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Long-term Strategy
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The Long-Term Strategist

What returns can we expect?

- **Strategic allocation requires an objective idea of what returns can be achieved over the longer term. We investigate this for the four main asset classes in the US dollar market: equities, bonds, credit, and cash.**
- **The standard model of future returns requires linking today's entry asset IRRs with future cycle-neutral IRRs, 1-2 cycles away.**
- **IRRs are driven by the economic fundamentals of capital spending, savings and inflation. Rather than choose one economic future, we look at three possible future regimes, probability weighted: the current one with surplus global savings, and two back-to-the-future alternatives with higher growth or higher inflation.**
- **We find very low future returns by historic standards, of 2-4% across regimes and asset classes. US equities come in only at 3.3%.**
- **Low returns derive from the mild mean reversion we expect coming from a staring point of high asset prices (low IRRs and risk premia) and high profit margins. Faster mean reversion would push expected returns towards, if not below, the zero point.**
- **Our risk-return efficient frontier peaks at corporate bonds, with lower returns on stocks, favoring by implication higher-income assets such as bond-like equities, and equity-like bonds.**
- Video.

Long-term Strategy
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After you decide the objectives of your portfolio, the most important input into your strategic asset allocation has to be **what returns** you can reasonably expect, with **what risk**. This is what we aim to do here for the main USD asset classes of cash, bonds, credit and equities for the next 10 years.

Why only for the US dollar? USD equities and bonds together make up half the investable world of marketable securities for global investors. The US economy makes up only just over a quarter of world GDP, but a larger part of its companies use the public capital markets and non-US investors and issuers use the dollar market to invest and fund themselves. There is, thus, a good case to be made that the rest of the world is largely a spread product to the USD market. If you have your long-term view of the US market right, then you have a good chance of getting the rest of the world right also.

Why only the four asset classes of cash, bonds, credit and equities? Here too, we believe that if you get these four basic asset classes right, then you are well on the way of getting the rest right also. For these four, we will use Tbills, US Treasuries, high-grade corporate bonds, and large cap equities (S&P500).

See page 15 for analyst certification and important disclosures.

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We will deal in later issues with currencies and alternative assets, and others that fall in between our basic ones. We would like to refer to the more extensive analysis of my colleagues in J.P. Morgan Asset Management (Long-term Capital Market Assumptions, 2018, 22nd annual edition) that covers a lot more asset classes and currencies than we do here.

Our **objective** here is to have a **look at the kitchen**, with a fully transparent model that shows where one has to make choices on future fundamentals to judge what returns one can expect to make on broad asset portfolios. The investor reader is invited to make their own choices on these fundamentals to see what returns this produces.

Two basic approaches

There are **two basic approaches** to judging returns over the long term. We will call them the **Past Return** approach and the **Equilibrium IRR** approach. The Past Return approach simply uses a long sample of past returns and thus assumes future asset returns will be randomly picked from a relatively stationary close-to-normal distribution. We thus only need to obtain as long a past sample as possible to produce the most efficient estimate of the means, correlations and standard deviations of this return population.

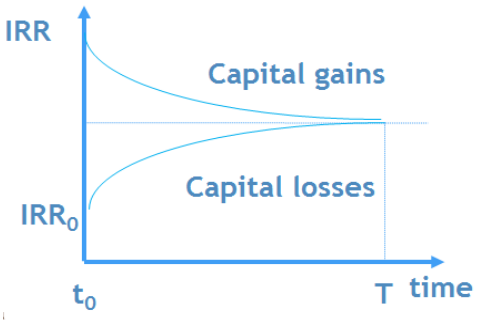
The **Past Return** approach has two weaknesses, in our mind. One is that it presumes that the range of conditions that will prevail over the next decade is best described by the range observed over the past so many decades. That is, there is no long-term structural change in financial asset returns. And the second is that it ignores the starting point of today's asset price levels and fundamental conditions.

We think instead of a world that is constantly changing, adapting and learning, and where tomorrow's conditions and thus returns spout from today's world. Change, thus, largely happens at the margin and is more evolutionary than revolutionary. Tomorrow's events are part extensions of recent trends and part reactions to today's world. One should thus start from today's asset prices and judge the range of potential alternative paths from here. Hence, our strong preference for a forward looking approach that tries to judge how today's asset prices could be changing.

But how do we assess this change? Asset prices are the present values of future cash flows and their changes and returns are thus driven by changes in expected future cash flows as well as changes in the discount rate (IRR) applied to value future cash flows in today's terms. There is ample empirical evidence that much of asset price volatility comes from fluctuations in IRRs instead of cash flows.

Hence, our approach at assessing future long-term returns comes down to starting from today's asset class IRRs and economic growth and then judge around what levels they are likely to fluctuate over the next 10 years, or to converge on. If these IRRs are different from today's, then we need to account for a convergence process and the implied capital gains or losses. Fig 1 below shows the principle that if your starting point IRR is below what we will call expected cycle-average or equilibrium IRRs, then convergence implies capital losses at some point, and vice versa.

Figure 1: Future returns as a process of IRR convergence from today to an average across future business cycles.



Source: J.P. Morgan.

Why do entry points matter? It could be argued that any IRR deviation from the long-term mean, and thus the current cheapness or expensiveness as an asset, is for the tactical manager to take account of, and should not affect the strategic allocation. On this view, SAA should simply look at asset returns from once they are back on their equilibrium IRR. This is a fair point, but one that depends on how fast IRRs revert to their mean. Tactical managers generally need to perform within one year over which momentum tends to be more powerful than any IRR mean reversion. For most of the macro asset classes we consider, any reversion to cycle-mean, equilibrium or fair-value IRRs is usually a question of years, if not decades. Hence, we think they are more the responsibility of strategic asset allocation and asset price/IRR entry points should thus be an important consideration for SAA.

How do we choose equilibrium IRRs? As shown more visually in Fig 2, we can think of asset IRRs as consisting of a safe rate – real plus expected inflation – and a set of risk premia that depend on the systematic riskiness of the

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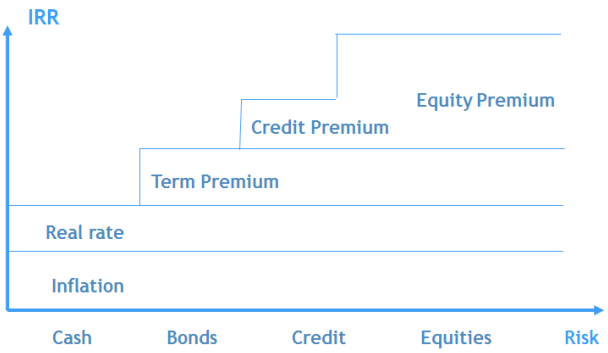
asset class. With our basic four asset classes, we think of these as a short real rate, inflation, plus a term premium to get to bonds, plus a credit premium to get to credit, or an equity premium to get to equity IRRs.

Figure 2: Fundamental components of asset class IRRs.



Source: J.P. Morgan.

We know today's IRRs. All we need to do is obtain reasonable estimates of the means of each of these IRR components across future business cycles to combine them with future cash flow growth to produce implications for asset class returns over that horizon. The easiest way of doing this, and to some the most compelling way, is to take the historic means of these IRRs. This would be equivalent to using past returns only if today's starting point would be exactly on that past average. We will use much of past average IRRs, but only where there has been clean mean reversion within 10-year periods and where we see no clear case for structural change. Most of the basic IRR components in Fig 2 have proven to deviate persistently from their post-war means for decades at a time and we thus resist the notion that they will this time return to these past means over the next decade.

Today's regime: Global Savings Surplus

If we cannot simply rely on IRR mean reversion to long-term historic means, then how do we go about choosing where they will be in 10 years from now? We think we should do it by understanding the fundamentals driving current asset prices and IRRs, such as growth, inflation, savings rates, capital spending, and volatility, and then judge whether they are likely to mean revert to past behavior, or to some other level. Given the uncertainty and subjectivity around such judgements, we will do this through what we will call economic "regimes,"

We define a regime as a set of values for these fundamentals and IRRs, arranged by a narrative of what drives them, with the recognition that these regimes can switch from time to time to another one.

We would call the regime we are in today ***Global Savings Surplus***. It denotes a by-historic-standards high supply of global savings capital from corporates, EM and QE-ing central banks against relatively low demand for capital for borrowing and capital spending. This regime is related to Larry Summers' Secular Stagnation, a term brought back after its first use by Alvin Hansen in the late 1930s. Secular stagnation denotes mostly low economic growth and capital spending rates, quite likely related to the global crash in global productivity growth at the start of the current decade. We prefer our Global Savings Surplus as we think the current regime is not all about low productivity growth but also about increased global savings, emanating from the rapid growth in high savings countries (predominantly China) and higher corporate profit margins that would have reduced corporate funding needs even in the absence of weak capital spending rates. The most obvious **impact** on markets of high savings and low funding needs are **high asset prices and low IRRs**.

There is a possibility, but not our main view, that the current regime is simply the aftermath of the Great Financial Crisis that made economic agents more cautious and uncertain and thus led to low capex and high savings. If that were indeed the main driver of the current regime, risk premia should have been higher than past norms, and savings portfolios more defensively positioned. We do not find this as those premia are for the most part already lower than pre-GFC means while US household portfolios are very long equities, with higher allocations held only once before, during the bubble years of the late 90s. Hence, we do not think that the fading of post GFC caution will lead to steadily lower risk premia.

If we stay in the current Global Savings Surplus regime, then asset IRRs are set to stay low. That avoids the capital losses from mean reversion to higher past IRRs, but from current levels still keeps future returns low by historic standards, mostly as we likely cannot rely on continued fast earnings growth, given already above average profit margins.

The nature of any regime is that **it does not last forever**. In our view, each regime bears in it the kernels of change to another one, largely as economic agents learn, or grew dissatisfied with it, with those gaining least from the regime agitating for change. The term "regime" comes

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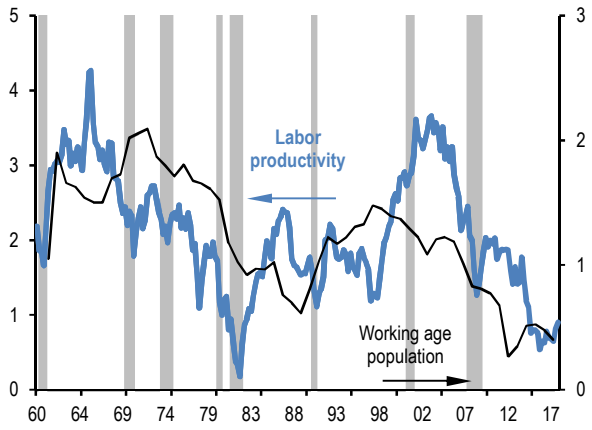
largely from politics, and we can think of democracy, capitalism, globalization, nationalism deregulation as general examples of regimes. Each has winners and losers and the latter group will be most actively trying to change the regime. One can look at many such political or social regimes and consider how today's regime can morph into another one in 10 years from now.

Two alternative regimes: Growth, and Inflation

For our more mundane financial forecasting purposes, we will want to focus on regime changes that have tangible and lasting impact on asset prices. From this point, we see two major possible regime changes that would have dramatic changes on future asset IRRs: we will call them **Growth** and **Inflation**.

Figure 3: Growth in US labor productivity and working age population.
%, 5-year rolling averages

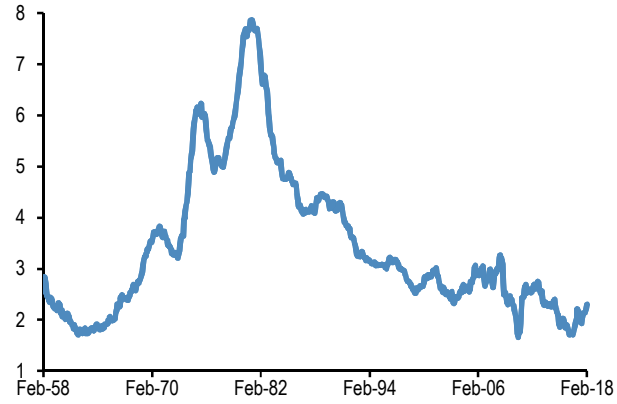


Source: J.P. Morgan.

The **Growth** regime looks at the low capital spending part of the current regime and considers that much of the fall in global growth this past decade is due to the collapse in global productivity growth (see e.g., The global productivity slowdown lowers sights on potential GDP, Lupton et al., Nov 2015)). Growth consists, by identity, of the growth of working hours, which is mostly demographics and labor participation and the growth rate of GDP per working hour. There is a huge literature trying to explain the fall in global productivity growth of the past decade. From our side, we believe it is real and not a measurement problem; we see it in virtually all US sectors; we see it in all countries; and, No, there is no easy explanation of this fall. But we know that productivity growth has mean reverted over the decades (Fig 3). And there are enough economists who argue that without a clear explanation of this fall, we should take seriously the possibility that it will bounce back in coming years. In this growth regime, we have productivity growth bouncing back to the 1.5% median pace of the previous few decades.

Our third regime, under which **inflation returns** and moves back eventually to above 3%, is likely the more contentious and also least likely, but not one that has zero probability. The 1970s and 1980s inflation, which rose to above 10% at times, was born in the late 1960s late cycle fiscal stimulus (the Vietnam war) that a Federal Reserve did not fight strongly -- either as a policy mistake, or as a political choice. It took the appointment of Paul Volcker as Fed chair and sustained tight monetary policy to finally bring long-term inflation expectations to below 3% by the late 90s (Fig 4).

Figure 4: Expected US long-term inflation.
%



Source: J.P. Morgan

Today, the US economy is also receiving significant fiscal stimulus at a late point in the cycle when the economy is already operating above full capacity. The leadership of the Federal Reserve in Washington is seeing dramatic changes but is so far not showing clear signs of an imminent change in policy objectives. We do not see a material risk of a sudden and public shift in policy objectives, but cannot ignore the risk of a slow and incremental shift in priorities towards growth with a reduced weight on inflation control.

With three possible scenarios to choose from, one can argue that the investor simply has to make a choice of where we are headed. We think the reality is that one cannot know for sure, and that all one can do is to put **odds on each of these possible scenarios**. But how does one do that? One way to do that would be to look at the

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past and see how frequently each of these scenarios has occurred. That would be the approach implied by using historic averages of asset IRRs and risk premia as our convergence points for the future. But we do not think that is a good approach.

For one, one should think of the current regime as a kind of anchor regime that requires significant action to get out of. Whether we time the start of this regime from the end of the last recession (2009) or the fall in global productivity growth (2011), using the frequency of this period over the post war period (less than 10%) would imply in our mind much too low a probability that it will persist over the next decade. At the same time, we can see the historic mean reversion of productivity growth and the recent rebound in capital spending as signs that the odds of moving back towards normal growth patterns are not that minimal either.

Lacking a clean quantitative metric to judge the odds of any of my three regimes prevailing over the next decade, we are down to asking economists, including ourselves, to give us their own subjective odds. When we do that we come up with about 1/2 odds we stay in the current Global Savings Surplus regime, 1/3 that we return to the productivity growth of the 1980s to 2010, and 1/6 that we move back to an inflationary cycle. The last 1/6th odds of an return to inflation may seem high to some, but should be put in context that over the past 70 years, long-term inflation expectations were above 3% more than half the time.

Table 1: Three regimes

	Regime	US historic precedent	Characteristics	Odds
1	Global Savings Surplus	2011 to now	Low productivity growth High global savings rates Public austerity	1/2
2	Growth	1997-2010	Higher productivity growth Corporate capex > profits	1/3
3	Inflation	1968-1997	High inflation expectation (>3%) High macro volatility up to '86	1/6

Source: J.P. Morgan.

What IRRs in what regime?

Having decided what the alternative regimes or scenarios for the next 10 years should be, now comes the hard work of deciding what the levels that the asset class IRRs depicted in Fig 2 should converge on in each of these scenarios. The good news, though, is that we are not without help. By having chosen scenarios for which there are historic precedents in the US, we at least have a good starting point as we can measure around what levels the main IRR components moved during these historic precedents.

Table 2: IRR components under three regimes

	Regime 1		Regime 2		Regime 3	
Odds	Global Savings Surplus 1/2		Growth 1/3		Inflation 1/6	
	2011-17	Future	1998-2010	Future	1967-97	Future
Real GDP	2.1%	0.9%	2.3%	1.9%	3.2%	1.4%
Labor force	0.5%	0.4%	2.0%	0.4%	2.0%	0.4%
Productivity	0.5%	0.5%	2.0%	1.5%	1.5%	1.0%
CPI inflation	1.9%	2.0%	2.1%	2.1%	5.5%	4.0%
Deflator GDP	1.7%	2.0%	2.1%	2.1%	4.7%	3.7%
Nominal GDP	3.8%	2.9%	4.4%	4.0%	7.9%	5.1%
Real Tbill	-1.7%	0.0%	0.8%	0.8%	1.4%	1.4%
Real 10yr UST	-0.2%	0.5%	1.9%	1.9%	3.8%	3.5%
HG spread	1.7%	1.7%	1.7%	1.7%	1.0%	1.5%
P/E	18.6	18.6	21.4	18.0	14.3	15.0
LT inflation exp.	2.2%	2.0%	2.7%	2.1%	4.6%	4.0%
EPS	7.7%	2.6%	5.4%	2.9%	7.4%	3.3%
Cash vol	0.1%	0.1%	0.6%	0.6%	0.8%	0.8%
Bond vol	3.6%	3.6%	5.0%	5.0%	6.0%	6.0%
HG vol	3.9%	3.9%	5.8%	5.8%	8.1%	8.1%
Equity vol	10.9%	10.9%	16.9%	16.9%	15.2%	15.2%

Source: J.P. Morgan.

Table 2 shows for each regime's historic precedent the average expected long-term inflation, real and nominal GDP growth, SPX reported EPS growth, real Tbill rates, real 10-year UST yield, the HG spread, SPX trailing multiples and the volatility the main asset classes. Unless there are convincing reasons otherwise (detailed below), we will use the historic means of these historic precedents for each regime. Currently, the 10-year benchmark and our overall UST index (GBI-US) have almost the same yield and duration and we thus use the history of the 10-year to make judgements about future returns on the overall UST market.

For **volatility and correlations**, we simply use the historic observations from each reference period. They show higher vol in Regime 2 then 1 and again higher in Regime 3, consistent with our prior and empirical observations that higher economic growth and inflation bring higher macro volatility and thus also higher asset price volatility.

In this exercise, we use a straight line **convergence** over 10 years from today's to tomorrow's. One could choose a faster one, but we find that the pace of mean reversion is too slow to make a clean case for faster convergence.

Economic growth consists by definition of the growth in workers/hours and the growth of GDP per worker hour (productivity). The first is driven by demographics. Fig 3 shows how the growth of the working-age population has steadily come down from ~1.5% in the 1960s to only

0.5% over the past decade, largely due to aging and reduced immigration post 9-11. We do not have a view on how immigration policy will change over the next decade, but using Census Bureau projections of population growth by cohort and our own labor participation models, we would project a **0.4% growth rate of the US labor force over the next decade**. The latest drop is largely due to baby-boomers entering retirement age.

Productivity growth stays at the current decade level of 0.5% in Regime 1, but bounces back to the median level of 1.5% of the previous three decades in our Growth Regime. By using the median, we are excluding the productivity boom of the late 90s, as an aberration unlikely to repeat itself this coming decade. For our Inflation Regime, we do not want to make a choice as to productivity and thus choose the midpoint between the other two regimes.

For **inflation**, we start with the reference period mean for each regime. For Regime 1, where we are now, we choose the slightly higher inflation rate of 2%, the Fed's implicit target, because inflation likely stayed lower as the economy operated below potential for most of this period. For the Inflation Regime, we choose a lower average (4%) than the reference period on a prior that even if the Fed were to implicitly let inflation targets rise, they would not let it rise as much as it did in the 1970s and 1980s.

In Regimes 1 and 2, we let the CPI and GDP deflator perform the same, but we accept the GDP deflator will grow by less in the high-inflation regime, as it did during the historic period. **Expected long-term inflation**, that we measure in the past from the Philadelphia Fed Survey of Professional Forecasters, should converge over our 10-year horizon to the CPI inflation rate that we see prevail over the period.

For **real rates and bond yields**, we also start with the historic means, but choose a higher level under the current regime as the economy has been operating below capacity for much of the 2011-17 reference period, and was early in this period still digging out from the worst recession in the past war period. One could be tempted to use the neutral rate used by the FOMC, which is currently 1% above its target inflation rate, but this rate also assumes a productivity growth pace between our Regime 1 and 2. Hence, we will take the zero real short rate prevailing late last year when the CBO estimates the economy was operating at full capacity.

The real 10-year UST yield (TIPS) has averaged 0.2% during the reference period of 2011-17, but was likely also held lower than the mean level one can assume if this Global Savings Surplus regime persists. We find that the real 10-year yield averaged 0.5% since 2013 and this thus seems a better anchor for this regime. For Regimes 2 and 3, we take historic means for both the real short rate and the real bond yield.

The **high-grade credit spread** over US Treasuries averaged 170bp in the reference periods for both Regimes 1 and 2, but was much lower in the earlier higher-inflation period of 1967-97. This is likely because the average credit quality of the HG market was much higher then and has steadily come down since. In the 1970s, the point of gravity of the HG market was around AA and now hangs in between A and BBB.

We know that spreads have a clear cyclical pattern, rising in the onset to recession and in early recovery when default and downgrade rates spike. Changing leverage patterns and central bank QE purchase also have significant impact on spreads between corporate bonds and USTs. But we are interested instead in a cycle-neutral average of expansions and recessions. Our fair value model from over a decade ago (A Fair Value Model of US Bonds, Credit and equities, N. Panigirtzoglou and J. Loeys, June 2005) showed that quarterly changes in spreads rise with defaults, downgrades, spread volatility, and lower equity returns. Looking back, we would consider much of this cyclical and thus not critical to a 10-year out view.

There is the question whether the higher volatility in a high inflation regime, which clearly drove equity premia up materially during the reference period, should not also structurally raise credit spreads. We considered this, but also find that for the HY market, where credit quality was more stable, we did not see higher spreads in the 1980s and early 90s, where our long-term inflation measures hovered between 3% and 4%. Hence, without a strong reason to project in 10 years a spread different from the last 20 years, we fix the cycle average spreads at the same 170bp in each of the three regimes.

For **equities**, where earnings are not fixed and thus prices can be affected by changing earnings expectations, we need **earnings growth** under each scenario, the ratio of these to prices (**multiples**) and the dividend rate. The latter has been quite stable around 2% and we thus keep it there in each regime. By definition, the way we set this up, the price index at the end of our horizon will be the last year's EPS on the index and the trailing multiple. We add the **2% dividend yield** to the forecast annual price

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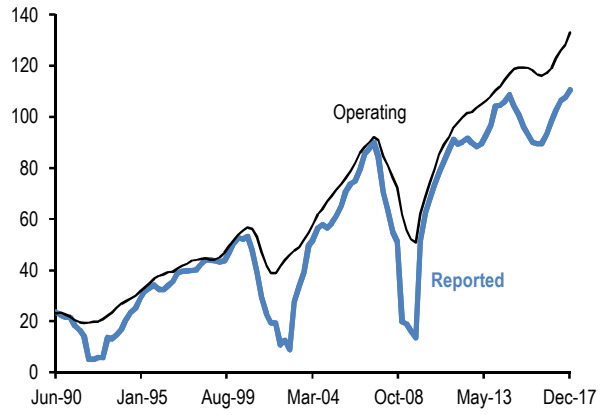
gain and we get our projection of total return in each regime.

Before we do this, we need to decide the difficult issue whether we use the actual **reported** earnings per share, under GAAP rules, or the so-called **operating** EPS, and if the latter, which one of the three on offer. In principle, this should not matter for a long-term investor as operating is simply reported earnings adjusted by excluding one-off non-recurring items. In theory, these non-recurring items should average to zero over the longer run and across the 500 companies in our large-cap index. In practice, though, we find that there are more non-recurring losses than one-off gains, and operating EPS at the index has therefore always been higher than reported since the industry started estimating operating earnings in 1988 (Fig. 5).

Figure 5: Reported and operating EPS, S8P 500.
$, 4-quarter rolling



Source: J.P. Morgan, Thomson Reuters, Bloomberg.

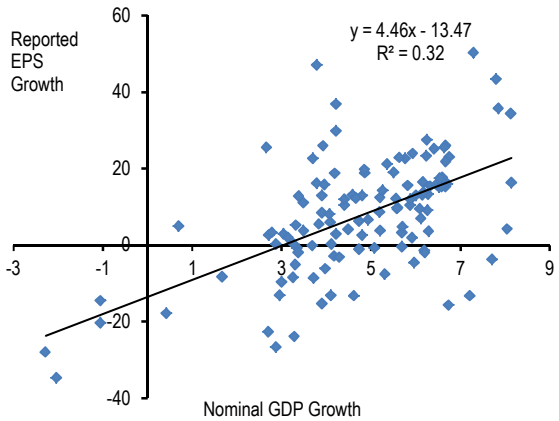
Excluding one-offs makes sense when analyzing a single company, but at the aggregate and long-term level, these one-offs are always there and are thus not really one-offs but a reality of owning the overall market. They thus need to be taken into account and valued. We acknowledge that this preference for reported EPS is not a consensus as GAAP standards have themselves also changed over time, creating questions about whether past multiples can be used to forecast future ones. On net, we are most concerned about the structural bias upward in operating earnings and thus will focus our analysis on **reported GAAP EPS**.

One area where one needs to make an adjustment to EPS forecasts, whether one works with reported and operating, is last year's **US corporate tax reform**. This had two important impacts on our EPS series. The first lowered Q4 of last year as companies took a one-time loss on the deemed repatriation of foreign earnings. This is one instance where we would agree to exclude this from core earnings as it is truly a one-off loss that very unlikely to be repeated. Adding the change in the % difference between reported and operating back into our 2017 reported base raises it to $114, from $111, and lowers the multiple by 0.6.

The second change is the permanent cut in the statutory corporate tax rate from 35% to 21%. The actual tax rate paid will fall by less as there were numerous deductions that lowered the effective tax rate to the high 20s. Our analysts expect that this lower tax rate raises EPS by a one-time $12 (Rosato and Lakos-Bujas, US Tax reform to drive equity upside and continued rotation, Dec 20, 2017). Given its one-time but permanent nature, we add this $12 to our reported EPS and multiple basis, from which we apply our regime based projections of earnings growth and multiple changes. Our starting reported multiple now falls to 21 and the EPS basis rises to $126.

EPS growth under each regime. Earnings growth equals **total revenue growth plus changes in profit margins** (earnings/revenues). We would expect revenues to grow in line with the overall economy (nominal GDP), although it is probably not growing at exactly the same pace. I find that since 1949, US nominal GDP grew at a compounded rate of 6.5%, reported S&P500 EPS at 5.8% and operating at 6.1%. Large-company earnings and revenues should indeed grow at a slower pace than the economy as innovations and high early-growth profits come mostly from small companies that are not included in large cap indices.

Figure 6: Reported EPS growth rates and nominal GDP, S&P 500
%oya, Q1 1988 to Q4 2017



Source: J.P. Morgan, Bloomberg.

It is important to note that this longer-term slower-than-GDP growth pace co-exists with the fact that during a

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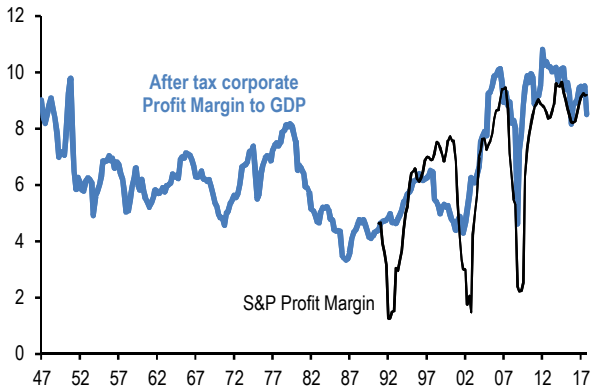
business cycle, earnings are highly leveraged to the economy. Fig 6, e.g., shows how EPS accelerates by 4.5% for each 1% rise in nominal GDP growth on an oya basis. We are not choosing this higher frequency relation as we are trying to look beyond the cycle for our 10-year outlook.

How do we forecast **profit margins**? Longer run, we would expect margins to mean revert, as high margins should motivate companies to expand, putting pressure on resource, labor and capital costs. This, in turn, lowers margins. Vice versa when margins are low, Fig 7 shows that US profit margins do mean revert over longer periods but only slowly.

Figure 7: US corporate profit margins
%, NIA after tax profits/GDP and SPX earnings/revenues

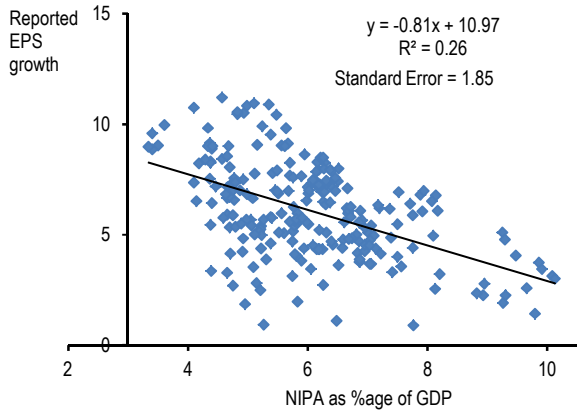


Source: J.P. Morgan, Bloomberg, S&P.

Fig 7 shows the ratio of US corporate after tax profits to GDP as well as the ratio of S&P500 earnings to revenues (data only since 1990). The two series do not correlate well quarter to quarter, due to coverage and conceptual differences, but perform quite similarly over the longer run. Since 1990, the NIPA margin averaged 7.3% while the S&P one averaged 6.6%. The chart shows the cyclical nature of profits, falling in recessions, and a slow form of mean reversion over the decades. But it also shows margins have dramatically risen over the last 20 years.

If profit margins mean revert, one should expect weak earnings growth following times of high margins and vice versa. When we regress 10-year rolling EPS growth on the NIPA after tax profit-to-GDP ratio in Fig 8, we find that future EPS growth indeed relates negatively to the starting level of profit margins. 10-year earnings growth slows 0.8% for each 1 percentage point excess of NIPA profit margin above its long-term average (and vice versa for below-average margins). Using the 2017 H2 9% profit margin starting point (Q4 saw an unexplained fallback) this relation projects 3.7% EPS for the next 10 years. This is well below the average EPS growth of 5.8% since 1949.

Figure 8: Future 10y EPS growth vs NIPA after-tax-profits/GDP
%, since Q1 1950



Source: J.P. Morgan, Bloomberg, S&P.

We now have a long-run relationship with GDP and a mean reverting one with profit margins. To combine these, we simple add 10-year contemporaneous nominal GDP growth to the relation in Fig 8 which yields the following result:

Table 3: Regression 10-yr EPS growth vs 10-yr GDP and starting profit margin

EPS 10yr growth =
4.1%
- 0.79 * NIPA after tax profits/GDP deviation from mean
+ 0.30* future 10yr nominal GDP growth

Regression Statistics	
R Square	34%
Sample Period	Q1 1950 - Q4 2007
Standard Error	1.75
t stat - NIPA after tax/GDP dev from mean	-9.22
t stat - Future 10y nominal GDP growth	5.41

Source: J.P. Morgan, Bloomberg, S&P.

Before applying this to our regimes, we need to assess how this relation is affected by the permanent **drop in corporate tax rates** to a level much lower than seen during the regression period. We have argued higher that this raises structurally, and thus long term, the level of corporate earnings. For our purposes, it raises both the current and the mean of the profit margins, but not the deviation between the two. The mean reversion effect on

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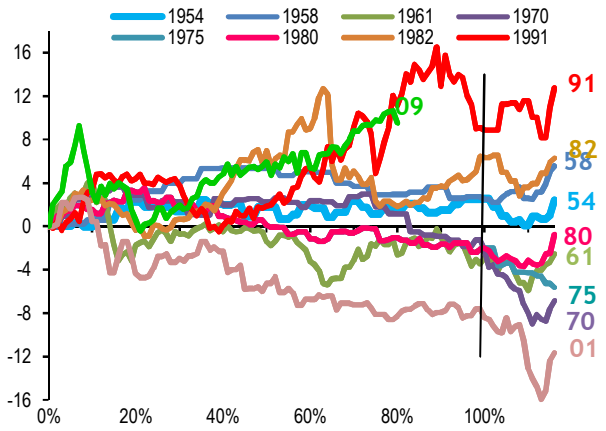
the future growth rate of earnings remains as is, even as the take-off level from which this growth rate should be applied has been raised by $12 or 11% in reported EPS terms.

Applying the regression to our regimes with three different levels of nominal GDP growth, we thus arrive at **2.6%, 2.9%, and 3.3% EPS growth over the next 10 years for Regimes, 1, 2, and 3.**

Multiples under each regime. Earnings have a clean cyclical pattern and move with the economy, but multiples do not. Figures 9 and 10 depict how multiples move during economic cycles in the post-war period and are enough to show there is no clean regularity. Looking beyond the cycle, theory and our Fig 1 set up suggest we should simply start with the projected UST yield in each regime and add the equity risk premium (ERP) consistent with the regime. Unfortunately, we have found a long time ago that equity excess IRRs over bond yield, the ERP, show little relation to anything fundamental.

Figure 9: US GAAP trailing multiples by cycle -- changes
Cumulative changes in S&P500 GAAP trailing P/E ratio against time line that measure how much of the expansion is completed. At 100%, the next recession starts. Dates on right show year that expansion started. We assume current cycle lasts 11 years.

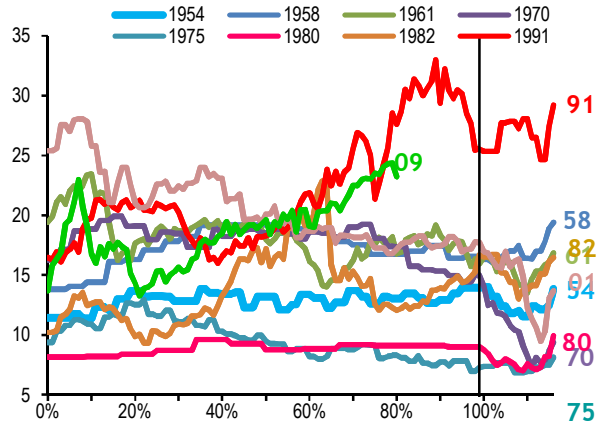


Source: J.P. Morgan, Bloomberg

Figure 11 shows the trailing equity yield (multiple reversed) and the 10-year nominal UST yield since the 1950s. It shows a decent correlation during the run up and then fall back in US inflation from the late 60s to late 90s, but no such correlation in the more stable inflation periods before and after it. We have argued and found in our fair value models (A Fair Value Model of US Bonds, Credit and equities, N. Panigirtzoglou and J. Loeys, June 2005), that inflation, which drives nominal bond yields, also creates macro volatility which drives equity yields.

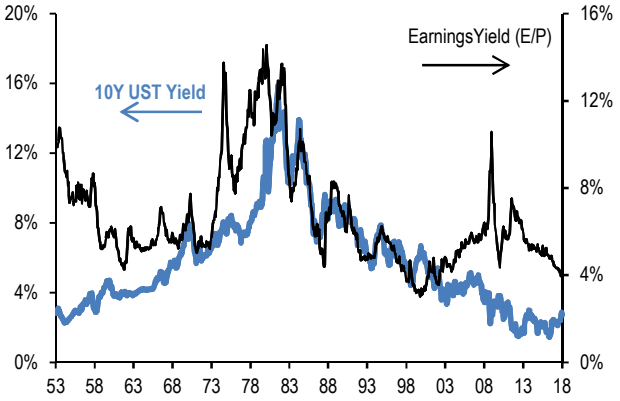
When we account in the Equity Discount Rate for this macro volatility, bond yields by themselves have only a minor impact, with a 1% rise in the UST yield by itself only leading to a 0.1% rise in the UST yield.

Figure 10: US GAAP trailing multiples by cycle -- levels
Levels of S&P500 GAAP trailing P/E ratio against time line that measure how much of the expansion is completed. At 100%, the next recession starts. Dates on right show year that expansion started. We assume current cycle lasts 11 years,



Source: J.P. Morgan, Bloomberg

Figure 11: US GAAP trailing multiple and 10y UST yield
% yield (lhs) and % earnings yield (rhs)



Source: J.P. Morgan, Bloomberg

Hence, we have little sympathy for the argument that the low level of interest rates and bond yields has pulled the EDR down. We do have sympathy for the argument that the same drivers of low interest rates, namely high global savings and low funding needs, have created an excess demand for financial assets, both equities and bonds, and thus created a low equilibrium IRR across asset classes. This tells us Regime 1 should have the highest multiple (and lowest bond yields) and we see little reason not to

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accept the multiple we observed during the reference period (18.6x).

We also find that during our Inflation regime, when macro volatility was orders of magnitude higher than in this cycle, the multiple averaged only 14, well below the other two regimes. But even our Inflation Regime does not see inflation spiking into double-digit territory and thus should not see the same macro volatility as during the reference period. Hence, we take slightly higher multiple of 15x for Regime 3.

The **Growth Regime**, for which we use the '97-'10 as reference period, saw an average multiple of 21x, largely because of the run-up during the 1990s Nasdaq bubble. We can't exclude another equity bubble but we also find it hard to make it a significant part of our Growth regime. At the same time, it makes sense that higher growth expectations should induce investors to hold equity markets at a higher trailing multiple. Higher funding needs, bond yields, and market volatility than in Regime 1 should keep its average multiple lower than in regime. We thus take a modestly lower one at 18x.

What returns come from going from today's to tomorrow's IRRs?

Having decided on all the inputs, it is now only an "F9" to obtain the expected returns. Below we show our starting levels as asset IRRs and combine them with the target IRRs and earnings growth through the calculations show to produce our expected total returns for our four asset classes.

Table 4: Expected returns under three regimes

Current Entry Points

Real Tbill (%)	-0.15
Nominal Tbill (%)	1.70
Real 10yr UST (%)	0.69
Nominal 10y UST (%)	2.75
HG spread (bps)	135
P/E	21*
LT inflation exp. (%)	2.05
EPS 2017 GAAP	124*

*Adjusted for corporate tax(see text for details)

Expected Return Calculation

S&P500	Dividend Yield (2%) + Nominal EPS growth + d(P/E Multiple)/Horizon (in yrs)
GBI US	(Current Yield + Regime Yield)/2 - Duration*d(Yield)/10+ (Current Yield-Cash) + ((regime_yield - cash)/2)/8)
US HG	(Current Yield + Regime Yield)/2 - Duration*d(Yield)/10+((current yield - cash) + (regime yield - cash)/2/8 - 15bp
Cash	(Current Nominal Yield + Regime Nominal Yield)/2

Expected Returns

	Regime 1	Regime 2	Regime 3	Probability Weighted
	Global Savings surplus	Growth	Inflation	
Odds	1/2	1/3	1/6	
Cash	2.2	2.7	3.9	2.6
Bond	2.9	2.8	2.4	2.8
HG	4.4	4.1	3.5	4.2
Equities	3.5	3.5	2.5	3.3

Source: J.P. Morgan

The projections produce **three surprises** against history: They are low by historic standards; they show little difference across the three macro regimes and they show little difference across asset types. Each of these surprises must come directly from the input choices we made.

Low expected returns across asset classes come from (1) the capital losses from mean reversion from high entry points on each asset class (high multiples, low real bond yields, low cash rates; and tight credit spreads); (2) mean reversion from high entry profit margins; and (3) a worsened US demographic, primarily aging and reduced immigration, that is lowering labor force growth to only 0.4%.

Low return divergence across regimes are largely due to our input choices of letting the regimes with higher nominal growth, either due to faster productivity growth or higher inflation, come with higher volatility and thus higher risk premia. That is, the **benefit of higher nominal earnings is largely offset by higher risk premia** making it almost a wash to the investor.

Low return divergence across asset classes. Mean reversion in risk premia should have the greatest price impact on the highest risk assets, which in our quartet means equities. This produces a relatively flat risk-return trade-off efficient frontier.

Table 5 show the negative impact on our return projections of our assumed mean reversion in profit margins and multiples. We use the long-term EPS growth of 5.8% since 1949, minus the 0.8% fall in labor force growth as benchmark for margin mean reversion and deduct our regime based EPS growth numbers from them. The loss from multiple falls is simply the negative compound rate of going from our starting point if 21 to the target in each regimes. For example, to go from 21x to 18x requires an annual loss of 1.4% over 10 years.

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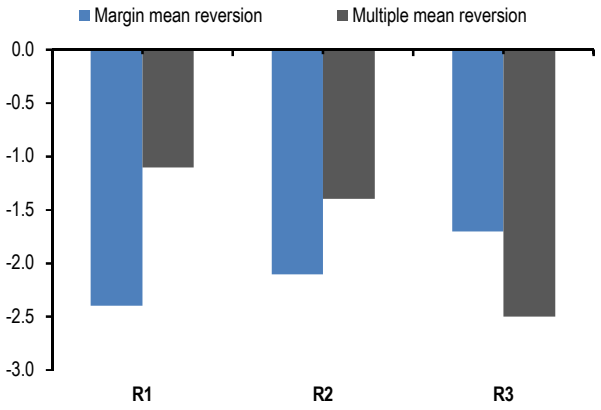
Figure 12: Impact of assumed mean reversion in profit margins and multiples on 10-year out expected returns
%, EPS growth difference from 5%, annual loss due to assumed changes in trailing multiples



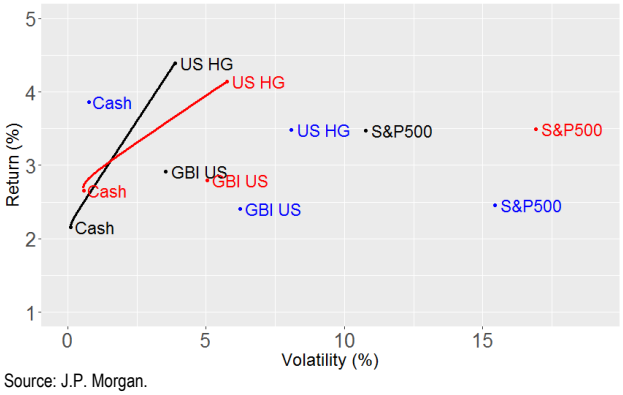
Source: J.P. Morgan.

A flat and bumpy efficient frontier

Efficient frontiers provide the best overview for investors of any analysis of expected returns and risks. They show for each level of portfolio risk/volatility, the combination of the available assets that maximize asset returns, given one's assumed asset expected returns, volatilities and correlations. Fig 13 shows in three different colors the frontiers for each scenario, and Fig 14 the combined probability weighted frontier. The latter uses Gaussian Mixture models (GMM) to model the combined return distributions for all assets under the 3 regimes and their cross-asset variance-covariance (see Portfolio Optimization when asset returns have the Gaussian Mixture Distribution, Buckley et al., European Journal of Operational Research, 2008). We then use these estimated inputs into a standard Markowitz mean-variance optimization with 500 iterations to plot the efficient frontier and their corresponding optimal asset allocations

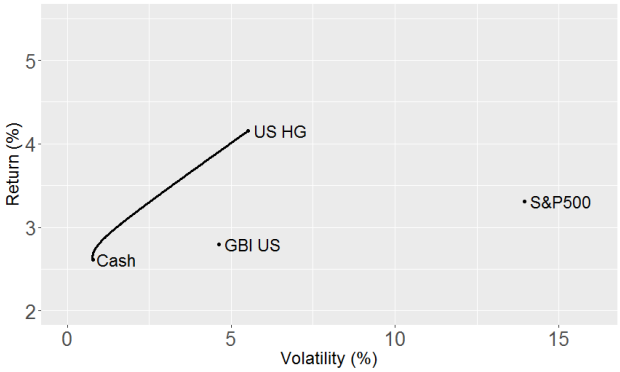
The frontiers show the relative flatness from our expected returns, peaking at HG Credit instead of equities as usual.

Figure 13: 10-yr out efficient Frontiers for the 3 regimes
Regime 1(Black), Regime 2(Red), Regime 3(Blue)



Source: J.P. Morgan.

Figure 14: Probability Weighted Efficient Frontier
Prob(Regime1)=1/2, Prob(Regime2)=1/3, Prob(Regime3)=1/6



Source: J.P. Morgan.

Have high entry points in the past given the right bearish signal?

Part of our bearish results come from our perception that entry points on asset valuations are high and that we should incorporate a bias to mean reversion in our projections. It is a valid question whether similarly high entry points in the past were indeed followed by low asset price returns. Figs 15-18 check this out by looking at rolling 10-year total returns on US large cap stocks (S&P500) by the PE multiple at the start of each 10-year period. We look at returns in both nominal and real terms, and against both reported and operating multiples. At the current SPX level around 2650, the reported trailing multiple on GAAP EPS is 21x, when adjusted for the projected 11% impact from tax cuts on EPS, and it is 18.4x on an operating basis.

Simply plugging in these entry points for PEs in the best fit lines in Figures 15-18 give us expected total returns on

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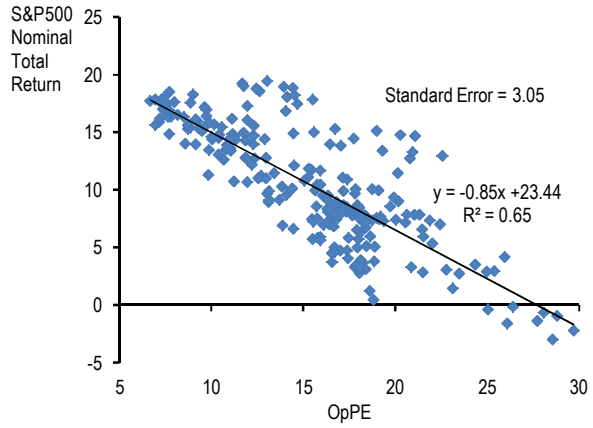
US large equities over the next 10 years of 6.4% to 7.9% nominal and 3% to 4.3% real.

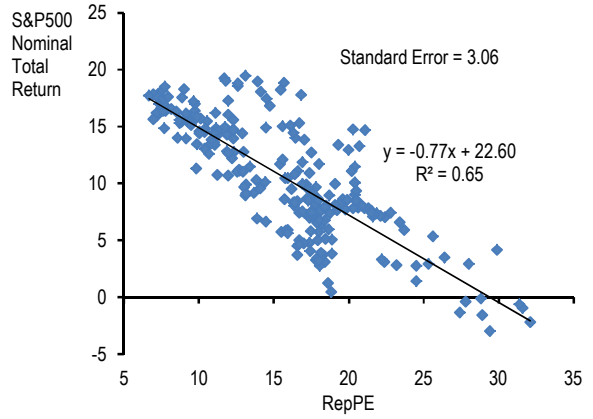
Our own equity return projections are well below those than implied only by current multiples. This can be because Figs 15-18 are relating 10-year out returns to the multiple based on only 1-year lagging earnings. One well known adjustment for the volatility of earnings from one year to another is Robert Shiller's cyclically-adjusted PE ratio (CAPE) (http://www.econ.yale.edu/~shiller/data.htm). This multiple takes the 10-year rolling average of inflation adjusted GAAP earnings.

Figure 15: Future 10y nominal returns vs to Op PE
% 10 years ago, since Q1 1950



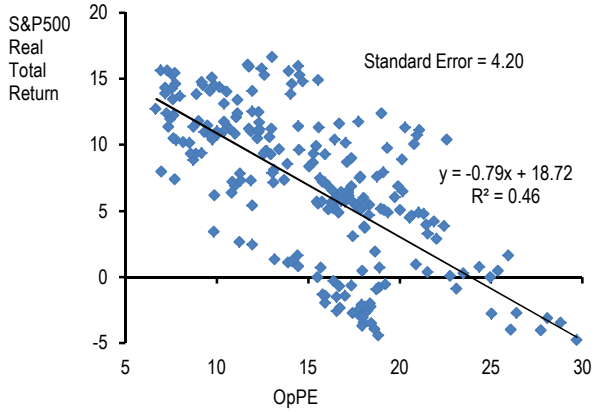
Source: J.P. Morgan, Bloomberg, S&P, Thomson Reuters.

Figure 16: Future 10y nominal returns vs Rep PE
% 10 years ago, since Q1 1950



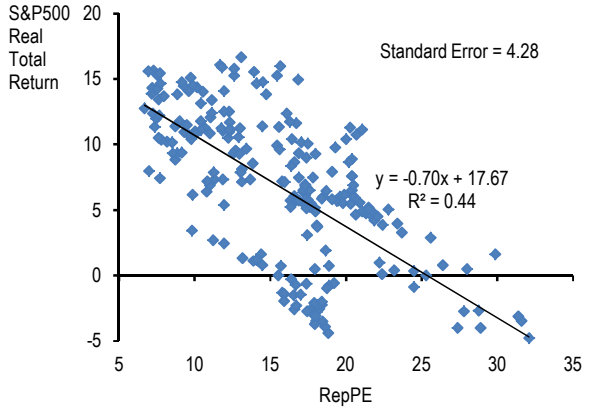
Source: J.P. Morgan, Bloomberg, S&P.

Figure17: Future 10y real returns vs Op PE
% 10 years ago, since Q1 1950



Source: J.P. Morgan, Bloomberg, S&P, Thomson Reuters.

Figure 18: Future 10y real returns vs Rep PE
% 10 years ago, since Q1 1950



Source: J.P. Morgan, Bloomberg, S&P.

Fig 19 shows how future 10-year rolling S&P500 total returns relate even more closely to the CAPE multiple than our own 1-year trailing multiples. Using the last CAPE observation of 32 (March 2018), we get a projected equity return of 3.1% over the next ten years, just around ours. There is the valid argument that CAPE as a trailing multiple does not incorporate the impact of the one-time drop in corporate tax rates from this year on. There is also the point that by using 10-year averages of earnings, it includes the financial crisis, with many arguing that the next recession should not be as severe as that one. Both arguments probably bias the CAPE equity return projection to the down side.

Our own equity return projections are lower than those implied by multiple valuations because we also incorporate some mean reversion from profit margins that are high by historic terms. To see the empirical

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impact of starting from a high profit margin, we regress below the 10-year rolling S&P500 total return on the starting point multiple, both operating and reported, in Figs 15-18, but now add the starting point NIPA after tax profit margin to nominal GDP ratio. These show a bit higher beta from expensive multiples but also one from high profit margins. Plugging in our judgment of current multiples (21 and 18.4 reported and operating) , as above adjusted for the cut in corporate tax rates, as well as the H2 NIPA H2 profit margin of 9%, we get a projection of 2.9% and 3.9% 10-year out equity returns (reported and operating), smack in line with our probability weighted projection of 3.3% in Table 3.

Here again, the more bullish investors must assume that profit margins will not show any mean reversion over the next 10 years.

Table 5: Model Specifications

SPX total return 10yr =
30.2%
- 0.84 * P/E reported
- 1.08 * NIPA after tax profits/GDP deviation from mean

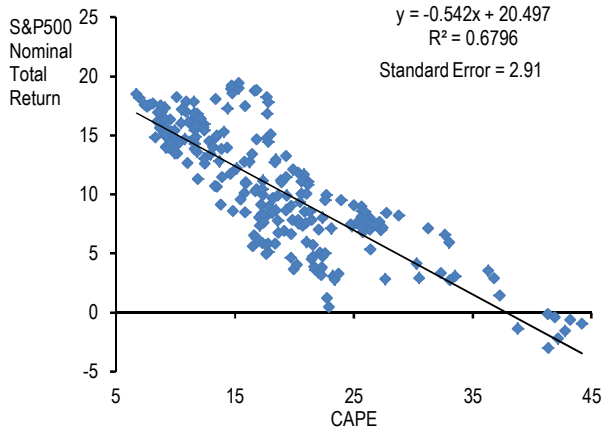
Regression Statistics	
R Square	72%
Sample Period	Q1 1950 - Q4 2007
Standard Error	2.72
t stat - P/E reported	-24.37
t stat - NIPA after tax profits/GDP deviation from mean	-7.83

SPX total return 10yr =
32.5%
- 0.95 * P/E operating
- 1.24 * NIPA after tax profits/GDP deviation from mean

Regression Statistics	
R Square	74%
Sample Period	Q1 1950 - Q4 2007
Standard Error	2.61
t stat - P/E operating	-25.79
t stat - NIPA after tax profits/GDP deviation from mean	-9.26

Source: J.P. Morgan, Bloomberg, S&P, Thomson Reuters.

Figure 19: Future 10y nominal returns vs Cyclically Adjusted Price Earnings (CAPE)
%10 years ago, since Q1 1950



Source: J.P. Morgan, http://www.econ.yale.edu/~shiller/data.htm.

Where could we be wrong and too pessimistic?

Our rather bearish conclusions against historic experience jar with the last nine years' worth of rallies in everything and the general prior that higher-risk assets should deliver higher returns over the longer run. On the latter, Finance Theory and empirical evidence support the supposition that higher-risk assets earn higher returns, over time, but they similarly imply and support the notion that moving from a low-risk to a higher-risk world requires risk premia to rise, which imposes the highest return cost on the riskiest assets.

The current regime has seen very low macro and asset price volatility, due both to record low growth for an expansion, and as a result, also record easy money. We observe that both risk and risk premia mean revert over very long period, probably longer than our 10-year horizon, but this creates the conundrum: We either stay in a low and stable growth environment, and from here, see little earnings growth, or move to a more higher growth and more dynamic world (read more volatile), and need to pay the price of higher risk premia to earn this higher economic growth.

Could we have our cake and eat it also? Could we have higher economic growth, sustained high earnings growth, a new record long economic expansion, and sustained low risk premia? Yes, that is not impossible, but requires, in our mind, a lot of luck and is not something we would like to posit as the mean of our return distribution, neither as a significant-probability scenario.

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A significantly more bullish scenario than ours would be a version of our Growth Regime, with faster growth coming all from productivity that does not raise the demand for capital, keeping savings rates high and given us sustained low real yields; that does not produce higher inflation; that does not lower profit margins as wages and other costs remain depressed; and that does not raise macro volatility, thus keeping risk premia low. We think of growth as a dynamic process that is inherently volatile. More growth without more volatility would be too much a free lunch in our mind. We are skeptical that we can score on all these conditions and have not included this much more positive return view in our scenarios. A more bullish investor than us needs to put a much higher probability on all things going right than we are.

Implications for investors

We highlighted already in our first issue that we are likely in a low-return world. Since then, we have found that most investors agree, but many are not as pessimistic as the numbers we are coming up with. Sometimes this is because they are looking further out in the future and over such a longer horizon, the impact of risk premia mean reversion is spread out more widely and thus does not drag returns down as much. Many also see not enough evidence that profit margins mean revert, and thus expect earnings growth to come more in line with underlying economic growth.

How are investors reacting, and how should they react to a low-return outlook for the next 10 years? Some have told us that one needs to be more active and more dynamic, thus earning alpha when beta is poor. This is hard to disagree with, but why wait until beta is poor? If the alpha opportunity is there, one should always take it. It is not clear to us that a low-return world offers greater alpha opportunities than a higher return one.

A second is to **economize on the cost** of managing money, through economies of scale (merging asset managers), or putting pressure on the fees of external asset managers. One way to cut on transaction costs is to focus more on strategic investing and less on tactical.

A third approach has been to invest in **beta-neutral long-short risk-premia products** that show little correlation with the large beta markets and thus permit one to take more strategic risk elsewhere. A fourth approach has been to invest more in **illiquid, private assets** across equities and credit.

From our point, observing a risk-return efficient frontier that peaks out at HG Credit, we think that a strategic overweight, relative to market outstandings or typical benchmark allocations, of bond-like equities, and equity like bonds makes most sense in a low-return world. We call this our **Income Strategy**, made for a world with low capital gains. As we argued before, for this, think EM fixed income, both local and in dollars, that generally pays about 6%; high-yield bonds and loans; preferred stocks; high-dividend shares; and real estate, despite the fact that in today's soft bear market in bonds, these high-income assets are not performing well.

We will investigate this income Strategy, as well as various macro tilts across sectors and countries, in forthcoming issues.

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Corrected Note: Figure numbers changed on Page 11, 12 and 13. Fig 19 description on Page 12 changed.

Disclosures

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