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The Strategic Balanced Bear

A Framework for Long-Term 60/40 Returns and Strategic Tilting

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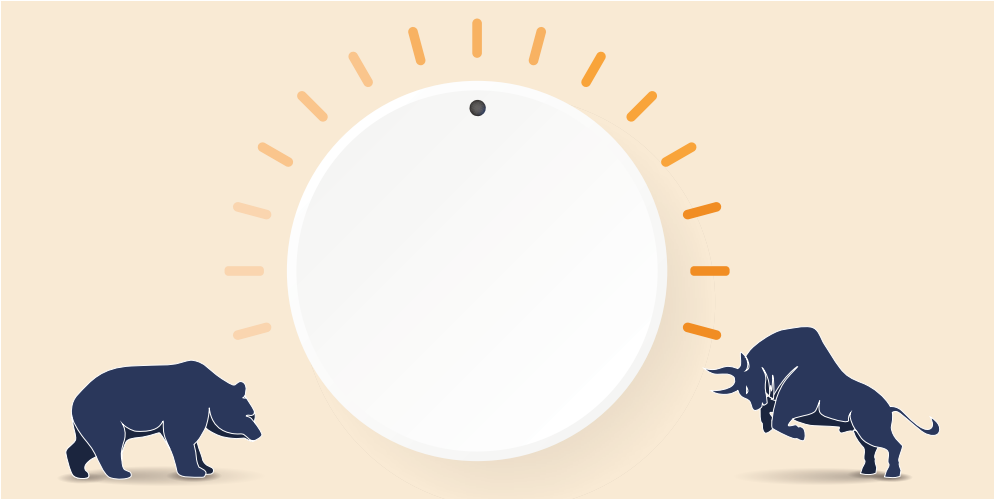


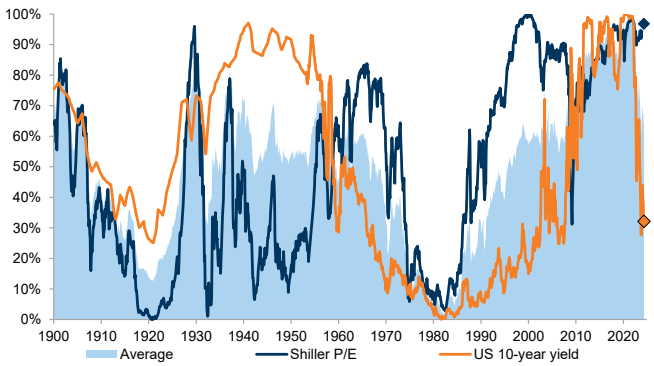
- **60/40 portfolios have mostly recovered from the large drawdown in 2022.** As a result, 60/40 valuations look again somewhat elevated. US 10-year bond yields are closer to the long-run average but equity valuations are relatively elevated, especially in the US.
- **However, valuations alone may send too bearish of a signal.** While over long horizons valuations tend to mean-revert, they can remain elevated as long as macro conditions remain supportive. Both 60/40 returns and realised equity risk premia in the coming years will not just depend on valuations but also on the structural cycle, i.e., trends in growth, inflation and policy. We develop a model to forecast long-term 60/40 returns combining both drivers.
- **Valuations and the structural cycle will also condition optimal multi-asset portfolios.** With solid growth and little inflation in the last 25 years, the optimal asset mix was roughly 40/60, closer to a risk parity strategy. Since the COVID-19 crisis, bonds have offered little benefit to portfolios, either on return or risk – the optimal portfolio was mixing 100% equities with cash based on risk tolerance.
- **We develop a framework for strategic tilting combining long-term returns and risk estimates** – historically, macro-based strategic tilts have materially improved risk-adjusted returns compared with a static 60/40 portfolio. Based on different scenarios for the coming years, we see value in being more balanced again with higher uncertainty about both growth and inflation.
- **Bonds can provide protection in the event of stagnation with higher real yields but are pricing low inflation risk.** Equities could provide some inflation protection via cash flow growth but valuations are elevated, with little risk of inflation or stagnation priced. Real assets, such as TIPS, commodities, real asset stocks, and those exposed to productivity growth, e.g., growth stocks, can further enhance diversification. But while real assets currently look cheap, growth stocks look expensive.

New Strategic Tilting Model
We develop a model for long-term 60/40 returns incorporating starting valuations as well as inputs on trend growth, inflation and profitability. We show the historical benefits of 'strategic tilting' in balanced portfolios based on structural regimes and model optimal asset allocations based on different future scenarios.

Summary

- In 2022 60/40 portfolios had one of the largest drawdowns on record owing to elevated valuations for both bonds and equities at the end of 2021, together with high and rising inflation. On the back of disinflation and expectations for central bank easing, coupled with growth optimism due to the US soft landing and AI, balanced portfolios have recovered most of the drawdown.
- As a result, 60/40 valuations again look somewhat elevated. US 10-year bond yields are closer to the long-run average but cyclically adjusted equity valuations are relatively elevated, especially in the US. There may again be a speed limit for 60/40 returns with lower prospective equity risk premia.
- However, valuations alone may send too bearish of a signal. While over long horizons valuations often mean-revert, they can remain elevated if macro conditions remain supportive. Also, equity valuations outside the US and the Tech sector are less elevated. Both 60/40 returns and equity risk premia in the coming years will not just depend on the valuation starting point but also on the structural cycle.
- 60/40 portfolios tend to suffer in prolonged periods of high inflation and/or stagnation. On the flip side, 'Goldilocks' periods with low inflation but strong growth tend to result in the best risk-adjusted returns for 60/40 portfolios. Those are also periods when realised equity risk premia tend to be above average and equity valuations remain elevated due to strong profit growth and high profitability.
- We develop a model for long-term 60/40 returns incorporating starting valuations, together with inputs on trend growth, inflation and profitability, to control for different structural cycle scenarios, such as Stagflation and Goldilocks. 'Strategic tilting' based on structural regimes historically materially enhanced risk-adjusted returns, and we model optimal asset allocations based on future scenarios. We also incorporate real assets and growth stocks for more targeted exposures.
- With solid growth and little inflation in the last 25 years, the optimal asset mix was roughly 40/60, closer to a risk parity strategy. Since the COVID-19 crisis bonds have offered little benefit to portfolios, either on return or risk – the optimal portfolio was mixing equities with cash based on risk tolerance.
- In the coming years we see value in being more balanced again. The outlook for the structural cycle has become more uncertain. Ongoing deglobalisation, decarbonisation and demographic trends could result in more inflation pressures, while technological innovations such as AI and GLP-1 could counter them and boost growth. We investigate different scenarios and strategic tilting opportunities.
- Bonds can provide protection in the event of stagnation with higher real yields but are pricing low inflation risk. Equities could provide some inflation protection via cash flow growth but valuations are elevated with little risk of inflation or stagnation priced. Tilts to real assets, such as TIPS, commodities, real asset stocks, and those exposed to productivity growth, e.g., growth stocks, can further enhance diversification. But while real assets currently look cheap, growth stocks are looking expensive.

Exhibit 1: 60/40 valuations are again somewhat elevated with equity valuations near all-time highs
Valuation percentile (since 1871)



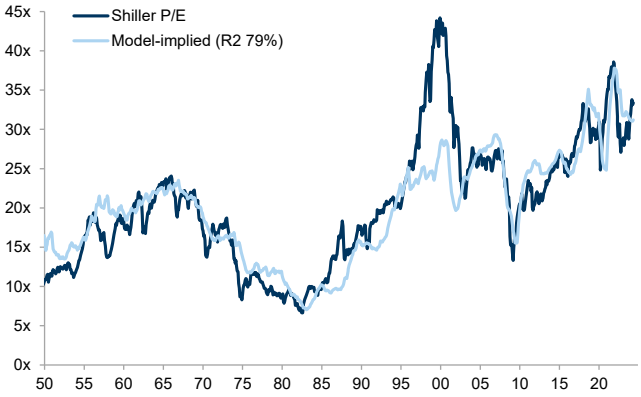
Source: Robert Shiller, Haver Analytics, Goldman Sachs Global Investment Research

Exhibit 2: 60/40 returns in the coming years will not just depend on the valuation starting point but also on the structural cycle
Since 1900 (10-year rolling return p.a.)

US 60/40 real return					
		Real GDP growth			
		< 2%	2% to 4%	> 4%	Avg.
Inflation	< 2%	6.9%	7.7%	5.8%	7.1%
	2% to 4%	2.7%	7.2%	4.5%	5.7%
	> 4%	-0.9%	2.3%	1.3%	1.7%
	Avg.	4.4%	5.5%	4.2%	5.0%

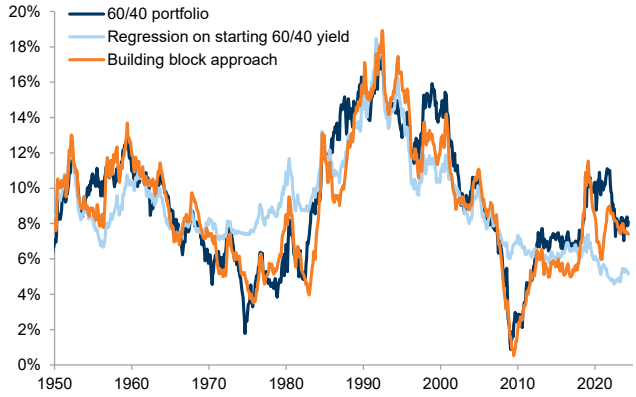
Source: Robert Shiller, Haver Analytics, Goldman Sachs Global Investment Research

Exhibit 3: Equity valuations can remain elevated in case of supportive macro conditions
Shiller P/E implied by 10y inflation and S&P 500 LTM ROE



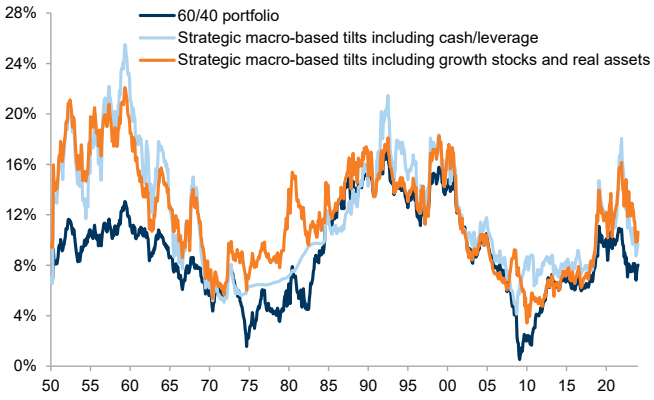
Source: Haver Analytics, Kenneth French, Robert Shiller, Goldman Sachs Global Investment Research

Exhibit 4: We develop a model for long-term 60/40 returns incorporating starting valuations and macro conditions
10-year rolling return p.a.



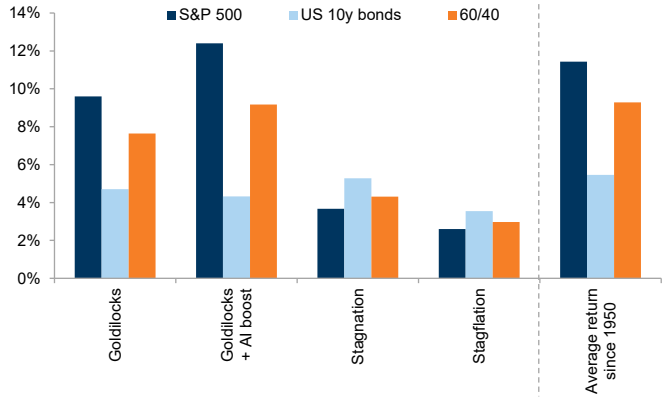
Source: Haver Analytics, Kenneth French, Robert Shiller, Goldman Sachs Global Investment

Exhibit 5: Macro-based strategic tilts would have added material value vs. a static 60/40 portfolio
10-year rolling return p.a.



Source: Haver Analytics, Goldman Sachs Global Investment Research

Exhibit 6: In the coming years we see value in being more balanced again given the uncertainty about the structural cycle
10-year nominal return p.a. scenarios



Source: Goldman Sachs Global Investment Research

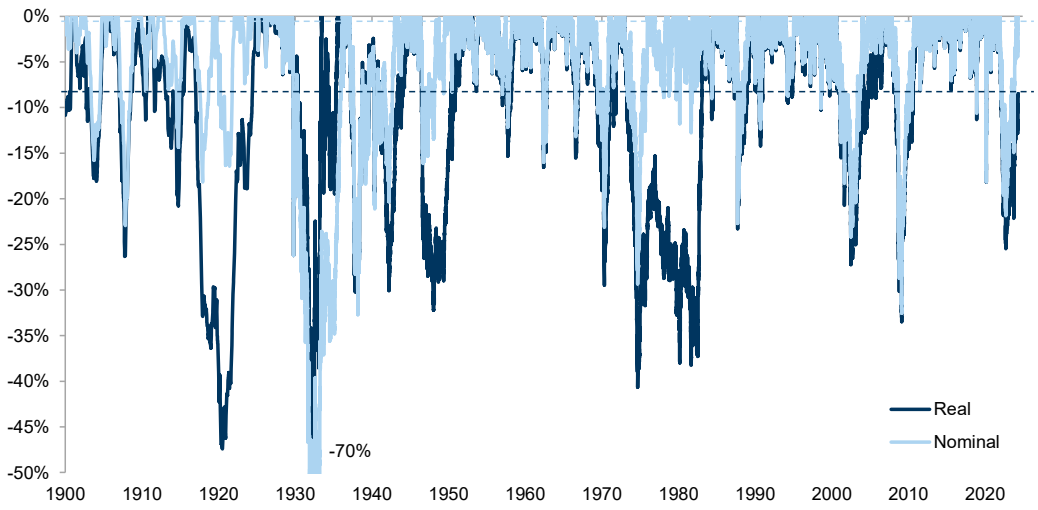
Drivers of Long-Term 60/40 Portfolio Performance — Valuations vs. Macro

From Despair to Repair — 60/40 portfolios recovering from 2022 drawdown

At the end of 2021 we wrote that balanced portfolios would be more risky owing to elevated valuations for both bonds and equities post the COVID-19 recovery, and much higher inflation. In 2022 global 60/40 portfolios did indeed have one of the largest drawdowns on record, triggered by aggressive central bank tightening (Exhibit 7). On the back of inflation normalisation and a US soft landing with tailwinds from AI, 60/40 portfolios have recovered from the drawdown in nominal terms, but are still down 8% in real terms due to value erosion from inflation over the past 3 years.

Outside of the US, real drawdowns have often been larger and the recovery more muted, especially in Europe, where the growth/inflation mix since the COVID-19 crisis was particularly unfavourable, in part due to the Russia/Ukraine war. European equities also had less of a boost from large cap Tech stocks due to AI optimism. Japan delivered the best 60/40 real returns since 2021 (albeit in Yen) due to lower inflation and strong equity performance, boosted by local corporate governance reforms and a weaker Yen.

Exhibit 7: US 60/40 portfolios have recovered from the drawdown in 2022, at least in nominal terms
Maximum 10-year total return 60/40 drawdown (daily data where available)

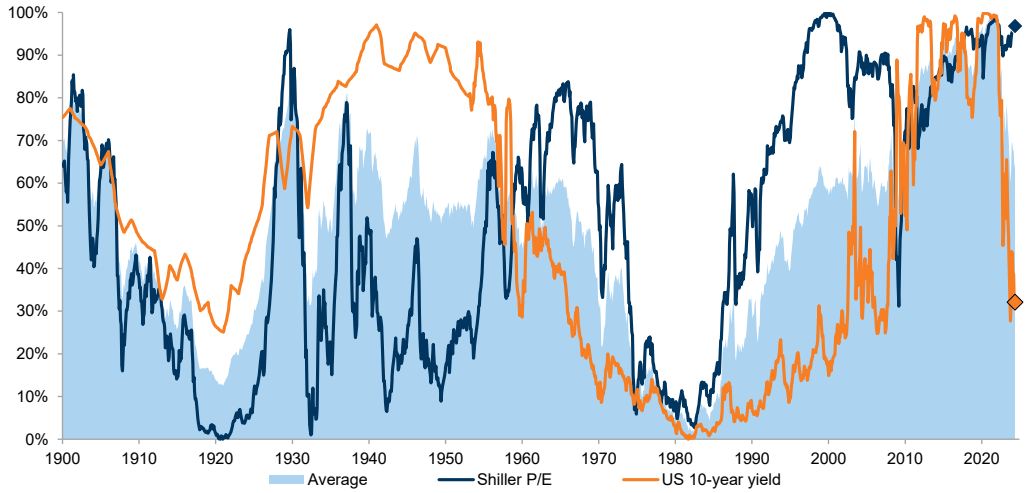


Source: Haver Analytics, Goldman Sachs Global Investment Research

Renewed valuation frustration, but mostly in (US) equities

The combined valuation starting point for a US 60/40 investor has improved but there has not been a major valuation reset for equities (Exhibit 8). S&P 500 Shiller P/Es are still elevated and in the 97th percentile since 1900. The more favourable growth/inflation mix since and in particular the AI optimism have boosted equity valuations. Somewhat elevated equity valuations could again become a speed limit for balanced portfolios over the medium term. On the flip side, US 10-year yields below the 50th percentile, suggesting bonds should be less of a drag on 60/40 portfolio returns going forward and can act as a buffer for equities in growth shocks.

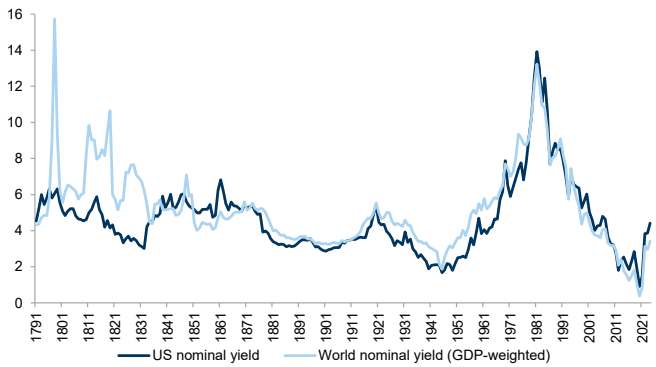
Exhibit 8: While equities look relatively expensive, bond yields are near their long-term average
Valuation percentile (since 1871)



Source: Robert Shiller, Haver Analytics, Goldman Sachs Global Investment Research

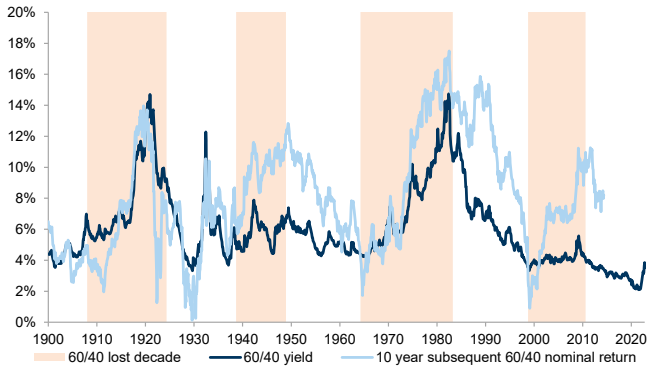
Since 2022 bond yields have increased sharply and are now close to their 250-year average of 4.6% (Exhibit 9, excluding the 1970s results in an average of 4.4%). As a result, US 60/40 yields are at 3.5%, higher than the all-time low of 2.1% at the end of 2021; however, because of low S&P 500 Shiller earnings yields they are still well below the long-run average of 6%. The 10-year rolling performance of a US 60/40 portfolio, both nominal and real, has been linked to valuations since the outset and from current levels the risk of a 'lost decade' remains elevated (Exhibit 10).

Exhibit 9: The name is Bond - US 10-year bond yields are back to their 250-year average
10-year government bond yields. Yearly data



Source: Bank of England, Goldman Sachs Global Investment Research

Exhibit 10: US 60/40 yields have increased with bond yields but are still below long-run average
60/40 yield = 60% S&P 500 Shiller earnings yield + 40% US 10-year yield

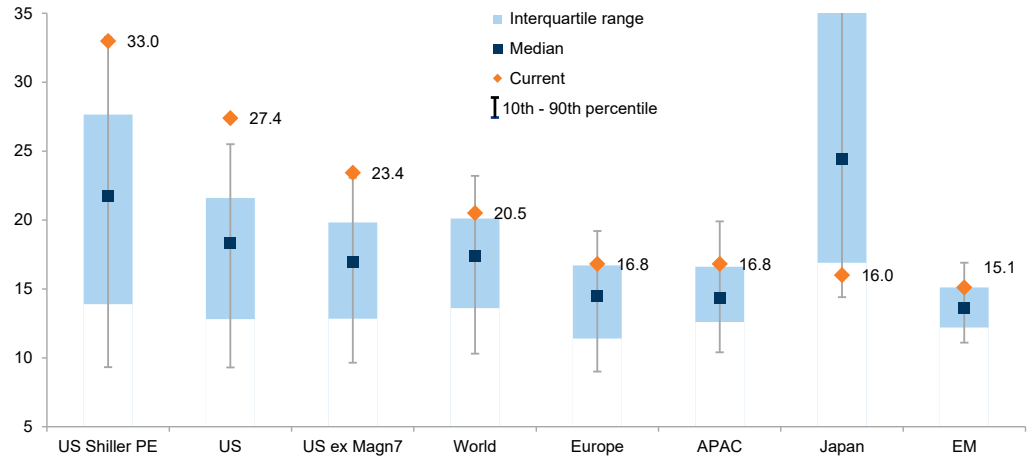


Source: Robert Shiller, Goldman Sachs Global Investment Research

But while S&P 500 Shiller P/Es are elevated, trailing P/Es are less so (Exhibit 11). If earnings do not decline materially, i.e., mean-revert, cyclically adjusted equity valuations would be sending too bearish a signal. Also, US equity valuations are lower excluding Tech stocks, whose higher valuations reflect strong profitability, growth prospects and balance sheets, as well as potential tailwinds from AI – this has also led to an unusually high concentration in the Magnificent 7. Non-US equity valuations are also lower,

reflecting weaker growth and profitability, and closer to their average since the 1970s.

Exhibit 11: Concentration frustration - US equity valuations are particularly elevated, especially for Tech
Trailing P/E (data since 1973)

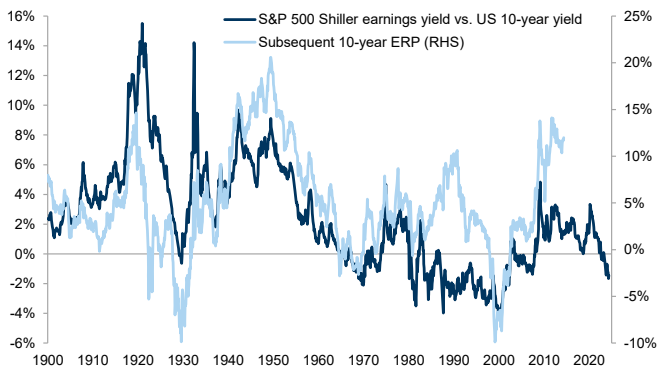


Source: Datastream, Worldscope, Goldman Sachs Global Investment Research

Nevertheless, after more than 20 years of de-rating equities have materially re-rated vs. bonds in the COVID-19 recovery – S&P 500 Shiller earnings yields are now below US 10-year yields (Exhibit 12). This is a big change to last cycle, when low bond yields made stocks appear more attractive vs. bonds. Now there is more competition from fixed income and prospective equity risk premia (ERP) are lower. That said, even from low equity/bond yield gaps equities can outperform bonds in the case of strong earnings growth, such as in the 1990s.

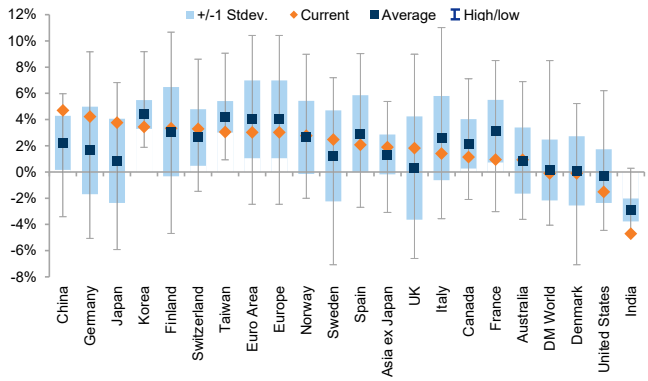
A lower ERP can reflect both better growth prospects and higher inflation, making bonds more risky relative to equities. Different equity/bond yield gaps reflect a different growth/inflation mix – higher bond yields might be due to higher or stickier inflation, while higher Shiller earnings yields reflect weaker growth prospects and investors demanding more 'yield' upfront. The yield gaps are largest for countries that are facing more challenging structural macro backdrops, such as China and Europe, while they are lowest for those with growth tailwinds, e.g., India (Exhibit 13).

Exhibit 12: Equity/bond yield gap is low but ex post equity risk premia also depend on subsequent growth



Source: Robert Shiller, Goldman Sachs Global Investment Research

Exhibit 13: Equity/bond yield gaps are very low in the US and India
Shiller earnings yield vs. 10-year govt. yield gap (data since 2000)



Source: Datastream, Haver Analytics, Goldman Sachs Global Investment Research

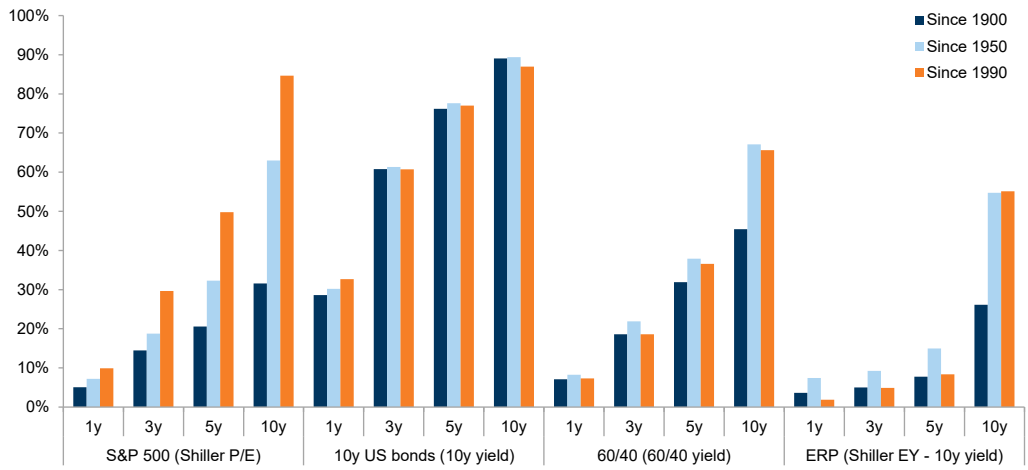
Valuations alone have limited predictive power

Those differences over time and across markets highlight that valuations alone may struggle to predict returns – indeed, they have a mixed track record for predicting both equity and bond returns. They have been more useful for forecasting long-term returns – their predictive power increases with the forecast horizon, both for equities and bonds (Exhibit 14). This is because, over the long run, there tends to be mean-reversion of valuations from extremes, one of the key tenets of value investing (a linear regression mechanically assumes valuations are mean-reverting to the long-run average).

In their timely paper, Campbell and Shiller (1998) showed that the starting valuations for equities can be critical, but Shiller P/Es still explain less than half the variation of 10-year S&P 500 returns since 1900 and predictive regressions often perform poorly out-of-sample[1]. Looking at the combined predictive power of valuations for 60/40 portfolio returns also points to limited predictive power, especially in the near term. The same is true for the equity risk premium (ERP): the equity/bond yield gap had particularly low predictive power for subsequent equity vs. bond performance.

Starting yields tend to be a good indication of future returns for bonds, especially for longer horizons, as carry is a larger proportion of total returns. Equity valuation changes can materially affect total returns, even for 5-10 year horizons. Equity valuations are more likely to mean-revert with a longer horizon as they tend to decline sharply and recover around a recession, which has historically happened every 7-8 years on average. However, persistent macro trends, i.e., structurally higher inflation or growth optimism, can change 'equilibrium' valuations and affect mean-reversion.

Exhibit 14: Outside of bonds, valuations have limited predictive power, especially for near-term returns
R2 of valuations for subsequent returns. Valuation metric in parenthesis



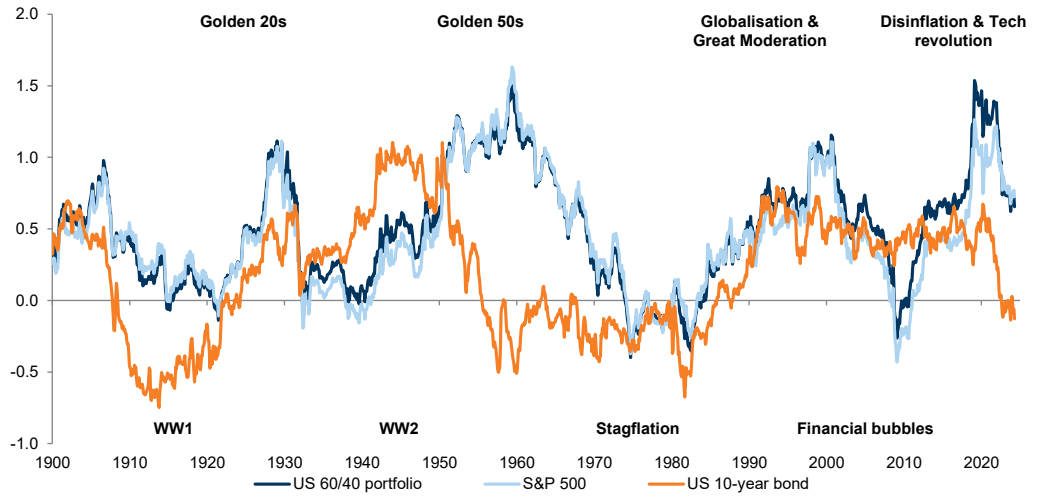
Source: Robert Shiller, Goldman Sachs Global Investment Research

[1] See Cenk and Philips (2016) for a comprehensive overview of problems and some solutions for using Shiller P/Es for forecasting returns. And as Boudoukh et al (2019) recently reiterated, long horizon predictive regressions for equity returns based on valuations tend to have small sample sizes due to overlapping data. This means statistical significance is often lower than traditional estimates and out-of-sample performance can be much worse.

60/40 portfolio performance between stagflation and Goldilocks

The structural cycle, i.e., trends in growth, inflation and policy, affects the performance (and valuations) of 60/40 portfolios. In the last cycle, up until the COVID-19 crisis, a US 60/40 portfolio delivered one of the strongest 10-year rolling Sharpe ratios on record despite somewhat elevated valuations (Exhibit 15). This was particularly the case for equities, which delivered strong cumulative returns post GFC – in fact, more recently equity valuations have expanded to the upper end of the range since the 1990s, indicating that macro conditions do matter.

Exhibit 15: US 60/40 portfolios have delivered strong risk-adjusted returns since the 1990s and post the GFC
10-year rolling Sharpe ratio



Source: Haver Analytics, Robert Schiller, Goldman Sachs Global Investment Research

As we wrote in Global Strategy Paper: Balanced Bear Despair - Part 1, 60/40 portfolios historically performed best in a structural 'Goldilocks' scenario with low inflation and good growth (Exhibit 16). With low and anchored inflation bonds tend to buffer equities in growth shocks, resulting in better risk-adjusted returns – this was the case in the Golden 1920s and 1950s and since the mid-1980s up until the COVID-19 crisis. On the flip side, 60/40 portfolios performed worse in periods with high inflation and weak growth, like the 1970s[2].

Exhibit 16: 'Not too hot, not too cold' or lowflation is usually best for 60/40 portfolio returns, especially in real terms
Annualised 10-year rolling performance of a US 60/40 portfolio (60% S&P 500, 40% US 10-year bond, monthly rebalancing, data since 1900)

US 60/40 nominal return

Inflation \ Real GDP growth	< 2%	2% to 4%	> 4%	Avg.
< 2%	6.0%	8.6%	7.1%	7.5%
2% to 4%	5.2%	10.3%	7.4%	8.7%
> 4%	5.1%	8.5%	6.6%	7.8%
Avg.	5.6%	9.3%	7.1%	8.1%

US 60/40 real return

Inflation \ Real GDP growth	< 2%	2% to 4%	> 4%	Avg.
< 2%	6.9%	7.7%	5.8%	7.1%
2% to 4%	2.7%	7.2%	4.5%	5.7%
> 4%	-0.9%	2.3%	1.3%	1.7%
Avg.	4.3%	5.6%	4.2%	5.0%

US 60/40 Sharpe ratio

Inflation \ Real GDP growth	< 2%	2% to 4%	> 4%	Avg.
< 2%	0.39	0.76	0.54	0.60
2% to 4%	0.36	0.67	0.50	0.57
> 4%	0.28	0.25	0.56	0.31
Avg.	0.36	0.54	0.52	0.50

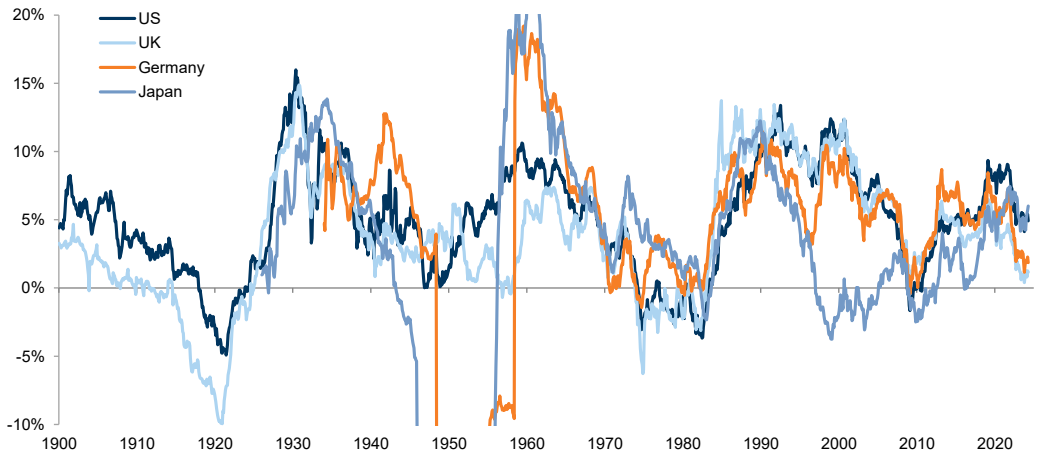
Source: Robert Shiller, Haver Analytics, Goldman Sachs Global Investment Research

'Lost decades' for 60/40 portfolios were not that unusual historically, especially

[2] See also Neville et al (2021) and Baltussen et al (2023) for a more detailed historical analysis of cross-asset performance in inflationary regimes.

outside the US (Exhibit 17). Japan had two lost decades, with negative real 60/40 returns during both the 1990s and 2000s due to stagnation. Similarly, 60/40 portfolios in Europe had poor real returns last cycle owing to weak growth and recent high inflation. Using a dataset covering 150 years of economic and market data for 16 countries, we find similar results – periods of high inflation and weak growth were quite common and usually resulted in weak 60/40 portfolio performance (see grey box).

Exhibit 17: Real 60/40 returns tend to be lower during periods of high inflation and stagnation
10-year rolling real return of a 60/40 portfolio (monthly rebalancing)



Source: Robert Shiller, Haver Analytics, Datastream, Goldman Sachs Global Investment Research

Long-term equity and bond performance is conditioned by the structural growth/inflation mix (Exhibit 18). High inflation tends to weigh on both equity and bond returns, especially in real terms, even though equity risk premia tend to be average. Higher growth is unsurprisingly good for equities and bad for bonds. However, Dimson et al (2002) and later Ritter (2005) showed that there is a weak link between equity returns and levels of GDP growth – the best examples have been Chinese equities in the last 30 years, which did not perform well despite strong GDP growth. This is in large part because of disconnects between cash flows accruing to equity investors vs. GDP, for example, due to different sector compositions, international exposure, taxation and regulation, dilution/share buybacks. Another reason, as Siegel (1998) suggests, is that equities anticipate future economic growth. However, extreme trend growth outcomes such as stagnation and very strong GDP growth episodes did condition long-term US equity returns and equity risk premia – we find similar results in the cross-section using our long-term regional dataset (see grey box).

Exhibit 18: Equities tend to perform best in Goldilocks, bonds in stagnation - equity risk premia tend to increase with growth
Annualised 10-year rolling performance (data since 1900)

S&P 500 real return

Inflation \ Real GDP growth	< 2%	2 to 4%	> 4%	Avg.
< 2%	6.5%	11.0%	7.6%	8.8%
2 to 4%	1.5%	9.4%	6.9%	7.6%
> 4%	0.8%	3.6%	3.4%	3.3%
Avg.	4.1%	7.7%	6.4%	6.7%

US 10Y real return

Inflation \ Real GDP growth	< 2%	2 to 4%	> 4%	Avg.
< 2%	5.3%	2.5%	2.2%	3.3%
2 to 4%	3.4%	3.6%	0.5%	2.6%
> 4%	-3.7%	-0.3%	-2.6%	-1.1%
Avg.	3.2%	1.9%	0.3%	1.8%

Realised Equity Risk Premium

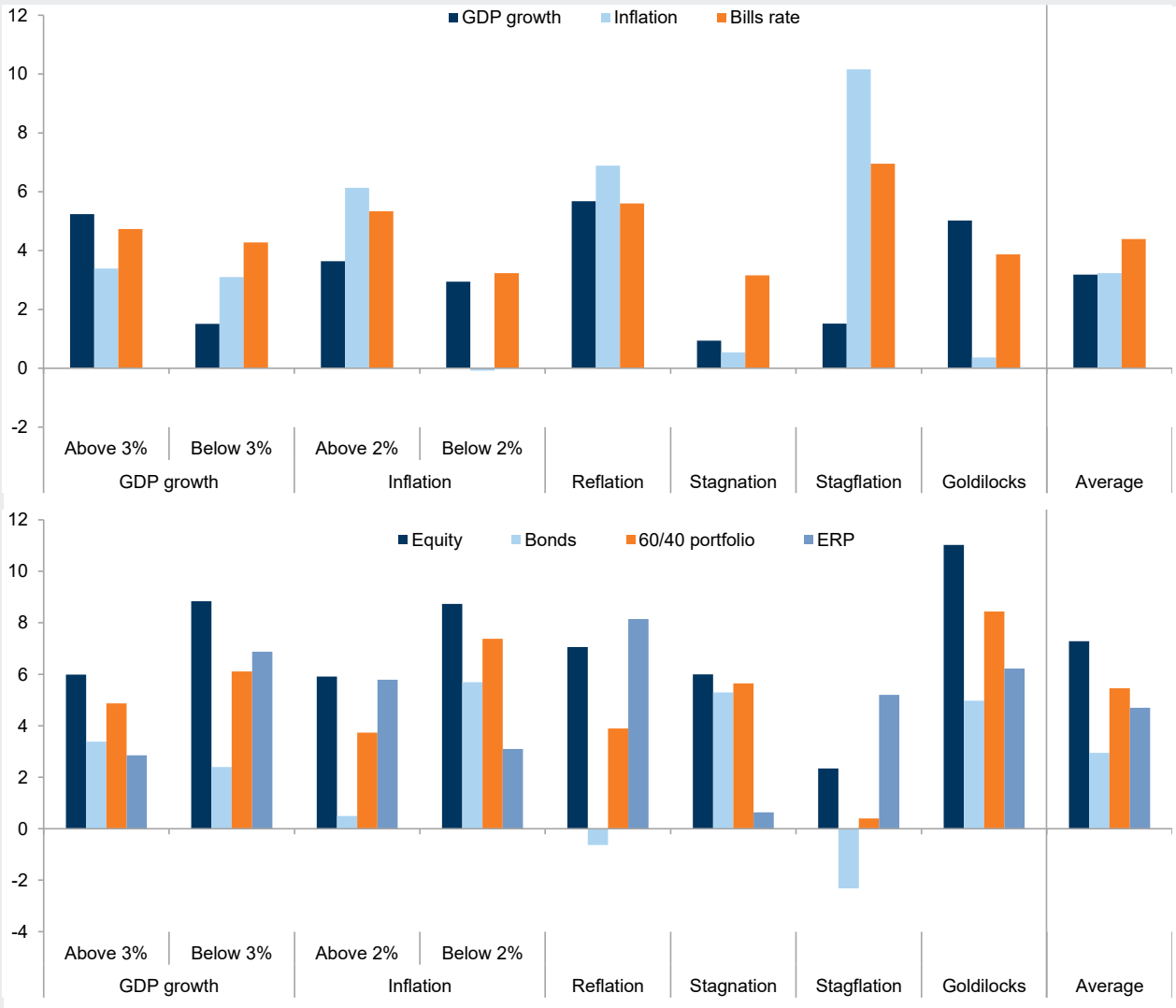
Inflation \ Real GDP growth	< 2%	2 to 4%	> 4%	Avg.
< 2%	1.2%	8.4%	5.4%	5.4%
2 to 4%	-1.8%	5.7%	6.4%	4.9%
> 4%	4.6%	3.9%	6.2%	4.4%
Avg.	0.9%	5.7%	6.1%	4.9%

Source: Robert Shiller, Haver Analytics, Goldman Sachs Global Investment Research

Lessons from 150 years of Goldilocks, stagnation and stagflation across 16 countries

We look at four structural regimes in a long-term dataset covering 150 years of economic and market data for 16 countries: (1) Reflation: growth and inflation above 3%; (2) Stagnation: growth below 2%, inflation below 4%; (3) Stagflation: growth below 2%, inflation above 4%; and (4) Goldilocks: growth above 3%, inflation below 3%. Stagflation and Goldilocks regimes were relatively common and drove large differences in cross-asset performance. Stagnation and Stagflation resulted in several prolonged periods of poor equity and/or bond returns (such as in the 1970s, Japan in the 1990s/00s). A recent study from McQuarrie (2024) extending US historical data to 1792 also confirms that before 1870 US equity returns and equity risk premia were often low for prolonged periods. Similarly, there were several prolonged Goldilocks periods, also outside the US, e.g., in the 1990s in Europe and also for a long time in Scandinavian economies. Structural macro conditions matter critically for long-term equity and bond returns.

Exhibit 19: Stagflation tends to be the worst scenario for 60/40 portfolios, and Goldilocks the best
Averages based on annual data since 1870 for 16 countries (real returns for assets)



Note: The phases are selected by looking for the first 5y rolling period when GDP growth and/or inflation crosses the threshold. Within this 5y period, the economic phase starts in the first year when y/y GDP growth (or y/y inflation) crosses the same threshold too (for example, the regime starts in 1885 if y/y GDP growth goes above 3% in 1885 and 5y growth is above 3% from 1883 to 1887). The end of the economic regime is defined in the same way. Hyper-inflationary periods (inflation > 50%) are eliminated.

Source: Jordà-Schularick-Taylor Macrohistory Database, Goldman Sachs Global Investment Research

Forecasting Long-Term 60/40 Returns — Combining Valuations and Macro

A building block approach combining valuations and macro conditions

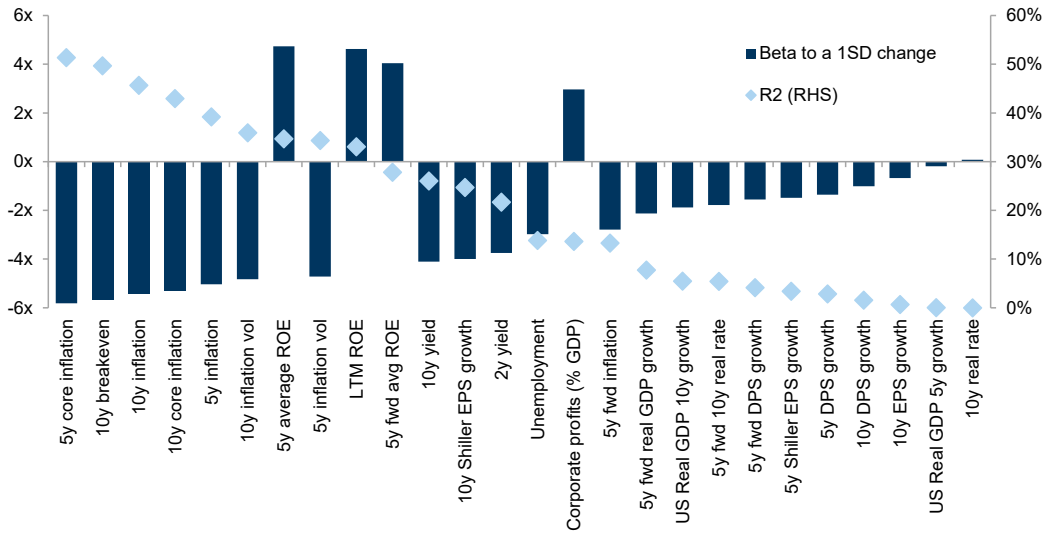
Using valuations alone to forecast returns does not incorporate changing macro conditions, while looking at historical performance in different structural regimes does not incorporate what is currently priced. With valuations somewhat elevated and the structural cycle more uncertain, the potential range for 60/40 returns is wider. We combine valuations and macro conditions in a long-term return forecasting framework for 60/40 portfolios using a building block approach. Following the work from Bogle (1991) and Bogle and Nolan (2015), we decompose long-term returns for both equity and bonds into a carry and changes in valuations.

Carry refers to the return (or cost) of holding an asset without any valuation change. Our measure for the bond carry is simply yield to maturity, while for equity it is the dividend yield + earnings growth during the forecast horizon. We then forecast the valuation changes for bond and equities based on an expected convergence to the equilibrium fair value, which depends on macro conditions – as a result, the valuation mean-reversion is controlled and driven by fundamentals.

(1) Forecasting long-term equity returns

We use the building block approach to forecast long-term S&P 500 returns. In contrast to bonds, a large part of equities' total return will still be driven by valuation changes even over longer forecast horizons. As a result, establishing a 'fair value' of equity valuations and controlling valuation reversion is even more important. Also, trend earnings growth can vary materially over time, affecting the 'carry' component.

Exhibit 20: US valuations have been most closely linked to inflation and corporate profitability since WW2
Sensitivity of S&P 500 Shiller P/E to changes in different macro variables (data since 1950)



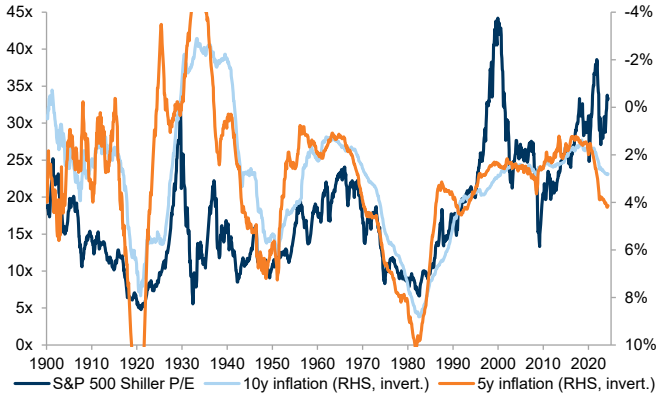
Source: Haver Analytics, Kenneth French, Robert Shiller, Goldman Sachs Global Investment Research

Even though the equity market is often very different from the economy, equity valuations were closely linked to macro conditions, both cyclical and structural –

Exhibit 20 shows the beta to 1 standard deviation moves of different macro variables. While GDP growth and inflation played a key role, there were multiple other drivers[3].

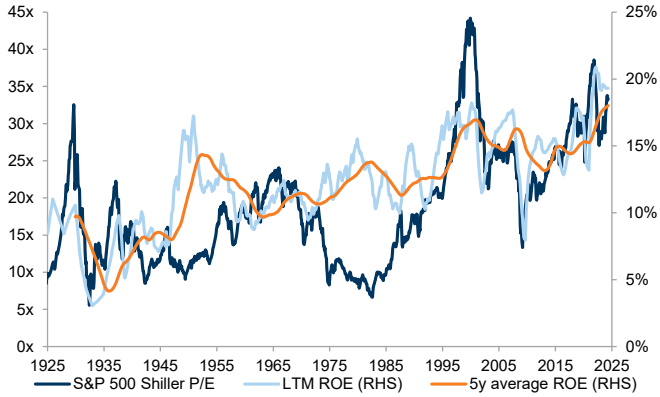
Trends in inflation and corporate profitability had the largest impact on S&P 500 valuations since WW2. Equity valuations were much lower during the 1970s, but higher with low and anchored inflation since the 1990s (Exhibit 21). Higher ROEs, helped by a growing weight of the highly profitable US Tech sector, further helps explain higher average S&P 500 Shiller P/Es since the 1990s compared with the 1960s (Exhibit 22). A key challenge is that equities are forward-looking and how macro conditions are incorporated varies. For example, during the 1970s, equity valuations took much longer to price out inflation risk compared with now.

Exhibit 21: US equity valuations have declined with rising inflation post WW2



Source: Haver Analytics, Robert Shiller, Goldman Sachs Global Investment Research

Exhibit 22: Rising ROEs have supported US equity valuations
ROE based on GAAP operating earnings (ex restructuring charges)



Source: Haver Analytics, Kenneth French, Robert Shiller, Goldman Sachs Global Investment Research

To predict changes in valuations we need to have a sense of fair *levels of S&P 500 Shiller P/Es*. A simple 'fair value' model combining levels of inflation and ROE captured a large part of the variation in the S&P 500 Shiller P/E in the last 75 years (Exhibit 23 and Exhibit 24). Including levels of GDP growth in the 'fair value' model added little explanatory power for equity valuations. The largest forecast error was during the Tech Bubble, which cannot easily be explained by macro fundamentals. To forecast *changes in S&P 500 Shiller P/E* we assume that valuations fully converge to their predicted 'fair value' at the end of our forecast horizon[4].

[3] For example, Arnott (2017) established a macro-based 'fair value' for S&P 500 Shiller P/Es based on inflation and real rates. Waser (2021) did a similar exercise with more macro variables. Using a similar S&P 500 'fair value' approach, Davis et al (2018) found material improvements in predictive power relative to a model based on valuations alone, especially out-of-sample since the 1990s. Also, our markets team recently showed a simple model using US 10-year yields, core CPI, changes in unemployment and the prime-age savers share (30-64) explained changes in US equity valuations in the last 60 years relatively well.

[4] While assuming full convergence works well for longer horizons, the gap between the market valuations and their 'fair value' can persist in the short term - it takes on average 2.5 years for the gap to close by half. Shorter-term forecasts for the change in valuations can be improved by assuming only a partial convergence to 'fair value' or by using a second regression for the changes in Shiller P/E as a function of the initial gap to 'fair value' level and changes in fundamentals (e.g., ROE, inflation, and GDP growth).

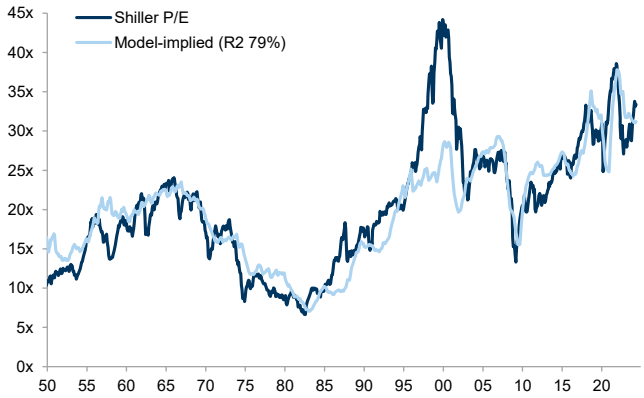
Exhibit 23: A simple model combining inflation and ROE explained a large part of the variation in US equity valuations since WW2

S&P 500 Shiller P/E 'fair value' model (LN of Shiller P/E)			
	Coefficient	Standard error	Impact of 1SD change
Constant	2.6 ***	0.1	
10y inflation	-15.7 ***	0.9	-0.31
LTM ROE	6.5 ***	0.6	0.17
Estimation period	*1950-2023*		
R2	*79%*		
Johansen cointegration test	**Statistic**		
H0: r = 0	40.7 ***		
H0: r = 1	10.2		
H0: r = 2	2.6		

*: p < 10%; **: p < 5%; ***: p < 1%. HAC standard errors. Model is estimated on logarithms.

Source: Haver Analytics, Kenneth French, Goldman Sachs Global Investment Research

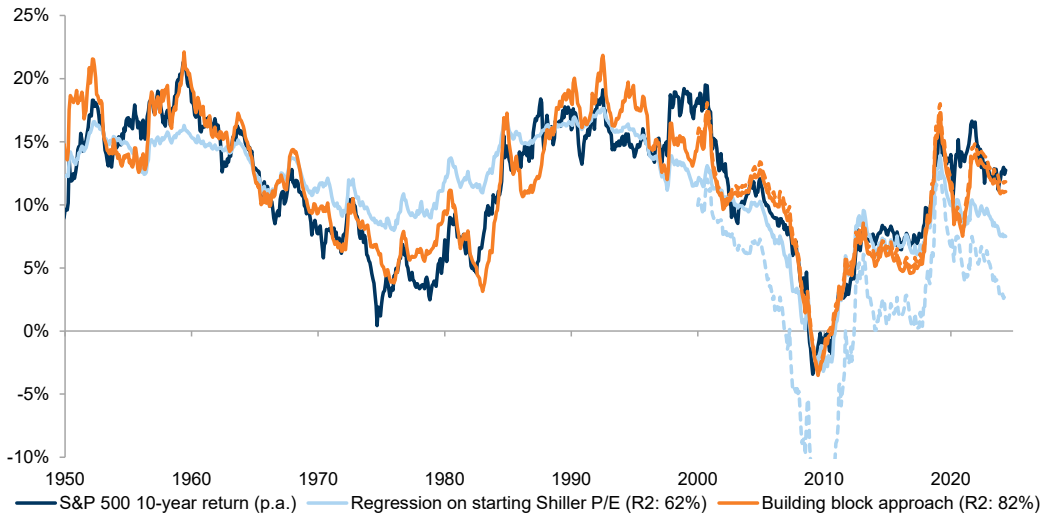
Exhibit 24: Tech Bubble valuations were not explained well by macro fundamentals



Source: Haver Analytics, Kenneth French, Robert Shiller, Goldman Sachs Global Investment Research

Our building block model is *S&P 500 total return = Dividend yield + Earnings growth + Change in Shiller P/E*. It predicted 10-year returns for the S&P 500 better than valuations alone, especially during the 1970s and since the 1990s (Exhibit 25). Importantly, our model did much better out-of-sample since 2000 – a valuation-based estimate was much too bearish as it did not account for support from low inflation and rising ROEs. We assume earnings growth equal to nominal GDP growth plus an adjustment for corporate profitability[5]. However, the forecast for earnings growth did not impact predictive power of the model much – just using a long-run average of 6% drives similar results (Exhibit 27). For a 5-year horizon our model did even better compared to valuations alone, especially out-of-sample since 2000 (Exhibit 26).

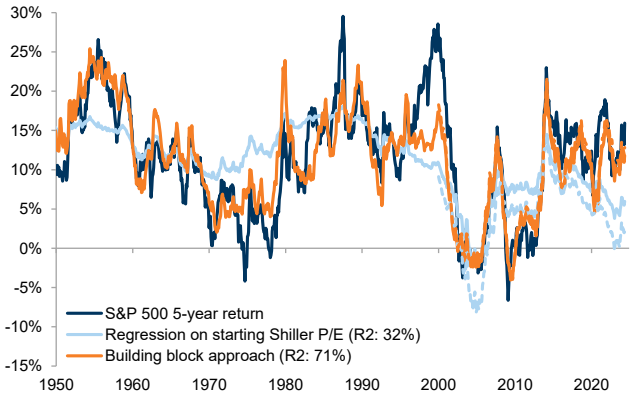
Exhibit 25: Our building block approach for forecasting S&P 500 returns outperformed vs. valuations alone
Dashed line: out-of-sample since 2000. R2 of returns since 1960



Source: Haver Analytics, Kenneth French, Robert Shiller, Goldman Sachs Global Investment Research

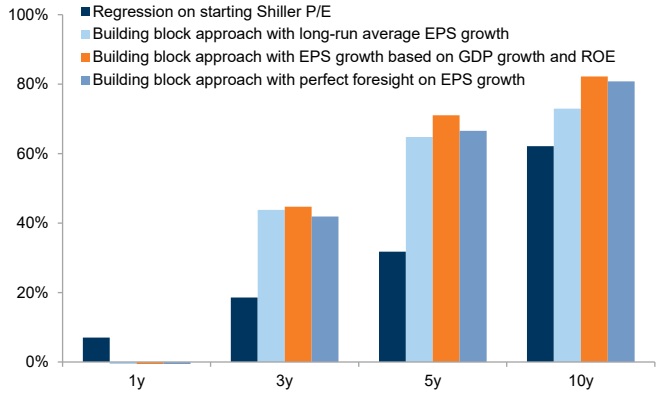
[5] Earnings growth is closely linked to nominal GDP growth but as mentioned in the previous section there can be large disconnects. To adjust for corporate profitability we use the accounting equation for the sustainable growth rate: Long-term growth = ROE x Retention ratio. We use the average retention ratio since 1950 (close to 50%), we then add the extra earnings growth vs. average to nominal GDP growth.

Exhibit 26: On a 5-year horizon our building block approach performs even better, especially out-of-sample
Dashed line: out-of-sample since 2000. R2 since 1955



Source: Haver Analytics, French, Shiller, Goldman Sachs Global Investment Research

Exhibit 27: In the near term, assuming mean-reversion of a macro 'fair value' reduces predictive power
R2 of S&P 500 returns with different forecast horizons

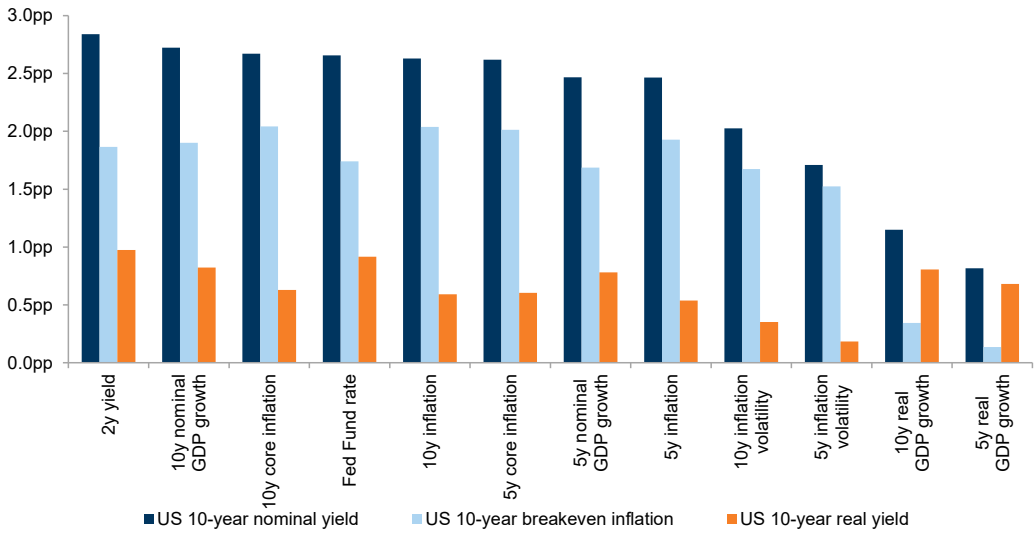


Source: Goldman Sachs Global Investment Research

(2) Forecasting long-term bond returns

With carry contributing the majority of total returns for 10-year horizons, starting levels of bond yields will be a key driver. However, it should be possible to improve forecasts for shorter horizons by estimating a fair value using some macro inputs. Growth, inflation and policy tend to be key drivers of 'fair value estimates' of bond yields – Exhibit 28 shows the betas to 1 standard deviation changes in different macro variables. We also show the betas for breakeven inflation, which tends to be closely linked to inflation, and real yields, which are more linked to growth.

Exhibit 28: Growth, inflation and policy variables tend to condition bond yields
Sensitivity of US 10-year yields to a 1 standard deviation change in macro variables since 1960

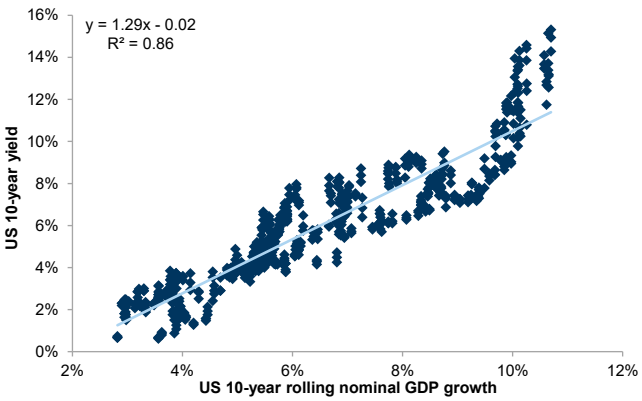


Source: Haver Analytics, Goldman Sachs Global Investment Research

Of course, bond markets are forward-looking and reflect expectations for growth/inflation/policy rather than historical averages. An additional complication is that global bond markets tend to be closely linked and spillovers matter for local equilibrium levels – our rates team has looked at more comprehensive approaches incorporating front-end rates and global spillovers.

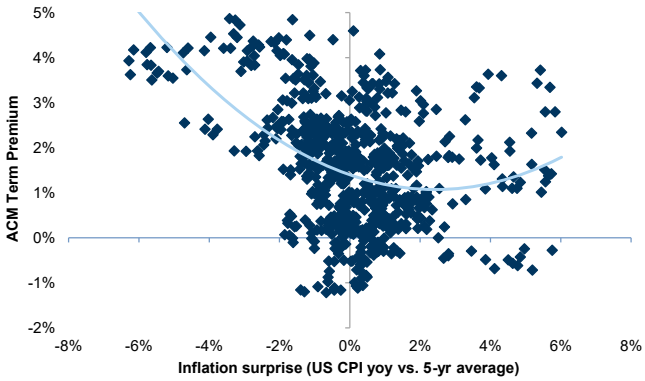
Most of the variation of US 10-year yields has been closely linked to trends in US growth and inflation. For example, a simple 10-year rolling average of US GDP growth explained nearly 90% of the variation in US 10-year yields since WW2 (Exhibit 29). Other drivers, such as monetary and fiscal policy regimes, inflation volatility and expectations for productivity growth may also play a role. For example, if inflation is more volatile bond investors might demand higher bond term premia (Exhibit 30). Our rates team has also found some impact of debt/GDP ratios and fiscal policy on longer-dated rates.

Exhibit 29: Since WW2 US 10-year yields tracked nominal growth
Data since 1950



Source: Haver Analytics, Goldman Sachs Global Investment Research

Exhibit 30: Rising inflation volatility drives higher bond term premia
Data since 1963



Source: Haver Analytics, Goldman Sachs Global Investment Research

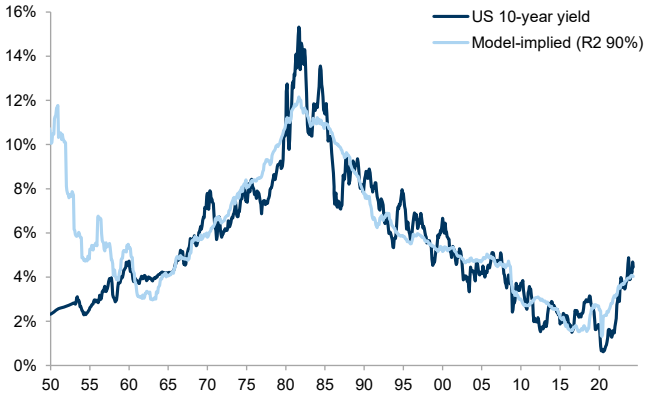
Exhibit 31: Growth and inflation were important drivers of US 10-year yields since WW2

US 10y nominal yield 'fair value' model			
	Coefficient	**Standard error**	**Impact of 1SD change**
Constant	-1.98% ***	0.30%	
10y real GDP growth	1.09 ***	0.07	0.9pp
10y inflation	1.25 ***	0.06	2.6pp
Estimation period	*1960-2023*		
R2	*90%*		
Johansen cointegration test	**Statistic**		
H0: r = 0	43.4 ***		
H0: r = 1	7.3		
H0: r = 2	0.9		

*: p < 10%; **: p < 5%; ***: p < 1%. HAC standard errors.

Source: Goldman Sachs Global Investment Research

Exhibit 32: The structural growth/inflation mix explained broad trends in US 10-year bond yields



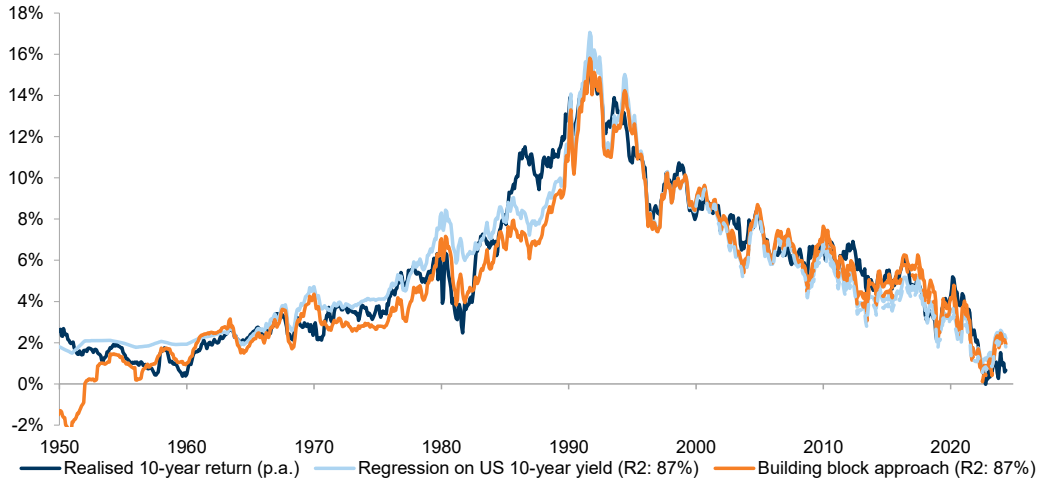
Source: Haver Analytics, Goldman Sachs Global Investment Research

Still, a simple fair value model using 10-year rolling US GDP growth and inflation explained the majority of the variation of *levels of US 10-year yields* since the 1960s (Exhibit 31 and Exhibit 32). Owing to the 1940s bond bubble, with the Fed capping nominal bond yields at 2.5%, most of the 1950s were less driven by macro conditions and are excluded from the sample. The largest forecast errors were during the 1950s and the early 1980s due to high rates volatility around the Volcker Fed. To forecast the *change in US 10-year bond yields* we assume again that bond yields fully converge to their predicted 'fair value' at the end of our forecast horizon[6].

[6] As for equities, assuming full convergence to fair value works best for longer horizons even though bond

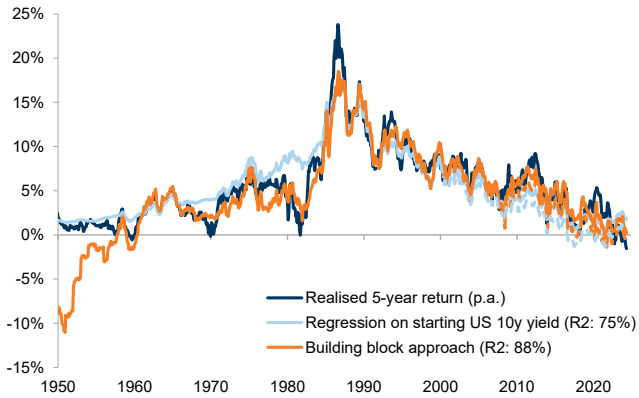
Our building block model is *US 10-year bond return = US 10-year bond yield + Duration[7] * (change in US 10-year bond yield).* It did not perform much better than simple linear regression on starting yields for longer horizons, also out-of-sample (Exhibit 33). In part this is due to carry being such a large proportion of total returns and as bond yields have been mean-reverting for longer horizons. However, the model added some value by capturing macro conditions – 10-year return forecasts were lower during the 1970s vs. a regression-based estimate and higher post GFC, reflecting lower inflation and growth. Incorporating macro conditions further improved forecasts for shorter horizons, such as 3-5 years, as carry becomes a smaller proportion of total returns and changes in yields matter more (Exhibit 34 and Exhibit 35).

Exhibit 33: Our building block approach for bonds does marginally better than a forecast based on yields
Dashed line: out-of-sample performance since 2000. R2 of returns since 1970



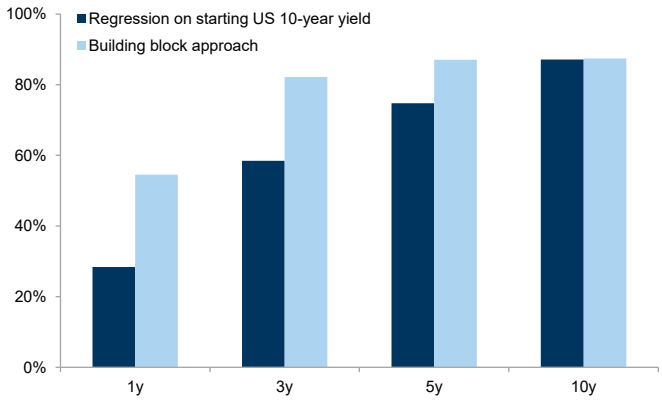
Source: Haver Analytics, Robert Shiller, Goldman Sachs Global Investment

Exhibit 34: For 5-year bond returns the building block approach added more value, especially in the 1970s
Dashed line: out-of-sample since 2000. R2 of returns since 1965



Source: Haver Analytics, Robert Shiller, Goldman Sachs Global Investment

Exhibit 35: The explained variation of the equilibrium approach is better for shorter forecast horizons
R2 of US 10y bonds total returns with different forecast horizons



Source: Goldman Sachs Global Investment Research

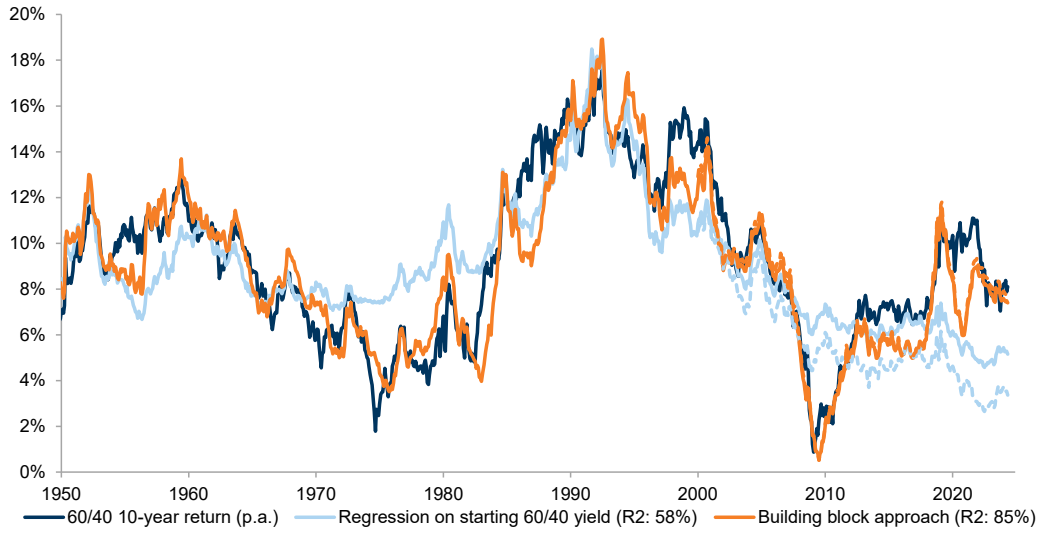
yields converge to fair value faster than equity valuations - it takes on average 1.2 years for the gap to close by half. Shorter-term forecasts for the change in valuations can be improved by assuming only a partial convergence to 'fair value' or by using a second regression for the changes in bond yields as a function of the initial gap to 'fair value' level and changes in fundamentals (e.g., inflation and GDP growth).

[7] We assume that the 10-year bond investment is rolled annually and use as duration the modified duration of a 10-year par bond less an adjustment for the reinvestment over the investment horizon.

(3) A integrated approach to forecasting long-term 60/40 returns and the ERP

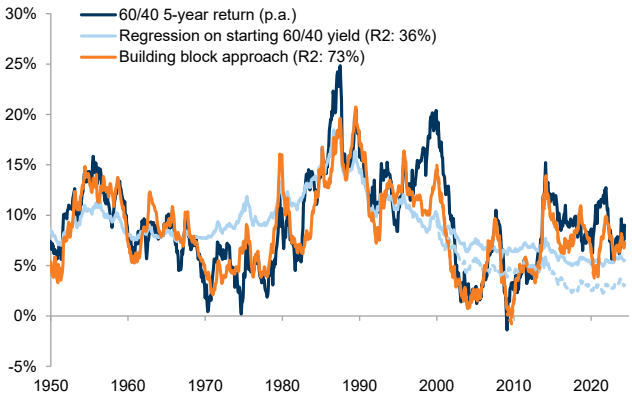
Combining the building block approaches for equities and bonds to forecast 60/40 returns provides much better estimates than a regression on 60/40 yields alone (Exhibit 36). This was particularly the case out-of-sample since 2000, when a valuation-based estimate would have been much too bearish, in large part due to tailwinds for equity valuations from lower US inflation and higher profitability. However, it also predicted 60/40 portfolio returns better during the 1970s, when high and rising inflation weighed on equity and bond valuations for the decade. The relative predictive power for 5-year returns is even better, indicating a more useful forecasting approach for medium-term 60/40 returns (Exhibit 37 and Exhibit 38).

Exhibit 36: Our building block approach for 10-year 60/40 returns had much better predictive power than valuations alone, especially out of sample
Dashed line: out-of-sample since 2000. R2 of returns since 1970



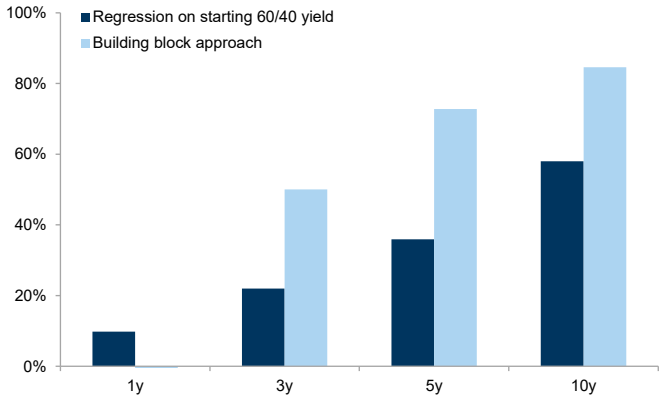
Source: Haver Analytics, Kenneth French, Robert Shiller, Goldman Sachs Global Investment

Exhibit 37: For 5-year 60/40 returns the building block return forecast appears even better, especially out-of-sample
Dashed line: out-of-sample since 2000. R2 of returns since 1965



Source: Haver Analytics, Kenneth French, Robert Shiller, Goldman Sachs Global Investment

Exhibit 38: The building block approach has much better predictive power for medium- and long-term 60/40 returns
R2 of 60/40 total returns with different forecast horizons

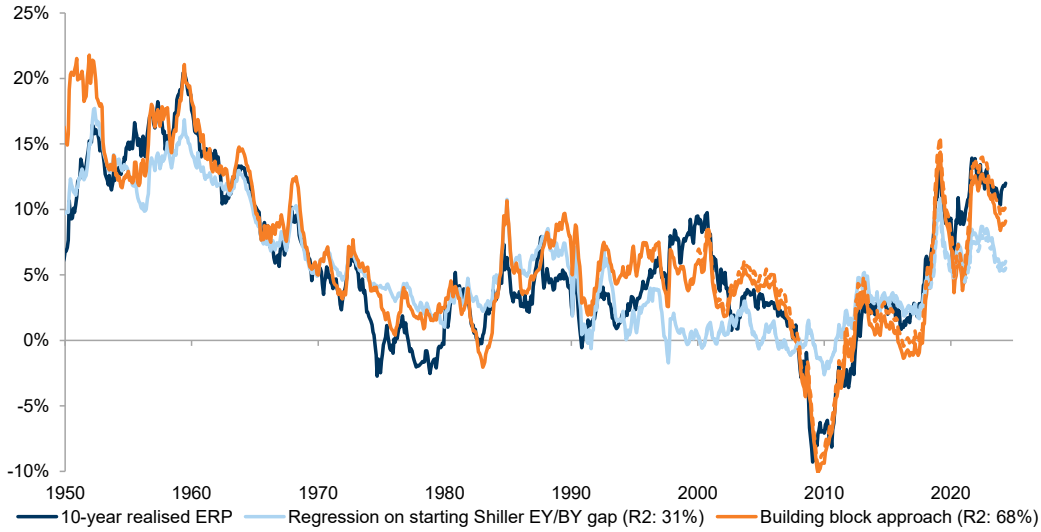


Source: Goldman Sachs Global Investment Research

Similarly, the building block approach performs better in forecasting ex post equity risk premia compared with equity/bond yield gaps alone (Exhibit 39). This has been the case particularly where there was a material change in macro conditions,

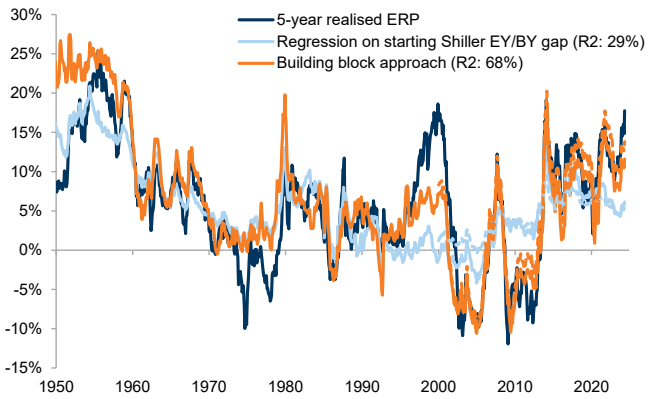
such as during the 1990s Goldilocks phase, the stagnation post the GFC and more recently in the COVID-19 recovery. Again the building block approach worked better than valuations alone for 3-5 year forecast horizons (Exhibit 40 and Exhibit 41). As equity risk premia are trending less, out-of-sample performance of a valuation-based model since 2000 is not very different to in-sample.

Exhibit 39: Our building block approach did much better in forecasting ex post equity risk premia
Dashed line: out-of-sample since 2000. R2 of returns since 1970



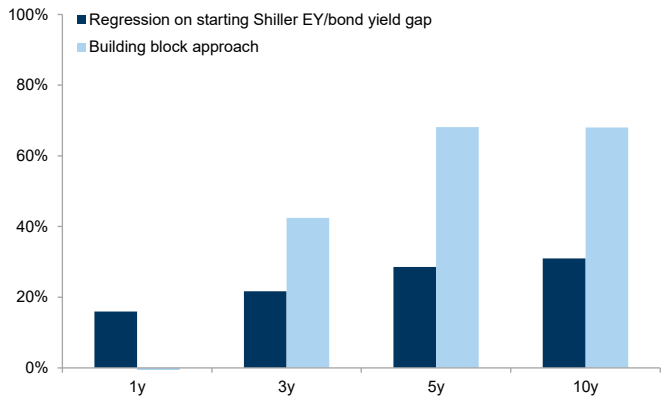
Source: Haver Analytics, Kenneth French, Robert Shiller, Goldman Sachs Global Investment Research

Exhibit 40: Starting valuations had poor predictive power for 5-year ex post equity risk premia
Dashed line: out-of-sample since 2000. R2 of returns since 1965



Source: Haver Analytics, Kenneth French, Robert Shiller, Goldman Sachs Global Investment Research

Exhibit 41: Especially on a 3-5 year horizon, the explained variation is much better for the building block approach
R2 of realised ERP with different forecast horizons



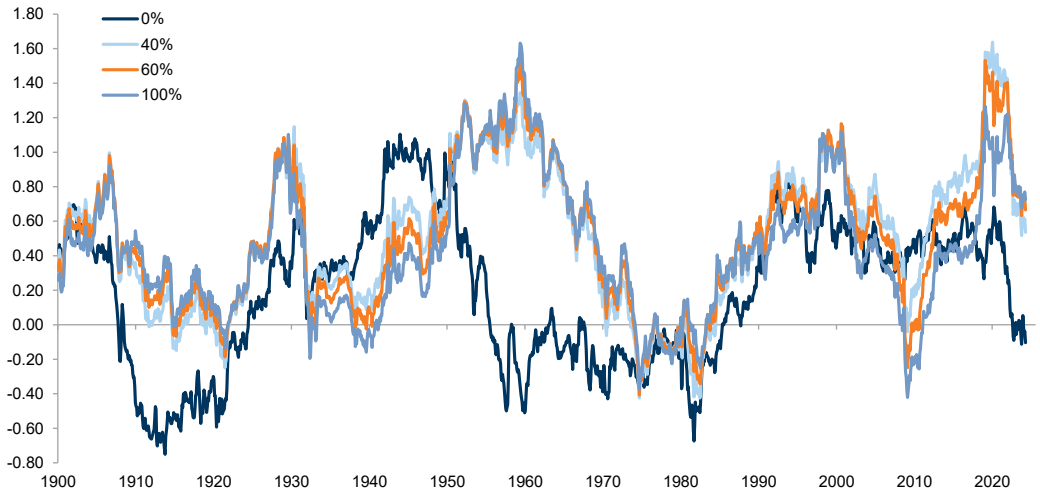
Source: Goldman Sachs Global Investment Research

Strategic Tilting — Benefits from Long-Term Allocation Shifts

How to be efficient — the optimal asset mix for different structural cycles

The structural cycle and valuations materially affect performance and the optimal asset mix of balanced portfolios. Risk-adjusted returns of a 60/40 portfolio in the post-GFC cycle were nearly three times the long-run average, outperforming a stand-alone investment in the S&P 500 (Exhibit 42). Bonds had a strong bull market and have provided diversification benefits for equities since the late 1990s with negative equity/bond correlations. As a result, the optimal asset mix up until the COVID-19 crisis was actually not 60/40 but more like 40/60, similar to a risk parity portfolio. And in 2022 there was a major shift, with one of the worst bond drawdowns since the 1970s.

Exhibit 42: Last cycle, 60/40 was not the optimal portfolio, it was more a risk parity weighting
10-year rolling Sharpe ratio with different equity allocations in a balanced portfolio (S&P 500 and US 10-year bonds)



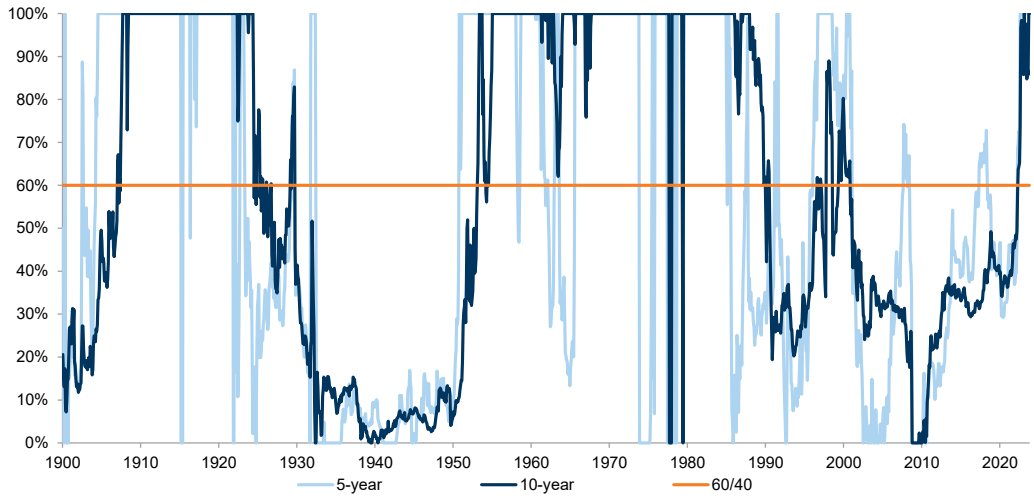
Source: Haver Analytics, Goldman Sachs Global Investment Research

While the optimal asset mix for a balanced portfolio has been 60/40 on average since 1950, there were large swings historically (Exhibit 43). For example, in the periods 1908-1922 and 1955-90 and since 2022, equity-only investors achieved similar or better Sharpe ratios than 60/40. At the end of 2021 we argued that a portfolio of 100% equities might outperform a 60/40 portfolio and investors should combine equities with cash according to their risk tolerance. With equities outperforming bonds, high rates volatility and more positive equity/bond correlations, both over 5- and 10-year rolling horizons ending in 2023, the optimal asset mix shifted to 100% equities.

The structural cycle was a key driver of 60/40 performance and the optimal asset mix. Periods with high equity allocations were due to elevated inflation weighing on bonds, like in the 1970s, or favourable macro conditions boosting equities, including the productivity growth in the 1950s and 1960s and the 1990s (Exhibit 44). Periods with low equity allocations were due to low inflation or stagnation boosting risk-adjusted return for bonds. We identify four structural regimes: (1) Goldilocks without productivity growth (1963-73, 1986-96, 2009-20), (2) Goldilocks with productivity growth (1948-59, 1957-68,

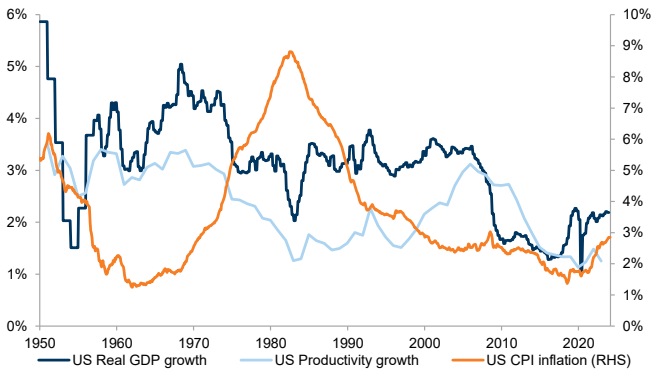
1990-00), (3) Stagnation (2001-11), and (4) Stagflation (1970-81) (Exhibit 45).

Exhibit 43: Outside of the 1950/60s and 1970s an equity allocation above or close to 60% was too high
Optimal portfolio weight of S&P 500 in a balanced portfolio



Source: Haver Analytics, Goldman Sachs Global Investment Research

Exhibit 44: The structural growth/inflation mix has varied materially with changing productivity growth
10-year rolling averages



Source: Haver Analytics, Goldman Sachs Global Investment Research, US Bureau of Labor Statistics, Census Bureau

Exhibit 45: Structural macro regimes since 1950 have led to very different backdrops
10-year rolling averages

	Long-term macro conditions				
	GDP growth	CPI inflation	Fed funds	LTM ROE	EPS growth
Historical averages					
Since 1950	3.1%	3.6%	4.4%	13%	6.3%
Since 1990	2.6%	2.7%	3.7%	14%	5.4%
Since 2000	2.3%	2.3%	2.4%	15%	6.0%
Since 2010	1.8%	2.1%	1.2%	15%	5.7%
Goldilocks no productivity	3.2%	3.0%	3.8%	13%	5.6%
Goldilocks w/ productivity	4.0%	2.1%	3.4%	13%	5.6%
Stagnation	1.7%	2.4%	2.0%	14%	4.8%
Stagflation	3.1%	8.2%	8.0%	12%	9.8%
Last 10 years	2.3%	2.8%	1.5%	17%	7.4%

Source: Haver Analytics, Goldman Sachs Global Investment Research

Those structural regimes affected both 60/40 returns and risk (Exhibit 46). As we wrote in Global Strategy Paper: Balanced Bear Despair - Part 2, the optimal equity weight in a balanced portfolio will be conditioned by relative returns (also vs. cash), equity/bond correlations and relative volatility. As we wrote, equity/bond correlations tend to be structurally more negative on average with lower inflation as growth shocks become a more important driver relative to rate shocks[8]. And higher inflation has often come alongside more macro volatility broadly, which in turn resulted in higher volatility for both equities and bonds. Stagnation also drove higher equity and bond volatility but with more negative equity/bond correlations.

[8] For recent research on macro drivers of equity/bond correlations, see Molenaar et al (2024) and Brixton et al (2023), who find higher inflation levels/uncertainty and real yields tend to drive more equity/bond comovements.

Exhibit 46: Structural regimes tend to affect 60/40 portfolio performance and the optimal asset mix

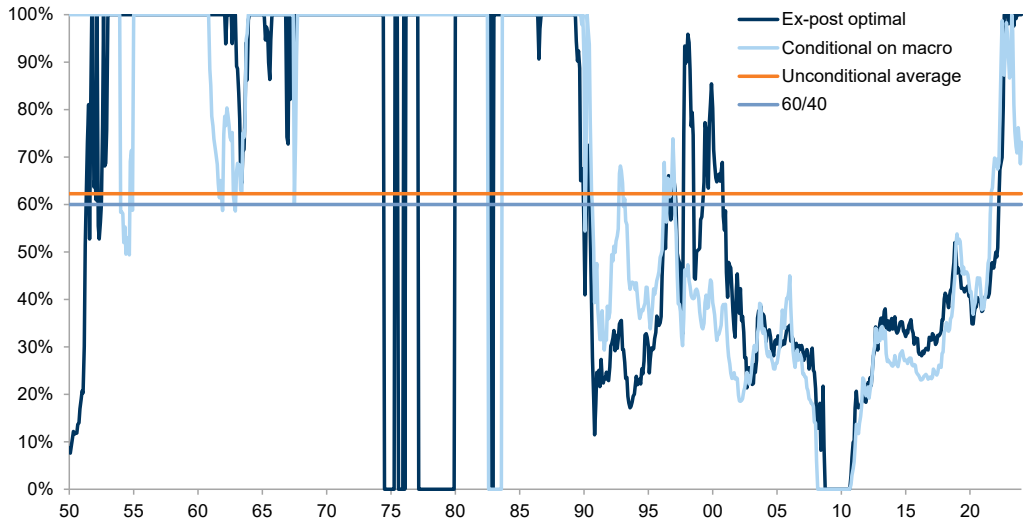
	Returns					Portfolio risk			60/40 Sharpe ratio	Optimal equity weight
	60/40 nominal	60/40 real	S&P 500	US 10y bond	ERP	S&P 500	US 10y volatility	Eq./ bond correlation		
Historical averages										
Since 1950	9%	6%	11%	5%	6%	14%	7%	0.07	0.59	63%
Since 1990	10%	7%	11%	7%	4%	15%	8%	-0.04	0.68	39%
Since 2000	8%	6%	9%	5%	4%	15%	7%	-0.20	0.66	37%
Since 2010	7%	5%	9%	4%	5%	15%	8%	-0.28	0.78	41%
Goldilocks no productivity	10%	7%	12%	5%	7%	13%	7%	0.05	0.75	66%
Goldilocks w/ productivity	11%	9%	16%	4%	12%	12%	4%	0.11	0.99	89%
Stagnation	5%	2%	3%	6%	-3%	16%	9%	-0.34	0.32	19%
Stagflation	7%	-2%	8%	4%	4%	16%	8%	0.20	-0.06	100%
Last 10 years	8%	5%	13%	1%	12%	15%	7%	0.10	0.68	100%

Source: Haver Analytics, Robert Shiller, Kenneth French, Goldman Sachs Global Investment Research

Benefits (and problems) from 'strategic tilting' within balanced portfolios

With large swings in the optimal asset mix there should be benefits from 'strategic tilting'[9] vs. static 60/40 portfolio. Using our long-run return forecast models for equities and bonds, we can estimate returns based on historical macro conditions. The return on cash, equity/bond correlations and volatilities also matter (albeit less) and we also estimate them based on levels and changes in trend GDP growth and inflation (see Appendix 1 for details). Exhibit 47 shows that the resulting optimal allocation to equities based on macro conditions closely tracked the ex post optimal allocation.

Exhibit 47: Our macro-implied strategic tilts tracked most of the variation in the optimal asset mix
Optimal allocation to S&P 500 for 10-year horizons



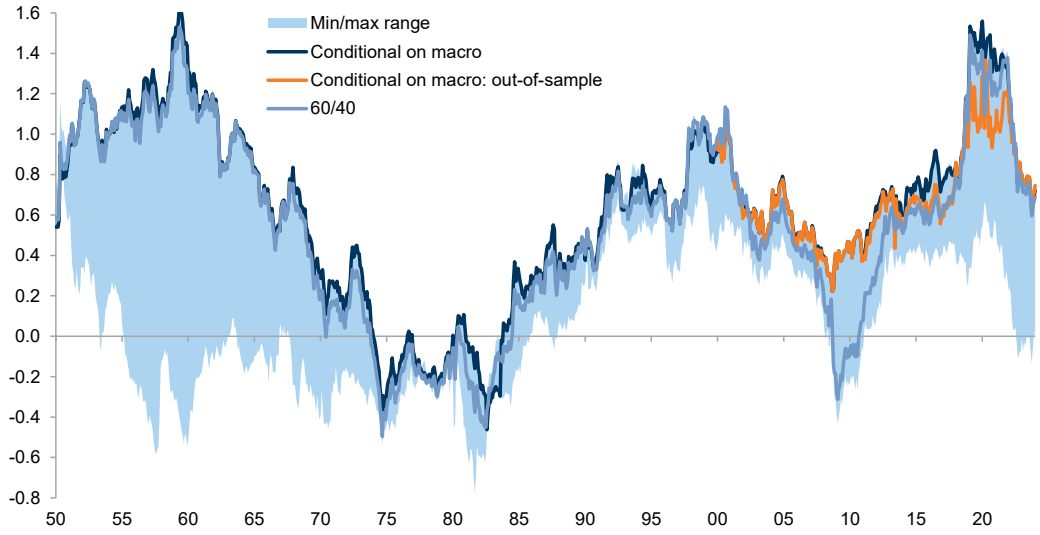
Source: Haver Analytics, Robert Shiller, Kenneth French, Goldman Sachs Global Investment Research

Sharpe ratios with our macro-based strategic tilts for the asset mix were better compared with a static 60/40 portfolio, especially during the GFC (Exhibit 48). Results are robust using out-of-sample forecasts from the models from 2000. This is not surprising as the backtest assumes perfect foresight and thus anticipated the sharp drop

[9] While there is a lot of literature on regime-based tactical or dynamic portfolio tilting, the term 'strategic tilting' with a longer horizon is often attributed to the approach first used by the Guardians of New Zealand Superannuation (see also Drew et al (2010)).

in 10-year rolling GDP growth around the GFC. Still, it highlights the value of anticipating extreme structural regime shifts and implementing strategic tilts. However, during the 1970s just tilting the asset mix did not create material improvements on risk-adjusted returns as both equities and bonds suffered from inflation.

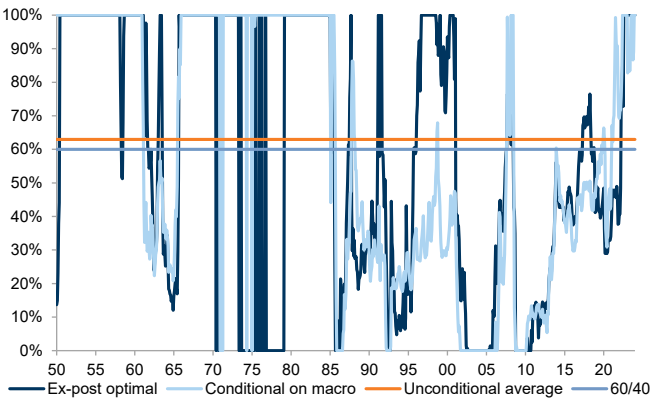
Exhibit 48: Macro-based strategic tilts could enhance Sharpe ratios but less so in the 1970s
10-year rolling Sharpe ratios for different asset mixes



Source: Haver Analytics, Robert Shiller, Kenneth French, Goldman Sachs Global Investment Research

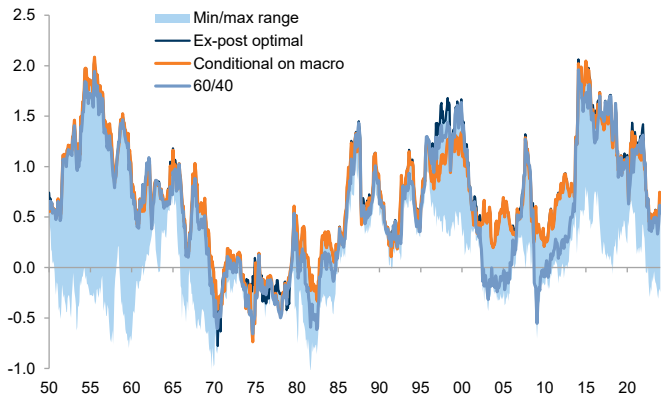
Using the models for 5-year returns shows that the resulting strategic tilts tracked the ex-post optimal portfolio even closer (Exhibit 49). And the Sharpe ratios of the strategic tilts were again higher on average compared with a static 60/40 portfolio. They reduced downside risks both when the Tech Bubble burst and during the GFC and Sharpe ratios in the 1960s and post GFC were also higher. While return predictability over long horizons generally looks better, there can be material variation during the investment horizon, making the implementation of strategic tilts more difficult[10].

Exhibit 49: On a 5-year rolling horizon our macro-based optimal allocations worked better in the 1960s
Optimal S&P 500 allocation for 5-year horizons



Source: Haver Analytics, Robert Shiller, Goldman Sachs Global Investment Research

Exhibit 50: On a 5-year rolling basis Sharpe ratio improvements from strategic tilting were larger
5-year rolling Sharpe ratios for different asset mixes

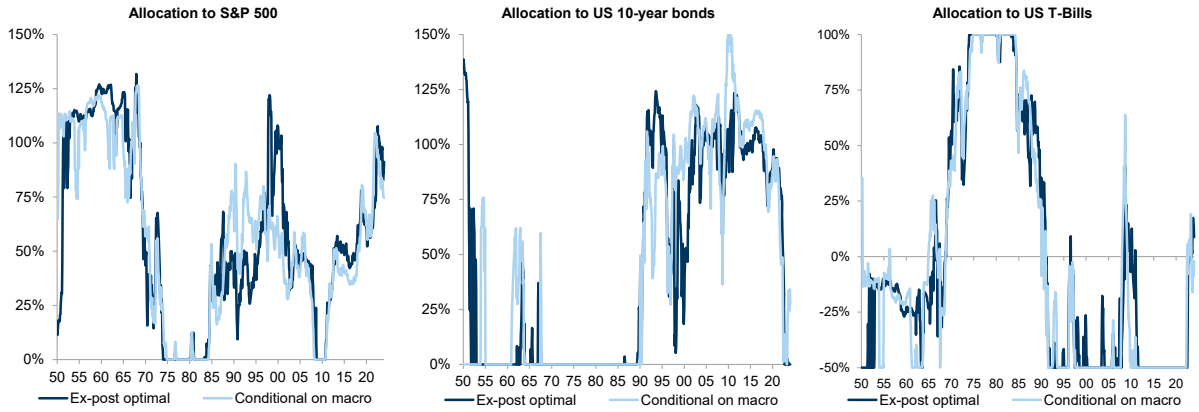


Source: Haver Analytics, Robert Shiller, Goldman Sachs Global Investment Research

[10] To create more robust strategic tilts near term, one could run similar models for shorter horizons and combine the signals or, similar to Asness et al (2017), incorporate price momentum for shorter horizons.

Allocations to cash could further enhance returns when expected Sharpe ratios for both bonds and equities were poor. During the 1970s cash outperformed both bonds and equities and, by extension, a 60/40 portfolio. We scale more into cash the more the expected 10-year Sharpe ratio is below the long-run average, with a 100% cash allocation for negative levels, and we leverage up the tangent portfolio when the Sharpe ratio is higher (see Appendix 2 for details on the strategic tilting approach). Exhibit 51 shows the macro-implied allocations to S&P 500, US 10-year bonds and US T-Bills.

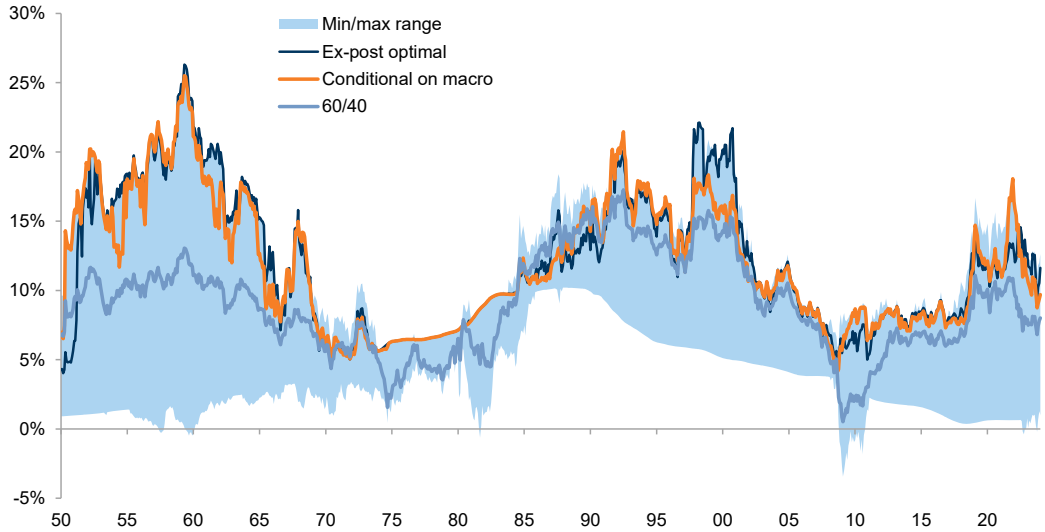
Exhibit 51: During the 1970s it would have been optimal to allocate to cash
10-year rolling optimal allocations including cash and leverage (max 1.5x)



Source: Haver Analytics, Robert Shiller, Kenneth French, Goldman Sachs Global Investment Research

Those macro-based tilts further enhanced returns relative to a static 60/40 portfolio, especially during the 1970s (Exhibit 52). During most of the 1970s and early 1980s the tilts were towards 100% cash. On average, they resulted in an improvement of 290bp a year for 10-year rolling returns since 1950, or 130bp without the use of leverage. However, a key challenge of strategic tilting is again that convergence to macro fair values can take a long time. To capture swings around a trend, one can use a shorter forecast horizon or combine them with dynamic asset allocation overlays.

Exhibit 52: Scaling into cash/ using leverage based on expected Sharpe ratios further enhanced returns
10-year rolling returns for different asset mixes



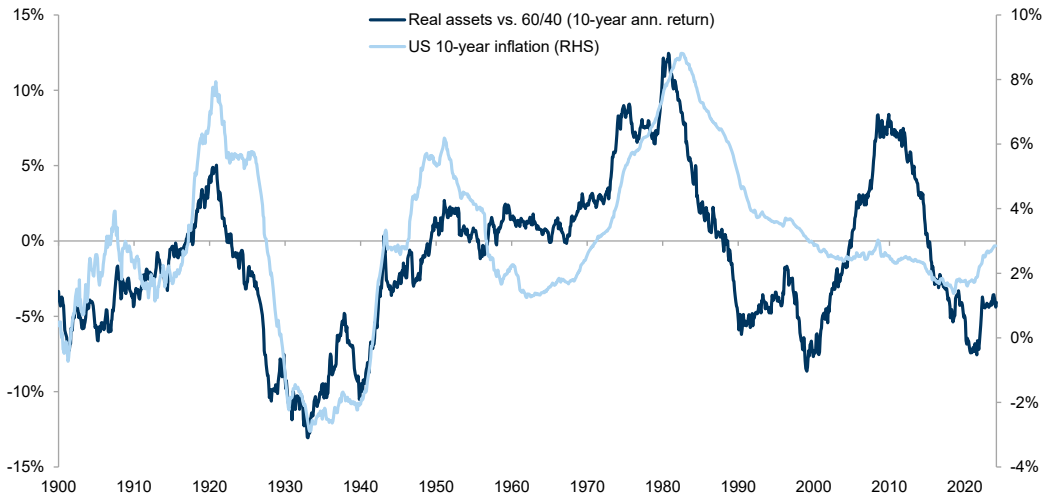
Source: Haver Analytics, Robert Shiller, Kenneth French, Goldman Sachs Global Investment Research

Strategic tilting for structural regimes with real assets and growth stocks

Different structural scenarios can result in very different optimal asset mixes. In a Goldilocks scenario, especially with high productivity growth, there is a strong case for high equity allocations while during stagnation episodes there is a strong case for higher bond allocations. Also, for stagflation there tends to be no reward for taking any risk, suggesting investors are better off in cash. Assets that diversify inflation risk or provide exposure to rising productivity growth can create a more diversified balanced portfolio and strategic tilting opportunities.

Allocations to real assets can diversify inflation risk in balanced portfolios. As we showed in Global Strategy Paper: Balanced Bear Despair - Part 3, post WW1 and WW2, as well as during the 1970s, allocations to real assets helped diversify 60/40 portfolios with uncorrelated returns and competitive real return potential (Exhibit 53)[11]. While equities provide a claim on nominal growth and also tend to offer positive real returns over the long run, real assets have outperformed equities in prolonged inflationary periods and commodities in particular can provide a more direct inflation hedge.

Exhibit 53: Real assets have outperformed a 60/40 portfolio in periods of high and rising inflation



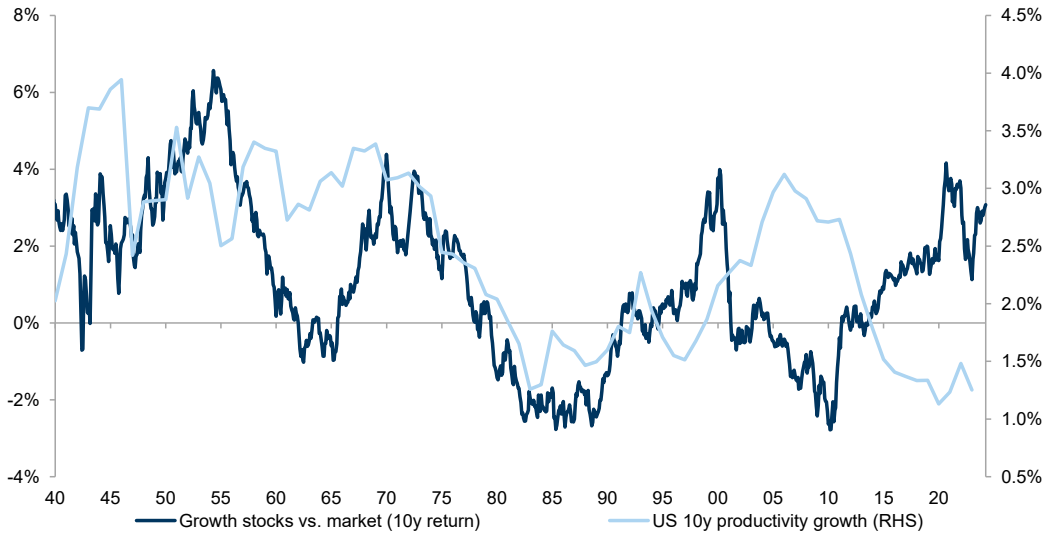
Note: 'Real assets' is an equal-weight average of S&P GSCI/ a broad commodities index (TR) since 1900, Gold since 1933, real estate since 1928, infrastructure/energy stocks since 1926, TIPS since 1959 using the a backcast; for details see Global Rates Notes: Introducing a backcast history of traded inflation.

Source: Haver Analytics, Kenneth French, Goldman Sachs Global Investment Research

Selective growth stocks could provide more exposure to higher productivity growth. As we have shown in Global Strategy Paper: Why AI is not a bubble, previous major new technology waves have driven material outperformance of the technology sector. Indeed, growth stocks broadly have outperformed during or ahead of periods with a material pick-up in productivity growth (Exhibit 54). Both in the Tech Bubble and the 1950s/60s they anticipated a pick-up of productivity growth well before it happened. Our US strategy team has already focused on the next phases of the 'AI trade' to diversify beyond current large cap AI beneficiaries, which have already outperformed materially.

[11] See recent research from Neville et al (2022) and Balthussen (2023) for a detailed historical comparison of cross-asset performance during inflationary regimes.

Exhibit 54: Growth stocks often outperform around periods of strong productivity growth

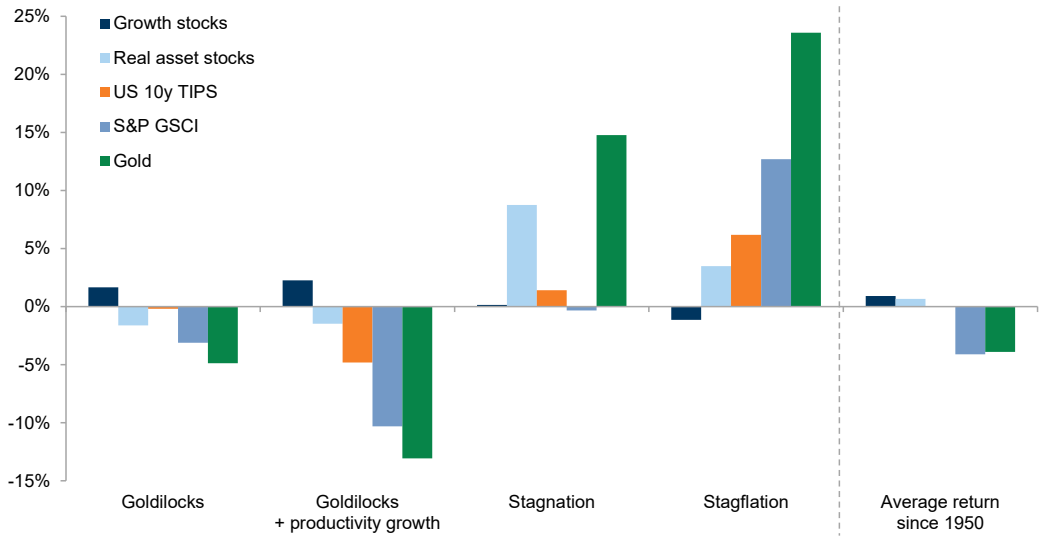


Note: MSCI US growth index. Before 1977 we use a value-weighted aggregate of the top quartile sub-sectors by dividend growth from Kenneth French.

Source: Kenneth French, US Bureau of Labor Statistics, Census Bureau, Haver Analytics, Datastream, Goldman Sachs Global Investment Research

The historical relative performance of real assets and growth stocks reveals potential diversification benefits in extreme structural cycle scenarios (Exhibit 55). During Goldilocks scenarios, especially those with high productivity growth, growth stocks have tended to outperform, while TIPS tend to underperform relative to bonds. Commodities and TIPS diversify stagflation risk and real asset stocks tend to do well during stagflation and stagnation (likely due to lower leverage costs). However, especially for commodities, both the S&P GSCI and Gold, there has been a cost of strategic allocations with nearly 5% annualised underperformance relative to a 60/40 portfolio since 1950 – and they tend to be more volatile. And over the long run neither growth nor real asset stocks (real estate/infrastructure/energy) offered much extra return, although they have potentially more risks.

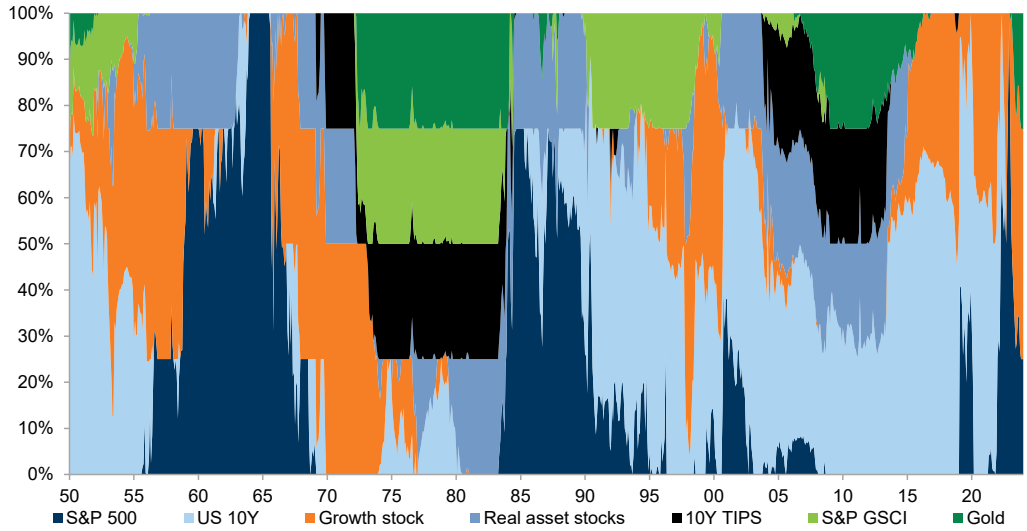
Exhibit 55: Real assets can diversify inflation risk, growth stocks provide exposure to productivity growth
Relative 10-year total return (stocks vs. S&P 500, TIPS vs. US 10-year bonds, commodities vs. 60/40 portfolio)



Source: Haver Analytics, Kenneth French, Robert Shiller, Goldman Sachs Global Investment Research

Allowing allocations to real assets and growth stocks can enhance risk-adjusted returns. As we wrote in Global Strategy Paper: Balanced Bear Despair - Part 3, the optimal buy-and-hold portfolio since 1950 has been roughly 1/3 equities, 1/3 bonds and 1/3 real assets. During the 1970s the optimal portfolio shifted primarily towards real assets broadly, which materially outperformed a 60/40 portfolio, especially commodities – there were also benefits from allocations to real assets in the 1950s[12] and in the run-up to the GFC (Exhibit 56). Growth stocks received a large allocation during the decades ending in the mid-1950s/late 1960s and early 1970s, when productivity growth was strong, and during the late 1990s Tech Bubble, as well as during the last cycle up until now.

Exhibit 56: Large strategic tilting opportunities beyond equities and bonds in the last 75 years
Optimal allocations to different assets for 10-year rolling horizons



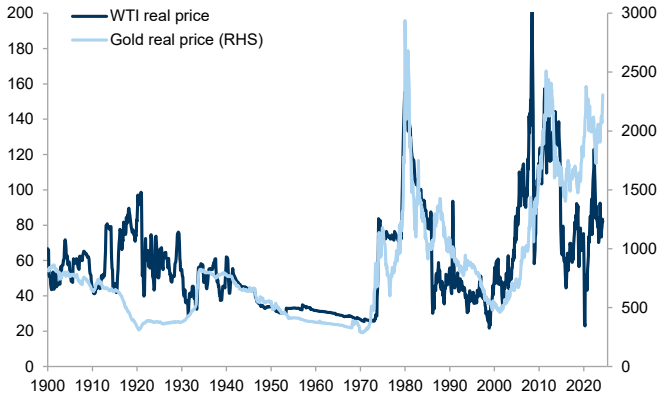
Note: maximum allocation to all assets outside S&P 500 and US 10-year bonds capped at 25% except growth stocks, which are capped at 50%.

Source: Haver Analytics, Robert Shiller, Kenneth, Goldman Sachs Global Investment Research

Of course, historical performance of real assets and growth stocks may not be a good guide for the future. During the 1970s, multiple, prolonged supply disruptions in the Middle East drove a sixfold increase in oil prices in real terms (Exhibit 57). Similarly, Gold rallied sharply after the end of Bretton Woods in the late 1960s. Such large and sharp increases look less likely now. Similarly, current valuations for growth stocks are high due to the strong performance of US large cap Tech stocks – this could become a speed limit for returns, even in the case of a bullish AI scenario, and we have recommended broader diversification within global growth stocks. Real asset stocks, on the flip side, trade at large valuation discounts, in part due to structural headwinds and deleveraging concerns – near-term, they could actually benefit from lower inflation if this results in lower rates (Exhibit 58).

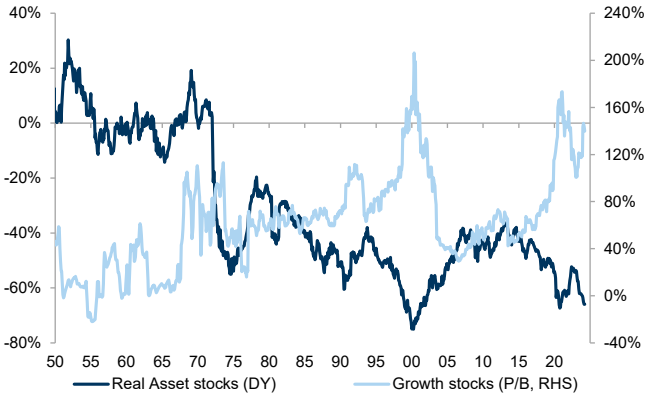
[12] The allocation to real asset stocks such as infrastructure/real estate/energy was maxed out at 25% in the 1950s - oil prices were regulated by the Texas Railroad Commission, gold prices were fixed by Bretton Woods and the TIPS market did not exist / we do not have a backcast going further back than 1959.

Exhibit 57: Real commodity prices have been relatively stable outside of periods of shortages



Source: Haver Analytics, Goldman Sachs Global Investment Research

Exhibit 58: Growth stocks trade at a large premium to the market while real asset stocks look cheap

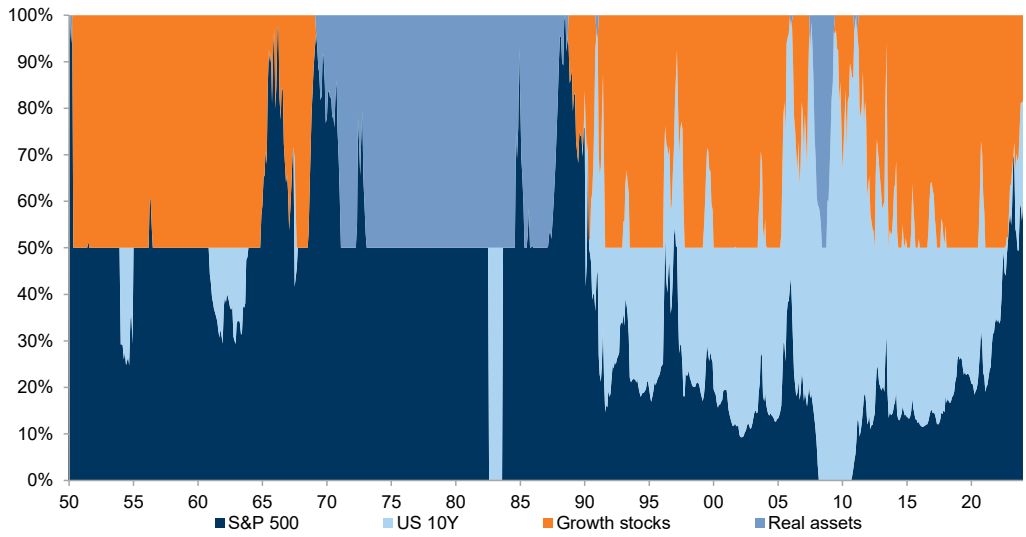


Source: Haver Analytics, Kenneth French, Goldman Sachs Global Investment Research, FactSet

Strategic tilting, including real assets and growth stocks

Based on the modelled long-term returns (and risk), we can make strategic tilts towards real assets and growth stocks. We again start with the optimal tilt between equities and bonds. Afterwards, if the expected Sharpe ratio is below the long-run average, likely due to inflation risk, we tilt the portfolio more towards real assets (again, see Appendix 2 for details on the strategic tilting approach). If the expected Sharpe ratio is above the long-run average, likely due to productivity growth, we tilt towards growth stocks. We cap the maximum tilt at 50% of the portfolio and look at aggregate real assets, i.e., an equal-weight portfolio of S&P GSCI, Gold, TIPS and real asset stocks, and growth stocks – Exhibit 59 shows the resulting strategic tilts.

Exhibit 59: Using forecast Sharpe ratios we can stategically tilt to real assets and growth stocks
10-year rolling strategic macro-based tilts

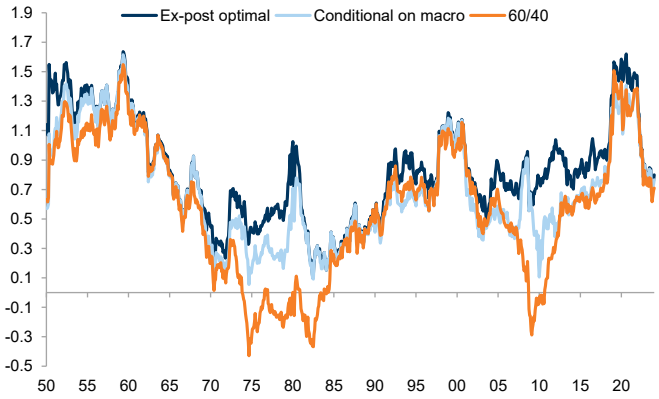


Source: Haver Analytics, Robert Shiller, Kenneth, Goldman Sachs Global Investment Research, Datastream

Our strategic tilts improved Sharpe ratios and returns materially relative to a static 60/40 portfolio (Exhibit 60). The biggest improvements were in the 1970s and the GFC. However, the average improvement in 10-year returns has been c.230bp a year since

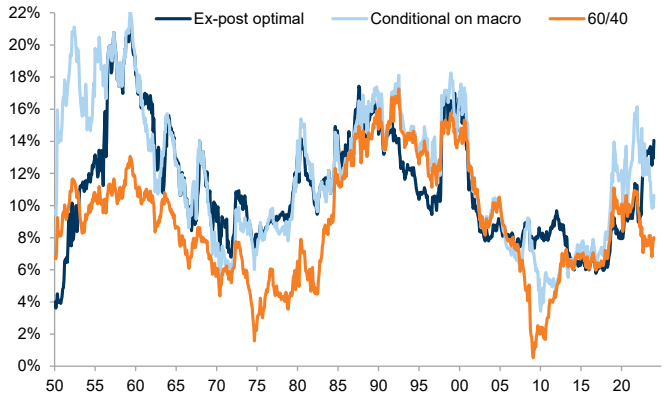
1950, with much better performance during the 1970s and GFC, but also in the 1950s, 1990s and more recently. Recently the optimal portfolio shifted towards 50% growth stocks (the maximum allocation) and 50% S&P 500, while our macro-based strategic tilts had some allocation to bonds.

Exhibit 60: Strategic tilts to real assets and growth stocks improved Sharpe ratios materially during the 1970s and Tech bubble
10-year rolling Sharpe ratio



Source: Haver Analytics, Goldman Sachs Global Investment Research, Dataset

Exhibit 61: Strategic tilts to real assets and growth stocks added 230bp return p.a. relative to a static 60/40 portfolio
10-year rolling annualised return



Source: Haver Analytics, Goldman Sachs Global Investment Research, Dataset

The strategic balanced bear — strategic tilting vs. static 60/40 portfolios

Strategic tilts based on structural macro regimes and starting valuations would have added material value relative to a static 60/40 portfolio since 1950 (Exhibit 62). Our tilts, which first find the optimal asset mix and then scale either into cash or into real assets and growth stocks depending on expected max Sharpe ratios, resulted in better risk-adjusted returns vs. a static 60/40 portfolio. All of them improved relative to the weakest (10th percentile) return outcomes over 10-year rolling periods. The tilts towards cash resulted in higher returns with lower volatility – and allowing leverage further improved returns. The tilts towards real assets and growth stocks results in slightly higher volatility but a much larger return improvement.

Exhibit 62: Our strategic tilting strategies added material performance vs. a static 60/40 portfolio
Performance of strategic tilting strategies vs. static 60/40 portfolio

	10-year rolling investment					5-year rolling investment				
	60/40 (static)	Equity /bond	+ cash	+ cash/ leverage	+ real assets/ growth equity	60/40 (static)	Equity /bond	+ cash	+ cash/ leverage	+ real assets/ growth equity
Average return	9.0%	10.4%	10.3%	11.9%	12.0%	9.1%	10.4%	10.4%	12.0%	12.2%
vs. 60/40		1.3%	1.2%	2.8%	3.0%		1.3%	1.3%	2.9%	3.1%
10th perc. return	4.6%	5.4%	5.8%	6.5%	6.7%	2.9%	5.1%	5.7%	6.1%	5.9%
vs. 60/40		0.8%	1.2%	1.9%	2.1%		2.1%	2.8%	3.1%	2.9%
Average volatility	9.2%	10.7%	7.4%	9.3%	11.0%	9.1%	10.2%	6.8%	8.6%	10.4%
vs. 60/40		1.5%	-1.8%	0.1%	1.8%		1.1%	-2.4%	-0.5%	1.3%
90th perc. volatility	11.4%	15.9%	13.0%	14.7%	14.0%	11.8%	15.6%	12.3%	14.0%	13.7%
vs. 60/40		4.5%	1.6%	3.3%	2.6%		3.8%	0.5%	2.2%	1.9%
Average Sharpe ratio	0.55	0.63	0.73	0.73	0.70	0.59	0.69	0.81	0.81	0.77
vs. 60/40		0.08	0.18	0.18	0.15		0.11	0.23	0.23	0.18
10th perc. Sharpe ratio	-0.16	-0.07	0.28	0.28	0.26	-0.21	-0.10	0.24	0.24	0.17
vs. 60/40		0.08	0.44	0.44	0.42		0.11	0.44	0.44	0.38

Source: Haver Analytics, Kenneth French, Robert Shiller, Goldman Sachs Global Investment Research, Dataset

Finding New Balance — 60/40 Scenarios and Asset Allocation Implications

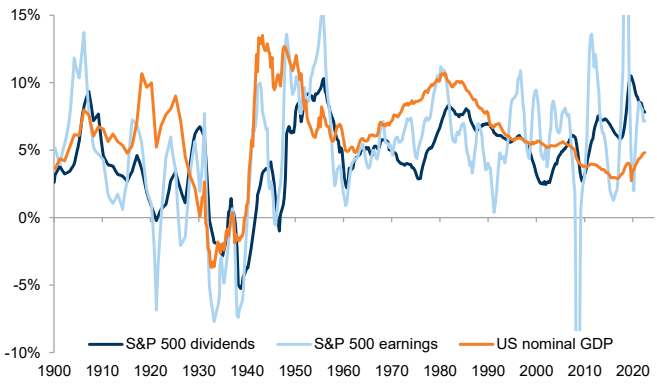
The structural cycle since the 1990s — Goldilocks and the three bears

The structural growth/inflation mix since the 1990s was very favourable for 60/40 portfolios but has become more uncertain since the COVID-19 crisis[13]. Low and anchored inflation since the 'Great Moderation' allowed central banks to provide a buffer for the business cycle, which also meant business cycles have become longer since the 1990s – the post-GFC was the longest on record.

Global government bonds had been in their longest and strongest bull markets since the mid-1980s until the COVID-19 crisis. US 10-year yields dropped from 16% in the early 1980s, when the Fed battled high inflation, to near zero in 2021. In the 1980s inflation declined materially, helped by the collapse of the Soviet Union and German reunification, increasing labour supply and commodity prices falling. In the 1990s a combination of globalisation, including China entering WTO, technology revolutions around the internet, a global savings glut and ageing populations, contributed to lower inflation. And stagnation and deflation fears post the GFC, especially in Japan and Europe, resulted in negative interest rates and QE – and there was a shift to fiscal austerity around the European debt crisis due to concerns on sovereign risk.

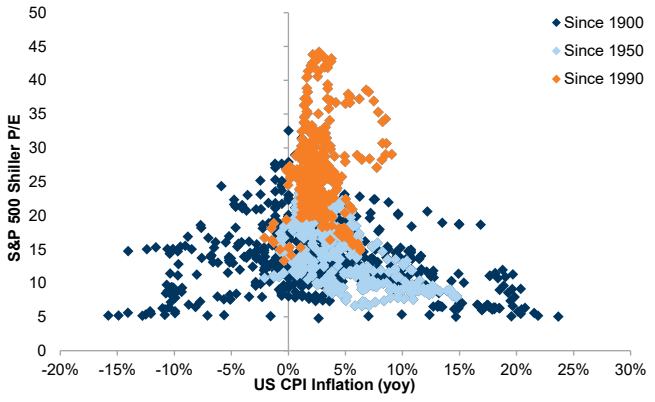
The structural backdrop since the 1990s has also resulted in strong equity returns. While US GDP growth was relatively low post GFC, the corporate sector materially outperformed the economy, at least in the US (Exhibit 63). S&P 500 earnings growth was boosted by rising profit margins, extending a trend that started in the early 1980s. US corporate profitability increased owing to the fast-growing US Tech sector, falling interest cost, low labour cost inflation, tax cuts and share buybacks. Low inflation supported higher equity valuations (Exhibit 64). But those higher valuations coupled with longer cycles, which allowed for financial imbalances to build, resulted in large equity drawdowns when the Tech Bubble burst, and during the GFC and the COVID-19 crisis.

Exhibit 63: S&P 500 earnings materially outstripped US GDP
10-year rolling growth



Source: Robert Shiller, Haver Analytics, Goldman Sachs Global Investment Research

Exhibit 64: Low and anchored inflation has also supported higher equity valuations



Source: Robert Shiller, Goldman Sachs Global Investment Research

[13] For a discussion of structural cycles and our equity cycle framework see our Research on Market Cycles.

The new structural cycle — 3D headwinds vs. innovation tailwinds

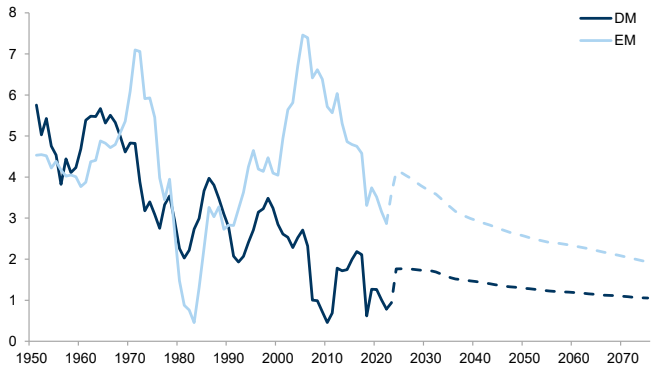
However, a lot of the tailwinds for 60/40 portfolios look more questionable going forward. And the optimal asset mix for the coming decade will be conditioned both by the new structural cycle and current valuations. Even for long-term investors there can be large benefits from strategic tilting if they are able to anticipate some of the more extreme structural cycle scenarios. Going forward, we think investors will need to navigate opposing trends that are likely to affect and drive material uncertainty growth, inflation and policy: higher inflation risk vs. innovations that could increase productivity.

Recent adverse trends have been: (1) Deglobalisation, both economically and geopolitically, (2) Decarbonisation, with risk of supply shocks and rising costs around climate change, (3) Demographics, such as lower population growth, higher dependency ratios and income inequality. On the positive side, there are potential tailwinds from innovations such as AI and GLP-1, which could increase labour productivity and participation rates. We discuss the potential impact of those drivers on the structural growth/inflation/policy mix, as well as current market pricing below:

(1) Growth: Population growth vs. productivity

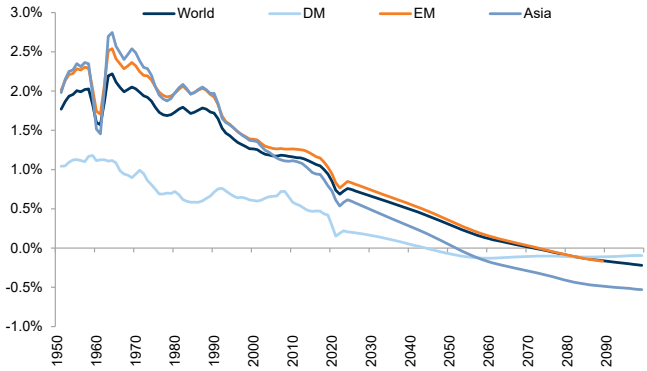
Long-term growth expectations have declined since the 1990s for the largest economies. Trend GDP growth has two drivers: population growth, or the increase in the labour force, and productivity growth, or the increase in output per worker. Our economists have forecast falling global trend GDP growth in the next 50 years mainly due to slowing labour force growth, with EM continuing to outstrip DM growth (Exhibit 65). That said, trend growth for China faces additional headwinds from the property market, high debt levels, demographics and policy – this is major change from the last cycle, when China was a key support for global growth.

Exhibit 65: Global growth is expected to slow, in particular in EM
5-year rolling real GDP growth (dotted lines are IMF forecasts)



Source: IMF, Goldman Sachs Global Investment Research

Exhibit 66: Population growth to slow, especially in Asia
Population growth



Source: UN, Haver Analytics, Goldman Sachs Global Investment Research

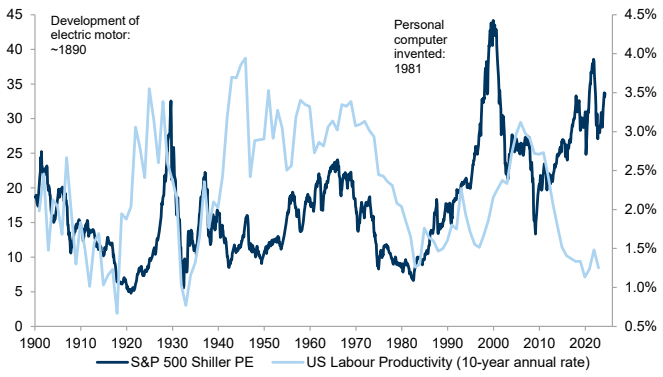
Population growth, especially for those of working age, is a key drag on global trend growth estimates – it has halved over the past 50 years to less than 1% currently, and UN projections imply that it will fall to close to zero by 2075 (Exhibit 66). In Asia, in large part due to China, population growth is expected to turn negative in c.30 years. Our economists think that healthcare innovation could provide some counterbalance to the drag from ageing populations by lowering healthcare costs and

increasing labour force participation. They estimate recent innovations such as GLP-1 could raise US GDP by 0.6-3.2% and by 1.3% in a baseline scenario, while increases in EM economies could even be larger.

Similarly, the emergence of AI and potential task automation could boost trend growth via productivity despite a shrinking labour force. Our economists estimate a potential boost from widespread adoption of generative AI of around 1.5% a year, similar to the increases after the discovery of the electric motor and the invention of the personal computer (Exhibit 67). Our economists upgraded their global growth forecasts from 2027 onwards; however, growth impacts are likely to remain more modest near term, in part due to barriers to AI adoption. While DM ex-US productivity growth has underperformed the US since the pandemic, it should pick up going forward. Equities should benefit via higher profits, but historically they have often anticipated higher productivity growth before it materialised, increasing the risk of overpaying.

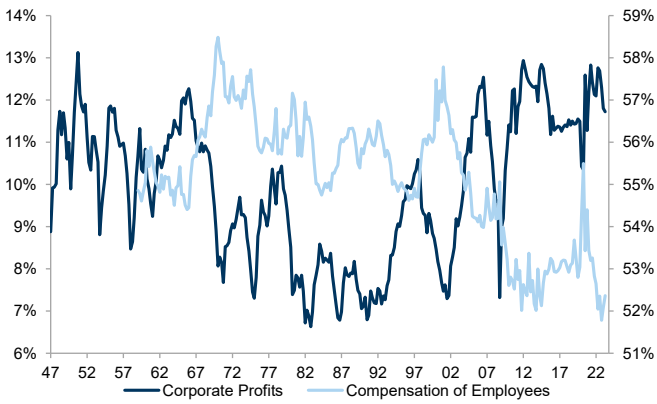
The US profit share of GDP is near the highest levels since WW2, with the labour share near all-time lows, resulting in peak corporate profitability (Exhibit 68). We think it will become more difficult for the corporate sector to outperform the economy going forward owing to several potential headwinds: labour scarcity, supply chain diversification and re-shoring, more regulation including anti-trust, rising interest rates, costs of risks from decarbonisation/climate change and potentially higher taxes. That said, AI adoption is an upside risk to profitability and earnings growth but this will depend on how the benefits are distributed – to consumers or corporates.

Exhibit 67: Labour producitivity often increases after a technological breakthrough but timing is difficult



Source: Robert Shiller, US Bureau of Labor Statistics, Census Bureau, Haver Analytics, Goldman Sachs Global Investment Research

Exhibit 68: Bargaining power could shift from capital to labour
Share of US GDP



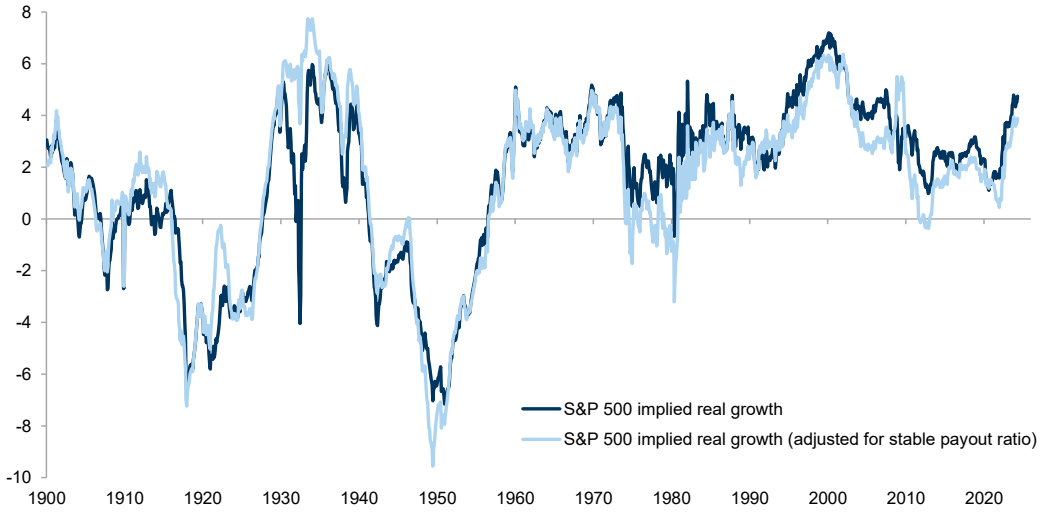
Source: Haver Analytics, Goldman Sachs Global Investment Research

Current market pricing: Long-term implied growth for S&P 500 is elevated

Long-term S&P 500 growth expectations have already picked up, likely helped by optimism on the growth impact of AI – the same was true in the 1960s and late 1990s, when productivity growth picked up. Based on a single-stage dividend discount model, long-term implied real growth near 4.7% is well above its average of 2.7% since 1950 (Exhibit 69). Assuming the same payout ratio since 1900 (as a lot of US Tech stocks do not pay dividends) results in a slightly lower implied real growth of 3.9%. This remains well below Tech bubble peaks, although some of the potential benefits from AI

may already be priced.

Exhibit 69: Implied long-term growth by the S&P 500 is already elevated but not at bubble levels
LT real growth = ERP + 10-yr yield – Dividend yield - 10-yr breakeven inflation (assuming an ERP of 4%)

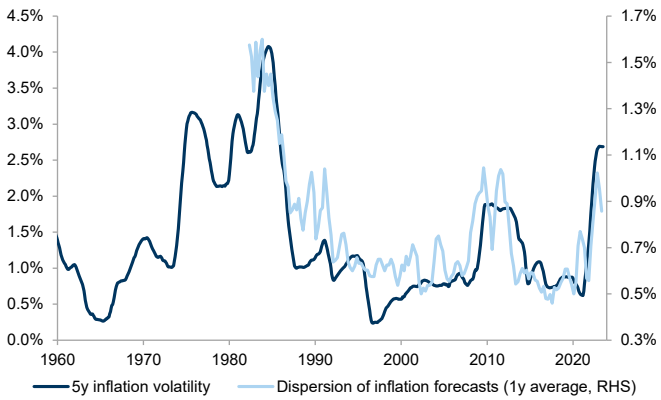


Source: Robert Shiller, Goldman Sachs Global Investment Research, Bloomberg

(2) Inflation: Potentially high on less supply

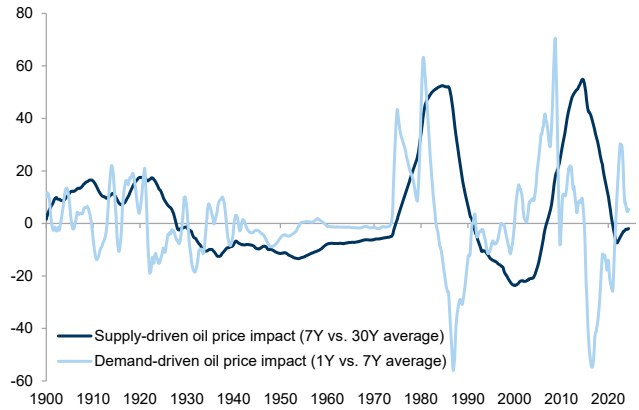
Even if levels of inflation are unlikely to be as high as in recent years, inflation uncertainty is likely to linger (Exhibit 70). While large supply shocks similar to post the COVID-19 shutdowns and the energy price shock around the Russia/Ukraine war appear unlikely, there is potential for more inflation volatility compared with the period since the 1990s. Energy has been one of the most important drivers of historical inflation volatility, e.g., during geopolitical supply shocks such as in the 1970s and 1990s or due to underinvestment since the 2000s (Exhibit 71). Decarbonisation reduces investment in traditional energy sources, increasing the risk of supply shortages in the near term.

Exhibit 70: Higher inflation uncertainty since the COVID-19 crisis
Data for the US



Source: Haver Analytics, Consensus Economics, Goldman Sachs Global Investment Research

Exhibit 71: Lack of investment could create more supply-driven oil price increases



Note: We follow the supply/demand composition based on different cycle definitions from our commodities team. See Commodity Insights: Timing the supercycle.

Source: Haver Analytics, Goldman Sachs Global Investment Research

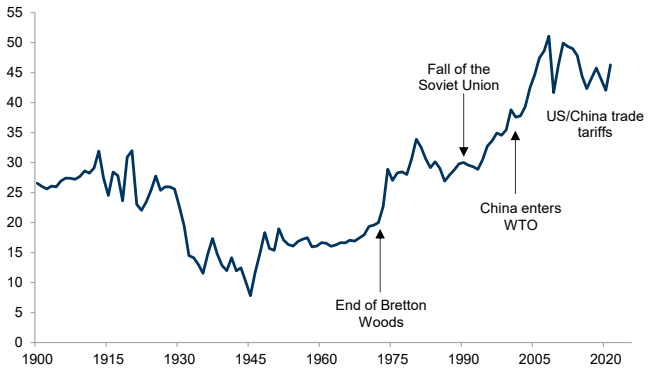
Electrification increases demand for metals such as copper and drives more upward price pressure. Governments may also impose carbon taxes or force a switch

to more expensive clean energy sources, which could be inflationary. However, our economists have highlighted that in the US the opposite has been the case so far, with subsidies from the Inflation Reduction Act (IRA). And in the long run, decarbonisation and renewable energy innovation, could lower the cost of energy and long-run oil demand. On the flip side, a lack of decarbonisation could increase the risk of natural disasters, which could also drive supply disruption.

Deglobalisation has the potential to reduce benefits from global, integrated supply chains and result in more trade tariffs. More geopolitical conflicts could also drive more supply and transport disruptions. Global goods trade rose sharply from the mid-1990s to the GFC but has since stalled (Exhibit 72). While the recent US shift to 're-shoring' could eventually increase inflation pressures, our economists think the impact has been limited so far due to subsidies from the IRA and Chips Act and 'nearshoring'. Also, China may continue to export disinflation in goods.

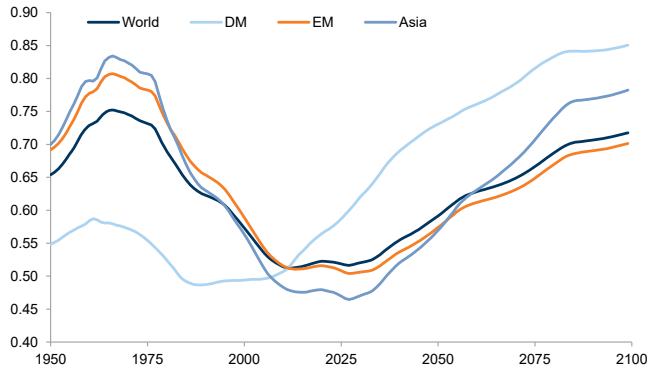
Finally, rising dependency ratios coupled with low population growth can increase labour shortages (Exhibit 73). Deglobalisation may limit immigration, which could alleviate those shortages – since the COVID-19 crisis immigration has helped ease US labour market tightness. And an increasing number of retirees could drive lower savings rates and increase spending, leading to more persistent services inflation. On the flip side, AI and GLP-1 could increase labour productivity and participation rates, which could eventually reduce unit labour costs and prove more disinflationary.

Exhibit 72: World trade has stalled since the GFC
World merchandise imports plus exports as % of GDP



Source: IMF, World Bank, Goldman Sachs Global Investment Research

Exhibit 73: Dependency ratios are rising rapidly in DM
Number of children (0-14 years old) and older persons (65 years or over)/working-age population (15-64 years old)

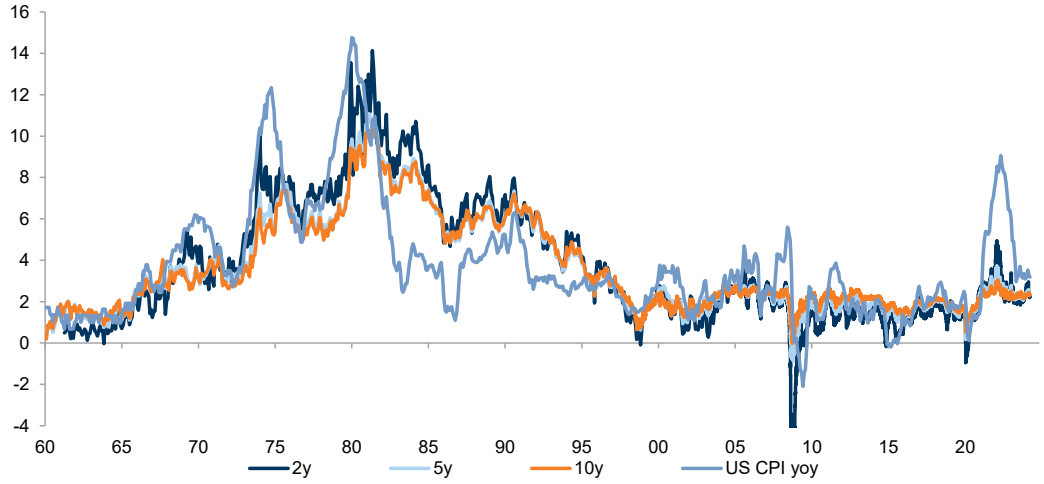


Source: UN, Haver Analytics, Goldman Sachs Global Investment Research

Current market pricing: Little inflation risk priced in the coming years

Markets have faded inflation risk quickly – this has been the case for both bond and equity markets (Exhibit 74). Bond markets have never priced a sustained increase in inflation since the COVID-19 crisis – that is very different from the 1970s, when breakeven inflation followed realised inflation on the way up and normalised only slowly during the 1980s. The fast decline in breakeven inflation and flat curves indicate that investors are not demanding much inflation risk premium.

Exhibit 74: TIPS markets have faded inflation risk fast and are pricing little risk from here
US breakeven inflation



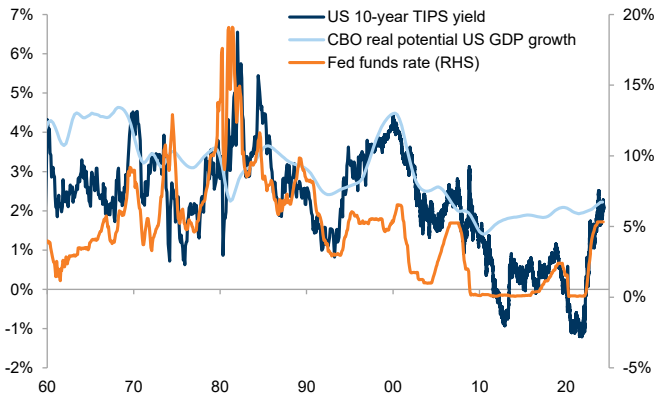
Source: Haver Analytics, Bloomberg, Goldman Sachs Global Investment Research

(3) Policy: From monetary to fiscal policy excess

Last cycle, US 10-year real yields were below real trend growth, creating an unusually friendly backdrop for risky assets (Exhibit 75). With aggressive central bank rate hikes since 2022, global bond yields increased sharply. And after expanding materially post GFC, central bank balance sheets have started to shrink (Exhibit 76). Higher inflation volatility and monetary policy uncertainty could put further upward pressure on bond term premia in the medium term.

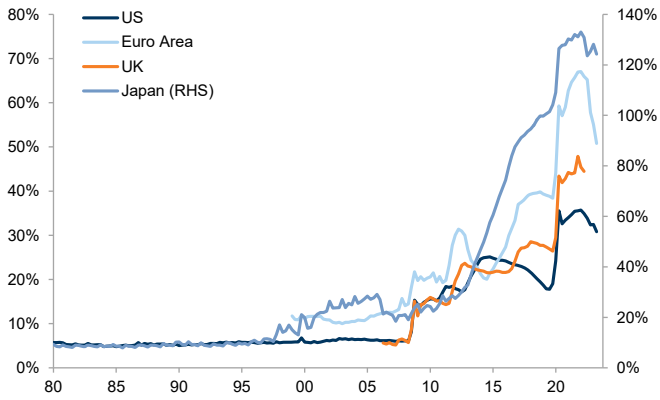
However, trend growth could be a speed limit for bond yield increases near term. Since 1960, longer-dated real yields have seldom overshot long-term real GDP growth expectations on a sustained basis. Overshoots during the 1970s/1980s and the 1994 bond sell-off eventually reversed on growth concerns due to excessive tightening of financial conditions. In the medium term, better growth and investment demand due to decarbonisation and AI could put further upward pressure on rates, but it should be more gradual, similar to the late 1990s.

Exhibit 75: Long-term real yields could be higher going forward, especially if trend growth picks up



Source: Haver Analytics, Bloomberg, Goldman Sachs Global Investment Research

Exhibit 76: During the GFC and the COVID-19 crisis central bank balance sheets expanded materially
Central bank balance sheets as % of GDP

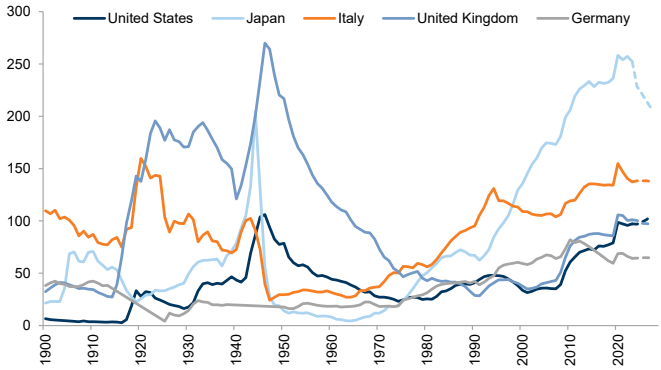


Source: Haver Analytics, Goldman Sachs Global Investment Research

Since the COVID-19 crisis, there has also been a handover from monetary policy to fiscal policy. Global debt/GDP ratios have increased materially due to more expansive fiscal policy (Exhibit 77). The EU's Recovery Fund has driven a fiscal expansion and increased the supply of safe assets. The US has been running a fiscal deficit of near 8% in 2023 despite the US unemployment rate being near 50-year lows. Similarly, there are growing concerns around the need for increased defence spending, e.g., in Europe, and necessary investments in decarbonisation / electrification.

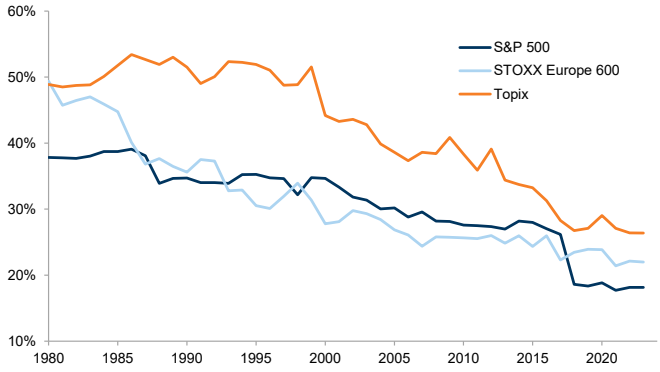
Expansive fiscal policy and higher bond supply, coupled with less central bank easing, have already triggered a repricing of bond term premia. Lower savings rates, due to a rising dependency ratio or investment demand, and less demand for DM bonds due to financial deglobalisation add to supply/demand concerns. There is increased risk of further increases in longer-dated bond yields and growing pressure for fiscal consolidation. This could eventually also weigh on corporate profits – corporate tax rates have declined materially in the last 40 years (Exhibit 78).

Exhibit 77: Debt/GDP ratios have increased across the major developed markets
Government debt/GDP ratio



Source: IMF, Haver Analytics, Goldman Sachs Global Investment Research

Exhibit 78: Corporate tax rates have declined despite rising government debt
Effective corporate tax rate

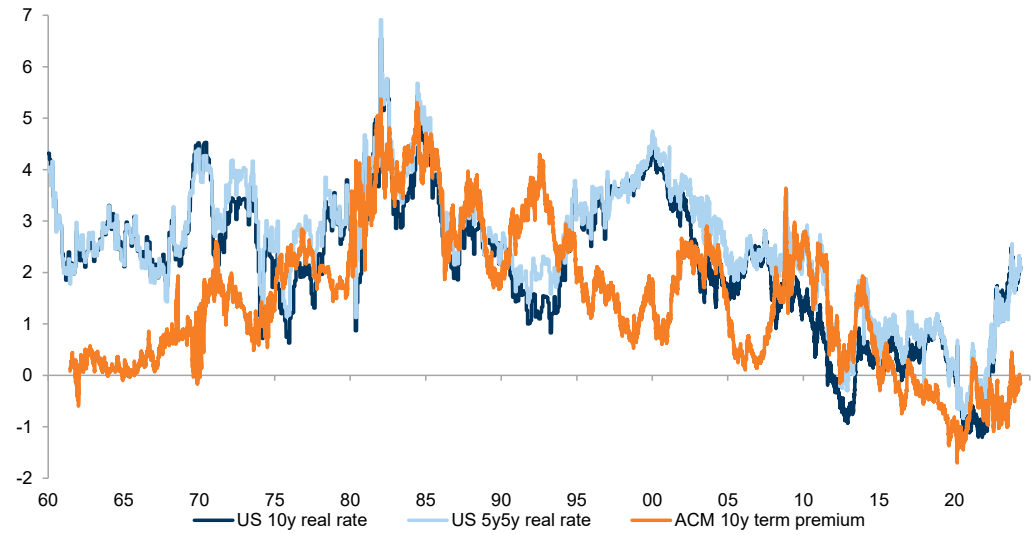


Source: Datastream, Goldman Sachs Global Investment Research

Current market pricing: More restrictive monetary policy but low term premia

Markets have repriced towards a more restrictive monetary policy regime compared with the last cycle but bond term premia remain low. Both US 10-year and 5y5y forward real yields are near their average since 1960, indicating that markets are already pricing a higher long-run rate equilibrium (Exhibit 79). While bond term premia have picked up, they remain low compared with the long-run history. Our rates team agrees that fiscal deficits and bond supply/demand imbalances will increase upward pressure on long-dated yields but shifts should be more gradual. Near-term there are counterbalancing factors such as declining rate volatility and the 'insurance value' of bonds.

Exhibit 79: Markets have repriced a new monetary policy regime but bond term premia still appear low



Source: Bloomberg, Haver Analytics, Goldman Sachs Global Investment Research

Finding new balance — four long-term scenarios for US 60/40 portfolios

Bonds provide protection in the event of stagnation with elevated real yields but are pricing little inflation risk. Equities could provide some inflation protection via cash flow growth but valuations are elevated with little risk of inflation or stagnation priced. Assets with real cash flows, such as TIPS, commodities, real asset stocks, or those exposed to productivity growth, e.g., growth stocks, can further enhance performance. But while real assets look cheap, growth stocks are looking expensive.

We focus on four structural cycle scenarios, as shown in Exhibit 80, with macro assumptions similar to historical periods: (1) Goldilocks, similar to the post-1990s average with some decline in ROE, (2) Goldilocks with an AI boost to productivity growth with ROE near peak, (3) stagnation similar to the post-GFC cycle and (4) stagflation, similar to the 1970s. Resulting valuations and portfolio risk assumptions, matching corresponding historical episodes, vary widely in those scenarios.

Exhibit 80: Assumptions for structural macro scenarios, valuations and risk parameters in the next 10 years

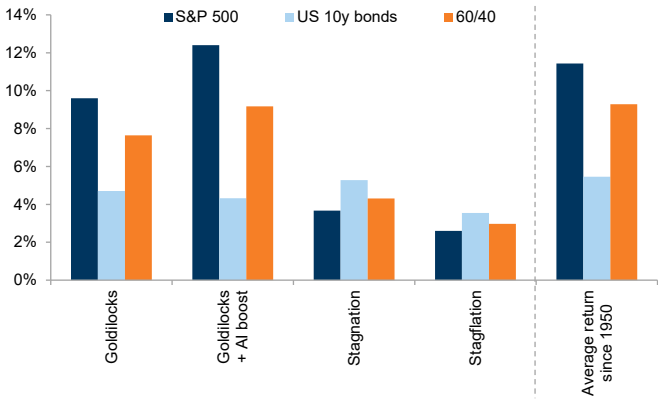
	Next 10-year macro scenario assumptions					Valuations		Portfolio risk assumptions		
	10 yr GDP	10 yr CPI inflation	10 yr Fed funds rate	LTM ROE	10 yr EPS growth	S&P 500 Shiller P/E	US 10 yr yield	S&P 500 volatility	US 10y volatility	Eq./ bond correlation
Next 10 year scenario assumptions										
Back to post-1950 average	3.1%	3.6%	4.7%	13%	8.4%	18.7x	5.9%	15%	8%	-0.01
Back to post-1990 average	2.6%	2.7%	3.6%	15%	7.4%	24.3x	4.2%	15%	7%	-0.14
Back to post-2000 average	2.3%	2.3%	3.1%	15%	6.8%	26.3x	3.4%	15%	7%	-0.20
Goldilocks	3.0%	2.0%	3.0%	19%	8.1%	34.7x	3.8%	14%	6%	-0.14
Goldilocks + AI boost	4.0%	2.0%	3.4%	21%	9.6%	39.5x	4.9%	13%	5%	-0.01
Stagnation	1.5%	2.0%	2.4%	14%	5.3%	25.1x	2.2%	15%	8%	-0.32
Stagflation	1.5%	6.0%	6.5%	15%	9.6%	14.3x	7.1%	17%	11%	-0.04
Current	2.3%	2.8%	1.5%	19%	7.4%	34.0x	4.5%	15%	7%	0.10

Source: Haver Analytics, Robert Shiller, Goldman Sachs Global Investment Research

Long-term forecast returns using our building block approach differ materially in each of the scenarios (Exhibit 81). In both Goldilocks scenarios, equities are outperforming bonds but only in the Goldilocks AI boost scenario are they delivering above-average returns. In fact, in that scenario forecast returns for 60/40 portfolios are

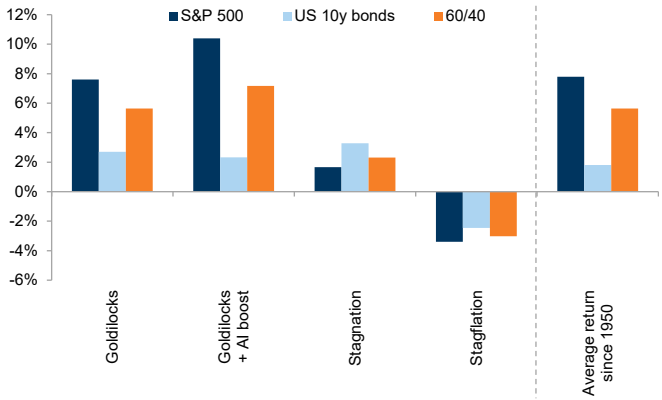
above the average since 1950. Helped by higher bond returns, a stagnation scenario is less bad but the stagflation scenario would unsurprisingly result in a 'lost decade' (10 years of negative real return). Bonds would deliver above-average real returns across all scenarios but stagflation (Exhibit 82).

Exhibit 81: Outside of Goldilocks, expected long-term 60/40 returns are lower than average
10-year nominal total return scenarios



Source: Goldman Sachs Global Investment Research

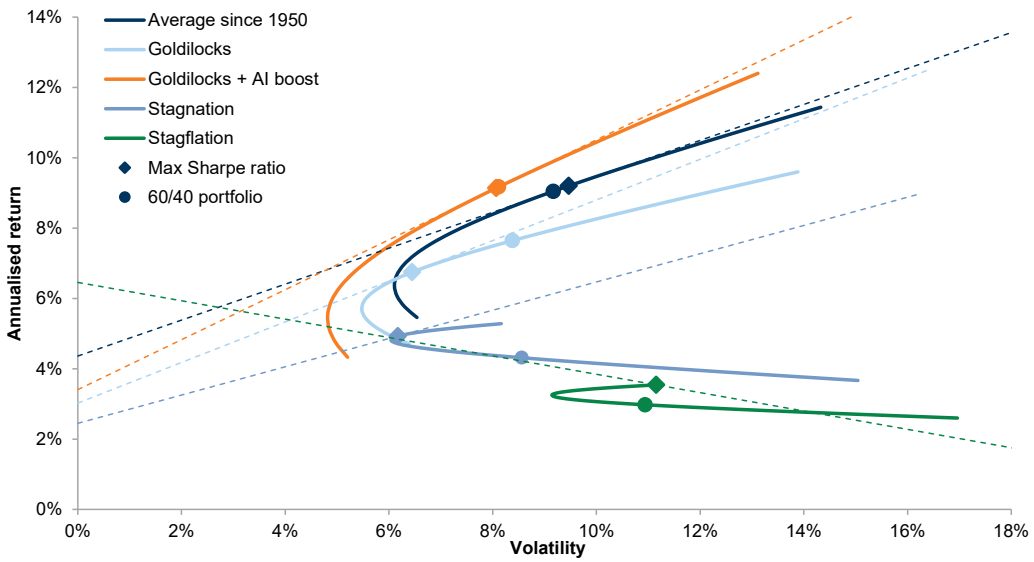
Exhibit 82: Bonds should deliver above-average real returns outside of a stagflation scenatio
10-year real total return scenarios



Source: Goldman Sachs Global Investment Research

Outside of the Goldilocks AI scenario, the efficient frontier is less steep compared with the average since 1950 (Exhibit 83). Markets are currently pricing relatively little inflation risk and already imply better growth for equities, which suggests favourable macro conditions are necessary for attractive equity and 60/40 returns. And, as expected, in the case of both stagnation and stagflation there is little incentive to move up the risk curve.

Exhibit 83: Only in a Goldiocks AI scenario is there a sizeable reward for taking more risk

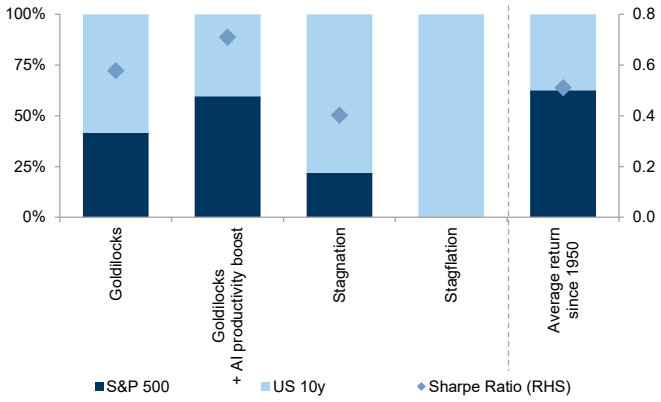


Source: Goldman Sachs Global Investment Research

Using the forecast efficient frontiers, we can look at long-term asset allocation implications from the different scenarios – based on how investors view the likelihood of those, they may want to implement the following strategic tilts:

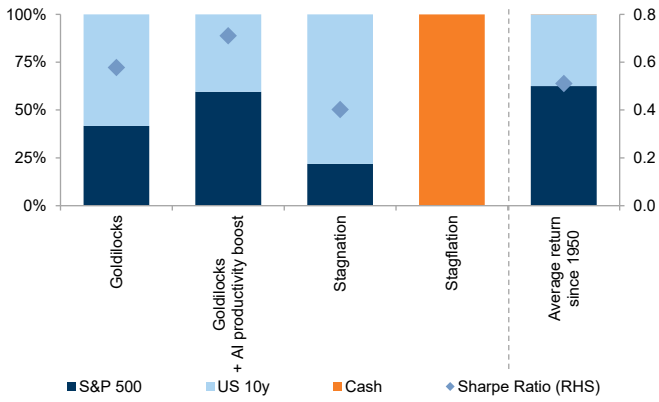
- **Optimal asset mix** (Exhibit 84): Even in the Goldilocks AI scenario the optimal allocation to equities is not above the long-run average, which is close to 60/40. This reflects already optimistic growth pricing in equities – in both the stagnation and the stagflation scenarios the optimal allocation to bonds is much higher.
- **Tilt towards cash** (Exhibit 85): Allowing for allocations to cash suggests a 100% allocation in the case of stagflation, in line with history. However, in all other scenarios investors should be fully invested.
- **Potential for using leverage** (Exhibit 86): Allowing for the use of leverage alongside allocations to cash suggests leveraging up the optimal portfolio in both Goldilocks scenarios and stagnation. Those assume a more negative equity/bond correlation and the optimal asset mixes are closer to a risk parity portfolio.
- **Tilts towards real assets and growth stocks** (Exhibit 87): In the AI Goldilocks and stagflation scenarios, growth stocks and real assets unsurprisingly had a large weight respectively, but they also saw some small allocation in the other scenarios. This indicates potential diversification benefits across scenarios.

Exhibit 84: In most structural macro scenarios the average optimal equity allocation is below 60%
Tangent portfolio (max Sharpe Ratio) in each scenario



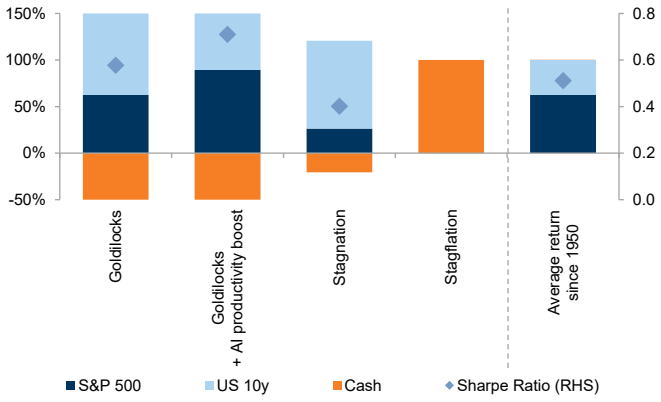
Source: Goldman Sachs Global Investment Research

Exhibit 85: Investors should shift to cash in a Stagflation scenario
Tangent portfolio + cash as a function of the max Sharpe Ratio



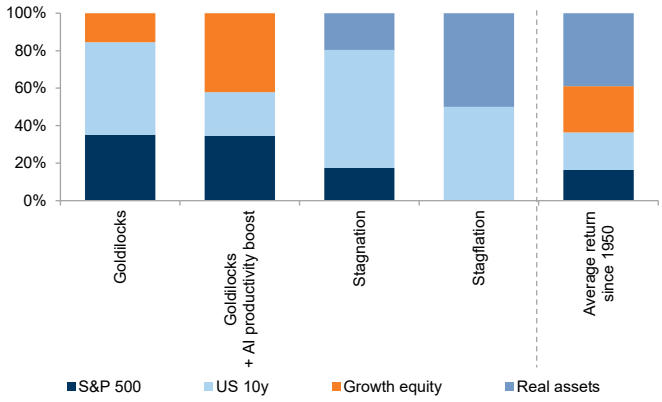
Source: Goldman Sachs Global Investment Research

Exhibit 86: In the stagflation scenario the strategic tilt would again be 100% cash
Tangent portfolio + cash/leverage as a function of the max Sharpe Ratio



Source: Goldman Sachs Global Investment Research

Exhibit 87: A combination of real assets and growth stocks can protect from extreme structural cycle scenarios
Optimal allocations for the next 10 years



Source: Goldman Sachs Global Investment Research

Appendix 1: Balanced portfolio risk parameter macro models

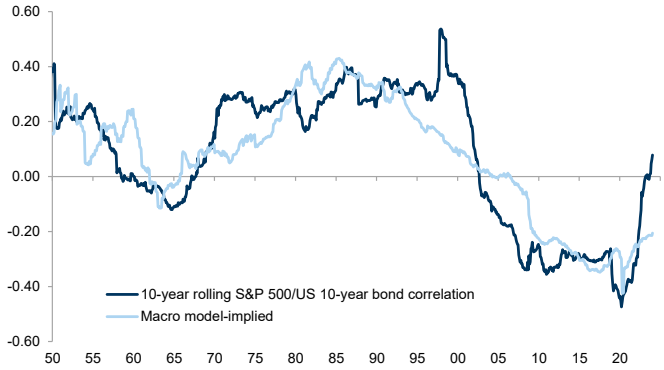
Exhibit 88: 10-year correlation between S&P 500 vs. US 10y bonds

10y correlation S&P 500 vs. US 10y bonds			
	Coefficient	Standard error	Impact of 1SD change
Constant (%)	-83.3 ***	4.5	
10y fwd real GDP growth	15.5 ***	0.0	0.14
10y fwd inflation	11.1 ***	1.3	0.22
10y fwd change in 10y real GDP growth	-3.1 ***	0.7	-0.06
10y fwd change in 10y inflation	-4.1 ***	0.7	-0.12
Estimation period	*1950-2023*		
R2	*73%*		

*: p < 10%; **: p < 5%; ***: p < 1%. HAC standard errors

Source: Goldman Sachs Global Investment Research

Exhibit 89: 10-year correlation between S&P 500 vs. US 10y bonds



Source: Haver Analytics, Goldman Sachs Global Investment Research

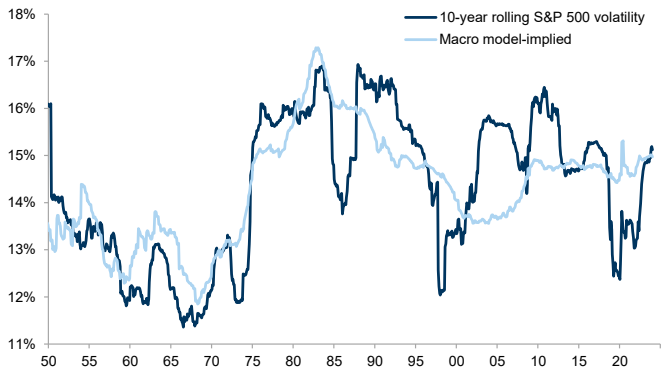
Exhibit 90: 10y volatility of S&P 500

10y volatility S&P 500			
	Coefficient	Standard error	Impact of 1SD change
Constant (%)	15.6 ***	0.4	
10y fwd real GDP growth	-1.0 ***	0.1	-1.0%
10y fwd inflation	0.6 ***	0.1	1.1%
10y fwd change in 10y real GDP growth	0.3 ***	0.0	0.5%
10y fwd change in 10y inflation	-0.1 **	0.0	-0.3%
Estimation period	*1950-2023*		
R2	*57%*		

*: p < 10%; **: p < 5%; ***: p < 1%. HAC standard errors

Source: Goldman Sachs Global Investment Research

Exhibit 91: 10y rolling S&P 500 volatility



Source: Haver Analytics, Goldman Sachs Global Investment Research

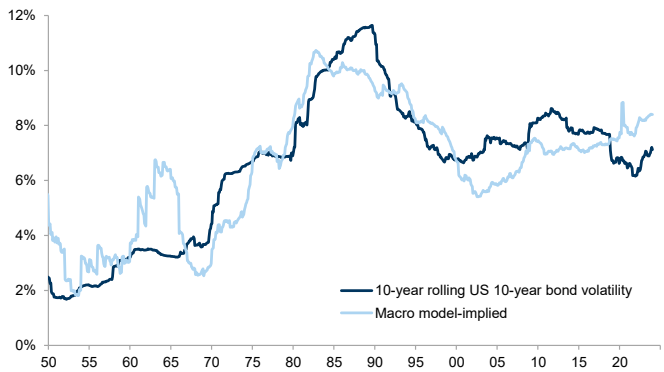
Exhibit 92: 10y rolling volatility of US 10y bonds

10y volatility US 10y bonds			
	Coefficient	Standard error	Impact of 1SD change
Constant (%)	9.6 ***	0.5	
10y fwd real GDP growth	-2.1 ***	0.1	-2.0%
10y fwd inflation	1.1 ***	0.1	2.2%
10y fwd change in 10y real GDP growth	0.9 ***	0.1	1.8%
10y fwd change in 10y inflation	-0.4 ***	0.1	-1.1%
Estimation period	*1950-2023*		
R2	*78%*		

*: p < 10%; **: p < 5%; ***: p < 1%. HAC standard errors

Source: Goldman Sachs Global Investment Research

Exhibit 93: 10y volatility of US 10y bonds



Source: Haver Analytics, Goldman Sachs Global Investment Research

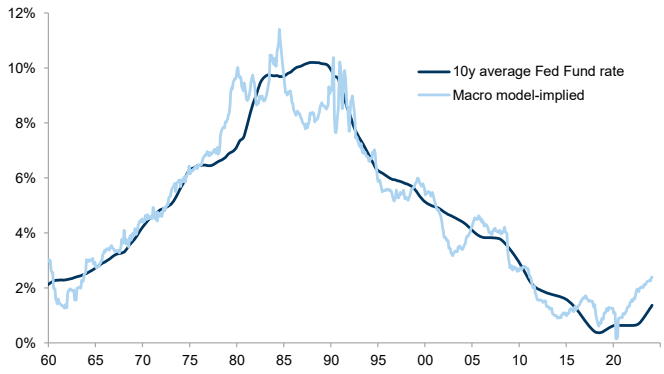
Exhibit 94: 10y average Fed Fund rate

10y average Fed Fund rate			
	Coefficient	Standard error	Impact of 1SD change
Constant (%)	-2.2 ***	0.4	
Fed Funds rate (current)	0.3 ***	0.0	1.1%
10y fwd real GDP growth	0.7 ***	0.1	0.6%
10y fwd inflation	1.0 ***	0.1	2.0%
10y fwd change in 10y real GDP growth	0.3 ***	0.1	0.3%
Estimation period	*1960-2023*		
R2	*92%*		

*: p < 10%; **: p < 5%; ***: p < 1%. HAC standard errors

Source: Haver Analytics, Goldman Sachs Global Investment Research

Exhibit 95: 10y average Fed Fund rate



Source: Haver Analytics, Goldman Sachs Global Investment Research

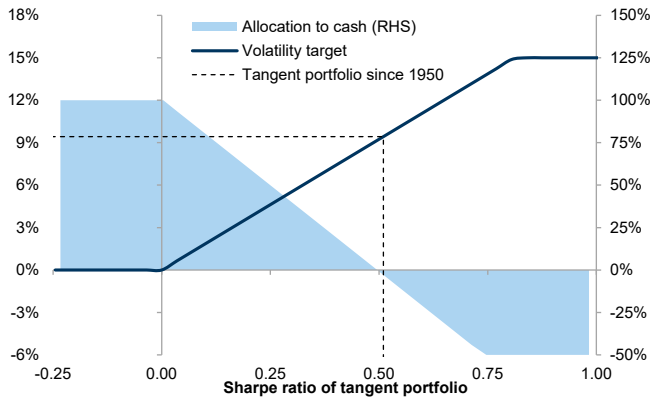
Appendix 2: Strategic tilting in a balanced portfolio

Mean-variance optimisation allows you to find the optimal asset mix that achieves the highest Sharpe ratio, i.e., the tangent portfolio. That said, the highest Sharpe ratio achievable with equities and bonds varies and can even be negative, e.g., in stagflation. At the same time, mean-variance optimisation does not tell you what the volatility of your portfolio should be as it usually depends on the investor (i.e., risk tolerance, etc.). Investors can allocate to cash or lever up the tangent portfolio to reach a risk target.

To incorporate strategic tilts, the target volatility of the portfolio can be a function of the max Sharpe Ratio you can achieve: the lower the compensation for risk, the lower the target volatility. We use a simple rule setting the target volatility to be proportional to the Sharpe ratio of the tangent portfolio (up to a max of 15%, Exhibit 96). This means that the allocation to cash is 100% when the tangent portfolio is expected to deliver a negative excess return and decreases linearly as the Sharpe ratio increases – leverage could be used to reach the target volatility (i.e., a negative allocation to cash). The factor of proportionality between the volatility target and the Sharpe ratio can depend on the investor's risk aversion. As a reference, we use the tangent portfolio based on the S&P 500 and US 10y bond performance since 1950, which has roughly a 60/40 split. We set our factor of proportionality to the volatility of the tangent portfolio since 1950 (c. 9.4%) divided by its Sharpe ratio (c. 0.5) - so we do not add cash/leverage if the tangent portfolio would be the same as the unconditional optimal portfolio since 1950.

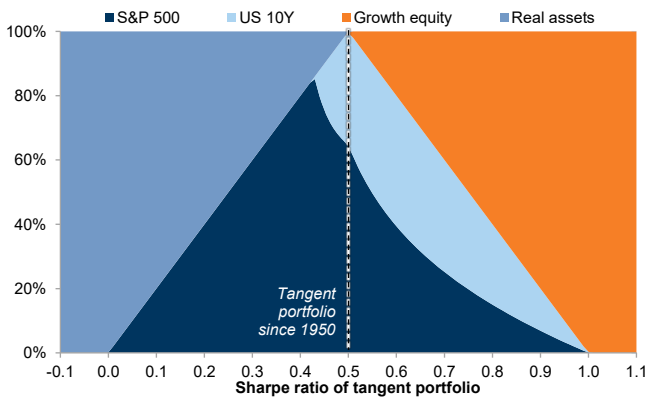
Similarly, we scale into a portfolio of real assets or a portfolio of growth stocks based on the maximum Sharpe ratio of the optimal equity/bond mix (Exhibit 97). Real assets outperform in prolonged inflationary periods when equity/bond portfolios deliver poor returns. Therefore, we increase the allocation to real assets as the Sharpe ratio of the tangent portfolio drops below that of the optimal portfolio since 1950 – we are fully invested in real assets once the Sharpe ratio turns negative. On the other hand, growth stocks can capture rising productivity growth, which would also boost equity returns. So we increase the allocation to growth stocks as the Sharpe ratio of the tangent portfolio goes above that of the optimal portfolio since 1950 (c. 0.5) – we reach the max allocation to growth stocks at a Sharpe ratio of 1.0.

Exhibit 96: Max leverage of 1.5x



Source: Goldman Sachs Global Investment Research

Exhibit 97: Real assets and growth equity tilts



Source: Goldman Sachs Global Investment Research

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Reg AC

We, Christian Mueller-Glissmann, CFA, Andrea Ferrario, Cecilia Mariotti, Marcus von Scheele and Peter Oppenheimer, hereby certify that all of the views expressed in this report accurately reflect our personal views, which have not been influenced by considerations of the firm's business or client relationships.

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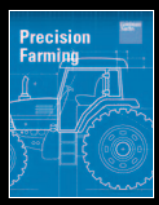

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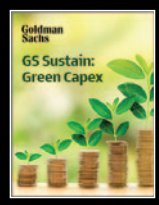

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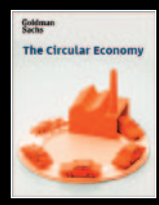

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The Metaverse

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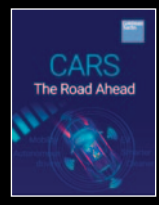
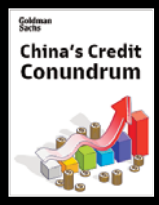


Music in the Air

China Property

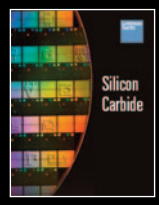
China's Credit Conundrum



Age of Automation

China Post-95s

Silicon Carbide



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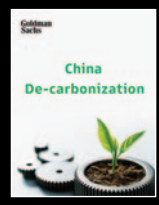

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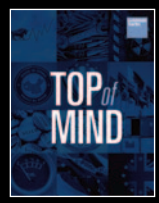

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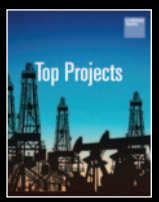
Top Projects



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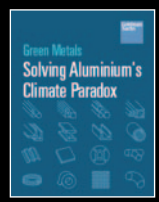
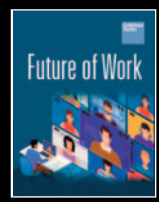
Clean Hydrogen

Green Metals



The Future of Work



What the Market Pays For

The Great Reset

The Competitive Value of Data