-term trend changes in the parameters that describe economic behavior, or of more discrete *regime changes* where policy makers, and the people who vote them into office, at some point figure out that is something is not right in their world and change their behavior and objectives.

**When to invest in regime changes or new trends?** If you want to be certain that there has really been a regime change, you will need to wait for quite some time before you can declare it a fact as you need a lot of data to show there was a statistically significant change in behavior. The problem to the investor is that, by that time, the new regime will be in the price, and it is too late to invest on it. As a result, we must invest already when we see an increasingly serious risk of a regime change developing before it is fully in the price. This is how we have been writing about the risks of de-globalization, a return of antitrust, an end to the Great Moderation, a move to structurally higher interest rates, and de-dollarization (see library at the end of this note as well as our J.P. Morgan Perspectives series). You do run the risk this way of seeing more than will eventually become reality, but it has the advantage that you will be investing with the direction of the market as you will not be the only one seeing this risk of a new regime.

**Not all known long-term trends are immediately in the price.** When a trend is very slow and very much in the future, markets will have problems pricing in their impact as the present value of far-away events will be quite low compared with those of the here-and-now events driving asset prices and investor attention. One does not have to be short-sighted for it to be hard to invest on something that will not have a meaningful impact until say 20 years from now. Similarly, when the impact of such trends on economies and markets are not that obvious.

How to deal with the biggest and most threatening trend of all: **climate change**? There has been a rush into new technologies to produce zero-carbon energy or to capture carbon. Funds that chase these technologies have not been doing well as these companies tend to be very pricey. I find much less priced in on assets that should be doing badly on extreme weather events that will only get more frequent and more damaging in coming years. People, businesses, and real estate do not seem by running away from areas that, in my mind, are “sitting ducks” for the next firestorm, drought, heat wave, storms or flooding. If anything, movement seems to be more towards these locations.

But people will eventually move, producing massive migration flows that countries in safer places will have trouble dealing with. Borders will thus come back. The big winners here should be the countries that are best at integrating immi-

grants (countries across North and South America, Australia, New Zealand and to some extent the UK), relative to those reluctant to do so.

**How to deal with demographics?** My colleague Alex Wise did some great work on demographics with a panel study combing some 60 years and nearly 200 countries to gauge the impact of changes in life expectancy, age structure (how many old people) and fertility. Increases in life expectancy but not retirement ages led people to save and invest more, but savings grew more than capex. Aging societies dissave more than capex falls. Thus, expecting to live longer pushes down bond yields, while aging societies push up bond yields. The effect of living longer has dominated historically, but demographic forecasts suggest the latter force will dominate looking ahead. The effects of fertility changes were less relevant.

**Thematic investing** is one way that many investors position on a view of how the world is changing. Besides climate change and energy transition, these themes include digitalization, fintech, demographics, EM consumers, and so on. When we looked at such funds, though, we found they badly underperformed the overall market. Half of this was due to the high fees on such funds. The other half was that investors only really tend to buy such funds on evidence that they are indeed outperforming, which means that by the time they bought them, the assets the funds held were rather expensive and set to produce lower returns from that point on. The lesson here is investing on a widely held view that already has had a measurable impact on asset prices probably means you will be a bit late to the game. Better to start on a theme that is not yet consensus and can only be judged a serious risk rather than a done deal.

**Stocks are not the same as GDP.** One important aspect of your portfolio allocation is deciding what country to invest in. If you are not sure, just buy the world portfolio. But we all try to have an opinion about what is the right country or sector to buy. There is very little in the Finance literature on what are the better countries or sectors for a long-term investor, as our profession has not found much, if anything, to guide this decision. One temptation is to overweight the stock markets of countries with high economic growth. But I have not found that to work as high GDP growth does not by itself give you high EPS growth of the companies listed in that country. That may be due to volatility in profit margins and foreign earnings, and most importantly, the fact that higher growth may not come from existing companies but from new ones that one cannot buy on listed exchanges until they have gone public. Country and sector choices are very difficult long-term decisions.

05 December 2023

**US exceptionalism** in markets, with steady long-term outperformance against the rest of the world, has been puzzling many a strategist, including me. Many of us have been fore-casting an eventual end to high US returns, some based on value, others on its dysfunctional politics, but none of these arguments have left much of a mark. If US companies are so much more profitable or faster growing, then that should be in the price and not create further excess returns. I recently had to give up on advising strategically underweighting US-listed stocks as the drivers of this expected underperformance – Congressional gridlock, a return of antitrust, faster wage growth, and global coordinated corporate tax hikes – did not all come through, or turned out too feeble. I don't expect this US return exceptionalism to last forever but need to see the beginning of a turnaround and some clear forces bringing it about before cutting back on US asset exceptionalism. Given the already very high weight of the US in global outstandings, I feel no need to own even more (i.e., to overweight).

**Does ESG and impact investing work?** This is a tough one. All economic and financial activity imposes externalities beyond the confines of the transaction. It benefits investors *collectively* to try to reduce any negative externalities of their investing, e.g., on climate or social conditions, and to pro-mote positive ones. But this requires that we are all in this together and are clear on what we are trying to achieve. That is where the problem is. If we are not all, or almost all in this together, then other investors will free ride on our efforts and will arbitrage our efforts away. ESG investors aim to lower the cost of funding of activities with positive externalities and raise those with negative ones, but non-ESG ones can then do the opposite and gain from buying “cheap” (high IRR) negative-externality investments. The EU is hoping to reduce this problem by forcing all EU-based managers to invest in a sustainable fashion, but EU investors do not control enough of global capital.

A second problem with aiming to “do good” is how we define and decide what is good. The ESG approach is to create metrics that can guide investors towards funding companies and countries that have positive externalities and away from those with negative ones without requiring each investor to do the costly and intricate analysis of what companies and activities have positive or negative externalities. Once we agree on metrics, however, everyone who needs money will manage towards them, rather than try to achieve the objectives the metrics are trying to accomplish. Greenwashing is the typical result.

I am thus not that bullish in ESG investing and think it is really the government's job to create the right incentives, through laws, regulations, and taxation, to boost activities with positive externalities and increase the costs of negative ones. **I am more open to Impact Investing, where a motivated investor**

with a clear vision of what they are trying to achieve takes substantial interest in a company where they can influence its behavior and thus have a real impact on environmental and social conditions.

**Does liquidity have value?** Yes, and no. Liquid securities have generally lower yields than less liquid ones as trading-oriented investors will prefer them. But is liquidity that much of value to a long-term investor? If our spending needs are uncertain, or we want to be able to jump in and out of markets at short notice, then yes, it has value. At the same time, as discussed above, we find that many individual investors “abuse” liquidity by trying to market time their investments and will tend to buy when the market is up and sell when it is down. i.e., **most of us tend to buy high and sell low**. It is a bit like working at home and having a fully loaded fridge nearby. The ability to snack or to trade at-will generally leads to overeating and overtrading. Controlling our overeating and overtrading by limiting our ability to do so, by not having a full fridge nearby, or by investing in less liquid assets such as private equity or credit, or having it managed by somebody else who is told not to trade, is worth a lot, in my own experience.

**Are alternatives really an alternative** to plain bonds and equities? To me, they are more an extension rather than an alternative to the public markets. A large part of what are called Alternatives are ownership of, or loans to businesses, buildings and infrastructure that are not listed on a public exchange. Hedge funds are, in principle, a more active way to trade public bonds and equities even as in aggregate their returns correlate well with their underlying assets. Commodities are different as they are not financial assets, but they are produced, traded, and sold by listed commodity companies. Alternatives are to me more an extension of the public markets, providing access to equities and credit of other issuers, rather than being a true alternative to them.

By not being traded on exchanges, they have no clear market price and are valued by managers on estimates of their earnings. Their posted returns are thus much smoother than those of the public markets. This provides some value to investors who are wary of high mark-to-market volatility. To me, being locked up in illiquid assets can also have value by preventing trading one's portfolio too much, which does not always raise performance return, as discussed above.

One extra issue is that it is much harder, if not impossible, to get full exposure to the overall alternative world, compared with how one can gain access to the full world public equity market with a single low-fee ETF. Owning alternatives thus exposes the investor to manager selection risk and to higher costs of monitoring and due diligence that need to be subtracted from expected returns. Alternatives are no panacea.

## The Long-term Strategist

### Ten more strategic questions

- **How should you construct a long-term portfolio?** Start with global bonds and equities, cut sectors, styles, countries that you believe will not deliver a good return to risk, and add those that will. There are arguments to cut unhedged foreign-currency bonds and government bonds. In equities, add sectors, countries, or styles you believe will outperform.
- **Should a long-term portfolio still be overweight Health Care?** The sector has outperformed global stocks by 1.3% pa since we advised the strategic OW early 2018, despite 1% pa underperformance in the US, where Tech outperformed massively. We maintain our long-term Health Care overweight.
- **Can Financials perform well in a high interest rate world?** Banks do well when interest rates are high but not when they are rising. Given real yields are near our long-term target, a strategic overweight on Financials is now justified.
- **What is the end game with ever-rising US government debt?** If debt growth remains uncontrolled, a debt crisis is the end point. The role of the USD as the world's reserve currency gives some leeway, but the US is not immune. The political will to shift to a sustainable trajectory will probably emerge when the government, households, and businesses cannot borrow at affordable rates.
- **Does long-term investing make you rich(er)?** The long-term approach to risk can deliver higher returns. Looking through higher frequency volatility allows a long-term investor to allocate heavily to high-return assets. They are also less likely to suffer from behavioral biases, buying high and selling low.
- **Can and should a \$100bn fund maintain a two-asset portfolio of global equities and local bonds?** It's possible but owning more funds can help diversify against the risk of counterparty failures, particularly managers of funds. Exposure to more asset classes and funds allows alpha from active positioning. Large firms also need to be in primary markets and engaged with banks that underwrite new issues.
- **How should one forecast real interest rates over the medium to longer term?** The  $r^*$  camp gauges the neutral policy rate using models driven by potential growth, then adds a term premium. The bond yield camp considers the supply and demand for capital, which leads us to think real yields have normalized.
- **Do higher bond yields mean higher equity yields and lower multiples?** In theory, yes; in practice, no. At moderate real bond yields, there is little correlation. Correlations were observed at higher real yields in the 70s and 80s.
- **Do high Sharpe assets or trades have expiration dates?** Yes. New high return ideas will keep emerging, but will have only a limited life span as risk capital will constantly exploit them, unless there is significant market segmentation.
- **Why are there still assets with superior returns to risk within the bond world?** In principle, higher returns to risk should be arbitrated away. But differences in capital requirements, taxes, and liquidity needs across types of investors will prevent the elimination of differences in returns to risk, such as between credit and government debt.

### Long-term Strategy

#### Jan Loeys AC

(1-917) 602-9440

jan.loeys@jpmorgan.com

#### Alexander Wise

(1-212) 622-6205

alexander.c.wise@jpmchase.com

J.P. Morgan Securities LLC

## 1. How should you construct a long-term portfolio?

A good way to start is with the broadest definition of publicly traded global bonds and equities, and then cut assets that will likely not deliver a good return to risk in your particular circumstances, in terms of when you need the investment horizon, currency base, tax and regulatory requirements, amongst others. Then, double up on parts of the remaining portfolio that should offer superior returns to long-term risk.

**Cutting out is mostly done in the fixed income part of the portfolio.** For one, bonds denominated not in one's own currency add significant FX risk, without much increase, if any, in return. **Foreign-currency bonds**, thus, do not naturally belong to your strategic portfolio, unless you can hedge the FX risk at an expense<sup>1</sup> that is only a small fraction of the domestic bond yield. In addition, if you are truly a long-term investor – say 10 years out or more – and can absorb periodic drawdowns in your portfolio, then you probably do not need **government bonds, cash**, or even a particularly large allocation to fixed income. Broad credit funds denominated in, or hedged into, one's own currency, ought to suffice.

**Adding holdings to create an overweight in certain desired sub-asset classes is largely done in the equity world**, where you can buy certain sector, country, style or thematic funds that you believe will do better than the overall market. However, one ought to keep such strategic overweights relatively modest, and avoid constructing a portfolio that is very different from global outstandings, as we all tend to be overly confident in our ability to pick winners and losers in the global equity market.

Watch the video on [jpmm.com](#), or on [LinkedIn](#).

## 2. Should a long-term portfolio still overweight Health Care?

Over 5 years ago, we advised a strategic overweight on the Health Care sector in a global equity portfolio ([Health Care: A Strategic Sector OW](#), May 11, 2018). In those 5 and a half years, global Health Care stocks outperformed the market by 1.3% pa, consisting of 0.6% pa underperformance in the US and 2.5% pa outperformance elsewhere.

---

1. With expense, we mean the costs of managing the regular FX forward transactions needed to hedge FX risk back to one's base currency, beyond the natural forward costs that reflect the difference in interest rates between foreign and domestic currency.

US Health Care's underperformance is mostly due to the **massive outperformance of the US Tech sector**, which beat the rest of the US equity market by over 10% pa over this period, amplified by its near 30% weight in the large cap index. In the rest of the world, Tech also outperformed, but only by 5% pa, and with diminutive impact as, even by now, it does not even have a 5% weight in non-US equity outstandings.

In addition, last year's Inflation Reduction Act allows **US Medicare to negotiate prescription prices** in the future, which can have significant impact on profit margins as Medicare manages health care for over 63 million Americans. We had highlighted a risk of price controls 5 years ago, given the massive price hikes we had seen on certain drugs, but thought it would be offset by a new innovation wave in the industry. In the event, we did get innovation during Covid, but not high enough profitability for the overall industry. In the rest of the world, price controls on drugs have always been there.

All considered, we **maintain our long-term strategic overweight of Health Care**. Medicare price negotiations ought to be in the price by now, although with uncertainty about how much this will weigh on earnings, but it is hard to believe it will be of the same magnitude as it has been in the last few years. The diffusion of AI could be particularly promising to drive innovation in the sector. In their totality, these observations give us confidence in a strategic Health Care overweight for the next 5-10 years.

Watch the video on [jpmm.com](#), or on [LinkedIn](#).

## 3. Can Financials perform well in a high interest rate world?

As a borrow-short and lend-long investor, banks tend to perform well when interest rates are high, as they benefit from deposit rates falling below market short-maturity rates, and from their loan portfolio earning interest rates that float with market rates. In the US, we note that there has been a positive correlation between US Financials performance relative to the market with the level of real interest rates. Financials have typically outperformed the market when the 10yr UST real bond yield is above 2%, as it is today. Financials, however, do not perform as well when interest rates are rising as the long-duration position of banks will incur losses in their trading books and some losses in their held-to-maturity books which are unrecognized, but understood by the market. It is difficult to discern whether we have reached the new "equilibrium" level of interest rates in the US, but having risen nearly to our medium- to long-term target of a 2.5% 10yr UST TIPS yield, the current level of interest rates motivates a strategic overweight on Financials.

Watch the video on [jpmm.com](#), or on [LinkedIn](#).

#### 4. What is the end game with ever-rising US government debt?

**If the growth of debt remains uncontrolled, a debt crisis is the inexorable end point.** US deficits are high, despite a strong economy and low unemployment, not because we have politicians who cannot do what is “right”, but because we, the voter, love to have our cake and eat it too. We love low taxes but also public goods and services, such as Medicare and Social security. In the meanwhile, US federal government debt keeps growing, seemingly uncontrollable, although it should more appropriately be called “uncontrolled.”

**This is putting steady upward pressure on interest rates** and has pushed the 10yr real US Treasury rate much faster towards the 2.5% target we set last year for the end of this decade.<sup>2</sup>

**To alter course, the US voter must demand that their representatives in Congress act**, and either cut public services or make sure they are properly funded with higher tax revenues. We believe this will only happen when households and businesses “feel the pain” and understand there is indeed no free lunch. This is more likely to happen when they can no longer borrow at affordable rates; when home prices decline substantially as it is costly to finance a new home purchase; when companies are forced to lay off people to cut labor costs to offset the higher cost of debt; when savings lose their value when stock and bond markets fall due to a weak economy and high interest rates; when our cities and communities have to lay off teachers or police officers, as they lose access to the bond market or simply cannot meet the high interest rates; and, when our currency collapses with a loss of confidence in our ability to repay our debt.

**Most emerging markets are familiar with such debt crises**, which compel painful fiscal adjustments, sometimes after first defaulting on their existing debt to the rest of the world. Even some developed countries have been in such debt crises, the UK more than once, most recently just last year. The US is in the enviable situation that it issues the world’s dominant reserve currency, creating some fiscal leeway. But that also means that it faces less pressure to reverse course early, before its fiscal situation becomes untenable. Japan, with more than twice the US government debt-to-GDP, has not yet endured much pressure as it finances it almost all domestical-

ly, with Japanese institutional investors not yet willing to play the bond vigilante role.

It is not easy to say what will induce Japan or the US to take concerted steps to control public debt, or when that will happen. **Arguably, the US is closer to that point as the bond markets are clearly putting heavy pressure on the government** with a ~3%-point rise in real long Treasury yields over the past 18 months. When that rise in yields does serious damage to stocks, the dollar, mortgage borrowers, and/or the overall economy, that may be the point at which US voters and their representatives will accept it is time for change.

Watch the video on [jpmm.com](#).

#### 5. Does long-term investing make you rich?

**Yes.** Or at least, it makes you richer than if you focus more on the short term. It is the long-term planning and approach to risk that allows a long-term investor to earn a higher return on their portfolio. It comes from **starting early, staying fully invested, and keeping one's eyes on the long run** and not being distracted or overly disturbed by shorter-term volatility and portfolio drawdowns that allows one to invest in riskier, higher-return assets.

The long-term investor should by definition focus on the further-out future when they will need to draw down savings, typically in old age, and should thus be motivated to **start saving and investing earlier** than those more focused on the near term. Starting just a few years earlier can make a huge difference for one’s future savings giving the convex shape of a compound return curve. Somebody who put \$1,000 a year for the past 35 years in the S&P500 (which earned 10% pa over that period), always staying fully invested and re-investing dividends, would have ended up now with ~\$28,000 more than if they had started only 1 year later, and ~\$120,000 more than if they had started 5 years later.<sup>3</sup>

By not needing their money over the short term, the long-term investor can afford to ignore shorter-term volatility and losses to their portfolio. This allows them to hold a portfolio with a heavy allocation to high-return assets, which will naturally have higher volatility. As we discussed in [Long-term vs short-term risk](#) (Feb 1, 2023), this shorter-term volatility does not fully translate into downside risk to one’s ultimate savings over periods of 10 year or longer.

In the case of **bond portfolios** that track the overall market, over this long a period, early losses or gains in prices due to

2. See [Long-term forces point to higher US bond yields](#), April 4, 2022, as well as our review of the debate on this forecasts in [The debate on the long-term outlook for real interest rates](#), August 2, 2023.

3. For simplicity, these calculations assume the same 10% return each year.

changing market yields will later be close to fully offset by changing coupon income. Your entry yield on your bond portfolio will be the return you will earn over the next 10 years, plus or minus 70bp with 2/3 odds, much less than what is implied by 1-year bond return volatility. In the case of **equity funds** that track the S&P500, knowing the current multiple – in various forms – allows one to make more accurate projections of 10-year out return than over the next year or than implied by annual volatility.

The old **Rule of 100**, according to which your equity allocation should be 100 minus your age, advising younger people to have a higher allocation to stocks than older people, does hold. And it creates a high probability that a high allocation to stocks will produce a larger savings pot when one needs it in old age than a lower equity allocation that somebody with nearer-term needs would want to hold in order to control risk.

Finally, by not having to react to, and to be overly concerned about, shorter-term market volatility, the long-term investor **should thus be able to stay fully invested** in the market, thus **avoiding one of the costliest traps of regularly adjusting one's portfolio allocations**, typically on momentum. Morningstar's latest report on [Mind the Gap](#) shows that the average investor in US mutual funds over the 10 years to end-2022 earned 1.7% pa less than the funds generated over the same period.

"This shortfall, or gap, stems from poorly timed purchases and sales of fund shares, which cost investors roughly one fifth the return they would have earned if they had simply bought and held."

That is, mutual and exchange-trade **fund investors tend to buy high and sell low**. This report cannot say, but it is our presumption that an investor with a further-into-the-future need for their money should be more able to stay fully invested in their holdings than somebody who is concerned about making sure they have enough in the near term.

In short, a patient, disciplined long-term investor who starts savings and investing early, who keeps their eye on the distant future when they will need their money back, and who can absorb shorter-term market volatility, can afford to hold more higher-return, volatile assets and is less likely to buy high and sell low by frequently acting on perceptions of fear and euphoria that typify today's markets. In this sense, **long-term investing should make you rich(er)**.

Watch the video on [jpmm.com](#), or on [LinkedIn](#).

## 6. Can and should a \$100bn fund also maintain a two-asset portfolio of global equities and local bonds?

We have previously discussed the merits of "keeping it simple", even to the point of holding a simple portfolio of just two assets: a global equity fund and a local bond fund denominated or hedged into one's own currency.<sup>4</sup> In principle, a large institutional investor, such as a sovereign wealth fund (SWF) with \$100bn under management, can construct a well-diversified global portfolio in this same way.

**However, there are reasons that large institutional investors will want to own more funds.** One important rationalization is to **diversify counterparty risk**, particularly with the managers of funds. Putting 70% of this \$100bn in a single global equity fund is not easy as there are not that many funds of this size. This risk could be simply operational and liquidity risk, but could go as far as default risk.

Further, many large pension and SWFs aim to earn "alpha" return from active positioning in the market. To the extent that the information needed to beat markets is very special and local to the asset class, sector, or location of the assets (e.g., Latam local bonds), this fund will want to invest across a number of such specialized active managers, instead of a single active global manager.

Third, some of these alpha opportunities will come from very volatile markets where the beta return from owning the assets is not high enough to rationalize a long-term passive allocation. Commodities and FX probably fit this bill, as we argued in [Strategic investing questions, by the dozen](#), Sep 26, 2023. But a fund manager who wants to earn alpha in these asset classes will have to be active in them and thus has to own some.

Fourth, many pensions and SWFs are active in **alternative markets**, such as real estate, hedge funds, and private equity and credit. In the publicly listed equity and bond markets, one can gain full exposure to the asset class with little tracking error and low costs by holding a simple passive index tracker. This cannot be done in the alternative world where any fund can easily produce a return that is some 10% points higher or lower than the overall market performance in any particular year. Judging the return to risk of alternative investing thus requires one to look not only at the risk on the overall asset class, but also to consider the extra manager selection risk. Reducing this requires one to invest in a number of different funds.

4. See [Strategic investing questions, by the dozen](#), September 26, 2023.

Finally, firms with large holdings and inflows will **need to be involved in the primary markets where new equities and bonds are issued**. To access primary markets, investors need to be involved with the major investment banks that underwrite new issues of bonds and equities.

Overall, the need to reduce counterparty risk and manager selection risk, and to access primary markets, and the desire for global alpha justify the presence of very large owners of capital in many more asset classes and funds than an individual investor, for whom a portfolio with as few as two funds should suffice.

Watch the video on [jpmm.com](#).

## 7. How should one forecast real interest rates over the medium to longer term?

**There is an ongoing debate in markets about how to best forecast real interest rates over the medium to longer term** given the steady rise in rates over the past 18 months. Broadly speaking, there are two camps in this debate: the “ $r^*$  camp” and the “bond camp”. The  $r^*$  camp is heavily populated by central bankers trying to estimate  $r^*$ , the real policy rate at which the economy is in equilibrium, neither pushing inflation up nor down, using models driven largely by estimates of potential economic growth. To forecasts bond yields from there, one adds a term premium to this short real rate to compensate for the higher price risk of longer-duration bonds.

On the other side, the **bond camp** starts with longer-maturity bond yields, typically the 10-year maturity US Treasury note, and thinks of the short rate as that bond yield minus what they think the term premium will be. This 10-year bond yield is considered the core capital market price from which all other asset yields are derived by adding or deducting risk and liquidity premia. As the core price of capital, the bond yield is considered to be determined by the supply and demand for capital in an economy, which means ultimately savings and investment. Potential economic growth only plays a very subsidiary role here.

**We subscribe to the latter view that the demand and supply for capital are paramount when considering the dynamics of real bond yields over the medium and long term.** This formed the basis of our view, [first stated 18 months ago](#), that the 10yr UST would reach a real yield of 2.5% by the end of this decade. The implied short *real* Fed funds rate, [derived from this forecast](#) for the 10-year bond yield, would be 1.1%, about twice as high as the current operating assumption at the Fed – yet another reason to think there is upside risk on inflation over coming years versus the 2% target.

The 10-year **real yield reached our long-term target of 2.5% much earlier than expected**. We see no reasons to raise our long-term target, though, and thus from here see a real 10-year bond yield moving up in a wide range over coming years. This is not a view that the bond yield will be stable, but only that one should expect a lot of ups and down around a stable, long-term mean of 2.5%.

Only two of the structural drivers that we saw putting upward pressures on yields – a **large US federal deficit and higher macro uncertainty/volatility** – have “arrived” so far. The other two major factors we saw changing the balance between savings and investment – dissaving by the growing number of the elderly in **aging** societies and massive capital investment needed across the world for **climate** mitigation and adaptation – are not reality yet.

The shorter-term cyclical factor driving up rates derives from the **surprising resilience of US consumers and business to Fed rate hikes**, quite plausibly because they have been able to lock in lower borrowing costs in the previous years. In addition, economic agents in much of the world have used the previous decade to clean up balance sheets and are thus now in much better financial condition to maintain their spending in the face of higher interest rates. The Fed will eventually get inflation under control, even as risk is biased to higher interest rates at the moment as core inflation seems stuck around 4%. But when inflation comes down, these shorter-term cyclical factors will fade, and bond yields will come down again.

Further out, we see yields rising again as the two structural forces pushing yields up – aging and climate – should then be asserting themselves.

Watch the video on [jpmm.com](#).

## 8. Do higher bond yields mean higher equity yields and lower multiples?

**In principle, yes; but in practice, no.** In principle, we think of the 10-year US Treasury note as the core market in the world, around which all other assets are priced. Corporate bond yields are UST yields plus a credit spread to compensate for default risk and lower liquidity, while equity yields, the inverse of equity multiples, could be considered as the same UST yields plus an equity risk premium to compensate for higher equity return volatility. A multiple of about ~20x for the S&P500 gives a real equity yield of ~5%.

**While this makes sense, it does not work in practice, or empirically.** Over the years, there has been only modest correlation between UST yields and equity yields, largely restricted to the period of high and volatile inflation in the

1970s and 80s, although there was a brief 2-year period, 2021-22, when the two correlated well in the US. More broadly, during periods of moderate levels of real bond yields, there was very little correlation in the US, and none to speak of in Europe or Japan. This year, US bond yields are up almost 1% point in real terms, while equity yields are down. Hence, one should not just extrapolate views on rising bond yields into higher equity yields and thus lower multiples. When projecting 10-year ahead returns, we find that present bond and equity yields are the most effective signals, so we do not attempt to forecast how equity multiples will change over time.

Watch the video on [jpmm.com](#).

## 9. Do high-Sharpe assets or trades have an expiration date?

**Yes, we think so.** We argued a few weeks ago in our [Strategic investing questions, by the dozen](#), Sep 26 (question 2), that there are not a lot of asset classes or trades anymore that offer long-term superior returns to risk as knowledge of these assets and/or trades nowadays spreads very rapidly and any superior returns are arbitraged rapidly in a world of ample capital availability and mobility.

That said, we need to be more precise and nuanced. **Risk arbitrage does not prevent the emergence of new superior returns to risk.** Instead, we mean that superior return ideas can and do emerge regularly in a volatile world with constrained market making, but that each such **superior asset effectively has a “sell by” date** as information and knowledge do not yet spread instantaneously, with those “in the know” fully motivated to keep the knowledge to themselves. This, therefore, leaves the advantage to the fastest money, such as those employed by some of the major hedge funds.

Investors who quietly do the extensive analysis needed to “road test” new ideas for high-return investing and who go through internal consensus building on such strategies are probably at a disadvantage against faster money. This is one reason why our view of a more volatile world has made and continues to make us advise holding some allocation to hedge funds in one’s strategic allocation.

## 10. ... but are there not still assets with long-term superior returns to risk within the bond world?

There are some caveats, if not exemptions, to our above statement that superior returns to risk all have a sell-by date. Consider the historic Sharpe ratios on US HG Credit and Treasuries of 0.41 and 0.27, respectively since 1986. These ratios

come from 2.15% and 1.02% pa excess returns over cash, and 5.22% and 3.80% vols of these excess returns. HG’s higher return is primarily because over this time, it offered on average a 150bp spread over same-maturity USTs and lost only ~30bp due to downgrades of issuers into HY.<sup>5</sup>

**Why has this considerable gap not been arbitraged away?** We see two forces that are keeping this return spread so wide. One is **liquidity preferences** as more short-term oriented investors with leverage or uncertain spending needs are willing to give up return to gain from the much higher liquidity that USTs offer relative to corporate bonds. This difference in liquidity has only widened since GFC.

One can see this factor at work in the allocation of **governments’ foreign asset holdings**. One part of these holdings, **central bank FX reserves**, that a country holds to pay for imported necessities or to pay off foreign debt in times of crises, will be almost all invested in the most liquid government debt in the most liquid markets. UST debt, which is the most liquid market in the world, makes up ~60% of global FX reserves, as a result.

The part of a government’s foreign assets that it holds for future generations, the quintessential long-term investment through what are called **Sovereign Wealth Funds**, will for the most part hold only minimal amounts of foreign government debt, and instead hold credit, public equities and significant amounts of private equity.

A second factor that keeps the return on government debt depressed versus credit is **financial repression**, as regulators in most countries impose much higher capital requirements on credit on banks, insurers and defined-benefit pensions. And these three types of institutions have such large holdings of government debt that other investors not subject to these onerous requirements have not been able to bring the credit spread in line with the return to risk on USTs.

**The implication is thus that investors with different liquidity needs and subject to different regulations, even with the same return expectations, can easily see very different returns to risk that will not be arbitraged away by the open capital markets.**

---

5. It is very rare for an issuer to default while still rated investment grade. Losses are instead due to issuers with falling credit quality first getting downgraded into below-investment grade (high yield), with some but not all then eventually defaulting. The HG investor’s loss comes from having to sell the bond at a below-par price when it migrates from HG into HY.

## The Long-term Strategist

Strategic investing questions, by the dozen

- Six questions on how one should put together a strategic portfolio and six on macro questions for the long-term investor.
- **How many assets do you really need?** Two will do the job. One global equity fund plus one broad bond fund in your own currency, with you deciding the balance, should give return and diversification.
- **Are there superior asset classes left?** Not many, as everyone knows everything nowadays, with new knowledge on what assets have high Sharpe ratios spreading rapidly and getting arbitraged in no time.
- **What kind of bonds belong to your strategic bond holdings?** Bonds in your own currency, and credit, with safe government debt only appropriate for those with low tolerance to shorter-term drawdowns.
- **How to resolve the entry point problem?** The current price/IRR of an asset class is the best predictor of long-term returns but can change daily and would thus regularly change your SAA. An investor who does not use external managers will have to integrate TAA with SAA, while having to decide which they are better at.
- **Do Commodities belong in your SAA?** Not really, as they lack income. But they do have hedging and trading value.
- **The extraordinary value of keeping it simple.** Simple portfolios with few assets and basic valuation and investment rules make it easier to understand one's risk and lower the time and cost of managing money, without giving up much return.
- **Is Climate Change now in the price?** It is beginning to be priced in, more in pushing up green asset prices than in pushing down the price of assets located in areas at high risk of extreme weather damage. It is not too late to invest on Climate Change.
- **Why care about high government debt/GDP ratios?** We should in principle focus on interest payments to GDP – flow-to-flow – which still looks OK in the US. But it is better to look at debt/GDP ratios when bond yields move quickly.
- **Is  $r < g$  enough to give us debt sustainability?** No, as low interest rates in turn induce governments to overspend and overborrow.
- **Can we forecast inflation and real asset returns over the long term?** Not really, as inflation that far out depends on the average output gap, which we can't forecast. We can forecast nominal returns reasonably, but if we can't project inflation over the next decade, we cannot be precise about future real returns.
- **What are our top long-term risks?** Climate Change outranks any other risk. Lower, but still meaningful, are US/China, uncontrolled US debt rises, and AI. Most risks will push interest rates and volatility higher but the dollar lower.
- **How does higher macro vol affect where you take risk?** To us, it means, at the margin, more tactical risk taking and less strategic.

### Long-term Strategy

**Jan Loeys** AC

(1-917) 602-9440

jan.loeys@jpmorgan.com

**Alexander Wise**

(1-212) 622-6205

alexander.c.wise@jpmchase.com

J.P. Morgan Securities LLC

## 1. How many assets do you really need in your long-term portfolio?

**In principle, you do not really need more than two:** a global equity fund and a broad bond fund in your own currency, with the relative amounts a function of your return needs, ability to withstand short-term drawdowns, and need to control long-term risk on your ultimate portfolio. This gives you very good diversification, clarity and simplicity on what you are holding, and high liquidity with minimum costs if held through passive funds, mutual or exchange traded (ETFs).

One could argue that your bond fund should be global, but that would add foreign-currency risk that is generally not well compensated. If you then have strong views on what asset types, countries, or sectors to have more of than is in these broad funds – say you fancy Technology – you can simply add a Tech ETF to these two funds. It is harder when there are certain assets you want to have less of, or not have at all – say oil companies. You would need a fund that excludes oil companies, but that may not exist if there are not enough investors like you who do not want to hold oil. If such a fund does not exist, then you will have to build a portfolio bottom up by trying to buy all the other sectors, for which funds will surely not all be available. Hence, it is much easier to execute overweights than underweights in a simple portfolio. In **short**, you will do quite well with holding only two funds: a global equity one and a local bond one.

Watch the video on [jpmm.com](#), or on [LinkedIn](#).

## 2. Are there any superior assets left that you should systematically overweight in a strategic portfolio?

**We used to think so**, yes. The Empirical Finance literature has found troves of high-Sharpe ratio assets that have high returns to risk and thus lie above the standard risk-return trade-off line of local-currency bonds and global equities, which is the standard of a simple, well-diversified portfolio. If markets are perfectly open, global, and frictionless, such superior assets should not exist, because everyone will buy them, bidding up their price and pushing down their likely future return, until they have been brought down to the global risk-return trade-off line, and are no longer a superior asset class. The opposite happens for assets with inferior returns to risk as nobody will buy them, pushing down their price until they move back up in return. We thus need market inefficiencies, as we call them, typically brought on by market segmentation, to produce superior assets.

We always thought this was the Holy Grail of strategic investing. And for years, we joined the search and testing of these

high-Sharpe assets, in Value, Small Caps, Momentum, High Buybacks, and Fallen Angels, to name just a few (see the library of past issues of *The Long-term Strategist* at the end of this note). But it has gradually been dawning on us the last few years that the majority of these show a fading pattern of outperformance, doing well decades ago, but then not doing any better than the broad markets over the past 10 years or so. A most plausible explanation is that “everyone knows everything” nowadays and has access to the same broad Finance Literature. Academic researchers after all are paid to get their results published and not to hoard them. As all this information spread out and markets became ever more global, the excess returns on these high Sharpe assets almost all dissipated.

Hence, we are now starting from a belief that there are very few superior asset classes left and that you might as well just stick to a simple portfolio of a global equity ETF and a bond fund in your own currency. We will make an exception within fixed income in the query below, as there remain real segmentations in world markets by base currency, investment horizon, and tax rates, that will make certain bonds produce better returns to risk, as experienced by the investors, than other bonds.

Watch the video on [jpmm.com](#), or on [LinkedIn](#).

## 3. What kind of bonds should be in your strategic fixed income allocation?

In equities, we think you should start with a global fund, to get maximum diversification within the asset class. But that is probably not the case for fixed income. Most investors will want some fixed income to limit short-term drawdowns and to get some diversification. **Foreign-currency bonds do not help** in this regard because of the extra volatility from currency changes. One could argue that a sell-off in domestic assets should also depress the currency and thus create gains on foreign currency holdings, but we are not convinced such offsets are stable and can be relied upon. We do see a strategic case to include foreign-currency bonds when one's own bond market is very small and illiquid and one's currency is pegged, or stable against one with a much larger and more liquid bond market.

Within one's own currency bond market, there is similarly the question whether one should be exposed to all bonds issued in one's currency, or only some part of it. US municipal bonds, e.g., are clearly not for everyone as most are not taxable and they thus pay a low yield that makes no sense for an investor who does not have to pay US taxes.

For different reasons, one can question whether a truly long-term investor should hold **government bonds** as these typically pay much lower yields than corporate bonds with a yield difference that is most of the time well in excess of long-term losses due to default. Government bonds do provide one advantage over credit in that the former have a much lower correlation with equities – frequently negative – than credit and thus provide better diversification, especially during recessions when equities can perform quite poorly. The investor who is quite sensitive to temporary drawdowns or is required by regulation to hold government debt does have a strong case to include default-free government debt in their bond portfolio. The investor who does not care much about short-term volatility and only about how much their portfolio will be worth years out when they need the money has no systematic need for safe bonds.

In short, we think **your basic strategic bond portfolio should be in your own currency and include government bonds only to the extent you are sensitive to shorter-term market volatility. The rest should be corporate bonds.**

Watch the video on [jpmm.com](#), or on [LinkedIn](#).

#### 4. How to resolve the entry point problem?

Our most objective and accurate forecasts for what returns you can expect for any asset class over the long term depend predominantly on its current internal rate of return (IRR), which combines today's asset price with what is known of its income (promised coupons on bonds or earnings/dividends for equities). The problem is that tomorrow's price will likely be different from today's. Hence, tomorrow, our expected long-term return on an asset class can be different from the one we calculate today. Should this then not change our strategic asset allocation (SAA) daily? This clearly **clashes with the notion of your SAA as the stable anchor allocation that one should stick to over the long run.**

**How does one resolve this conundrum? One approach** is simply to only adjust your SAA on an annual, or bi-annual basis and thus ignore intervening price movements, to keep a cleaner separation between TAA and SAA. A **second approach** is to use a floating entry point to calculate future returns and to use, say, the average IRR over the past year or quarter instead of today's, which means that your expected return will not move much from day to day. You can then stick to reviewing your SAA only on an irregular basis. Neither seems quite right as you are ignoring the most relevant information on future returns, which is today's price.

A **third approach**, and the one I prefer, is to integrate value-based changes in your holdings with what is called tactical investing to make it, simply, “no-labels” investing. Any

changes in your asset allocation would be a **combination of changes based on long-term expected returns and expected shorter-term movements in markets**. These two signals could easily clash as tactical moves are generally more momentum driven, while SAA changes should be based on value and are thus really anti-momentum. When an asset's price is cheapening, the long-term investor will want to hold more, but the momentum-driven one may want to sell instead as what goes down tends to go down further, at least in the short run. Which will dominate should depend on the strength of each signal, and how good you consider yourself on making short- versus long-term calls. This will at times lead to a certain inertia in one's trading where an asset class going down in price versus others may lead you to want to sell on negative momentum, but your long-term calculations tell you the asset is now cheap and your SAA wants to hold more. This may seem like the proverbial “bunny frozen in the headlights,” not knowing what to do, but is quite rational when you are receiving opposing signals.

This is not to say that a separation between strategic decisions makes no sense. It is most appropriate when there is **more than one decision maker** involved: the ultimate owner of the money and the asset manager hired to manage typically one part of the money around a strategic benchmark chosen by the ultimate owner. **Combining short- and long-term signals, or strategic and tactical considerations, make most sense when they are decided by the same owner of the money.**

One major **caveat** in this combo approach is that the investor must be honest and **clear about where their knowledge really lies**. The danger is that many of us tend to over-rate our ability to call the market short term. It is our perception that the most successful investors over time tend to be the ones that base their decisions on what they can be quite confident about, which is generally the yield/value of an asset or asset class and its historical long-term relative performance. Hence, a “realistic” individual investor is in our mind probably best off sticking with long-term value-based allocation and to ignore the temptation to trade the market on short-term beliefs. The general perception that “retail” tends to buy high, after a market has rallied for some time, and sell low, after that asset class has gone through severe losses, would be consistent with many of us overrating our trading skills. To leave tactical trading to the professionals is probably not bad advice.

**In short**, the entry-point problem is that your SAA depends on expected long-term returns that depend on the IRRs of asset classes, which can change day to day, implying more frequent changes in SAA than is consistent with its objective of serving as a stable anchor to one's investments. For the

individual investor who makes her own decisions on how to invest, this suggests merging tactical and long-term value considerations into one combined approach. The larger investor who uses professional asset managers for different parts of their holdings will more likely want to stay with the TAA/SAA separation and only make SAA changes on an infrequent basis.

Watch the video on [jpmm.com](#), or on [LinkedIn](#).

## 5. Do commodities belong in a strategic portfolio?

**In principle, No.** Commodities are “stuff” and not financial assets like bonds and equities that generate income from coupons or dividends. Most investors hold commodity exposure through futures that can earn income from rolling from the expired to next contract. However, over the very long run, this roll income has been more negative than positive.

Commodity prices are **very volatile** and, yes, they can, in the short run, produce gains that beat financial assets. They are thus a good asset for trading, but to invest in them longer term, you need to have reason for them to produce a return competitive with equities, which have about the same volatility. With our valuation-based models projecting ~7.0% annual return on the S&P 500 for the coming decade, commodities with no income need to double in price over the next 10 years to be competitive.

**Over the last 30 years, the commodity complex has earned only 1.3% pa in dollars**, less than any other major asset class. But their huge volatility and sustained medium-term momentum did produce 10-year periods of double-digit gains such as the 1970s when oil prices rose tenfold, or the pre-GFC decade when China entering the WTO pushed up the broad commodity price complex by a factor of 4. It is not impossible that oil, which is the main component of broad commodity indices, doubles in price in the coming decade, but it requires an active view that many could disagree with.

If not on straight return, **can commodities be a good diversifier, or hedge against long-term risks?** Simply by historical experience, not really. Commodities have a positive correlation with equities, ~0.4, unlike the negative correlation of US bonds with US equities, and bonds at least pay decent income nowadays.

**Commodities do correlate positively with inflation**, which threatens real returns on assets, but this correlation and thus hedging value are about the same for real estate, which again at least produces good income.

That said, we can see some strategic value for exposure to **food prices** and to metals important for the move to renewable energy in case of an acceleration of climate change and adverse weather events.

In short, without direct income from holding commodities, **they are not a good fit for your strategic portfolio, although they have value for tactical trading and as a hedge against extreme climate change.**

Watch the video on [jpmm.com](#), or on [LinkedIn](#).

## 6. The extraordinary value of keeping things simple

**Our industry does seem to love complexity and to abhor simplicity.** The more complex the financial world is seen to be, the more managers, analysts, traders, consultants, regulators, and risk managers feel they add value and expect to be paid. But there is a lot of benefit to the ultimate buyers of financial services and products to keep things simple.

For one, one should not buy assets that are too complex to be easily understood as the risk is then that the asset will not be appropriate for one’s financial objectives. Second, the fewer the assets one has in one’s portfolio, the **easier it is to judge risk** on them, the easier it is to gauge one’s exposure, the easier it is to manage one’s portfolio, and the **less time it takes**.

**Time is indeed money.** And probably the greatest benefit of simpler products is that they are **cheaper**, in terms of management fees and the costs of buying and selling them. Simpler products that are well understood by everybody will likely also be more liquid. The simplest investing rules, like “buy and hold” and do not move assets around much, are also easier to follow, save on taxes and other transaction costs, and reduce the trap all of us are at risk of falling into, which is to sell when markets have been going down a lot and to buy when they have been going up (i.e., the risk of buying high and selling low). Finally, we have found that the **simplest valuation rules**, like using an asset class IRR, bond yields and equity yields, or mean reversion in real exchange rates, have had a much better record in judging future long-term returns than more complex systems.

Overall, then, we feel that **keeping things simple in finance, fewer assets, simple valuation rules, simple investment rules, is an underrated strategy** and one that too few of us actively pursue as the mainstay of their strategic allocation.

Watch the video on [jpmm.com](#), or on [LinkedIn](#).

## 7. Is climate change now in the price, as everyone knows that it is serious reality?

Should Climate Change by now not be priced, and is it then not too late to start or still be investing on this theme? After all, everyone by now should know about Global Warming, even if there is some disagreement about its causes and whether we can do something about it. And indeed, we do find that scientists' forecasts for rises in temperature and sea levels made from the 1970s on are pretty much on track 50 years later, when looking at the trend rises in each. However, scientists' forecasts are not always followed closely by investors, nor are they necessarily believed as many may think of them as Cassandras that should have more faith in the ability of the capitalist system to find solutions to problems like global warming, when given an incentive to do so.

Investors do not have to be ignorant, short-sighted, or irrational for having ignored these risks in past decades. **It is hard for markets and companies to price in events one to two generations out**, or to make very long-term investments, even if they could be of huge impact, as discounting them to the present makes them usually of much smaller value than the here and there of the present.

Still, when we look at research on whether Climate Change is priced in, we find **some evidence** here and there that the market is by now starting to look at which assets will gain, and which will lose from accelerating climate change. But we think we are very far from fully pricing in Climate Change, probably because many have been thinking for some time that this remains a far-into-the-future event that new technologies will be able to address.

As a broad generalization, there seems to be **more upside than downside priced in from Climate Change** as buying a particular "green" asset in a specialized long-only Climate fund will push its price up more than not buying others that will be hurt, mostly because there are many more of the "others." One frequently hears that green assets have become quite expensive.

On the downside, with Climate Change creating greater extremes in weather that do massive damage around the world, one would expect that assets, such as real estate, located in areas with higher risk of damage from flooding, hurricanes, tornadoes, wildfires, drought, or mud slides would be priced much lower than those with lower such risks.

Again, we see a little here, mostly driven by higher costs of insuring one's property in high-risk areas, but overall, not that much. There is some evidence that sovereign borrowers and municipalities in high weather risk areas now must pay a risk

premium over those with lower such risk.<sup>1</sup> But we have not seen a dramatic enough repricing of real estate by weather risk as Americans have in recent years on net migrated *toward* areas with higher risk of adverse weather, rather than away from it.<sup>2</sup> Much of this is probably because the federal government and a number of states have been taking measures to protect property owners from the escalating cost of insuring against the damage from extreme weather events.

In short, we **do not think that Climate Change is fully in the price yet** and are most worried about assets located in higher risk areas do not seem to have priced in that much yet.

Watch the video on [jpmm.com](#), or on [LinkedIn](#).

## 8. Why do we care about a high debt-to-GDP ratio?

A high government debt-to-GDP ratio is frequently seen as a dangerous development that merits concern for long-term investors. We do not disagree, but for a different reason than is usually argued. One of the first lessons we learn in Economics is **not to compare a stock with a flow**. Only compare flow with flow or stock with stock. Debt is a stock measure of outstanding liabilities. GDP is a flow measure of economic activity during a year. Hence, they do not compare properly. Better to compare debt with the present value of future GDP flows – both are stock measures – **or the flow of interest payments on debt with GDP** – two flow measures. Each of these ratios involve interest rates, in the former as a discount rate to calculate the PV of future GDP. And over the past decade, with real interest rates on government debt almost always in negative territory, neither of these flow or stock measures by themselves gives much reason for concern for the largest advanced economies.

In principle, if a government can borrow at a negative real rate of interest, any public investment with zero real return is worth pursuing. Admittedly, much of recent deficit spending was not really on public investment. And government did use cheap funding indeed to run up spending and cut taxes, **with**

1. In [Pricing of climate risk in financial markets: A summary of the literature](#), BIS Papers No. 130, Dec 2022, Eren et al. conclude that "While studies find that these risks are starting to be priced, concerns are growing that current prices do not fully reflect the risks."

2. See e.g., [Migration towards environmentally risky areas: a consequence of the pandemic](#), Freddie Mac, Nov 9, 2022; [Americans are flocking to wildfire: A US migration story](#), Dec 8, 2022; [Redfin reports migration into America's most flood-prone areas has more than doubled since the start of pandemic](#), July 24, 2023.

**the US raising its total federal debt held by the public from ~40% to ~100% of GDP the last 15 years.**

**Even today, the US government is paying less than inflation on its debt. What is to worry then?** The reason we should indeed worry is that interest rates can be quite volatile, as we have seen the last year and a half, and do not really mean revert but can keep on going and going. And they can change a lot faster than governments can change their spending and revenues. Hence, when a government, or a private entity for that matter, uses the good times of cheap money to load up on debt, any sustained rise in interest rates can quickly raise interest payments, raising outstanding debt further, which makes investors more worried, making them demand a high interest rate, and so on, with a borrower falling into a **doom loop** of higher rates creating more debt that pushes rates up even higher, producing a debt crisis. That is indeed how Emerging Markets borrowers have gotten into trouble time and time again.

The maturity of US federal debt has averaged about 5.5 years over the past few decades and is today only slightly higher. It thus does not take that many years for higher rates to push up the total cost of federal debt. That is why we and the US CBO are quite worried about the inability of the US Congress to curtail spending or raise taxes or voters not electing people to Congress that credibly commit to cut the deficit. **We thus see this looming US debt crisis as a force to keep pushing US – and global – interest higher over the coming decade.**

Watch the video on [jpmm.com](#), or on [LinkedIn](#).

## 9. Is economic growth exceeding the level of real interest rates enough to produce debt sustainability?

In the classical models,  $r < g$  is all you need to reduce debt-to-GDP, but it comes with two major caveats that have recently been reality. One is that it requires a government to have a primary budget balance, that is, a balanced budget excluding interest payments. That has surely not been the case in the US, because of caveat number 2, which is that governments should not be using the ability to borrow at low interest rates to load up on debt, which is exactly the understandable temptation. Hence, do not try to judge debt sustainability of government by comparing its real cost of borrowing with the growth rate of its economy, as a lower rate than the growth of its economy is exactly the time when a government will want to load up on more debt.

Watch the video on [jpmm.com](#), or on [LinkedIn](#).

## 10. Can we forecast long-term inflation and real returns?

Well, **not really**. We have tried and have not come up with anything quantitative that works for inflation. And that is probably because theory tells us that inflation rises when the economy is operating above full capacity and falls when it is operating below. But over the next 10 years, one ought to assume that at least on average, the economy will be operating at capacity.

We have models to forecast economic growth, but how do we know that is faster or slower than its potential? Our profession is not very good at forecasting changes in the supply side of the economy. Since 1979, the US *Blue Chip* Consensus of some 50-60 US economists have overpredicted US inflation 10-years out, each time by an average of  $\frac{3}{4}\%$ .<sup>3</sup>

Our Chief Economist, Bruce Kasman, always reminds me that over the long run, [inflation is a policy choice](#), but how do we then forecast what choices will be made by policy makers and the voters and broad society that appoint them? Are we still in a world where central banks are almost exclusively focused on inflation, or will jobs growth, financial stability, and government borrowing costs get a larger weight than they have the past few decades? We think so but can't give you a model on this and thus can't say "You have to believe me." We think about an average rate of 3% in the US for the next decade, with US inflation breakevens giving us only about 2  $\frac{1}{4}\%$ .<sup>4</sup>

**What does this mean for forecasting the long-term real return on asset portfolios?** Real is nominal minus inflation. We can reasonably project nominal returns 10 years out, but if we can't do inflation, that leaves us up the creek, as they say. Many pension funds have a real return target, frequently  $\sim 4\%$  + inflation, as in Canada and Australia. We think it is tough on them. We can see why they hold a lot of real estate and infrastructure where revenues are indexed to inflation, but for the main part of their bond and equity holdings, they will simply have to make an "assumption" on inflation.

In short, **No, we do not think we can reliably forecast long-term inflation and real asset returns.**

Watch the video on [LinkedIn](#).

3. See our paper on this in [Long-term economic growth forecasts](#), Oct 10, 2022.

4. For more details on this view, see the Macro risk cluster discussed in our long-term risk paper: [Top long-term risks and what to do about them](#), July 18, 2023.

## 11. Top long-term risks

You all must receive at the start of each year strategists' lists of that year's Top Risks. We had a good look at what we see as top long-term risks that can affect markets over the coming decade. There is some overlap with the usual short-term risks, but most are quite different.

**None of these risks will be unknown to you,** and markets already price in the average investor's views of their odds, timing, and impact. But in many cases, we think they have higher odds and more adverse impacts than is priced in. Ordered from most impactful to markets to least, for us they come from **Climate Change and the destruction of Nature, worsening US/China tensions, a Tech/AI boom, aging populations, weakened inflation control, DM government debt crises, domestic polarization, and post-GFC market structure.**

The majority of these risks, Tech excluded, by our reckoning, bring **higher interest rates, upward pressures on prices/inflation, a weaker dollar, lower growth, EM underperformance, and higher macro and market volatility and risk premia.** This world benefits the active investor. If realized and more extreme than expected, these forces will likely give us somewhat lower nominal returns on the global bond and equity market than their current prices suggest. But most of the impact would be on the different performance of countries, regions, sectors, and asset classes.

Investors concerned about these longer-term risks should overweight bonds up to five-year maturities, cost-efficient macro-active managers, domestic banks, Value, Tech, inexpensive green/sustainable assets, agriculture prices, and inflation linkers against global benchmarks and should underweight longer-duration bonds, JPY, SEK and CHF bonds, the US dollar, P&C insurers, and assets located in areas with higher flood, heat, fire, storm, or droughts risks, which includes a lot of EM.

Watch the video on [jpmm.com](#), or on [LinkedIn](#). Read the [paper](#).

## 12. Does higher macro volatility tell you anything about where you should take risk?

**How does Macro volatility affect where and when you should be taking risk?** We have been arguing to you that we are likely in a period of sustained higher macro volatility than we have seen in previous decades, likely caused by instability of the central bank's control functions – NAIRU,  $r^*$ , the Phillips curve – some de-globalization, a probable return of the dual mandate of the Federal Reserve, making it less exclusively focused on purely stabilizing inflation, and raising the

focus on jobs.<sup>5</sup>

To us, that gives higher, short-dated macro volatility, also market volatility, and that ought to translate into higher long-term uncertainty too – although not one for one. Hence, the long-term investor, seeing somewhat higher long-term risks, should be less purely focused in equities. More tactical investors seeing higher short-dated volatility now at least have the necessary condition in place, not by itself a sufficient one, to make better returns from tactical risk-taking. As we see already, hedge funds have done very well here.

So, we conclude by putting it a very simply: **higher macro volatility gives you more tactical risk-taking, less strategic. We would call it less SAA, more TAA.**

Watch the video on [jpmm.com](#), or on [LinkedIn](#).

---

452 5. See [Where are we in Regime Change? Macro volatility, deglobalization, and secular rise in yields](#), Nov 8, 2022.



## The Long-term Strategist

Is thematic investing worth it?

- A broad set of 1,000 thematic ETF/mutual funds that operated during all/part of the past 16 years underperformed global equities by 1.4% pa.
- Thematic funds charge on average ~55bp more in expenses than a passive global equity portfolio that covers both DM and EM.
- They are overall high beta, with a focus on future growth, but are also negative alpha, maybe as they pay high prices for "hot" stocks and themes.
- High expenses and negative long-term alpha suggest the universe of thematic funds does not belong in one's strategic asset allocation. However, selecting funds that incur less than 1% cost gives the investor even odds of outperforming.
- Thematic funds can be used to tactically position on an emerging theme.
- [Video](#).

Thematic investing has become very hot, with the asset class close to tripling in size in just 2 years.<sup>1</sup> Much of this is likely due to a growing sense that economies and markets are going through a number of "gut-wrenching" paradigm shifts that investors should prepare for.<sup>2</sup> Thematic investing aims to do this by only holding stocks that are expected to directly benefit and outperform from a specific secular force, or "theme", that is seen to be structurally changing our world.

Thematic investing is intrinsically long term and thus quite different from standard tactical asset allocation (TAA) where a manager picks sectors, countries, and individual securities that they expect will outperform the overall market in coming months or quarters. It is also different from systematic risk premium investing where managers choose asset styles -- such as the classic trio of Value, Momentum and Size -- that have proven over time to deliver a higher return to risk than the broad market.

There is clearly some overlap between TAA and thematic investing as active managers will also use ideas and stories about how the world is changing to try and beat the market over the shorter term. A thematic fund is different in that it typically focuses on a single, unchanging theme, generally ignoring others stories or ways to beat the market. Similarly, there is overlap between thematic and risk premia investing<sup>3</sup> as in the case of a high-buyback strategy where a fund only buys the shares of companies that have been buying back a certain amount of their shares in recent years.

<sup>1</sup> Morningstar [Global Thematic Funds Landscape](#), May 2021, and Fig. 1 on p. 2.

<sup>2</sup> It is with this in mind that we started focusing regular issues of our sister publication, J.P. Morgan Perspectives, on paradigm shifts. See Joyce Chang et al. [Paradigm shifts: what lies ahead?](#), March 2019 and subsequent issues.

<sup>3</sup> We analyzed such high Sharpe ratio asset types in previous issues, such as those on [Value](#), [small caps](#), [buybacks](#), and [fallen angels](#).

In this paper, we investigate **whether thematic investing indeed helps investors beat the market.** We accept, but do not analyze the potential of thematic funds to hedge the impact that these secular forces could have on one's broad economic or financial conditions

## Where to find a theme?

There is no shortage of potential themes that one could focus on. But they all are **forward-looking** and foresee a **change in economic or industrial structures from what was there before.** Thematic investing explicitly does not look at past returns, but envisions a structural change that will make future relative returns different from what was seen before, allowing the investor in this theme to outperform the broad world market. Hence, new themes emerge when there is change in spending and investment patterns, such as those engendered by demographics, regulation, climate change, the pandemic, geopolitics, and technological innovation.

## What are typical themes?

There is no single agreed upon classification of the different types of thematic funds that have been launched in recent years. The most popular themes involve technological innovation/disruption and the energy transition in response to climate change. Morningstar, e.g., in its May 2021 [Global Thematic Funds Landscape](#) provides a 3-level taxonomy of thematic funds, starting at the top with Technology, Physical world (such as energy), Social (demographics and politics), and Broad, which is essentially "Other".

## How to build a thematic portfolio?

Building a thematic fund portfolio requires selecting the assets that are set to benefit/outperform from the realization of a selected theme. If the theme is, e.g., the move to electric vehicles (EVs), then the fund will include companies involved in the manufacturing of electric cars, electric batteries for cars, and the electric grid to charge these EVs. There is clearly a lot of judgment required in deciding what companies are in or out as almost all car companies produce both gas-fueled and electric cars. Thematic funds range from those that use pure discretion to decide what assets fit a particular theme to those that are largely systematic. Systematic funds generally determine their allocations by tracking a thematic index, managed by an index provider. But the manager can also use their own rules on how to match assets with a particular theme. All major equity index providers offer a wide range of such thematic indices.

On the systematic side, we can highlight the work of our Equity Derivative Research colleagues who have been using their **QUEST** (QUantitativEly Selected Theme) framework to select the right stocks with any chosen theme. They do this by using their 'Smart Buzz' thematic engine to identify the key words and phrases belonging to a target theme, and then use machine learning methods on alternative data, in particular news-based indicators, to search for companies associated with that topic<sup>4</sup>.

## Is ESG Thematic?

ESG investing is to us **not per se** thematic and we are thus excluding it from our analysis, even as there is clearly some overlap with it. At its core, ESG investing aims to broaden the objectives of a portfolio beyond narrow financial risk and return, by incorporating Environmental, Social and Governance metrics. Most simply, ESG aims to have *impact* on the world by investing in a manner that improves environmental, social and governance conditions in the world, ultimately to the benefit of the people whose money it manages<sup>5</sup>. Thematic investing to us aims to earn superior returns without raising risk by exploiting structural change in societies and economies.

## Performance

**Our premise is that thematic investors want to beat the market. But do thematic funds help them do that?** An alternative to buying a thematic fund would be simply to create tilts to one's strategic portfolio that reflect a view on such themes. As put succinctly by Morningstar's [report](#) on thematic funds, in order to beat the market, the thematic investors must (1) select a theme that indeed represents a future structural change in markets and economies; (2) choose the right assets that will benefit from the realization of this theme; and (3) make sure the theme is not already fully priced into these assets. To this, we would add the thematic investors must select a portfolio that will beat the market by enough to offset the extra expenses that most thematic managers charge.

One approach to analyzing the return on thematic funds is to follow the thematic indices that many such funds track, an approach we have used frequently to test the performance of

<sup>4</sup> [AI and Big Data Approach to Thematic Investing: Identifying themes and selecting stocks via NLP](#), Kolanovic et al., June 18, 2020, and: [Thematic Investing Handbook Global Outlook and Key Themes](#), Kolanovic et al., June 10, 2021.

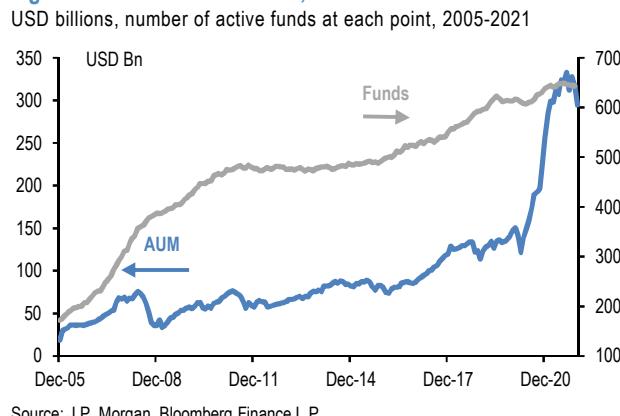
<sup>5</sup> J.P. Morgan Research has extensive ESG content that can be found on our [ESG website](#). See also most recently our J.P. Morgan Perspectives, [ESG 2022: Energy Crunch challenges Net Zero transition](#), Joyce Chang et al., Dec 16, 2021.

risk premia investing. We are reluctant to go this route here as the construction of such funds will differ from one index provider to the other, given the many diverging ways that one can build a stock portfolio on a particular theme. In addition, some thematic indices are back-cast to before the index launch date, creating the risk that the index constructions was optimized over its past performance. Also, investors need to account for fund expenses that are not included in index returns. We, therefore, prefer to look at actual thematic mutual funds and ETFs.

## The data

We start by collecting the ~2,000 funds that Bloomberg indicates are thematic. From these, we exclude those that are clearly ESG, as discussed above, as well as those that appear mostly regional or sectoral in focus. This leaves us with 1000 funds that have return data at some point since 2005<sup>6</sup>. Funds come and go, with managers trying out new thematic ideas and then closing the ones that do not attract enough funding. The majority of the theme categories we are looking at had funds that were already live at the end of 2005, where we thus start our return data. At the end of 2005, we had 173 live funds, with \$18.5bn under management. Figure 1 shows how AUM grew by a factor of 16 from that point to \$295bn at the end of 2021 with still 643 funds operating, when global equity capitalization grew only by a factor of 3. Only 93 funds were operational over the full sample since 2005.<sup>7</sup>

**Figure 1: 1000 Thematic funds, AUM and number**



<sup>6</sup> We find that the term ‘Thematic’ is used quite expansively, if not loosely, with many funds labelled as thematic where we could not really find any link to clear secular/structural forces separate from sectoral or regional designations. We thus felt we needed to “hand check” each fund until we had just over 1,000 funds that we felt comfortable can be considered thematic.

<sup>7</sup> In comparison, the much broader population that Morningstar categorizes as thematic had 1,276 surviving funds as of March 2021, with \$595bn in AUM.

Tables 1 provides a summary overview of our thematic fund sample with the number of funds in each theme, category returns, return vol, expense ratios. Table 2 offers a brief descriptions of each theme. The theme designations are our own creations, but are very similar to those we have seen in other papers on this topic.

**Table 1: Thematic funds**

number, ratio, %, 2005-2021

Category	No. of funds	Expense ratio	Return (%)	Vol (%)
Infrastructure	166	1.21	7.3	16.6
Sustainability	149	0.93	7.1	16.4
Disruptive Technology	144	0.75	12.1	19.9
Natural Resources	132	1.12	3.5	21.6
Islamic	101	1.39	10.0	13.4
Ethical	83	0.80	7.5	17.4
Other	76	1.03	7.1	18.0
Clean & Renewable Energy	62	0.76	4.2	24.7
Health Care Innovation	30	0.95	4.6	17.5
Mega trends	25	0.92	5.8	18.1
New Consumer	22	1.40	6.8	20.9
Cannabis	17	0.77	-1.3	56.1
Thematic 1000	1005	0.95	6.6	18.0
MSCI AC World Index	N/A	0.4	8.0	15.9

Source: J.P. Morgan, Bloomberg Finance L.P. Cannabis funds only since Apr 2017.

Returns, risks and expense ratios for each thematic category and the overall asset class are calculated on an AUM-weighted basis, similar to how the major market indices calculate returns on a capitalization-weighted basis. Investors may not want exposure to each fund, or may not want to hold more of a fund simply because others pile into it, boosting its AUM. But AUM weighting is the right thing to do when one wants to assess the returns and risk of the full asset class held by the population of all investors<sup>8</sup>.

How do we deal with **newly launched funds** and those **that are closed** and paid out to shareholders? We deal with these in the same way as the broad equity and bond

<sup>8</sup> Two other ways to calculate returns are equal weighting and total return weighting. The first takes the simple average of each fund return over each period (month or quarter) as investors may indeed put equal initial capital in each fund, but then unrealistically assumes investors constantly rebalance from high to low return funds, which is costly given high transaction costs. The problem can be reduced by letting the weight of each fund grow by its cumulative return, but does not eliminate it as new funds are launched regularly.

Jan Loeys  
(1-917) 602-9440  
jan.loeys@jpmorgan.com

Alexander Wise  
(1-212) 622-6205  
alexander.c.wise@jpmchase.com

Shiny Kundu  
(91-22) 6157-3373  
shiny.kundu@jpmchase.com

Global Research  
The Long-term Strategist  
18 January 2022

J.P.Morgan

market indices are calculated. Newly launched funds enter each thematic index at the start of each month, with existing funds making “room” through dilution, and we delete the funds that have been closed.

**Table 2: Thematic categories descriptions**

Theme	Description
Infrastructure	Infrastructure, human or physical capital development, smart cities
Sustainability	Low carbon target, environmentally friendly, fossil fuel free, climate change, companies that lead to a sustainable future
Natural Resources	Natural resource companies, energy, oil & gas, wind, nuclear, generation, transmission and distribution of power, mining
Disruptive Technology	Automation, AI, Big Data, Robotics, Blockchain, Fintech, E-commerce, Digital/Cloud Infrastructure, Internet, Cybersecurity
Islamic	Shariah law compliant or Islamic principled companies
Ethical	Refrain from tobacco, alcohol, gambling, weapons use socially responsible investing in any way, promoting gender equality, women leadership, excludes ESG
Other	Trends like Pop Culture, Travel and Leisure, Defense, Military, Gig Economy, Media, Buybacks, Fallen Knives, New China A shares, SOE/PSUs, Online retail
Clean & Renewable Energy	Clean Tech, Energy Efficient, New energy economy, Electric and Autonomous Vehicle and Battery, Mobility
Health Care Innovation	Biotech, Genomic Advancement, Medical or Health care breakthrough, Biopharma, Immunology
Mega Trends	A mix of two or more of these thematics, multi-themes/trends
New Consumer	New Consumption trends in EM; millennials
Cannabis	Marijuana use related, follow a Marijuana Index

Source: J.P. Morgan, Bloomberg Finance L.P.

Is **survivorship bias** present in our data? Survivorship bias emerges and artificially boosts returns when return data are reported voluntarily by managers who have an incentive to “forget” about funds that did not perform well. In our data base, though, the funds are either ETFs that are traded on exchanges which report all prices, or are retail mutual funds, Sicavs, or Ucits where return reporting is public and a regulatory requirement. There are many more institutional and over-the-counter thematic funds where survivorship bias can be present, but these are not covered by our analysis.

## Relative Performance

Table 1 showed that the thematic asset class significantly **underperforms** the world equity market, represented by MSCI AC, which covers both EM and DM markets. Weighted monthly by AUM, our Thematic 1000 portfolio earned 6.6% since end 2005. Over this period, the MSCI AC index itself earned 8.4%. This comparison is somewhat “unfair” as our Thematic 1000 returns are after management fees and other expenses, and market

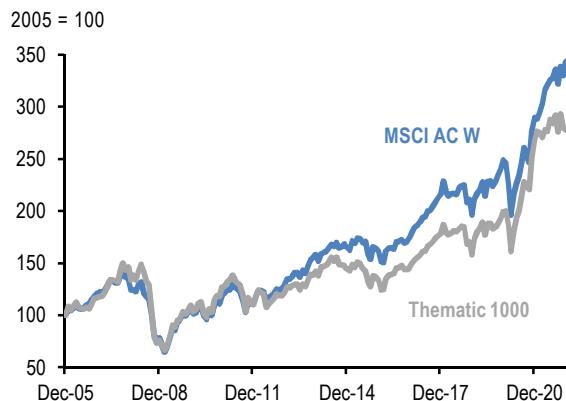
index returns do not include such expenses. The largest ETF -- ACWI -- that passively follows MSCI AC currently reports 0.3% as the expense ratio. Since the inception of this ETF on March 26, 2008, it has underperformed the index by 40bp, so it is in our mind a fair assumption that over our sample period from 2005, global investors would have paid ~40bp in expenses to have passively invested in MSCI AC. We thus use in our analysis throughout an **8.0% MSCI AC net of expense return** since 2005 as our metric of the return on the global equity market.

**Including expenses**, our portfolio of Thematic 1000 funds thus **underperformed a passive global equity portfolio by 1.4% pa over 16 years**.

**What explains this negative “alpha”?** One reason is the **higher expenses** of holding thematic funds. At an AUM-weighted average of 95bp, against 40bp to hold a global equity portfolio over the past 16 years, thematic funds thus charged **55bp higher in costs**, which accounts for 40% of their underperformance.

Looking at relative **performance over time** similarly shows how thematic funds steadily lag the broad public equity markets. Figs 2-3 show the cumulative total return of our Thematic 1000 and MSCI AC (after 40bp expenses) since 2005 as well as the ratio between the two. The ratio shows that thematic funds outperformed modestly over a 6-year period until 2011, then lost some 25% versus global stocks until the eve of the pandemic, rebounded in 2020, but gave it again back in 2021. The two surges in thematic funds versus global stocks came during the equity market selloffs in 2007-08 and 2020, quite possibly as investors first sell their more liquid non-thematic holdings. The later thematic rally in 2020 was quite plausibly related to the massive capital gains in one EV stock.

**Figure 2: Thematic 1000 funds and MSCI ACWI cumulative total return**



Source: J.P. Morgan, Bloomberg Finance L.P.

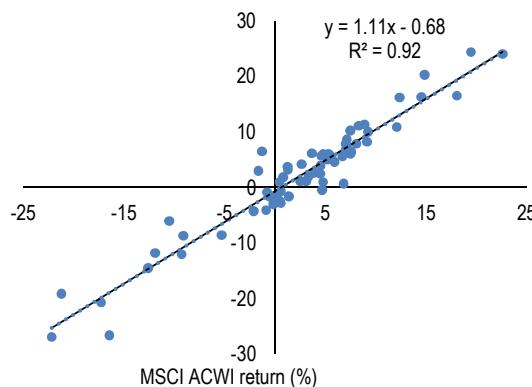
**Figure 3: Thematic 1000 funds and MSCI ACWI cumulative total return ratio**



Source: J.P. Morgan, Bloomberg Finance L.P.

Thematic outperformance during broad equity market sell offs could indicate that they consist of a lot of low-beta stocks. However, we find no support for this. Figure 4 below regresses quarterly returns on our Thematic 1000 against global equities (MSCI ACWI), to produce a classic market line. We find that thematic funds actually were **high beta, at 1.11, with a quarterly alpha (intercept) of -68bp, which compounds to -2.7% pa.**

**Figure 4: Thematic 1000 quarterly returns against MSCI AC %, 12/2005 to 12/2021.**



Source: J.P. Morgan, Bloomberg Finance L.P.

The higher than 1.0 beta is likely because some 39% of the current Thematic 1000 AUM are in the Technology Disruption category, with many other companies also having a bias to tech companies. A different sector composition is thus probably not the reason for thematic fund underperformance. MSCI AC currently only has a 24% weight in tech. If we recalculate the return on MSCI AC with the same tech weights as our Thematic 1000, then the underperformance rises from -1.4% to -2.0%.

Without a clear factor to explain thematic fund underperformance beyond their higher expenses, we must guess at the probable cause. Remember that for a thematic fund to outperform, it must target a secular force that is indeed getting momentum; select stocks that properly represent this force; and buy assets where the theme is not yet priced in. **Our guess is that the last requirement, the asset price, is where the problem is.** If fund managers really purely randomly choose "phantom" themes and randomly choose stocks to represent them, then their portfolios would consist of randomly selected stocks and over the long run should perform on par with the broad equity market, after expenses. While difficult to prove analytically, our guess is that thematic funds get launched and attract a lot of inflows when certain themes become "hot." This suggests that thematic funds pay high prices for the stocks they select as they buy companies in sectors that fit the hot theme and where the theme is fully priced in.

## Should you hold thematic funds, and, if so, which should you hold?

**In principle, there is nothing wrong with buying a thematic fund as a way to express a view, or hedge a scenario of a secular change in economies and markets.** The question is whether such funds indeed represent

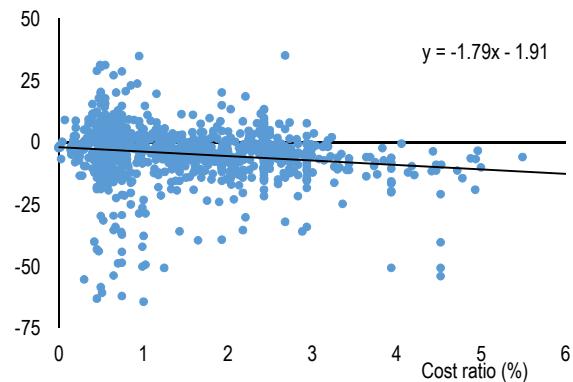
such themes well, select the right securities and do all this at an acceptable price. As discussed, the fees on these funds do not help performance. But one has to be careful not to judge each and every fund by the performance of the overall asset class.

There is to us no necessity that selecting the stocks that present a particular theme has to cost 55bp pa more than a passive global fund. We would thus advise selecting the funds that are either passively tracking an established thematic index, at low cost, comparable to other passive tracking funds, or that are using their own algorithm to select such fund and charge less than 1% pa for this.

Indeed, at the fund level, we do find a **negative correlation between individual fund expenses and their excess return to index**. Figure 5 shows a scatter of our 1000 thematic funds' expense ratios against their excess return over index over the life of each fund, which differs from fund to fund. The figure shows a beta of excess return on expenses of -1.8, implying that each basis point increase in expenses lowers a thematic fund's excess return by 1.8 times as much. There is similarly a positive relation between expenses and the share of funds that outperform the market. Of the funds that charged over 2% for expenses, only 17% outperformed the market while a much higher share of 42% outperformed when the funds charged less than 1% in expenses.

**Figure 5: Thematic fund excess returns over global equities against fund expense ratios**

1005 funds, %, 12/2005 to 12/2021, excess return of each fund over MSCI AC during the life of the fund.

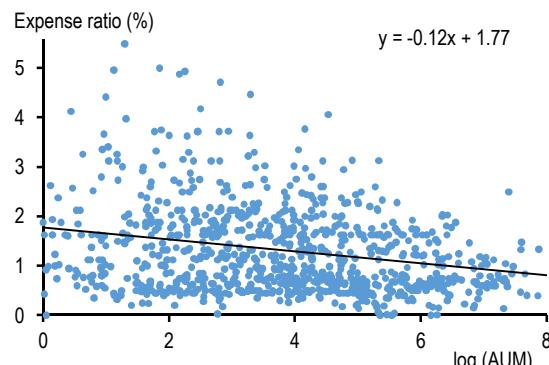


Source: J.P. Morgan, Bloomberg Finance L.P.

A fund's expenses should be driven by how efficient they are and how well they can spread their fixed costs over the fund, which is simply a question of the fund's size. Figure 6 confirms that larger funds have on average lower expenses.

**Figure 6: Thematic fund expense ratios against their average AUM during the fund's life time**

%, log of fund's average AUM in \$bn over its life time



Source: J.P. Morgan, Bloomberg Finance L.P.

Should one therefore buy into larger funds to benefit from lower costs? **More broadly, should one buy the bigger funds or those with momentum in price and/or inflows?** Given that smaller bespoke funds will have low turnover and are thus subject to liquidity risk, it makes sense to hold the funds with larger AUM or at least higher turnover. Also, one could ask whether funds that are growing fast due to superior returns or high inflows have momentum that can be exploited in one's choice of fund. We tested this extensively to see whether various forms of relative momentum in prices, inflows, or total AUM (which combines the previous two) over say the past 1-2 years provide a reliable signal of the future superior returns. Unfortunately, we could not find anything that was reliable, or statistically significant, neither positive nor negative. Strong returns or inflows suggest neither superior nor inferior returns relative to market.

**What thematic categories?** Aside from expenses, can we say anything about which themes one should buy and what to void? By definition, as the themes that people invest in are all based on a view of a future that will be different from the past, one cannot just look at past data to show which secular themes one should invest in. We have written before in these issues that we like the Health Care sector long term, but otherwise have no strong opinions which theme will produce superior returns.

And even with Health Care, the question arises whether one should invest in an active thematic health care innovation fund, or simply buy a passive broad health care sector ETF, not related to any particular theme. To help with this decision, one can try to match each of the theme categories we have in Table 3 with its closest

broad equity sector index, recognizing that many thematic funds select stocks across different sectors.

**Table 3: Thematic fund categories returns and matching MSCI ACWI sector returns**

Index returns have been reduced by 0.4% pa to account for expenses.

Category vs Sector	CAGR	Since
Thematic: HC Innovation	4.6%	
MSCI AC Health Care	10.6%	Dec-05
Thematic: HC Innovation	4.6%	
MSCI AC Health Care Tech	9.1%	Apr-06
Thematic: Islamic	8.6%	
MSCI AC Islamic	6.1%	May-07
Thematic: Tech disruption	12.1%	
MSCI AC Technology	14.1%	Dec-05
Thematic: Sustainability	14.1%	
MSCI AC Sustainable impact	14.2%	Mar-16
Thematic: Clean Energy	4.2%	
MSCI AC Energy	2.6%	Dec-05
Thematic: Infrastructure	7.3%	
MSCI AC Infrastructure	6.6%	Dec-05
Thematic: Natural Resources	3.5%	
S&P Global Natural Resources	4.9%	Dec-05

Source: J.P. Morgan, Bloomberg Finance L.P., S&P.

Table 3 compares our theme category returns with broad equity indices that in our mind come closest to them. Here, we do find significant differentiation between sector and thematic funds. In the case of **Health Care, Technology, and Natural Resources**, a simple passive sector ETF has significantly outperformed their matching thematic funds. **Islamic Thematic** outperformed its matching MSCI Islamic index, but our set of 100+ Islamic funds has ~80% of its AUM in just two funds, managed by the same company where the return profile suggests it is overweight Tech. 88% of the funds in this category have underperformed MSCI AC Islamic.

For **Sustainable** Thematic funds, we can only compare with the MSCI Sustainable Impact Index which was return data since March 2016. Over these almost 6 years, the index earned 14.2% pa before expenses, compared with 14.1% on our thematic funds. This may sound like one should prefer Sustainable over other thematic funds, but note from Figure 1 that over this period the overall thematic fund asset class performed on par with global equities.

Only two thematic categories -- **Clean & Renewable Energy** and **Infrastructure** -- have outperformed their matching broad market sector indices.

Our Health Care Innovation and Disruptive Technology thematic fund categories amount currently to 50% of thematic AUM, and their underperformance is thus primarily responsible for the weak underperformance of the broad thematic asset class. The smaller themes, in terms of AUM amounting to 22% of out thematic asset class, have in contrast been outperforming. These also happen to have been the **weaker total returns sectors and themes**, compared with Health Care and technology.

## Conclusion

A broad portfolio of 1,000 thematic equity funds, mutual and ETF, has underperformed the global equity market by 1.4% pa since 2005. Much of this took place during the last decade, 2010-19, with more par performance since. The ~55bp higher expenses of holding these funds versus a passive equity tracker explains only part of the lower return. Thematic funds are high beta, as they focus on growth. Weak returns are thus due to a negative alpha, which we suspect is because many funds buy into popular themes that are probably already more than fully priced in when the funds sees its greatest inflows.

In principle, there is nothing wrong with investing in views of a changing future, as we advised in many of our strategic notes, listed below. But one needs to be "economical" with how one does this, selecting funds that charge no more than 1% pa.



## The Long-Term Strategist

Why long term?

- The longer-term perspective has become more important to investors.
- At first blush, it would be suboptimal to constrain oneself to a longer-term plan, as it throws away new information. But constantly adapting one's portfolio to all this new information does not work well either, as it incurs transaction costs and is more subject to return-destroying behavioral biases than is long-term investing.
- Fallen market liquidity is also making it much harder for large investors to trade actively around their longer-term asset allocation.
- The poor relative performance of hedge funds suggests that short-term opportunities have become harder to come by.
- Time diversification is making it easier to judge return over a longer horizon, producing a higher return to risk to long-term investing.
- By itself, longer-horizon investing does not raise return. It only lowers risk. But lower risk can be transformed into higher returns, as it allows longer-term investors to hold more risk and less liquid asset classes.
- Long-term investors generally look at different signals than shorter-term ones. They focus on value, the supply side of the economy, long-term inefficiencies, and structural change, like demographics and productivity. Shorter-term investors look more at the demand side of the economy, flows, and positions – factors that have little lasting impact over the long run.

- [Video](#).

**How far out** should an investor think, plan and act? What is your right investment horizon? We live and act in real time, and it thus makes sense to use all we know to act now and here. Reality is the present. The strong focus of many investors and much of sell-side research is thus on the immediate news flow and what it means for markets.

Traditionally, investing has been divided into longer-term Strategic Asset Allocation (SAA) and shorter-term Tactical Asset Allocation (TAA), which takes tactical over- and underweights against long-term SAA positions. In this note, we look at what the function and value are of longer-term investing<sup>1</sup> and why, in our minds, the long-term focus has become more important.

To start with the prosecution case *against* long-term investing: Why constrain oneself and not react to all new information when it arrives? Why throw information away? Why make long-term investment plans and stick with them when new information might tell you otherwise?

<sup>1</sup> We are not looking at capital investing by corporates as the long out payoffs to most capital spending makes it obvious why companies need to plan and act over long-term horizons.

We argue that **long-term investing is lower risk** and makes sense for savers whose dominant need is income in old age, at a time when short-term tactical investing has become harder as liquidity has worsened and short-term “alpha” opportunities are harder to find.

An investor puts money aside, saving out of income, to have funds available for a future when income will not cover desired spending. This might be just a few months away, as spending does not align perfectly with inflows. The lion’s share of savings, though, is for old age and thus for most people several decades away.

To manage for these longer-term needs, an investor can either think and act shorter term, one step at a time, optimizing their portfolios for each quarter and year, or they can think and act over the full time horizon until they need the money back, applying what they can tell over this longer term.

In principle, there is nothing wrong with a short-term, one-step-at-a-time approach to investing. Most important, it allows you to react to all new information, getting in front of “slower” long-term investors. In addition, it creates flexibility to respond to your changing needs and cash flows.

### Long term is “easier”

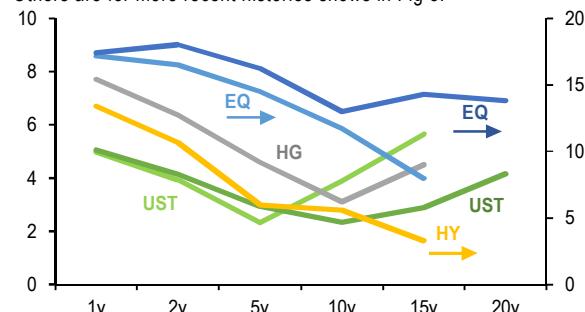
On balance, though, we think there are greater benefits from a longer-term approach to investing. Foremost, **judging future returns and risks is “easier” over longer periods**. This was the core of our previous paper on [Time Diversification](#). We argued there that the most important variable to judge the future return on different financial assets is their current internal rate of return (IRR), or yield. This yield allows you to gauge future returns better than simply taking an average of long-term historic returns.

Most important for our argument is that the power of using current IRRs to gauge future **returns improves the further we look into the future**, though only up to a point. Figure 1 from our [Time Diversification](#) paper shows the annualized standard errors from regressing different US asset class returns across different holding periods against their starting yields. 5-10 years out, all asset class returns become easier to judge, with high-yield bonds continuing to show lower risks beyond 10 years.

Our result that longer-out return forecasting is easier than short term is **not intuitive**. It would seem quite logical to argue that, if it is already hard enough to figure out where the dollar and stock market will be in a month or at year-end, then it must be nearly impossible to say where it will be in ten years’ time. We would not argue here that it is outright easier to call the level of the dollar or of stock market in 10 years’ time than in 1 year. It is not. Total wealth risk does rise with time. Instead, we find it is easier to judge the *average* or compound annual return over ten years than over one.

**Figure 1: Annualized standard errors of compound returns of regressing different asset classes against starting yield by holding period**

%, EQ and UST lines with 20yr periods refer to history since 1876. Others are for more recent histories shown in Fig 8.



Source: J.P. Morgan, S&P, Bloomberg Barclays,  
<http://www.econ.yale.edu/~shiller/data.htm>.

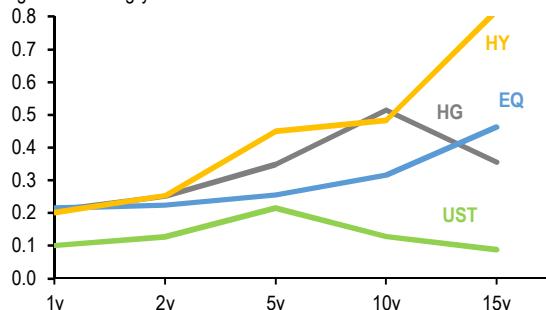
The lower annualized risk on long-term investing comes from **mean reversion in periodic returns**. For equities, this comes from mean-reverting multiples and earnings growth. For bonds, it comes from the cyclical behavior of credit spreads and defaults and the fact that any price losses on bonds in one year eventually bring higher coupons on new bonds in later years. Fig 1 shows that this mean reversion is strongest for high-yield bonds.

Fig 2 shows our expected returns to risk on the four main US asset classes. These **Sharpe Ratios** rise from a low 0.1-0.2 for investors with only a 1-year investment horizon, to 0.2-0.45 for 5-year holding periods, and equities and high-yield bonds moving all the way up to 0.45-0.8 on 15-year holding periods. We take risk as the annualized standard errors displayed in Fig 1. Expected returns for bonds are current yields minus long-term credit losses. For the US equity market, we combine long-term views on the main components of return – dividends, multiples, economic growth and profit margins – to arrive at a 4.7% 10-year out return, from which we deduct a 1% expected return on cash. Our

numbers are very much in line with consensus for estimating 10-year out returns.

**Figure 2: Sharpe ratios (excess return to risk) by asset class and holding period**

%, Returns are long-term expected derived from yield, minus 1% cash.  
Risk is annualized standard error from regression 10-year annual returns against starting yield.



Source: J.P. Morgan, S&P, Bloomberg Barclays,  
<http://www.econ.yale.edu/~shiller/data.htm>.

## Short term is getting harder

Judging annual returns 10-15 years out is to us easier – i.e., subject to less uncertainty – than calling the market over the next 3-12 months due to mean reversion in periodic returns. It is also easier because shorter-term investing has its own challenges, which, if anything, are getting worse.

Buying and selling short term incurs **transaction costs** from bid-ask spreads, fees, stamp duties and capital gains taxes, depending on the country and asset class. Over the last 3-4 decades, pure transaction costs have come down due to competition and computerization, initially boosting turnover.

Over the past decade, though, post GFC, market **liquidity has worsened significantly**. It is particularly acute in **dealer-driven OTC markets**, but even exchange-traded derivatives and stocks have seen declines in turnover and depth. Many factors underlie this fall in market liquidity, ranging from higher capital costs and regulations on bank dealers, to the shift from active fundamental to quantitative and passive investment, the prevalence of volatility targeting and trend-following investors, and automation of market making, all of which reduced the ability of the market to prevent large drawdowns<sup>2</sup>.

2 We wrote last year about the decline in market liquidity in [Paradigm Shifts: What Lies Ahead](#), JPMorgan Perspectives, Joyce Chang et al., April 2019, pp. 11-36. See also, [Global Financial Markets Liquidity Study](#), PWC, Aug 2015, 156 pp.

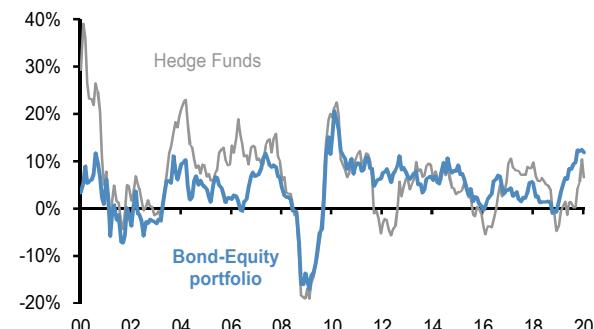
Adding insult to injury to the problem of reduced liquidity is the high likelihood, at least in our minds, that the **ability of investors to find short-term opportunities to beat the long-term asset allocation has weakened significantly**. Short-term trading adds no value if you cannot make use of higher-frequency information to do better than your long-term strategic allocation.

For individual investors (“retail”), a case can be made that the greater freedom to move money around short term frequently leads to reduced returns relative to a longer-term buy and hold strategy, even without appealing to transaction and tax costs. There is much literature on **behavioral biases** in Finance<sup>3</sup>, ranging from overreaction, loss aversion, herd mentality, confirmation bias, recency bias, home bias, among many others. Many of these (though not home bias) apply largely to the short-term investor, and may indeed be why retail investors are generally not seen to be beating the market.

For larger, more institutional investors, a good measure of the ability of tactical investors to beat the long-term passive investor is to analyze the performance of **hedge funds**, which should be the ultimate in smart trading. Fig 3 shows in grey the rolling the 12-month total return net of fees on HFRI, one of the widest indices of hedge fund returns. It compares this with a portfolio of US bonds and global equities, weighted to produce the same rolling return volatility as HFRI.

**Figure 3: Returns on hedge funds and global bond/equity portfolios**

%, 12 month rolling returns, rolling vol weights for equities and bonds



Source: J.P. Morgan, Bloomberg. Last observation is Jan 2020.

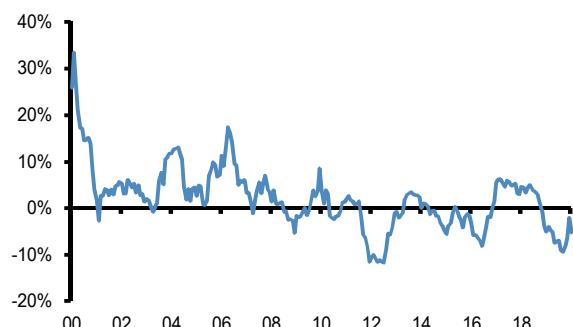
Fig 4 depicts the excess returns of HFRI over this equal-volatility portfolio of bonds and equities. It shows that, after a strong decade in the 00s, hedge funds have underperformed over the past decade and have thus not

3 See, e.g., Misbehaving: The Making of Behavioral Economics, by Nobel Prize winner Richard Thaler, 2015.

beaten the market, net of fees. To us, this means that it has become a lot harder for active investors to find short-term investment opportunities.

**Figure 4: Hedge fund excess returns**

%, monthly, 12 month rolling returns, rolling vol weights for equities and bonds



Source: J.P. Morgan, Bloomberg. Last observation is Jan 2020.

One can guess at the reasons of why finding profitable shorter-term trading has become more difficult. Global monetary easing and massive asset purchases are often blamed, but this makes little sense, in our view, as policy is simply one of the many macro factors that hedge funds have in the past used to beat the market. More likely, information is nowadays ubiquitous, leaving nobody with an information advantage, while the hedge fund model of trading is now adopted by all major asset managers across the world, both leveraged and real money, and is slowly arbitraging itself away out of existence.

## What does the long-term investor look at?

Long- and short-term investors should look at information that is most relevant for their time horizons. For the long-term investor, that means first the **internal rate of return** on the assets that they have access to, closely followed by the longer-term risks they run on those assets. On assets with uncertain cash flows, such as stocks and corporate bonds, one then needs to judge potential economic growth, inflation, profit margins, leverage, and multiples. For this, we start with historic means and then assess the risk of **structural change** from past patterns. In our papers, we call these paradigm shifts, and among these we have written on de-globalization, US-China, the global savings glut, and climate change, among others (for a list, see the Library at the end of this note).

In addition to judging the returns on asset classes, the long-term investor also needs to assess the return on different **investment Styles**, such as **Momentum, Value, Size, and Quality**, among others. These could be considered active investing, as they involve switching

between assets depending on a particular signal. However, it is nowadays possible to buy a rule-based product or fund that passively follows this signal to switch tactically among assets, or individual securities. We similarly have tried in our work to analyze what returns to expect from certain investment styles, or factors. See the library at the end for notes on Value and Size investing<sup>4</sup>.

The shorter-term investor generally does not focus on longer-term forces, partly because they are not as dominant in driving near-term asset prices, but also as these forces are too low-frequency and do not move enough to provide enough trading signals.

The shorter-term investor, instead, looks at higher-frequency factors such as positions, flows, policy actions, statements, and economic data releases, among others. The tactical investor looks largely at the demand side of the economy, while the strategic one looks at the supply side. Most of these short-term signals do not add up to enough to change the long-term picture and are to the latter thus largely noise to the long-term investor.

## How long is long term?

What is the relevant long term? Several factors impinge on this issue. Foremost, it is a function of when you need your money back, as you should plan and judge markets for the full horizon over which you need to stay invested. Second is the size of your holdings. This is mainly an issue for institutional investors. The larger your AUM, the harder it is to move capital around. The largest pensions and sovereign wealth funds in the world have to think in terms of at least a generation when planning their holdings.

Finally, given that returns become easier to judge over a number of years, as discussed above, it makes sense to plan over a period for which the error and thus risk on projecting returns is the lowest. For safer bonds, both government and high-grade corporate, that is close to 10 years. For high-yield and equities, that is 15 years plus.

## Is there a return premium for longer-term investors?

With the same assets, simply holding assets longer-term does not directly add to returns, except that you reduce transaction and tax costs and the behavioral biases of

<sup>4</sup> For a more exhaustive review of systematic risk premia strategies, see the reference publications on our [website](#), among which [Systematic Strategies across Asset Classes, Risk factor approach to asset allocation](#), Marko Kolanovic, Dec 2013.

trading around your strategic position. The longer-term investor largely reduces risk.

However, by reducing the uncertainty on one's holding, and giving up the need for short-term liquidity, **the long-term investor can now hold a different portfolio with riskier, higher-return assets** than a short-term oriented investor. In our [Time Diversification](#) paper, we showed that 15-years out, the reduction in return uncertainty applies only to riskier assets, such as equities and high-yield. Hence, **long-term investing does increase your returns, because it allows you to hold riskier asset classes.**

## Should a longer-term investor hold more illiquid assets?

One riskier asset class that many long-term investors increasingly hold is **private assets** – private equity, private debt, and direct real estate. These assets are illiquid and thought to offer a higher return than public assets, those traded OTC or on exchanges. There is, however, a growing argument among academia and some practitioners that this illiquidity premium is no longer there, after massive inflows into the asset class, and still a large pool of un-invested commitments, and may never have been there to start with<sup>5</sup>.

Private assets do make sense, though, for funds that have longer-term, relatively known liabilities, such as pension, life insurers and endowments. Private assets have the advantage that due to their lack of being traded, their value is driven by cash flows and present value calculations that are much less volatile than public market prices. This could be seen as putting your head in the sand, but could alternatively also be seen as shielding returns from the excessive, technical volatility of public markets. Banks similarly do not mark to market their loan portfolios and neither their liabilities. Long-term funds that do not mark to market their liabilities thus have an incentive to hold a large share of their assets in illiquid assets, that themselves have not quoted public price.

## What balance between tactical and strategic risk?

Many institutional investors hire external managers for the asset classes on which they determine the strategic allocation. Frequently, they allow and expect these

managers to try and beat, through tactical over- and underweights, the passive benchmark given by the owner of the money. This creates a clear division of labor between those deciding TAA and those that work on SAA.

Whether tactical risk is outsourced or taken in house, the owner of the money must decide the balance between tactical and strategic risk. Let's call these alpha and beta risk. Alpha risk is additive to beta risk and needs to pay its own return for it to be worth it. If alpha returns are uncorrelated to the beta returns on the benchmark, then total portfolio risk is just the sum of the two. Alpha risks needs to offer the same return to risk as the benchmark for there to be a case to have any alpha risk at all: if the return to risk of active trading around the benchmark is the same as that on the benchmark, then the overall return to ratio does not rise.

For it to be worth it to add any tactical risk at all, its return to risk must either be the same as the benchmark, or its excess return negatively correlated to the benchmark return, or a combination of the two. Chart 3 suggests that for the sum of all active returns after fees earned by hedge funds the return to risk was both lower than the overall equity and bond market and was positively correlated to them: +0.85 during 2000-09 and +0.54 during 2010-20. We would except that there are pockets of sufficiently positive alpha in markets where information is not ubiquitous, such small caps, EM, and private markets, but these are also, not by coincidence, the markets where liquidity is not great. The alpha opportunities are probably there, but are not easily exploited in size.

Overall, we argue that, over the past decade, the **optimal balance is shifting strongly in favor of taking more beta and less alpha risk.**

<sup>5</sup> See, e.g., [Demystifying Illiquid Asset: Expected Returns on Private Equity](#), Ilmanen et al., Q1 2019, and [The Illiquidity Discount](#), Cliff Asness, Dec 19, 2019.

A photograph of a stack of books. In the foreground, an open book reveals its aged, yellowish pages. The background is filled with the spines of many other books, creating a rich, textured backdrop.

# Library of past issues

## Library of past issues

### Asset allocation

[New SAA Q4 2024](#), October 18, 2024  
[Updating our SAA](#), June 21, 2024  
[Building Strategic Asset Allocation 2023](#), October 10, 2023  
[What to do with 60/40?](#) June 16, 2022  
[Our strategic portfolio](#), March 5, 2021

### Climate

[The climate threat to EM assets](#), November 29, 2024  
[Climate change is starting to bite for US real estate](#), November 8, 2024  
[Climate and extreme weather risk is not priced into US residential real estate](#), February 26, 2024  
[Why invest in Climate Change?](#) December 10, 2019  
[Climate change investing](#), May 30, 2019

### Demographics

[Longevity: What do investors need to know?](#) February 14, 2025  
[Depopulation and PAYG pensions](#), January 24, 2025  
[Working-age depopulation has arrived](#), January 10, 2025  
[Demography and markets](#), September 20, 2024  
[Long-term impact of aging on equity markets](#), August 30, 2024  
[A demographic reversal to start pushing real interest rates up](#), March 2, 2022

### Emerging markets

[Can EM save 60/40?](#) December 2, 2020  
[Strategic questions on EM allocations](#), September 28, 2018

### Equities

[Strategic country scorecard](#), April 11, 2025  
[How can valuations help long-term sector selection?](#) January 10, 2025  
[Long-term equity returns across DM ex-US](#), October 11, 2024  
[CAPE and country long-term equity returns](#), October 4, 2024  
[What drives low future US equity returns?](#) September 13, 2024  
[Long-term impact of aging on equity markets](#), August 30, 2024  
[Does higher growth boost long-term equity returns?](#) August 23, 2024  
[Will Americans continue to love equities?](#) February 21, 2024  
[Democracy metrics and equity markets](#), October 21, 2021

[Will US market exceptionalism last?](#) June 24, 2021  
[Small Caps: A Strategic Overweight](#), February 15, 2019  
[Will Value Come Back?](#) November 16, 2018  
[Health Care: A Strategic Sector OW](#), May 11, 2018

### Forecasting returns

[Long-term yen forecast](#), November 15, 2024  
[Very long-term return forecasts for US bonds and equities](#), August 2, 2024  
[Long-term forecasts: Update January 2023](#), January 6, 2023  
[Forecasting long-term US equity returns with a neural network](#), November 29, 2022  
[US Equity, Bond and USD long-term returns after the repricing](#), February 16, 2022  
[Long-Term FX forecasts](#), December 14, 2021  
[Empirical models of long-term US equity returns](#), March 1, 2021  
[What returns can we expect?](#) April 13, 2018

### Interest rates

[Lowering our long-run US bond yield forecast](#), November 28, 2023  
[The debate about the long-term outlook for real interest rates](#), August 2, 2023  
[Real yields along the US curve: Long-term forecasts](#), March 13, 2023  
[Real bond yields in DM: Long-term projections](#), February 21, 2023  
[Long-term forces point to higher US bond yields](#), April 4, 2022  
[A demographic reversal to start pushing real interest rates up](#), March 2, 2022  
[60/40 in a zero-yield world](#), June 30, 2020  
[Zero US yields, almost there](#), March 11, 2020  
[Financial repression, risk aversion and zero yields](#), January 24, 2020  
[What if US joins the Zero-Yield World?](#) July 12, 2019

### Long-term macro

[The looming competition for skilled immigration](#), March 27, 2025  
[Deregulation, long-term growth and markets](#), March 7, 2025  
[Demography and markets](#), September 20, 2024  
[Government debt: Japan vs the US](#), July 5, 2024  
[Long-term impacts of immigration](#), June 28, 2024  
[Long-run economic growth forecasts](#), October 10, 2022  
[Commodity-linked assets as a long-run inflation hedge](#), July 28, 2021  
[Business Concentration](#), September 29, 2020  
[Some longer-term consequences of the Covid-19 crisis](#), April 9, 2020

## Long-term risk

[Does cash lower or raise long-term risk?](#) September 27, 2024  
[Top long-term risks and what to do about them](#), July 18, 2023  
[Long- versus short-term risk](#), February 1, 2023  
[How good are long-term forecasts?](#) June 14, 2022  
[Bonds time diversify much better than you think](#), February 14, 2020

[Short As to long-term Qs](#), April 19, 2021  
[Why long term?](#) February 25, 2020  
[The Value of Income](#), June 15, 2018  
[First thoughts](#), February 26, 2018

## Regime change

[What went wrong with capitalism?](#) February 28, 2025  
[US-China de-risking, long-term inflation and interest rates](#), October 23, 2023  
[The de-dollarization risk scenario](#), June 16, 2023  
[Industrial policy, deglobalization and strategic asset allocation](#), January 27, 2023  
[Where are we in Regime Change? Macro volatility, deglobalization, and secular rise in real yields](#), November 8, 2022  
[Inflation, markets and the end of the Great Moderation](#), September 27, 2021  
[De-globalization Update 2020](#), April 23, 2020  
[De-globalization](#), April 5, 2019  
[Politics and markets, long term](#), November 6, 2018

## Structural alpha

[Fallen Angel and Buybacks: Strategy Update 2020](#), September 28, 2020  
[Do BBs still offer better returns?](#) October 3, 2019  
[Buybacks and the investor](#), July 18, 2019

## Retirement

[Should saving for old age be mandatory?](#) December 13, 2024  
[Rules of thumb for managing retirement savings](#), December 6, 2024  
[Longer-term challenges to managing retirement savings](#), November 22, 2024  
[Taxes, bequests, and couple spending in retirement](#), October 25, 2024  
[Inflation and retirement finances](#), September 6, 2024  
[Are annuities a good retirement investment?](#) July 26, 2024  
[Life expectancy and retirement spending](#), July 19, 2024  
[How much can you spend out of retirement savings?](#) July 12, 2024  
[The defined-contribution problem](#), June 28, 2024

## Strategic investing

[Total portfolio approach vs SAA](#), March 14, 2025  
[The attraction of illiquidity](#), January 31, 2025  
[KISS investing](#), May 8, 2024  
[Ten topics in strategic investing](#), March 19, 2024  
[What have I learned so far on strategic investing?](#) December 5, 2023  
[Ten more strategic questions](#), November 9, 2023  
[Strategic investing questions, by the dozen](#), September 26, 2023  
[Bigger questions, shorter answers](#), June 21, 2022  
[Eight clips on strategic questions](#), February 17, 2022  
[Is thematic investing worth it?](#) January 18, 2022

Jan Loeys  
(1-917) 602-9440  
jan.loeys@jpmchase.com J.P.  
Morgan Securities LLC  
Alexander Wise AC  
(1-212) 622-6205  
alexander.c.wisej@jpmorgan.com

Global Long-term Strategy  
The Long-term Strategist

J.P.Morgan

## Disclosures

**Analyst Certification:** The Research Analyst(s) denoted by an “AC” on the cover of this report certifies (or, where multiple Research Analysts are primarily responsible for this report, the Research Analyst denoted by an “AC” on the cover or within the document individually certifies, with respect to each security or issuer that the Research Analyst covers in this research) that: (1) all of the views expressed in this report accurately reflect the Research Analyst’s personal views about any and all of the subject securities or issuers; and (2) no part of any of the Research Analyst’s compensation was, is, or will be directly or indirectly related to the specific recommendations or views expressed by the Research Analyst(s) in this report. For all Korea-based Research Analysts listed on the front cover, if applicable, they also certify, as per KOFIA requirements, that the Research Analyst’s analysis was made in good faith and that the views reflect the Research Analyst’s own opinion, without undue influence or intervention.

All authors named within this report are Research Analysts who produce independent research unless otherwise specified. In Europe, Sector Specialists (Sales and Trading) may be shown on this report as contacts but are not authors of the report or part of the Research Department.

## Important Disclosures

**Company-Specific Disclosures:** Important disclosures, including price charts and credit opinion history tables, are available for compendium reports and all J.P. Morgan-covered companies, and certain non-covered companies, by visiting <https://www.jpmm.com/research/disclosures>, calling 1-800-477-0406, or e-mailing [research.disclosure.inquiries@jpmorgan.com](mailto:research.disclosure.inquiries@jpmorgan.com) with your request.

### History of Investment Recommendations:

A history of J.P. Morgan investment recommendations disseminated during the preceding 12 months can be accessed on the Research & Commentary page of <http://www.jpmorganmarkets.com> where you can also search by analyst name, sector or financial instrument.

**Analysts' Compensation:** The research analysts responsible for the preparation of this report receive compensation based upon various factors, including the quality and accuracy of research, client feedback, competitive factors, and overall firm revenues.

## Other Disclosures

J.P. Morgan is a marketing name for investment banking businesses of JPMorgan Chase & Co. and its subsidiaries and affiliates worldwide.

**UK MIFID FICC research unbundling exemption:** UK clients should refer to [UK MIFID Research Unbundling exemption](#) for details of J.P. Morgan’s implementation of the FICC research exemption and guidance on relevant FICC research categorisation.

Any long form nomenclature for references to China; Hong Kong; Taiwan; and Macau within this research material are Mainland China; Hong Kong SAR (China); Taiwan (China); and Macau SAR (China).

J.P. Morgan Research may, from time to time, write on issuers or securities targeted by economic or financial sanctions imposed or administered by the governmental authorities of the U.S., EU, UK or other relevant jurisdictions (Sanctioned Securities). Nothing in this report is intended to be read or construed as encouraging, facilitating, promoting or otherwise approving investment or dealing in such Sanctioned Securities. Clients should be aware of their own legal and compliance obligations when making investment decisions.

Any digital or crypto assets discussed in this research report are subject to a rapidly changing regulatory landscape. For relevant regulatory advisories on crypto assets, including bitcoin and ether, please see <https://www.jpmorgan.com/disclosures/cryptoasset-disclosure>.

The author(s) of this research report may not be licensed to carry on regulated activities in your jurisdiction and, if not licensed, do not hold themselves out as being able to do so.

**Exchange-Traded Funds (ETFs):** J.P. Morgan Securities LLC (“JPMS”) acts as authorized participant for substantially all U.S.-listed ETFs. To the extent that any ETFs are mentioned in this report, JPMS may earn commissions and transaction-based compensation in connection with the distribution of those ETF shares and may earn fees for performing other trade-related services, such as securities lending to short sellers of the ETF shares. JPMS may also perform services for the ETFs themselves, including acting as a broker or dealer to the ETFs. In addition, affiliates of JPMS may perform services for the ETFs, including trust, custodial, administration, lending, index calculation and/or maintenance and other services.

Jan Loeys  
(1-917) 602-94401  
jan.loeys@jpmchase.com J.P.  
Morgan Securities LLC  
Alexander Wise  
(1-212) 622-6205  
alexander.c.wisej@jpmorgan.com

Global Long-term Strategy

J.P.Morgan

**Options and Futures related research:** If the information contained herein regards options- or futures-related research, such information is available only to persons who have received the proper options or futures risk disclosure documents. Please contact your J.P. Morgan Representative or visit <https://www.theocc.com/components/docs/riskstoc.pdf> for a copy of the Option Clearing Corporation's Characteristics and Risks of Standardized Options or [https://www.finra.org/sites/default/files/2020-08/Security\\_Futures\\_Risk\\_Disclosure\\_Statement\\_2020.pdf](https://www.finra.org/sites/default/files/2020-08/Security_Futures_Risk_Disclosure_Statement_2020.pdf) for a copy of the Security Futures Risk Disclosure Statement.

**Changes to Interbank Offered Rates (IBORs) and other benchmark rates:** Certain interest rate benchmarks are, or may in the future become, subject to ongoing international, national and other regulatory guidance, reform and proposals for reform. For more information, please consult: [https://www.jpmorgan.com/global/disclosures/interbank\\_offered\\_rates](https://www.jpmorgan.com/global/disclosures/interbank_offered_rates)

**Private Bank Clients:** Where you are receiving research as a client of the private banking businesses offered by JPMorgan Chase & Co. and its subsidiaries ("J.P. Morgan Private Bank"), research is provided to you by J.P. Morgan Private Bank and not by any other division of J.P. Morgan, including, but not limited to, the J.P. Morgan Corporate and Investment Bank and its Global Research division.

**Legal entity responsible for the production and distribution of research:** The legal entity identified below the name of the Reg AC Research Analyst who authored this material is the legal entity responsible for the production of this research. Where multiple Reg AC Research Analysts authored this material with different legal entities identified below their names, these legal entities are jointly responsible for the production of this research. Where more than one legal entity is listed under an analyst's name, the first legal entity is responsible for the production unless stated otherwise. Research Analysts from various J.P. Morgan affiliates may have contributed to the production of this material but may not be licensed to carry out regulated activities in your jurisdiction (and do not hold themselves out as being able to do so). Unless otherwise stated below in the legal entity disclosures, this material has been distributed by the legal entity responsible for production, or where more than one legal entity is listed under the analyst's name, the first legal entity will be responsible for distribution. If you have any queries, please contact the relevant Research Analyst in your jurisdiction or the entity in your jurisdiction that has distributed this research material.

**Legal Entities Disclosures and Country-/Region-Specific Disclosures:**

**Argentina:** JPMorgan Chase Bank N.A Sucursal Buenos Aires is regulated by Banco Central de la República Argentina ("BCRA"- Central Bank of Argentina) and Comisión Nacional de Valores ("CNV"- Argentinian Securities Commission - ALYC y AN Integral N°51).

**Australia:** J.P. Morgan Securities Australia Limited ("JPMSAL") (ABN 61 003 245 234/AFS Licence No: 238066) is regulated by the Australian Securities and Investments Commission and is a Market Participant of ASX Limited, a Clearing and Settlement Participant of ASX Clear Pty Limited and a Clearing Participant of ASX Clear (Futures) Pty Limited. This material is issued and distributed in Australia by or on behalf of JPMSAL only to "wholesale clients" (as defined in section 761G of the Corporations Act 2001). A list of all financial products covered can be found by visiting <https://www.jpmm.com/research/disclosures>. J.P. Morgan seeks to cover companies of relevance to the domestic and international investor base across all Global Industry Classification Standard (GICS) sectors, as well as across a range of market capitalisation sizes. If applicable, in the course of conducting public side due diligence on the subject company(ies), the Research Analyst team may at times perform such diligence through corporate engagements such as site visits, discussions with company representatives, management presentations, etc. Research issued by JPMSAL has been prepared in accordance with J.P. Morgan Australia's Research Independence Policy which can be found at the following link: [J.P. Morgan Australia - Research Independence Policy](#).

**Brazil:** Banco J.P. Morgan S.A. is regulated by the Comissão de Valores Mobiliários (CVM) and by the Central Bank of Brazil. Ombudsman J.P. Morgan: 0800-7700847 / 0800-7700810 (For Hearing Impaired) / [ouvidoria.jp.morgan@jpmchase.com](mailto:ouvidoria.jp.morgan@jpmchase.com). **Canada:** J.P. Morgan Securities Canada Inc. is a registered investment dealer, regulated by the Canadian Investment Regulatory Organization and the Ontario Securities Commission and is the participating member on Canadian exchanges. This material is distributed in Canada by or on behalf of J.P. Morgan Securities Canada Inc.

**Chile:** Inversiones J.P. Morgan Limitada is an unregulated entity incorporated in Chile.

**China:** J.P. Morgan Securities (China) Company Limited has been approved by CSRC to conduct the securities investment consultancy business.

**Colombia:** Banco J.P. Morgan Colombia S.A. is supervised by the Superintendencia Financiera de Colombia (SFC).

**Dubai International Financial Centre (DIFC):** JPMorgan Chase Bank, N.A., Dubai Branch is regulated by the Dubai Financial Services Authority (DFSA) and its registered address is Dubai International Financial Centre - The Gate, West Wing, Level 3 and 9 PO Box 506551, Dubai, UAE. This material has been distributed by JP Morgan Chase Bank, N.A., Dubai Branch to persons regarded as professional clients or market counterparties as defined under the DFSA rules.

**European Economic Area (EEA):** Unless specified to the contrary, research is distributed in the EEA by J.P. Morgan SE ("JPM SE"), which is authorised as a credit institution by the Federal Financial Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht, BaFin) and jointly supervised by the BaFin, the German Central Bank (Deutsche Bundesbank) and the European Central Bank (ECB). JPM SE is a company headquartered in Frankfurt with registered address at TaunusTurm, Taunustor 1, Frankfurt am Main, 60310, Germany. The material has been distributed in the EEA to persons regarded as professional investors (or equivalent) pursuant to Art. 4 para. 1 no. 10 and Annex II of MiFID II and its respective implementation in their home jurisdictions ("EEA professional investors"). This material must not be acted on or relied on by persons who are not EEA professional investors. Any investment or investment activity to which this material relates is only available to EEA relevant persons and will be engaged in only with EEA relevant persons.

Jan Loeys  
(1-917) 602-9440  
jan.loeys@jpmchase.com J.P.  
Morgan Securities LLC  
Alexander Wise  
(1-212) 622-6205  
alexander.c.wisej@jpmorgan.com

Global Long-term Strategy  
The Long-term Strategist

J.P.Morgan

**Hong Kong:** J.P. Morgan Securities (Asia Pacific) Limited (CE number AAJ321) is regulated by the Hong Kong Monetary Authority and the Securities and Futures Commission in Hong Kong, and J.P. Morgan Broking (Hong Kong) Limited (CE number AAB027) is regulated by the Securities and Futures Commission in Hong Kong. JP Morgan Chase Bank, N.A., Hong Kong Branch (CE Number AAL996) is regulated by the Hong Kong Monetary Authority and the Securities and Futures Commission, is organized under the laws of the United States with limited liability. Where the distribution of this material is a regulated activity in Hong Kong, the material is distributed in Hong Kong by or through J.P. Morgan Securities (Asia Pacific) Limited and/or J.P. Morgan Broking (Hong Kong) Limited.

**India:** J.P. Morgan India Private Limited (Corporate Identity Number - U67120MH1992FTC068724), having its registered office at J.P. Morgan Tower, Off. C.S.T. Road, Kalina, Santacruz - East, Mumbai – 400098, is registered with the Securities and Exchange Board of India (SEBI) as a ‘Research Analyst’ having registration number INH000001873. J.P. Morgan India Private Limited is also registered with SEBI as a member of the National Stock Exchange of India Limited and the Bombay Stock Exchange Limited (SEBI Registration Number – INZ000239730) and as a Merchant Banker (SEBI Registration Number – MB/INM000002970). Telephone: 91-22-6157 3000, Facsimile: 91-22-6157 3990 and Website: <http://www.jpmipl.com>. JPMorgan Chase Bank, N.A. - Mumbai Branch is licensed by the Reserve Bank of India (RBI) (Licence No. 53/ Licence No. BY.4/94; SEBI - IN/CUS/014/CDSL : IN-DP-CDSL-444-2008/ IN-DP-NSDL-285-2008/ INBI00000984/ INE231311239) as a Scheduled Commercial Bank in India, which is its primary license allowing it to carry on Banking business in India and other activities, which a Bank branch in India are permitted to undertake. For non-local research material, this material is not distributed in India by J.P. Morgan India Private Limited. Compliance Officer: Spurthi Gadamsetty;

[spurthi.gadamsetty@jpmchase.com](mailto:spurthi.gadamsetty@jpmchase.com); +912261573225. Grievance Officer: Ramprasad K, [jpmipl.research.feedback@jpmorgan.com](mailto:jpmipl.research.feedback@jpmorgan.com); +912261573000. Registration granted by SEBI and certification from NISM in no way guarantee performance of the intermediary or provide any assurance of returns to investors.

**Indonesia:** PT J.P. Morgan Sekuritas Indonesia is a member of the Indonesia Stock Exchange and is registered and supervised by the Otoritas Jasa Keuangan (OJK).

**Korea:** J.P. Morgan Securities (Far East) Limited, Seoul Branch, is a member of the Korea Exchange (KRX). JPMorgan Chase Bank, N.A., Seoul Branch, is licensed as a branch office of foreign bank (JPMorgan Chase Bank, N.A.) in Korea. Both entities are regulated by the Financial Services Commission (FSC) and the Financial Supervisory Service (FSS). For non-macro research material, the material is distributed in Korea by or through J.P. Morgan Securities (Far East) Limited, Seoul Branch. **Japan:** JPMorgan Securities Japan Co., Ltd. and JPMorgan Chase Bank, N.A., Tokyo Branch are regulated by the Financial Services Agency in Japan.

**Malaysia:** This material is issued and distributed in Malaysia by JPMorgan Securities (Malaysia) Sdn Bhd (18146-X), which is a Participating Organization of Bursa Malaysia Berhad and holds a Capital Markets Services License issued by the Securities Commission in Malaysia.

**Mexico:** J.P. Morgan Casa de Bolsa, S.A. de C.V. and J.P. Morgan Grupo Financiero are members of the Mexican Stock Exchange and are authorized to act as a broker dealer by the National Banking and Securities Exchange Commission.

**New Zealand:** This material is issued and distributed by JPMSAL in New Zealand only to "wholesale clients" (as defined in the Financial Markets Conduct Act 2013). JPMSAL is registered as a Financial Service Provider under the Financial Service providers (Registration and Dispute Resolution) Act of 2008.

**Philippines:** J.P. Morgan Securities Philippines Inc. is a Trading Participant of the Philippine Stock Exchange and a member of the Securities Clearing Corporation of the Philippines and the Securities Investor Protection Fund. It is regulated by the Securities and Exchange Commission.

**Singapore:** This material is issued and distributed in Singapore by or through J.P. Morgan Securities Singapore Private Limited (JPMS) [MDDI (P) 068/08/2024 and Co. Reg. No.: 199405335R], which is a member of the Singapore Exchange Securities Trading Limited, and/or JPMorgan Chase Bank, N.A., Singapore branch (JPMCB Singapore), both of which are regulated by the Monetary Authority of Singapore. This material is issued and distributed in Singapore only to accredited investors, expert investors and institutional investors, as defined in Section 4A of the Securities and Futures Act, Cap. 289 (SFA). This material is not intended to be issued or distributed to any retail investors or any other investors that do not fall into the classes of “accredited investors,” “expert investors” or “institutional investors,” as defined under Section 4A of the SFA. Recipients of this material in Singapore are to contact JPMS or JPMCB Singapore in respect of any matters arising from, or in connection with, the material. **South Africa:** J.P. Morgan Equities South Africa Proprietary Limited and JPMorgan Chase Bank, N.A., Johannesburg Branch are members of the Johannesburg Securities Exchange and are regulated by the Financial Services Conduct Authority (FSCA). **Taiwan:** J.P. Morgan Securities (Taiwan) Limited is a participant of the Taiwan Stock Exchange (company-type) and regulated by the Taiwan Securities and Futures Bureau. Material relating to equity securities is issued and distributed in Taiwan by J.P.

Morgan Securities (Taiwan) Limited, subject to the license scope and the applicable laws and the regulations in Taiwan. **To the extent that J.P. Morgan Securities (Taiwan) Limited produces research materials on securities not listed on the Taiwan Stock Exchange or Taipei Exchange (“Non-Taiwan Listed Securities”), these materials shall not constitute securities recommendations for the purpose of applicable Taiwan regulations, and, for the avoidance of doubt, J.P. Morgan Securities (Taiwan) Limited does not act as broker for Non-Taiwan Listed Securities.** According to Paragraph 2, Article 7-1 of Operational Regulations Governing Securities Firms Recommending Trades in Securities to Customers (as amended or supplemented) and/or other applicable laws or regulations, please note that the recipient of this material is not permitted to engage in any activities in connection with the material that may give rise to conflicts of interests, unless otherwise disclosed in the “Important Disclosures” in this material.

Jan Loeys  
(1-917) 602-9440  
jan.loeys@jpmchase.com J.P.  
Morgan Securities LLC  
Alexander Wise  
(1-212) 622-6205  
alexander.c.wisej@jpmorgan.com

Global Long-term Strategy

J.P.Morgan

**Thailand:** This material is issued and distributed in Thailand by JPMorgan Securities (Thailand) Ltd., which is a member of the Stock Exchange of Thailand and is regulated by the Ministry of Finance and the Securities and Exchange Commission, and its registered address is 3rd Floor, 20 North Sathorn Road, Silom, Bangrak, Bangkok 10500.

**UK:** Research is produced in the UK by J.P. Morgan Securities plc ("JPMS plc") which is a member of the London Stock Exchange and is authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority or J.P. Morgan Markets Limited ("JPMM Ltd") which is authorised and regulated by the Financial Conduct Authority. Unless specified to the contrary, this material is distributed in the UK by JPMS plc and is directed in the UK only to: (a) persons having professional experience in matters relating to investments falling within article 19(5) of the Financial Services and Markets Act 2000 (Financial Promotion) (Order) 2005 ("the FPO"); (b) persons outlined in article 49 of the FPO (high net worth companies, unincorporated associations or partnerships, the trustees of high value trusts, etc.); or (c) any persons to whom this communication may otherwise lawfully be made; all such persons being referred to as "UK relevant persons". This material must not be acted on or relied on by persons who are not UK relevant persons. Any investment or investment activity to which this material relates is only available to UK relevant persons and will be engaged in only with UK relevant persons. A description of J.P. Morgan EMEA's policy for prevention and avoidance of conflicts of interest related to the production of Research can be found at the following link: [J.P. Morgan EMEA - Research Independence Policy](#).

**U.S.:** J.P. Morgan Securities LLC ("JPMS") is a member of the NYSE, FINRA, SIPC, and the NFA. JPMorgan Chase Bank, N.A. is a member of the FDIC. Material published by non-U.S. affiliates is distributed in the U.S. by JPMS who accepts responsibility for its content.

**General:** Additional information is available upon request. The information in this material has been obtained from sources believed to be reliable. While all reasonable care has been taken to ensure that the facts stated in this material are accurate and that the forecasts, opinions and expectations contained herein are fair and reasonable, JPMorgan Chase & Co. or its affiliates and/or subsidiaries (collectively J.P. Morgan) make no representations or warranties whatsoever to the completeness or accuracy of the material provided, except with respect to any disclosures relative to J.P. Morgan and the Research Analyst's involvement with the issuer that is the subject of the material. Accordingly, no reliance should be placed on the accuracy, fairness or completeness of the information contained in this material. There may be certain discrepancies with data and/or limited content in this material as a result of calculations, adjustments, translations to different languages, and/or local regulatory restrictions, as applicable. These discrepancies should not impact the overall investment analysis, views and/or recommendations of the subject company(ies) that may be discussed in the material. Artificial intelligence tools may have been used in the preparation of this material, including assisting in data analysis, pattern recognition, and content drafting for research material. J.P. Morgan accepts no liability whatsoever for any loss arising from any use of this material or its contents, and neither J.P. Morgan nor any of its respective directors, officers or employees, shall be in any way responsible for the contents hereof, apart from the liabilities and responsibilities that may be imposed on them by the relevant regulatory authority in the jurisdiction in question, or the regulatory regime thereunder. Opinions, forecasts or projections contained in this material represent J.P. Morgan's current opinions or judgment as of the date of the material only and are therefore subject to change without notice. Periodic updates may be provided on companies/industries based on company-specific developments or announcements, market conditions or any other publicly available information. There can be no assurance that future results or events will be consistent with any such opinions, forecasts or projections, which represent only one possible outcome. Furthermore, such opinions, forecasts or projections are subject to certain risks, uncertainties and assumptions that have not been verified, and future actual results or events could differ materially. The value of, or income from, any investments referred to in this material may fluctuate and/or be affected by changes in exchange rates. All pricing is indicative as of the close of market for the securities discussed, unless otherwise stated. Past performance is not indicative of future results. Accordingly, investors may receive back less than originally invested. This material is not intended as an offer or solicitation for the purchase or sale of any financial instrument. The opinions and recommendations herein do not take into account individual client circumstances, objectives, or needs and are not intended as recommendations of particular securities, financial instruments or strategies to particular clients. This material may include views on structured securities, options, futures and other derivatives. These are complex instruments, may involve a high degree of risk and may be appropriate investments only for sophisticated investors who are capable of understanding and assuming the risks involved. The recipients of this material must make their own independent decisions regarding any securities or financial instruments mentioned herein and should seek advice from such independent financial, legal, tax or other adviser as they deem necessary. J.P. Morgan may trade as a principal on the basis of the Research Analysts' views and research, and it may also engage in transactions for its own account or for its clients' accounts in a manner inconsistent with the views taken in this material, and J.P. Morgan is under no obligation to ensure that such other communication is brought to the attention of any recipient of this material. Others within J.P. Morgan, including Strategists, Sales staff and other Research Analysts, may take views that are inconsistent with those taken in this material. Employees of J.P. Morgan not involved in the preparation of this material may have investments in the securities (or derivatives of such securities) mentioned in this material and may trade them in ways different from those discussed in this material. This material is not an advertisement for or marketing of any issuer, its products or services, or its securities in any jurisdiction.

**Confidentiality and Security Notice:** This transmission may contain information that is privileged, confidential, legally privileged, and/or exempt from disclosure under applicable law. If you are not the intended recipient, you are hereby notified that any disclosure, copying, distribution, or use of the information contained herein (including any reliance thereon) is STRICTLY PROHIBITED. Although this transmission and any attachments are believed to be free of any virus or other defect that might affect any computer system into which it is

Jan Loeys  
(1-917) 602-9440  
jan.loeys@jpmchase.com J.P.  
Morgan Securities LLC  
Alexander Wise  
(1-212) 622-6205  
alexander.c.wisej@jpmorgan.com

Global Long-term Strategy

J.P.Morgan

received and opened, it is the responsibility of the recipient to ensure that it is virus free and no responsibility is accepted by JPMorgan Chase & Co., its subsidiaries and affiliates, as applicable, for any loss or damage arising in any way from its use. If you received this transmission in error, please immediately contact the sender and destroy the material in its entirety, whether in electronic or hard copy format. This message is subject to electronic monitoring: <https://www.jpmorgan.com/disclosures/email>

**MSCI:** Certain information herein (“Information”) is reproduced by permission of MSCI Inc., its affiliates and information providers (“MSCI”) ©2025. No reproduction or dissemination of the Information is permitted without an appropriate license. MSCI MAKES NO EXPRESS OR IMPLIED WARRANTIES (INCLUDING MERCHANTABILITY OR FITNESS) AS TO THE INFORMATION AND DISCLAIMS ALL LIABILITY TO THE EXTENT PERMITTED BY LAW. No Information constitutes investment advice, except for any applicable Information from MSCI ESG Research. Subject also to [msci.com/disclaimer](https://www.msci.com/disclaimer)

Sustainalytics: Certain information, data, analyses and opinions contained herein are reproduced by permission of Sustainalytics and: (1) includes the proprietary information of Sustainalytics; (2) may not be copied or redistributed except as specifically authorized; (3) do not constitute investment advice nor an endorsement of any product or project; (4) are provided solely for informational purposes; and (5) are not warranted to be complete, accurate or timely. Sustainalytics is not responsible for any trading decisions, damages or other losses related to it or its use. The use of the data is subject to conditions available at <https://www.sustainalytics.com/legal-disclaimers>. ©2025 Sustainalytics. All Rights Reserved.

"Other Disclosures" last revised May 24, 2025.

**Copyright 2025 JPMorgan Chase & Co. All rights reserved. This material or any portion hereof may not be reprinted, sold or redistributed without the written consent of J.P. Morgan. It is strictly prohibited to use or share without prior written consent from J.P. Morgan any research material received from J.P. Morgan or an authorized third-party (“J.P. Morgan Data”) in any third-party artificial intelligence (“AI”) systems or models when such J.P. Morgan Data is accessible by a third-party. It is permissible to use J.P. Morgan Data for internal business purposes only in an AI system or model that protects the confidentiality of J.P. Morgan Data so as to prevent any and all access to or use of such J.P. Morgan Data by any third-party.**