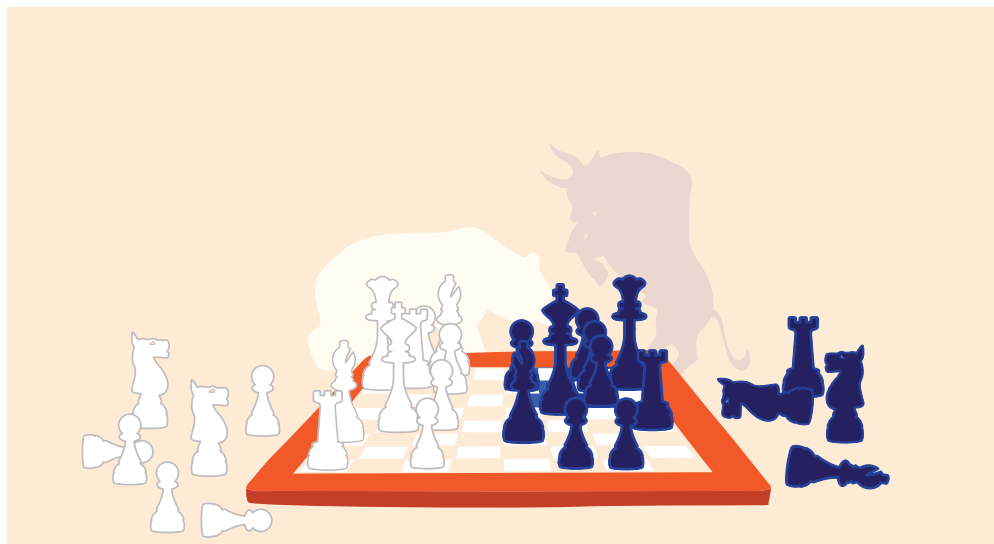


## GLOBAL STRATEGY PAPER NO. 55

## Balanced Bear Despair – Part 3

## Strategies to keep it real with balanced portfolios



- **With rising stagflation risks, investors face lower real returns and higher risks from 60/40 portfolios.** There is pressure for higher equity allocations given the prospect of poor returns and less diversification potential from bonds. But while higher equity allocations increase the potential for attractive real returns in the long run, they increase the risk of large and fast drawdowns in the near term. In Part 3 of our *Balanced Bear Despair* series, we introduce five strategies to help achieve acceptable real returns without unacceptable risk.
- These strategies aim to reduce the risk of a slow, *real* drawdown for a multi-asset portfolio. We look at assets that have historically provided a better real risk/reward during 'lost decades' for 60/40 portfolios, such as the 1970s stagflation. **Broadly, they aim to improve diversification by reducing duration risk and increasing exposure to real assets and cash flows to help achieve positive real returns despite sticky, elevated inflation.**
- We model efficient frontiers, optimal portfolios and allocations since World War 2 with a broader opportunity set. **A combination of allocations to commodities, real estate, infrastructure, more international diversification as well as value, high dividend yield stocks and convertibles could help to reduce the risk of another 60/40 'lost decade'.** Private markets might offer more opportunities to gain exposure to these themes. Since the GFC, many of these strategies have had mixed success due to low and anchored inflation, but we think that in the Post-Pandemic Cycle they are likely to enhance risk-adjusted returns for a balanced portfolio.

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**Balanced Bear Despair Series**

- ➔ In **Part 1** we highlighted the risk of a 'lost decade' for 60/40 portfolios based on valuations and potential changes to the structural growth/inflation mix.
- ➔ In **Part 2** we wrote that the buffer from bonds for equities is smaller with stickier, elevated inflation and low yields – equities alone might offer a similar risk/reward to a 60/40 portfolio.
- ➔ In **Part 4** we plan to introduce five strategies to reduce the risk of fast drawdowns in balanced portfolios.

**See our interactive efficient frontier charts >**

Investors should consider this report as only a single factor in making their investment decision. For Reg AC certification and other important disclosures, see the Disclosure Appendix, or go to [www.gs.com/research/hedge.html](http://www.gs.com/research/hedge.html).

## Five strategies to keep it real with balanced portfolios

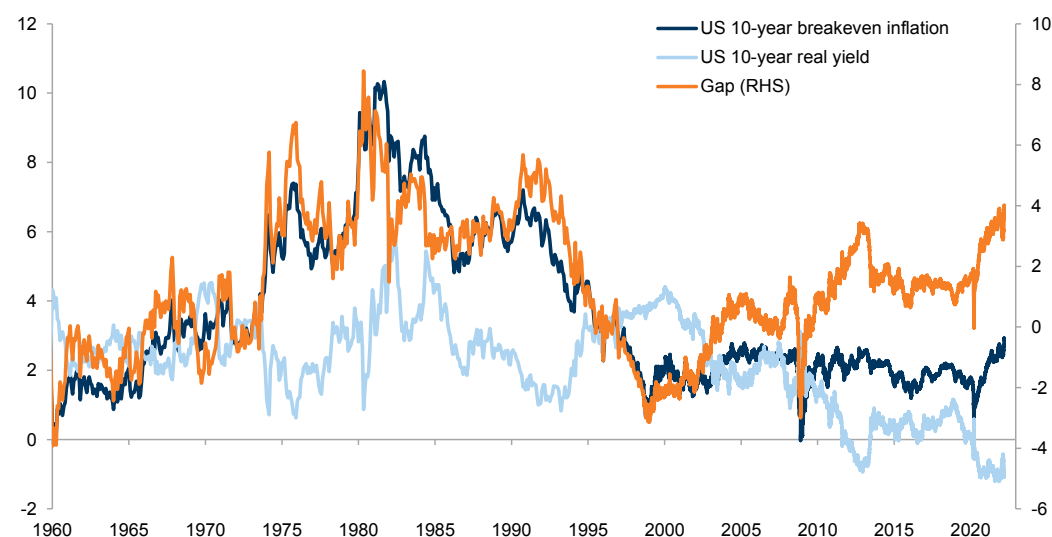
**Investors face lower real returns and higher risks from 60/40 portfolios with rising stagflation risk. Higher equity allocations could increase real return potential in the long run but also increase the risk of large and fast drawdowns in the near term. Our five strategies aim to improve the real risk/reward for a multi-asset portfolio – they broadly reduce duration risk and increase exposure to real, return-generating assets that can do well despite sticky, elevated inflation.**

### Stagflation increases the risk of a ‘lost decade’ for 60/40 portfolios

As we wrote in **Balanced Bear Despair – Part 1**, in the last cycle US 60/40 portfolios benefited from a structural ‘Goldilocks’ scenario, with falling inflation/real rates boosting valuations and strong profit growth despite relatively weak economic growth. With a less favourable structural growth/inflation mix and less of a tailwind from valuations and profit margins, real returns are likely to be lower in the Post-Pandemic Cycle.

**The risk of a ‘lost decade’ for 60/40 portfolios, i.e., a prolonged period of poor real returns, increases with stagflation.** Markets have further repriced risk of stagflation, boosted by the commodities rally due to the Russia/Ukraine crisis – US 10-year breakeven inflation has reached the highest level since the 1990s, while real yields remain near all-time lows, resulting in a similar gap to that in the 1970s ([Exhibit 1](#)). This points to little optimism on LT real growth and material concerns on inflation risk.

**Exhibit 1: Markets are pricing higher risk of stagflation**



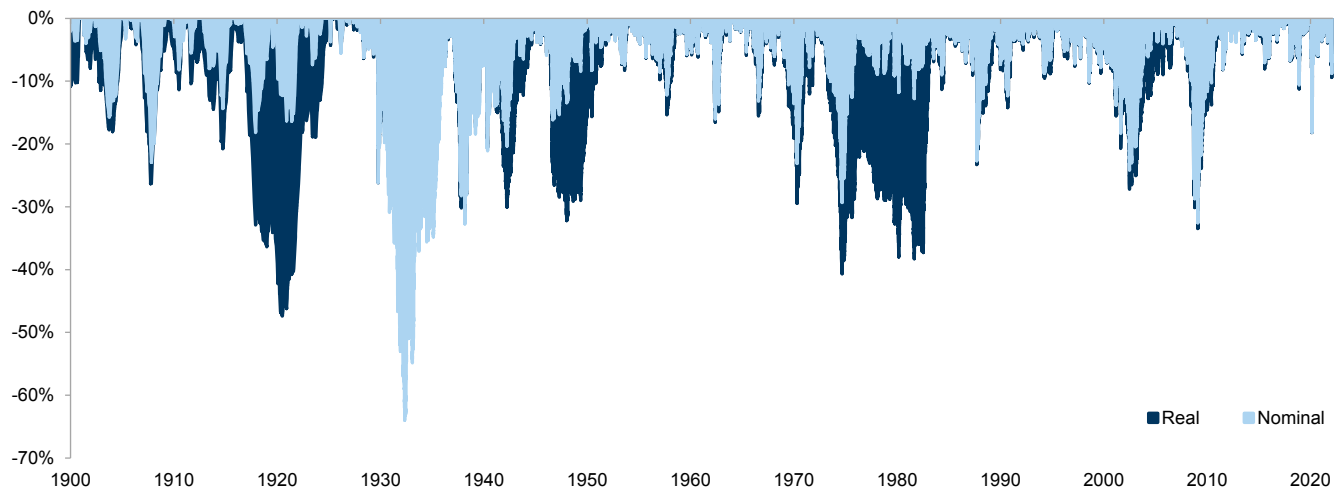
Source: Bloomberg, Goldman Sachs Global Investment Research

### 60/40 portfolios delivered very poor real returns during the 1970s stagflation

([Exhibit 2](#)). In **Balanced Bear Despair – Part 2** we wrote that the buffer from bonds for equities is smaller with low yields and stickier, elevated inflation. Fewer diversification benefits and lower real returns from bonds point to higher equity/lower bond allocations compared with the last cycle; so in order to reduce the risk of poor real returns in the medium term investors might have to accept more risk in the near term.

**Exhibit 2: There have been several prolonged periods of poor real returns for US 60/40 portfolios**

Maximum 10-year rolling drawdown of a US 60/40 portfolio



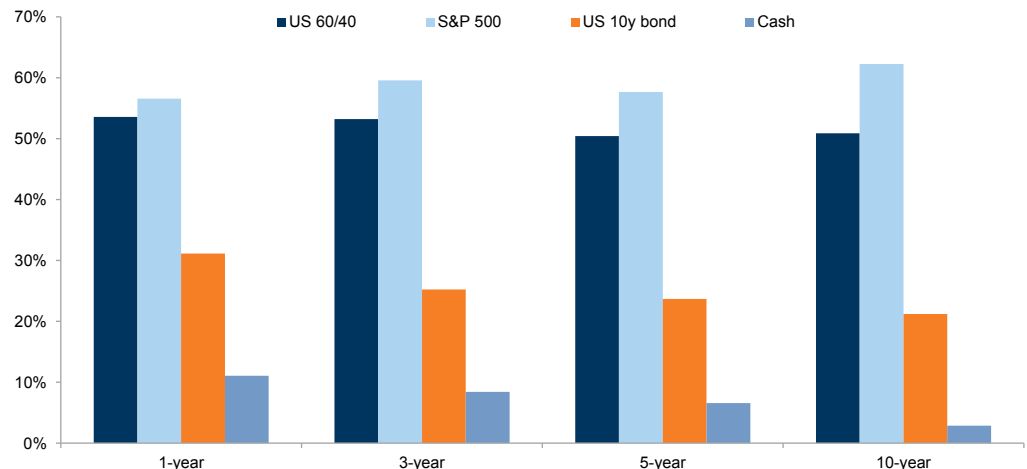
Source: Bloomberg, Haver Analytics, Goldman Sachs Global Investment Research

**Balancing the *real* Bear — the *real* risk/reward trade-off**

**Equities generally have a better chance of delivering attractive real returns than bonds with longer holding periods.** Equities are a claim on nominal growth and in most macro scenarios have the best chance of delivering positive real returns. While larger bond or cash allocations reduce the risk of large capital losses in the near term, they don't help to achieve attractive real returns in the long run – the prospects of achieving real returns above 5% p.a. are poor and worsen with a longer investment horizon, especially with the current low interest rates (Exhibit 3).

**Exhibit 3: The risk of strong real returns declines for bonds and cash with a longer investment horizon**

Frequency of real total return >5% p.a. (data since 1900)



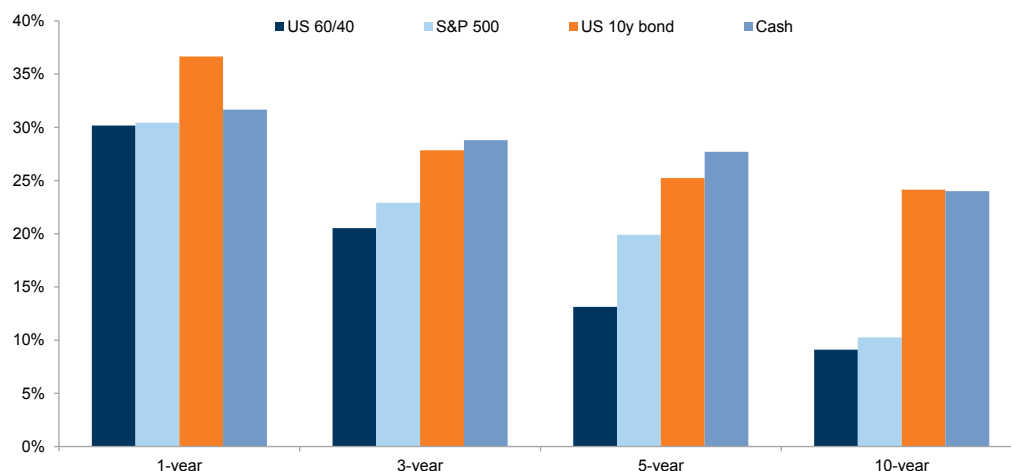
Source: Haver Analytics, Goldman Sachs Global Investment Research

**With longer holding periods the risk of poor real returns (<-1% p.a.) declines much faster for equities than for cash or fixed income** (Exhibit 4). Higher equity allocations increase portfolio risk and the potential for large drawdowns in the near term, especially in the event of recessions. But with equities the risk of poor real returns declines with

the investment horizon – with cash and bonds the risk of losing value in real terms over the long run is higher. Current fixed income valuations are a more binding constraint for returns: the current US 10-year TIPS yields at -100bp indicate a high likelihood of negative real returns for bonds in the coming decade.

**Exhibit 4: Risk of poor real returns in equities decreases materially with investment horizon**

Frequency of real total return <-1% p.a. (data since 1900)



Source: Haver Analytics, Goldman Sachs Global Investment Research

**How to keep it real — multi-asset strategies for the Post-Pandemic Cycle**

**Multi-asset investors need new strategies to achieve acceptable *real* returns**

**without unacceptable risk in the Post-Pandemic Cycle.** Equities may not be a clear inflation hedge, but they have a good chance of beating inflation over the long run, especially from low valuations. But in a 60/40 portfolio the majority of risk already comes from equities, which tend to have more than twice the volatility of bonds. Higher equity allocations increase portfolio risk and the potential for larger drawdowns. **We are leveraging different tools to enhance the *real* risk/reward of multi-asset portfolios:**

- **Illiquidity:** Investors can harvest additional risk premia by moving down the liquidity curve. This usually entails more risk or at least issues with risk measurement – often tail risks are larger and there can be lagged reactions during ‘risk off’ episodes. And this is usually not a solution for investors with short-term cash flow needs – long-horizon investors have a natural advantage to harvest illiquidity risk premia.
- **Leverage:** Explicit or implicit leverage can improve returns, especially if the cost of leverage is low. However, higher leverage exacerbates tail risk and does not necessarily improve performance for assets with high left tail risk. Frequent rebalancing can improve returns (before transaction costs) but increases left tail risk – less frequent rebalancing can affect performance due to implicit market timing. And there is risk of forced deleveraging, e.g., due to margin calls.
- **Market timing:** Market timing in terms of broad beta exposure over time, but also switching between assets/investments with better risk/reward than others, can unsurprisingly have a material impact on risk-adjusted performance. That said, market timing is difficult to get right and few strategies have worked consistently

over time. Besides capturing positive or negative momentum, successful market timing also needs to anticipate reversals.

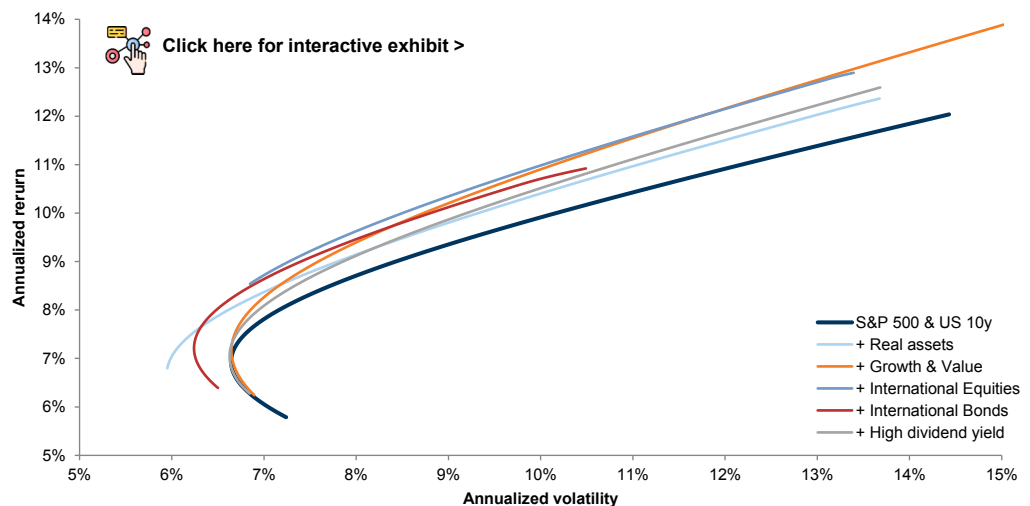
- **Diversification:** The benefits of diversification across assets and regions throughout history are well-known and documented – capital destruction due to inflation, recessions, wars and defaults has often been localised. Broader diversification across markets, including real assets, private markets and other alternatives, as well as within markets, across regions, sectors, styles, duration and credit quality can further improve the risk/reward of multi-asset portfolios.
- **Dynamic risk management:** Volatility targeting and momentum overlays can actively reduce risk in portfolio but without ‘active’ market timing. However, they have a mixed track record in enhancing returns as they are based on historical risk and return trend patterns and in recent years rising vol of vol and high intra-day volatility have made some of those strategies more costly in sharp reversals.
- **Option overlays:** Options allow investors to create contractually defined risk/rewards, at a cost. Systematically buying options, especially shorter-dated ‘risk off’ hedges, usually generates significant negative carry. However, more focused option strategies that aim to benefit from technical dislocations can offer access to leverage while mitigating tail risk, and improve the risk/reward in portfolios.

### Balancing the *real* Bear — Strategies for slow, real 60/40 drawdowns

Below we present five strategies, combining several of the tools above, aimed at improving the *real* risk/reward of multi-asset portfolios in the Post-Pandemic Cycle. A combination of allocations to non-US, value or high dividend yield stocks as well as convertibles, commodities, real estate, infrastructure and private markets might help reduce the risk of 60/40 ‘lost decades’. Those strategies would have steepened or shifted higher the efficient frontier for a balanced portfolio since 1950 (Exhibit 5) – they helped diversify growth risk and lower inflation risk/duration risk.

**Exhibit 5: Several strategies have steepened the efficient frontier since 1950**

Efficient frontier with different combinations of assets (data since 1950, monthly returns)

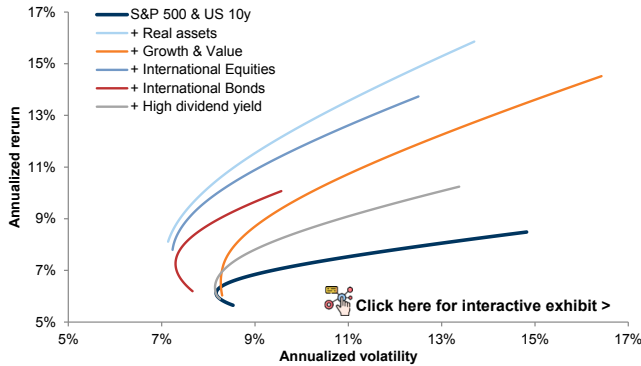


Source: Datastream, Haver Analytics, Goldman Sachs Global Investment Research

**Benefits from those strategies were large during the 60/40 'lost decades' in the 1970s and 2000s.** Exhibit 5 shows that they helped steepen the efficient frontier significantly during the 1970s stagflation with the largest improvements came from allocations to real assets and international equity markets. But international bond allocations and managing style skews would also have helped. Exhibit 7 shows smaller benefits during the 2000s due to the bursting of the Tech Bubble – still, there were large benefits from including real assets and international equities in a US balanced portfolio.

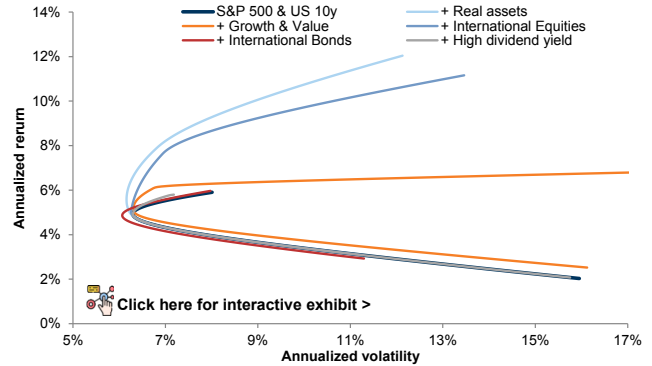
**Exhibit 6: During the 1970s stagflation there were material benefits from broader diversification**

Efficient frontier (data for 1970s, monthly returns)



**Exhibit 7: Results from diversification during the Financial Bubble period of the 2000s**

Efficient frontiers (data for 2000s, monthly returns)



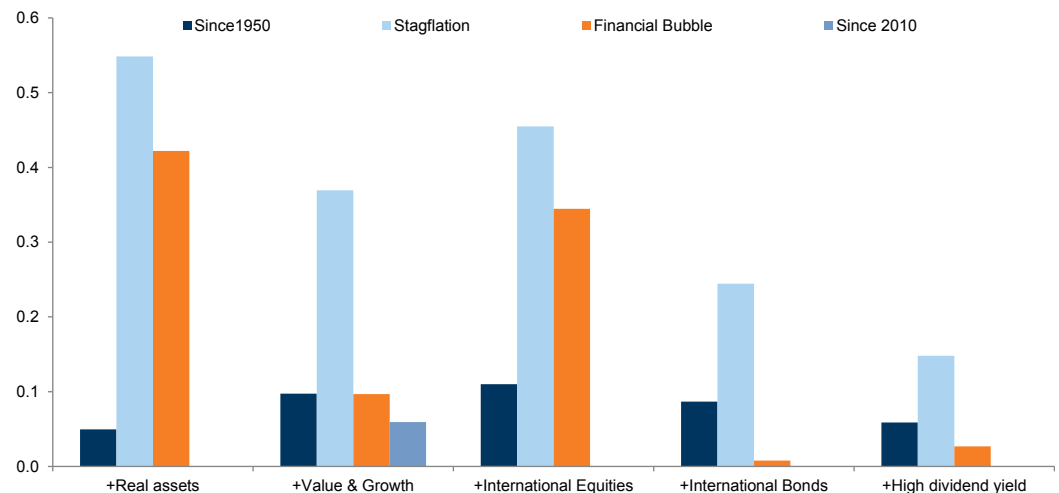
Source: Datastream, Haver Analytics, Goldman Sachs Global Investment Research

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

**Allocating to those assets in a US balanced portfolio would have improved Sharpe ratios for the optimal portfolio materially** (Exhibit 8). Again, the largest improvements were during the 1970s stagflation but there was also major boost from allocations to real assets and international equities during the 2000s Financial Bubble period. Since the GFC there has been little benefit from those strategies, which is not surprising as there was little inflation risk and tailwinds from falling bond yields for nominal assets.

**Exhibit 8: During 60/40 'lost decades' our 5 strategies would have materially enhanced Sharpe ratios**

Improvement in optimal Sharpe ratio from adding assets to a US balanced portfolio (monthly returns)

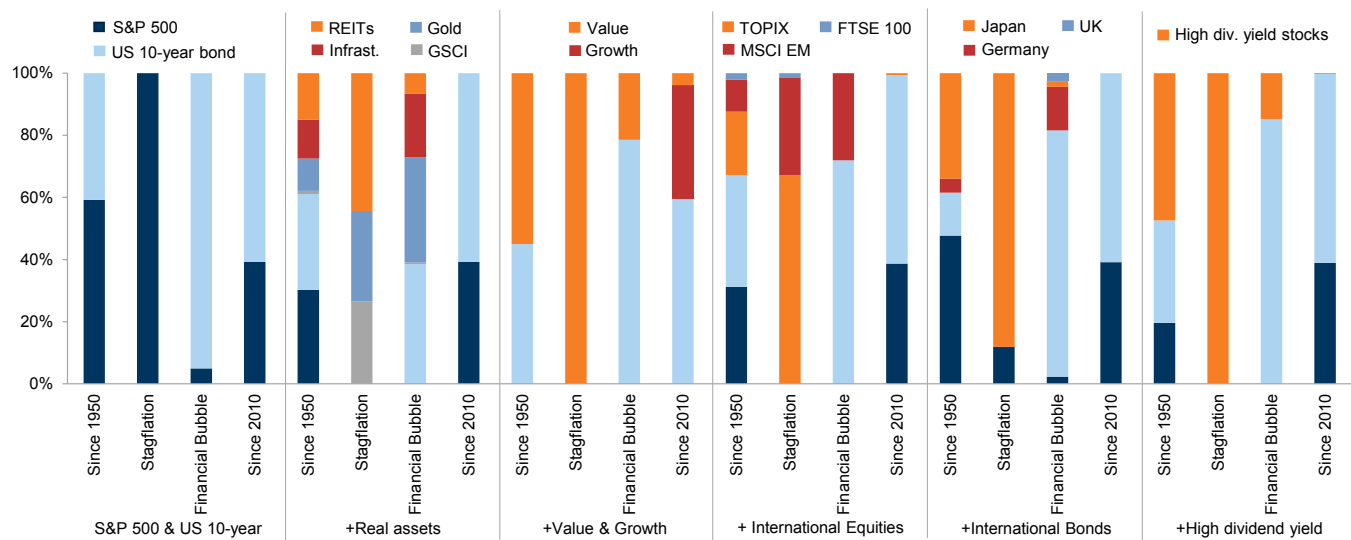


Source: Datastream, Haver Analytics, Goldman Sachs Global Investment Research

**To improve the risk/reward in the historical 60/40 ‘lost decades’, some extreme allocation shifts would have been necessary (with hindsight).** As we wrote in *Balanced Bear Despair — Part 2*, the optimal asset mix since 1950 has been roughly 60/40 but it varied materially over time: during the 1970s stagflation the optimal equity allocation was close to 100%, whereas during the 2000s Financial Bubble period it would have been better to have very small equity allocations. Since the GFC the optimal asset mix has been roughly 40/60.

**Exhibit 9 shows the optimal asset allocation across our strategies for the different macro regimes.** Post the GFC only more direct growth stock allocations would have improved Sharpe ratios. However, both in the 1970s stagflation and the 2000s Financial Bubble the optimal portfolios had material allocations to non-US equities and bonds, real assets, value and high dividend yield stocks. Since 1950, broadening the opportunity set for US balanced portfolios materially enhanced the risk/reward.

**Exhibit 9: To improve risk-adjusted returns in 60/40 ‘lost decades’ required material allocation shifts (with hindsight)**  
Optimal weights in a balanced portfolio (based on monthly returns)



Source: Goldman Sachs Global Investment Research

**In the following five sections we discuss each strategy in more detail: when and why they worked well historically, what their optimal allocation has been historically and how we think they will enhance balanced portfolios in the Post-Pandemic Cycle. A key challenge remains that while the strategies can improve real return prospects in the long run, they often increase portfolio risk in the near term. In *Balanced Bear Despair — Part 4* we plan to look at five further strategies, leveraging our multi-asset toolbox, to help mitigate the risk of fast drawdowns for balanced portfolios.**

## (1) Getting real asset allocation

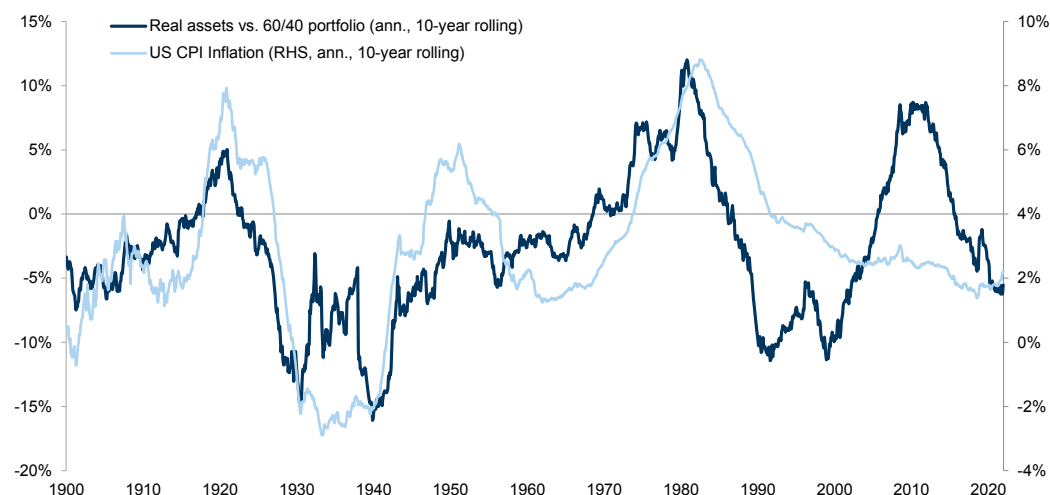
***The case for allocations to real assets is stronger with high and sticky inflation. Last cycle inflation was low and anchored – as a result financial assets such as 60/40 portfolios outperformed real assets, with tailwinds from falling inflation risk premia and the search for yield. But a 60/40 portfolio tends to struggle in periods of high and rising inflation or with rising real yields – allocations to commodities, real estate and infrastructure can help diversify that risk.***

**With higher inflation risk, allocations to real assets look more attractive – this strategy combines diversification with some elements of illiquidity and leverage.**

Broadly defined, real assets are mostly physical assets with an intrinsic value due to their substance or properties – the asset class subsumes commodities, real estate, infrastructure investments but may include collectibles, wine, etc.<sup>1</sup>

Last cycle, nominal assets performed very well in real terms, boosted by falling inflation and the search for yield. Real assets such as commodities, real estate and infrastructure generally underperformed a 60/40 portfolio. **But in the event of high and rising inflation periods, real assets can offer both the opportunity for uncorrelated returns and competitive real return potential** ([Exhibit 10](#)).

**Exhibit 10: Real assets have outperformed a 60/40 portfolio in periods of high and rising inflation**  
Total return performance



Note: Real assets is an average of S&P GSCI/ broad commodities index (TR) since 1900, Gold since 1939, FTSE NAREIT since 1970, S&P Global Infrastructure since 2000. Kenneth French sector portfolios before.

Source: Datastream, Bloomberg, Goldman Sachs Global Investment Research

**In inflationary periods real assets tend to outperform vs. fixed income, either due to intrinsic real value or as cash flows are linked to inflation** ([Exhibit 11](#)). Equities

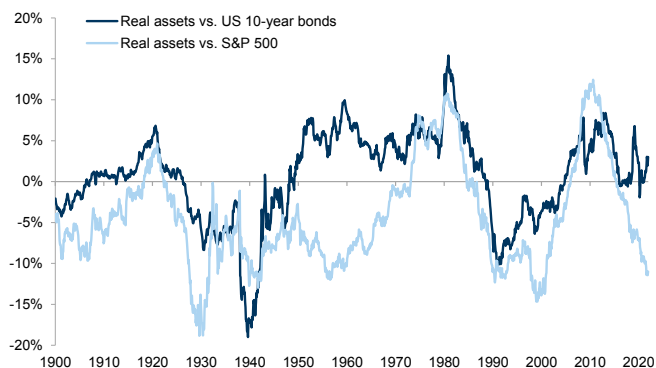
<sup>1</sup> Commodities include oil, industrial metals, timber and Gold. In recent years cryptocurrencies have also been thought to be a potential store of value due to limited or constrained supply. Real estate might comprise land, residential or commercial real estate. Infrastructure assets are used to transport, store and distribute goods, energy, people and information; they include toll roads, pipelines (MLPs), airports and data centres. Real estate and infrastructure also have large active private markets (see Strategy No. 5).



provide a claim on nominal growth and can be an inflation hedge if companies have pricing power and/or stable input costs. However, if inflation triggers central bank tightening it can weigh on equities, especially leveraged or long duration stocks. And elevated inflation volatility tends to put upward pressure on equity risk premia (as we discussed in *Part 1*). Last cycle commodities underperformed particularly significantly relative to a US 60/40 portfolio due to excess energy supply from the shale revolution ([Exhibit 12](#)).

### Exhibit 11: Real assets tend to outperform bonds more markedly while they struggle vs. equities

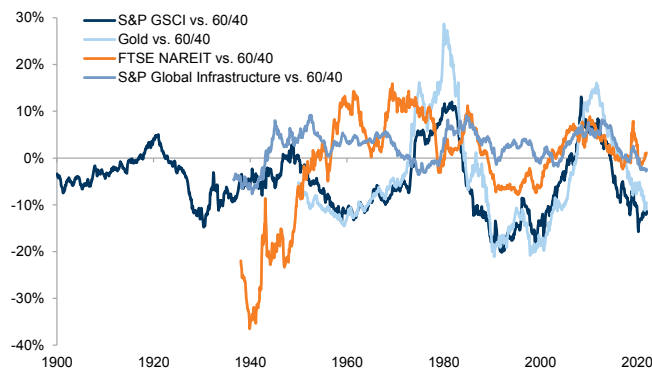
10-year rolling relative return



Source: Datastream, Bloomberg, Goldman Sachs Global Investment Research

### Exhibit 12: Real assets broadly underperformed post GFC with the exception of REITs

10-year rolling relative return



Source: Datastream, Bloomberg, Goldman Sachs Global Investment Research

### The source of inflation matters – whether it is demand pull, cost push, commodities or currency debasement.

If inflation is demand-driven, the best inflation hedge could be companies selling what is in demand as they are likely to have pricing power. If it is cost-push inflation, it may be best to have exposure to the drivers of inflation, e.g., commodities or low labour cost businesses that are facing less cost pressure, such as infrastructure investments and real estate. And, finally, if investors are worried about monetary debasement or currency devaluation, they may want to own stores of value such as Gold, safe haven FX or even Bitcoin.

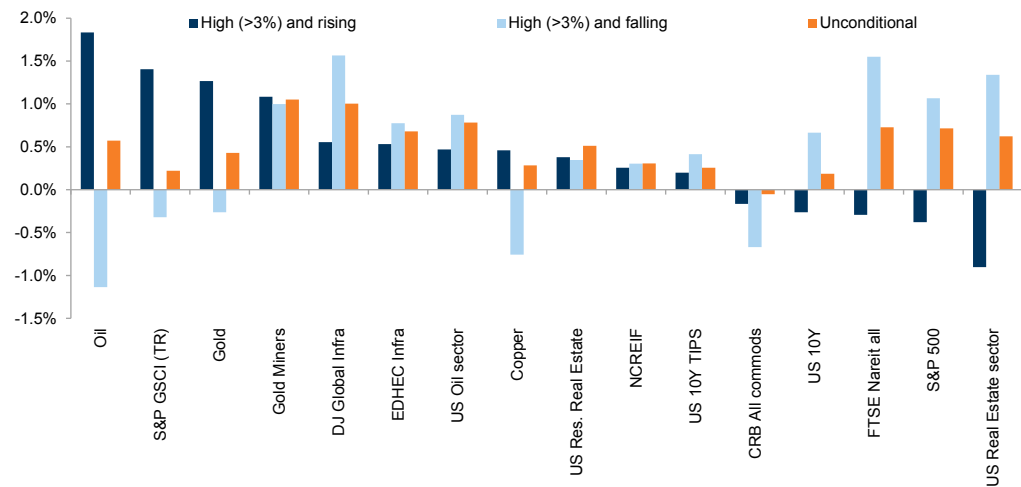
### Cross-asset performance in inflationary times not only depends on the level of inflation but also on whether it is rising or falling.

This is because some assets are anticipating inflation – if inflation falls from high levels or rises from low levels, it can be very supportive for equities as they fade inflation or deflation tail risks. As we write in Strategy No. 2, shorter duration value stocks outperformed vs. long duration growth stocks during the 1970s stagflation – value benefits from fading deflation tails, while growth outperforms with lower inflation.

### Commodities have performed best in periods of high and rising inflation ([Exhibit 13](#)) – in part this is due to their direct link to inflation but also as they are less driven by expectations.

However, commodities have done less well in periods of falling inflation. Cash generative, capital heavy assets such as real estate, infrastructure and commodities sectors such as Energy and Gold Miners have done well in periods of high inflation, irrespective of the inflation momentum. REITs have done less well on average with high and rising inflation, likely due to leverage and cyclicity – that said, private residential real estate have proved a good inflation hedge.

**Exhibit 13: Real assets outperform in periods of high and rising inflation but less with falling inflation**  
Average monthly, real return (data since 1950, inflation based on US CPI)



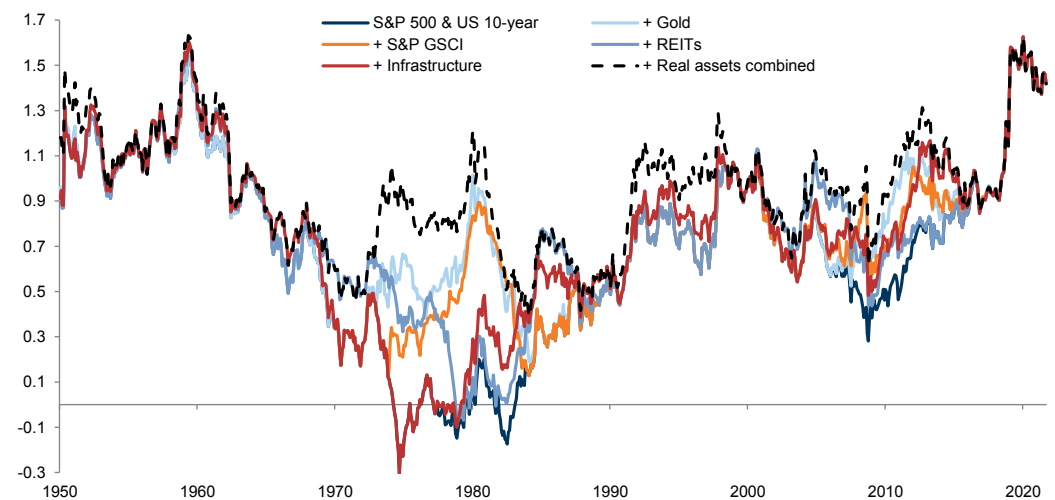
Note: The FTSE NAREIT All index tracks all US REITs since 1972; before that, we use the Kenneth French real estate sector. We construct the Residential Real Estate index using Case/Shiller HPI from 1987 (FHFA before) and an estimate of rental yield before transaction cost (Zillow since 2016, macrohistory database before 2016). The NCREIF index (NPI) is a quarterly, unleveraged total return for private commercial real estate properties held for investment purposes only. The Dow Jones (DJ) Brookfield Infrastructure index tracks listed companies since 2012 - before we aggregate sectors from Worldscope (1973-2012) and Kenneth French (1926-73). The EDHEC Infrastructure 300 index replicates broad market exposure to unlisted infrastructure investments gross of fees or other costs - the index is calculated monthly as total return index and adjusted annually.

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

**Getting real with allocations to commodities, real estate and infrastructure**

**Unsurprisingly, allocations to real assets enhanced risk-adjusted returns for a balanced portfolio materially during the 1970s stagflation (Exhibit 14).** This was particularly the case when combining real assets. And higher allocations to real assets also improved the risk/reward of a balanced portfolio during the bursting of the Tech Bubble and 1994 Bond Bubble, when long duration assets suffered. On the flip side, there has been little benefit from allocations to real assets since the GFC.

**Exhibit 14: Allocations to real assets broadly improved Sharpe ratios during periods of elevated inflation**  
10-year rolling Sharpe ratio of the optimal portfolio (monthly returns)

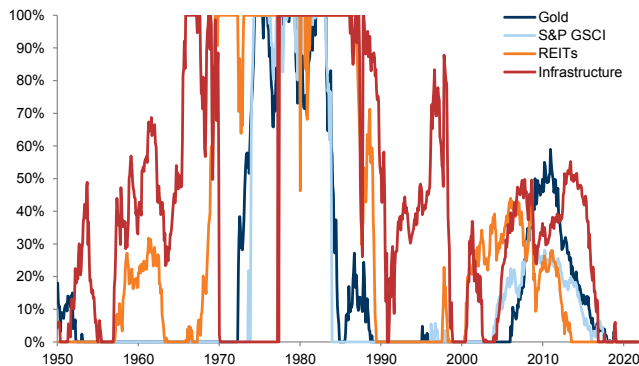


Source: Datastream, Haver Analytics, Kenneth French, Goldman Sachs Global Investment Research

**The optimal weight for real assets was high during the 1970s and low since the GFC (Exhibit 15).** Adding each real asset individually to a balanced portfolio shows that the optimal portfolio would have had large allocations to all of them during the 1970s. Adding all real assets at the same time shows that commodities, a mix of oil and Gold, had the largest allocation (Exhibit 16) – real estate had a larger weight early in the 1970s, likely as growth was strong and rates were still low, but a smaller weight later on.

**Exhibit 15: Optimal allocation to real assets was high during the 1970s stagflation and low since the GFC**

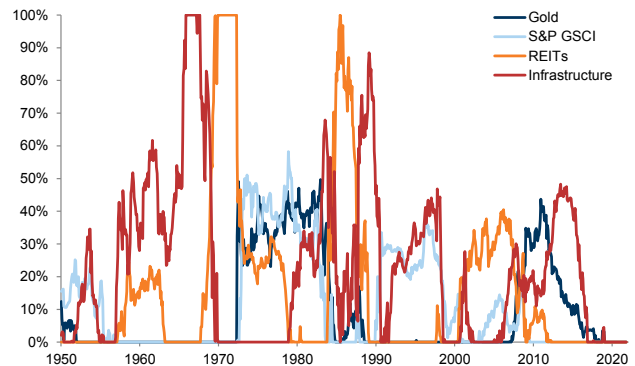
Weights for optimal portfolio (individual optimisation)



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

**Exhibit 16: Real estate had a larger weight early in the 1970s while a mix of commodities dominated after**

Weights for the optimal portfolio (adding all real assets at once)



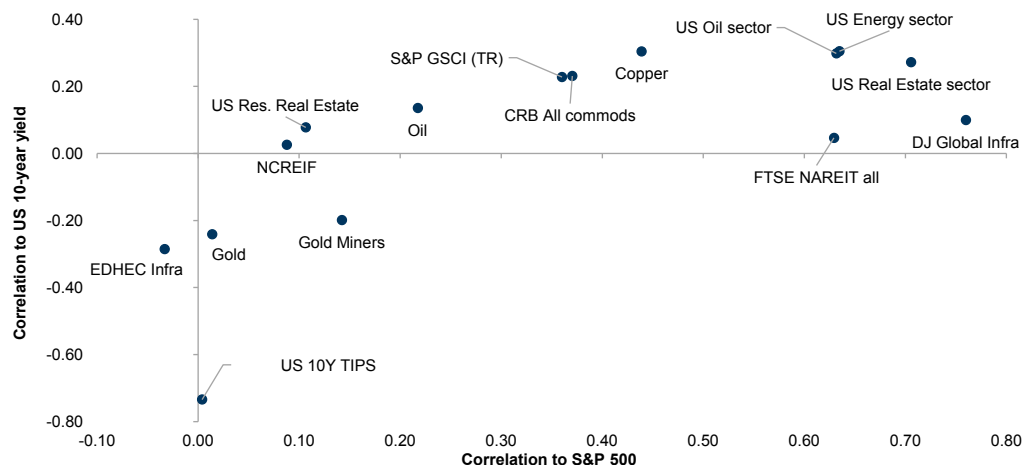
Source: Datastream, Haver Analytics, Goldman Sachs Global Investment Research

**Real risk/reward potential and correlation frustration**

**Real assets offer a better risk/reward in times of high inflation but results were mixed over time.** In part this is due to the source of inflation but also as real assets have other macro or micro drivers. Commodities have micro drivers and supply/demand imbalances can drive material volatility. REITs have leverage and commercial real estate can be very cyclical, resulting in a higher equity beta. Private real estate (NCREIF and US residential) and infrastructure (EDHEC Infra) had a low correlation with equities but this likely underestimates risk due to illiquidity (see Strategy No. 5).

**Exhibit 17: Most equity-linked real assets have high correlations with equity**

Data since 2000 (monthly returns)

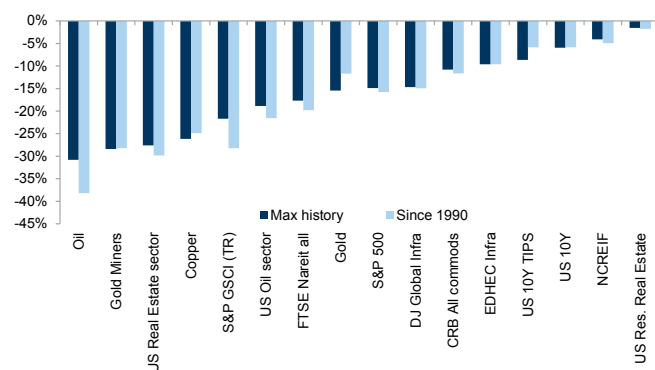


Source: Bloomberg, Datastream, Goldman Sachs Global Investment Research

**While real assets have had a relatively low correlation to equities and bonds since 2000, they sometimes had left tail risk, as measured by the 5% CVaR (Exhibit 18).**

When allocating to real assets investors need to balance the potential for better real returns in the medium term with the increased risk of fast drawdowns in the near term (Exhibit 19). There is also a large divergence in left tail risk between private and public real estate and infrastructure assets – the *real* risk/reward through cycle is not easy to assess as real assets are illiquid and have limited performance history and transparency.

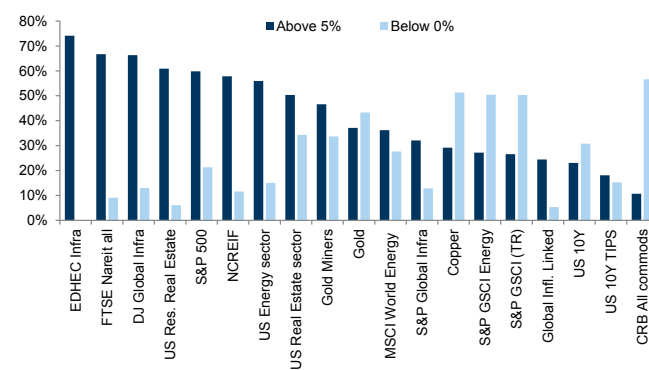
**Exhibit 18: Commodities and REITs had large drawdowns**  
3-month 5% CVaR (monthly, conditional value at risk, data since 1950 where available)



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

**Exhibit 19: Real assets tend to perform well during periods of high inflation but worse than equities through cycle**

Frequency of 5-year real returns above 5% and below zero (monthly, data since 1950 where available)

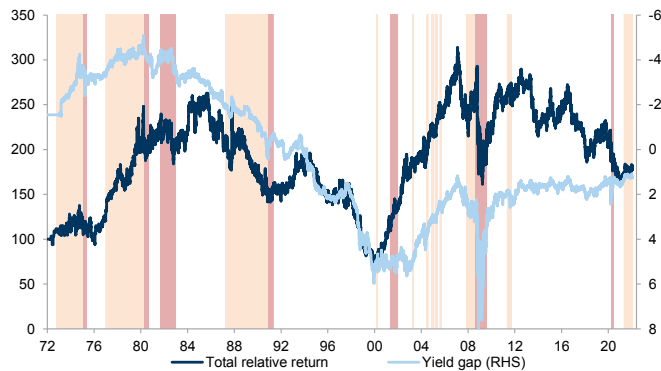


Source: Datastream, Haver Analytics, Kenneth French, Goldman Sachs Global Investment Research

**Elevated inflation and the search for *real* yield benefit allocations to real estate and infrastructure (Exhibit 20).** While FTSE NAREIT underperformed the S&P 500 last cycle, during the 1970s stagflation it outperformed and re-rated. Real estate and infrastructure can offer attractive, real cash flow yields – leases often include contractual clauses to pass on inflation, and there is some embedded inflation protection. Similarly, infrastructure tends to have pricing power due to concessions/regulation and monopolistic market structures. Real estate and infrastructure also offer more investment opportunities linked to ESG, including improvements in ageing, less environmentally friendly assets.

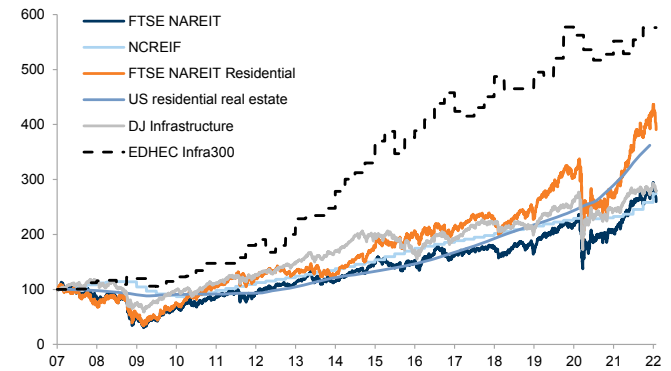
**Real estate has underperformed during the COVID-19 crisis, in part due to headwinds for office and retail assets.** Commercial real estate tends to be more cyclical and there are structural headwinds from changing patterns in office work and retail transition to online (Exhibit 21). That said, in Europe for example, our Equity Real Estate team thinks that the lack of quality office space, logistics and residential markets should support the sector. Residential real estate is more defensive and has outperformed but could face headwinds from regulation and taxation. Infrastructure is less cyclical and outperformed real estate last cycle, especially unlisted real estate. Several infrastructure assets such as data centres, waste management, renewable energy and logistics are exposed to secular growth trends.

**Exhibit 20: During periods of high and rising inflation REITs outperformed but they tend to underperform in recessions**  
 FTSE US NAREIT vs. S&P 500 (orange shading = US CPI inflation >3% and rising, red shading = US recession)



Source: Bloomberg, Goldman Sachs Global Investment Research

**Exhibit 21: Residential real estate has outperformed since COVID-19 and has been more defensive**  
 Total return performance

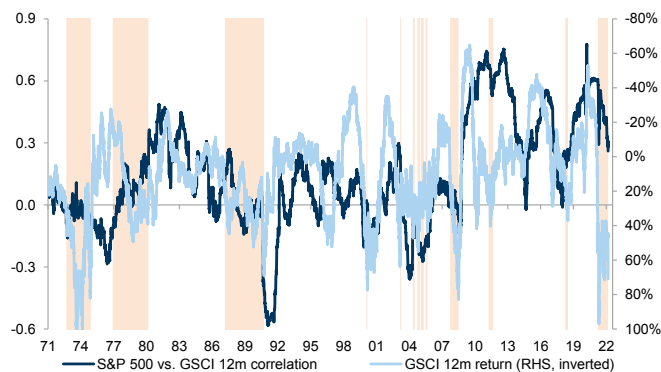


Source: Bloomberg, Haver Analytics, Goldman Sachs Global Investment Research

**Allocations to commodities can also improve the diversification of balanced portfolios in periods of high and rising inflation.** Stagflation periods were often accompanied by sharp oil price rallies during which equities and commodities were negatively correlated (Exhibit 22). Commodities are less driven by expectations and thus very short duration and less sensitive to rates. As our commodities team has highlighted, deficits across markets remain large with the Russia/Ukraine crisis intensifying energy supply/demand imbalances.

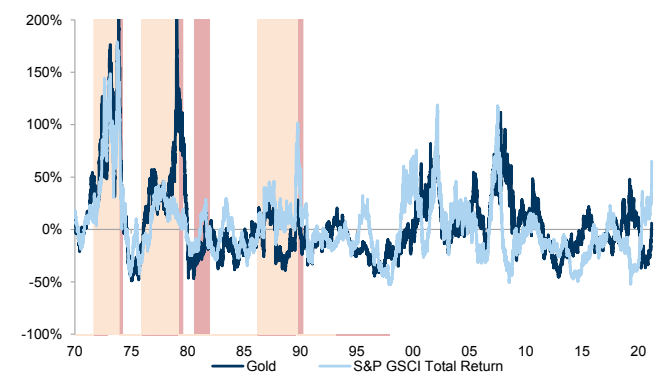
**During the 1970s stagflation both Gold and the S&P GSCI outperformed the S&P 500 materially** (Exhibit 23). With current commodity supply disruptions outside of energy there are also some diversification benefits within commodities. Into recessions Gold outperformed broad commodity indices, which are driven primarily by oil. Besides offering a store of value in the event of monetary debasement, Gold can provide protection during bear markets and geopolitical risks. Bitcoin could also turn out to be a store of value in the long run in the event of de-Dollarisation, although it has been very correlated with cyclical assets in recent years (see grey box below).

**Exhibit 22: Equity/commodity correlations tend to decline after prolonged, large commodities rallies**



Source: Datastream, Goldman Sachs Global Investment Research

**Exhibit 23: Commodities outperformed equities with high inflation**  
 1-year rolling performance vs. S&P 500 (orange shading = US CPI inflation >3% and rising, red shading = US recession)



Source: Datastream, Goldman Sachs Global Investment Research

## Case study: Bitcoin in a balanced portfolio

Bitcoin is often perceived as a potential store of value due to its limited supply and decentralised nature, outside traditional financial markets. Our analysis suggests that just a small allocation to Bitcoin in a standard US 60/40 portfolio would have enhanced risk-adjusted returns materially since 2014 (while Bitcoin prices are available from mid-2010, we use prices since 2014 as Bitcoin was not easily accessible to investors before then), even as balanced portfolios performed strongly on their own. The strong risk-adjusted performance of Bitcoin was due to strong returns rather than to low risk.

However, Bitcoin's strongest performance contribution to the portfolio resulted from isolated rallies in 2017, 2019 and 2020, when it received a major boost from the COVID-19 crisis. Since 2014, Bitcoin has often declined during equity drawdowns, as in 2015, 2018 and 1Q20. These large drawdowns, combined with Bitcoin's high volatility, have eventually outweighed the benefits of having it in a portfolio at higher allocations. Even with just a 5% allocation in a 60/40 portfolio, Bitcoin drove roughly 20% of the portfolio's volatility, while US 10y bonds contributed just 2%.

**Exhibit 24: Small allocations to Bitcoin would have had a big impact on balanced portfolios**

	S&P 500	US 10yr bond	Bitcoin	60/40 portfolio	Allocation to Bitcoin			
					+2.5%	+5%	+10%	+20%
<b>Since 2014</b>								
Return p.a.	13%	4%	62%	10%	11%	13%	17%	24%
Volatility (daily)	17%	6%	73%	9%	10%	10%	12%	18%
Volatility (monthly)	14%	6%	86%	8%	9%	10%	13%	20%
Return/ volatility	0.76	0.56	0.86	1.01	1.19	1.31	1.41	1.38
5% CVaR	-10%	-3%	-35%	-5%	-6%	-6%	-7%	-9%
Max drawdown	-34%	-11%	-83%	-18%	-19%	-19%	-20%	-29%
<b>2014-2019</b>								
Return p.a.	12%	4%	46%	9%	11%	12%	15%	21%
Volatility (daily)	13%	6%	74%	7%	7%	8%	10%	16%
Volatility (monthly)	11%	6%	87%	6%	7%	8%	11%	19%
Return/ volatility	0.92	0.66	0.62	1.26	1.46	1.56	1.53	1.31
5% CVaR	-7%	-3%	-35%	-4%	-4%	-4%	-5%	-8%
Max drawdown	-19%	-11%	-83%	-11%	-11%	-12%	-18%	-29%

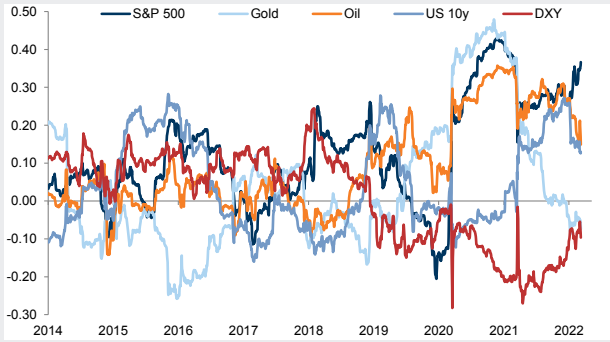
Source: Bloomberg, Goldman Sachs Global Investment Research

To assess the potential diversification benefits, investors need to understand the linkages between Bitcoin and macro fundamentals, sentiment and other assets through the cycle. But Bitcoin's history is too short to cover several business cycles or a period of high inflationary pressures, so it is unclear how Bitcoin would behave during a period of large growth and rate shocks. During the COVID-19 crisis, Bitcoin became very correlated with other assets. Since the beginning of 2021, correlations with traditional assets have declined again, although Bitcoin remains negatively correlated with the Dollar. While too early to say for certain, this suggests that investors are treating Bitcoin as a hedge against monetary debasement, similar to Gold. Also, during recent geopolitical tensions it has performed better.

Despite these correlations, most of the variation in Bitcoin has been idiosyncratic. This could be good from a diversification perspective, but only if Bitcoin were to have a positive expected return that is both predictable and attractive on a risk-adjusted basis. Given its limited and known supply, the price of Bitcoin should primarily depend on investor demand and its perceived value. But investor demand so far seems to be linked to the asset itself rather than macro factors; adoption by retail investors – and recently some institutions – has boosted prices while regulatory and tax concerns, as well as positioning, have driven sharp setbacks. Without more clarity on these idiosyncratic drivers, assessing Bitcoin's future risk/reward and role in balanced portfolios remains difficult.

**Exhibit 25: Bitcoin has remained correlated with cyclical assets since the COVID-19 crisis**

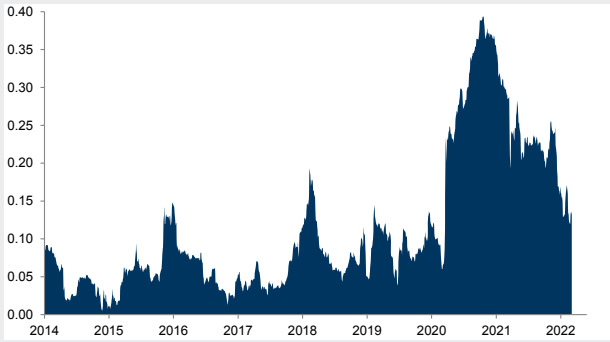
1-year rolling correlation (weekly returns)



Source: Bloomberg, Goldman Sachs Global Investment Research

**Exhibit 26: Bitcoin has a lot of idiosyncratic risk**

One-year rolling R-squared of a regression of Bitcoin on S&P 500, US 10y bond, oil, gold, and DXY, weekly changes



Source: Bloomberg, Goldman Sachs Global Investment Research

## (2) Finding more balance in style (and themes)

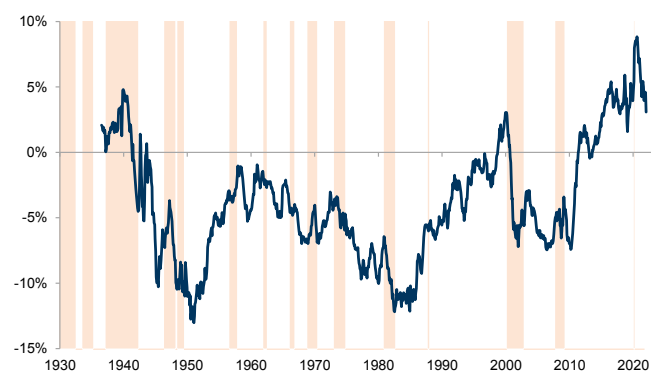
**Managing style and thematic exposures within equities actively can improve a portfolio's risk/reward. Since the GFC broad benchmark equity indices are often more concentrated in specific styles and stocks – isolating parts within indices can provide a better risk/reward or diversification benefits. Correlations between value and growth have declined since the 1990s, in part due to different duration risk – the same is often true for sectors and themes.**

**Isolating equity styles and themes also improves diversification – this strategy combines broader diversification with market timing.** Factor or style investing has become popular since the seminal paper from Fama and French (1993). The outperformance of growth vs. value in the US in the last cycle was unprecedented ([Exhibit 27](#)). Before the GFC value tended to outperform growth on average, both through cycle but in particular during bear markets. Especially during periods with high and rising inflation such as the 1970s stagflation, short duration value stocks generally outperformed growth materially in the US.

As we wrote in [Global Strategy Paper: The Equity Duration puzzle](#), this again reflects a repricing of duration risk within equities – value stocks are shorter duration with more cash flow upfront while growth stock valuations are more forward-looking. The steady decline in bond yields post the GFC has as a result been a tailwind for growth vs. value valuations – but recent higher rates volatility (reflecting inflation risks) has led to some large rotations between growth and value. **The correlation of growth and value has declined sharply since the COVID-19 crisis, pointing to diversification benefits from being balanced across value and growth** ([Exhibit 28](#)).

**Exhibit 27: While growth has outperformed value post GFC it generally underperformed since 1930**

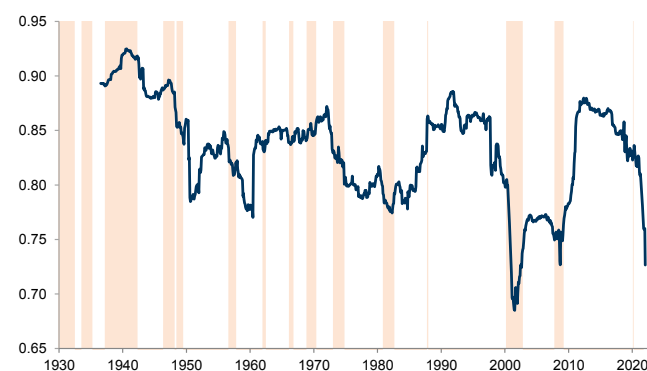
10-year rolling return of US growth vs. value (orange shading denotes S&P 500 drawdown >20%)



Source: Kenneth French, Goldman Sachs Global Investment Research

**Exhibit 28: Value and growth have been less correlated recently and de-correlated during the 70s**

10-year rolling US value vs. growth correlation (monthly returns, orange shading denotes S&P 500 drawdown >20%)



Source: Kenneth French, Goldman Sachs Global Investment Research

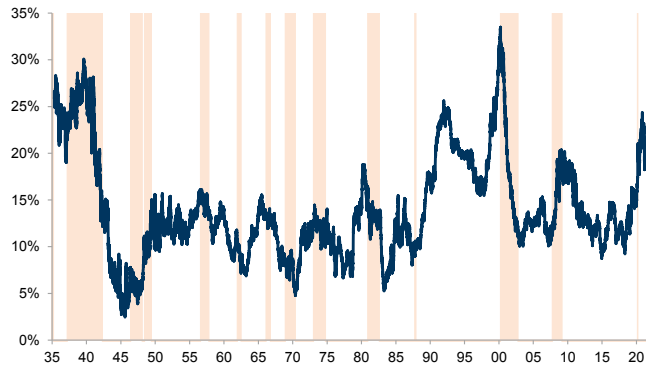
Closely related has been the outperformance of the US Technology sector last cycle, which generated strong top-line growth while many old economy sectors such as Banks, Utilities, Telecoms and Energy faced macro and micro headwinds. During the COVID-19 crisis, the 10-year rolling return differential between the best and worst



performing US sector increased to near all-time highs, which were last reached during the Tech Bubble (Exhibit 30). **Sector correlations have not trended down but into bear markets they often decline, again pointing to some diversification benefits.**

**Exhibit 29: The outperformance of US Tech has been extreme and sector dispersion might decline**

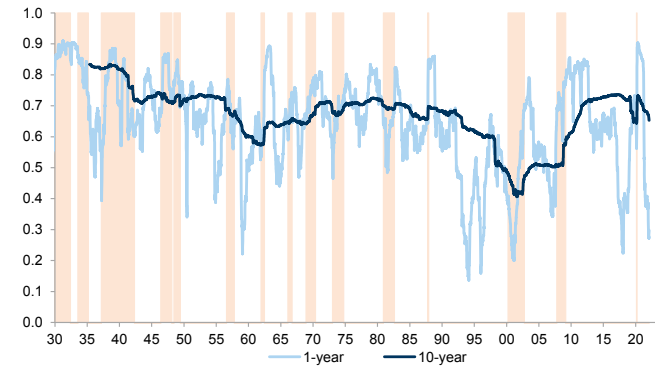
10-year rolling return differential best and worst performing US sector (monthly returns, orange shading denotes S&P 500 drawdown >20%)



Source: Kenneth French, Goldman Sachs Global Investment Research

**Exhibit 30: Correlation across sectors has been stable but is often lower into bear markets**

Average pair-wise correlation across US sectors (monthly returns, orange shading denotes S&P 500 drawdown > 20%)

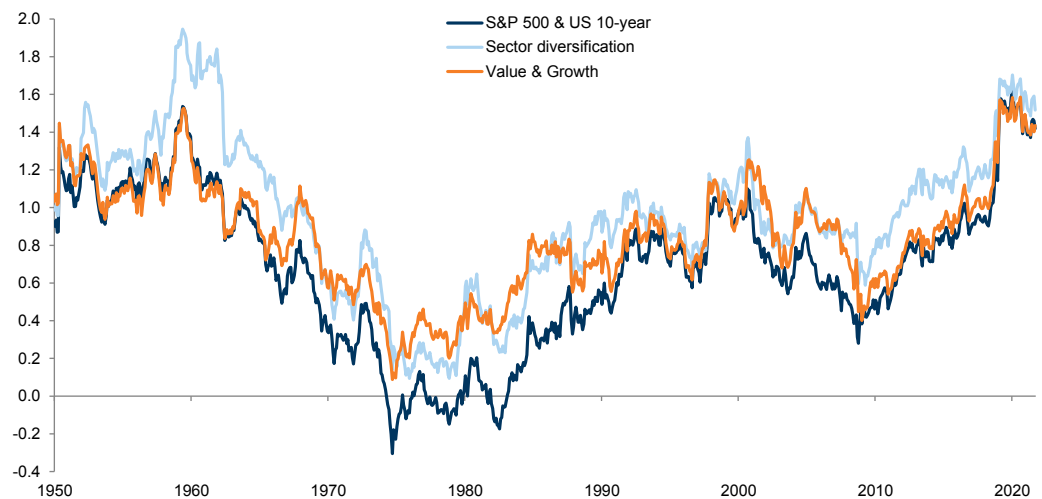


Source: Kenneth French, Goldman Sachs Global Investment Research

**Balancing risks in style — diversification benefits from isolating styles and sector**  
**Historically, style and sector diversification has helped risk-adjusted returns in**  
**balanced portfolios.**

Since WW2 the Sharpe ratio of the optimal portfolio was generally higher if style and sector exposures were investable. Since the GFC there has been less benefit in diversifying across styles due to the strong outperformance of growth vs. value – isolating sectors still added to risk-adjusted performance. During the 1970s stagflation there was a material benefit from managing style and sector exposures.

**Exhibit 31: Allocating more granularly to style and sectors enhanced risk-adjusted returns historically**  
 10-year rolling Sharpe ratio of the optimal portfolio



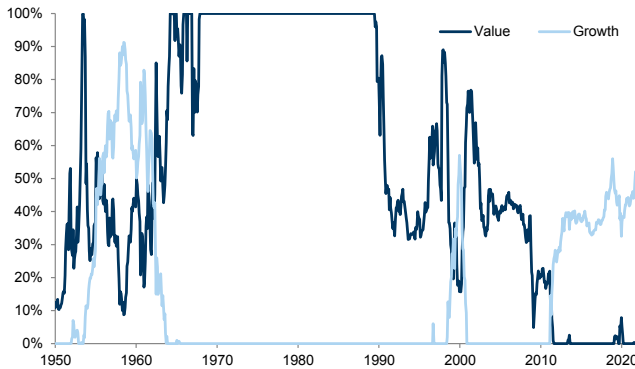
Growth/Value is the portfolio of companies above top 70th/below the 30th percentile in terms of P/BV. Market-cap weighted

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

**The optimal allocation during the 1970s stagflation was 100% value stocks.** This is much in contrast to the last cycle, when optimal equity allocations were lower and tilted to growth stocks ([Exhibit 32](#)). Since 1950 the average allocation to value (c.54%) was higher than to growth stocks (c.12%). Unsurprisingly, there were material benefits from picking the right sectors – the optimal allocation was Healthcare, Energy and Telecom sectors in the 1970s and Tech in the last cycle ([Exhibit 33](#)).

**Exhibit 32: During the 1970s stagflation an allocation to value materially enhanced Sharpe ratios**

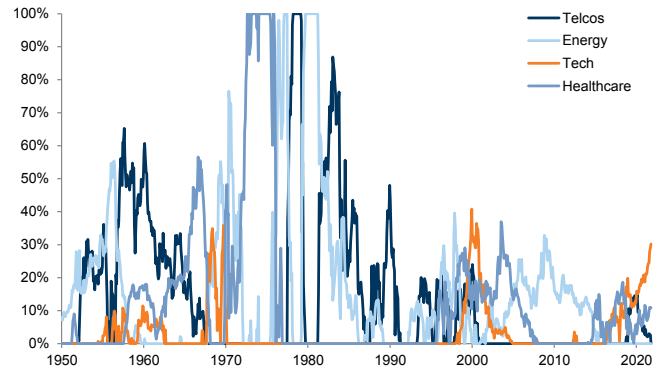
Optimal style allocation (10-year rolling, monthly returns)



Source: Datastream, Kenneth French, Goldman Sachs Global Investment Research

**Exhibit 33: Technology dominated optimal equity allocations in the last cycle**

Optimal equity sector allocation (10-year rolling, monthly returns)



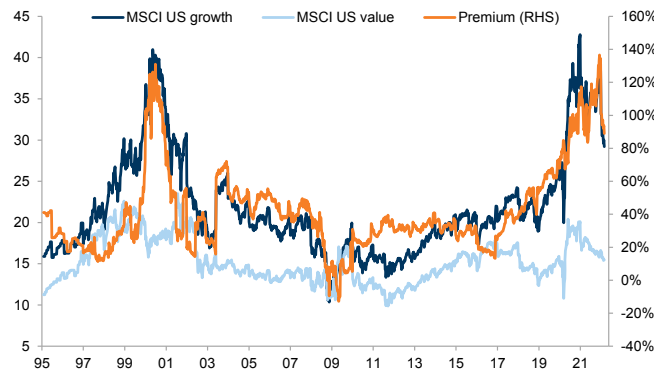
Source: Datastream, Kenneth French, Goldman Sachs Global Investment Research

**Balancing duration frustration and higher growth beta**

**We expect less outperformance of growth vs. value and from the US Technology sector in the Post-Pandemic Cycle with less tailwinds from falling bond yields and rising margins.** Growth vs. value valuations have started to mean-revert in the recovery from the COVID-19 crisis, which was in large part triggered by rising bond yields ([Exhibit 34](#)) – longer duration growth stocks had a negative beta to US 10-year yields ([Exhibit 35](#)). Lower return differentials coupled with lower correlations across sectors and styles point to increased diversification benefits going forward.

**Exhibit 34: While the premium on growth stocks has started to decline, it remains high**

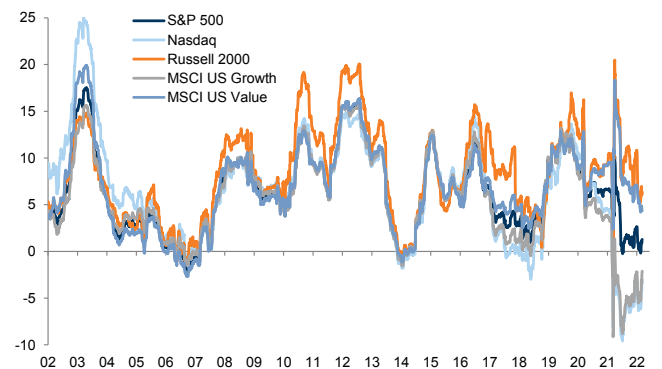
12m forward P/E ratio



Source: Bloomberg, Goldman Sachs Global Investment Research

**Exhibit 35: US growth stocks have become more negatively linked to bond yields**

1-year rolling beta to US 10-year yields (weekly changes)

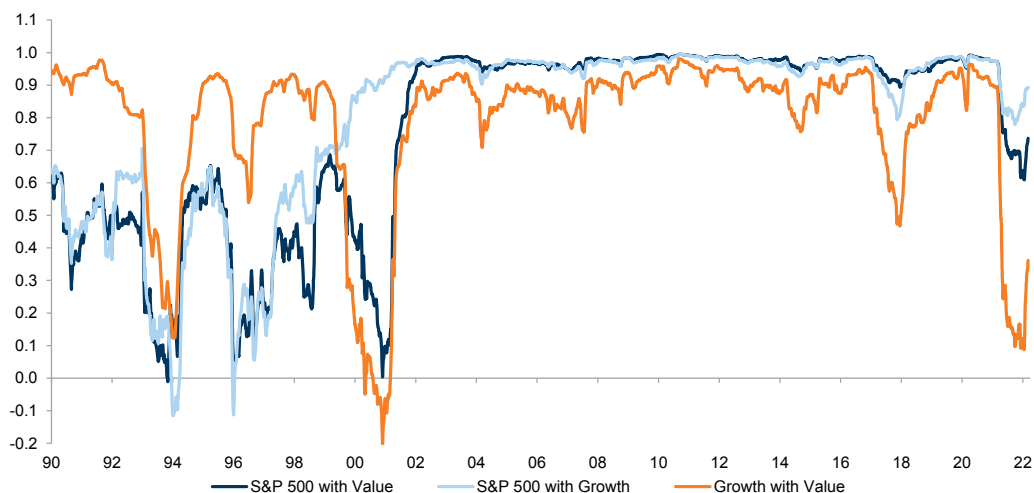


Source: Bloomberg, Datastream, Goldman Sachs Global Investment Research

**In our view, S&P 500 investors should think about larger allocations to value and related sectors to improve diversification.** Since the GFC and in particular the COVID-19 crisis, the S&P 500 has become concentrated in a few large cap growth stocks in the US Tech Technology sector. In the last two years the correlation of MSCI US Growth and Value indices declined materially – in large part this reflects higher duration risk for growth stocks and more rates volatility. However, the S&P 500 has become less correlated with the MSCI US Value index and as a result broad index investors lose out on diversification benefits between styles ([Exhibit 36](#)).

**Exhibit 36: Since the COVID-19 crisis growth and value have become much less correlated and offer significant diversification potential**

1-year correlation (monthly returns)



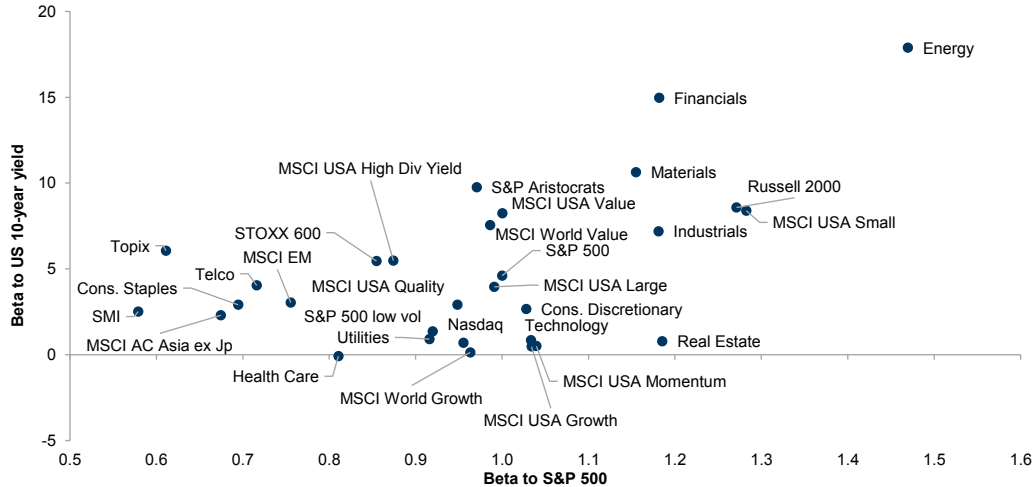
Source: Bloomberg, Goldman Sachs Global Investment Research

**But sectors with lower rate sensitivity are usually more cyclical and allocations can increase exposure to growth shocks** ([Exhibit 37](#)). While value stocks and sectors like Energy and Banks tend to outperform with higher inflation, they carry more growth risk. Since 2000, with deflation risk more prevalent, stocks most positively correlated with US 10-year yields have had a higher beta to the S&P 500. As inflation expectations increase, so does the potential for disappointments and negative growth shocks, e.g., due to excessive monetary policy tightening. Investors need to balance inflation and growth risk, which suggests more exposure to quality, low vol and bond-like equities (see Strategy No.4).

**Investors can also isolate specific themes and alpha outside of traditional styles and sectors that may offer attractive risk/reward or benefits in the portfolio context.** Those themes are often more long-term and could be related to ESG, climate change and green capex, megatrends such as digitalisation and 'moonshot' technologies, investor positioning or macro exposures such as exporters vs. domestic stocks, beneficiaries from fiscal spending and high pricing power. Our portfolio strategy teams across regions have created several thematic baskets to capture both tactical opportunities or attractive risk/reward in the medium term.

**Exhibit 37: Lower duration historically often came with increased cyclicality**

Data since 2020 (weekly returns)



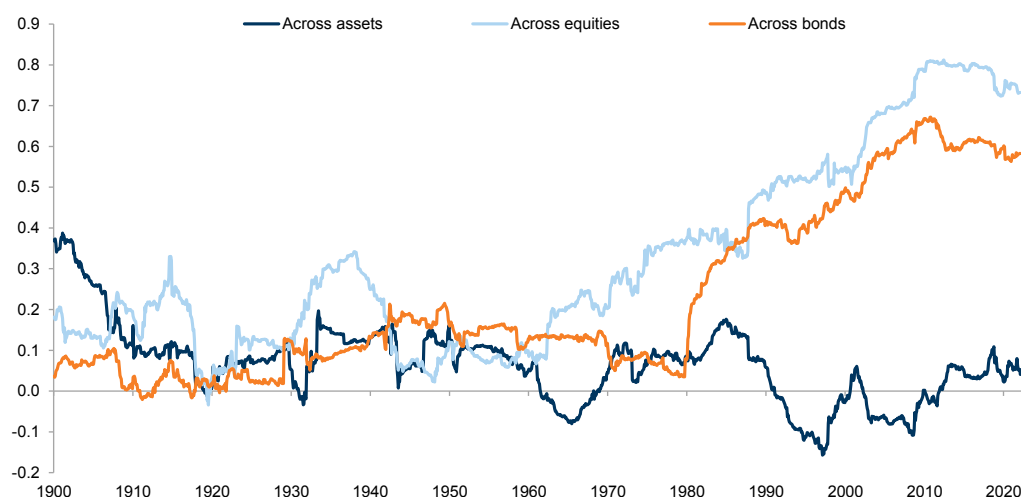
Source: Datastream, Goldman Sachs Global Investment Research

### (3) Less desperation with regional diversification

*We expect more opportunities to diversify across regions. After more than a decade of US outperformance, global equity benchmarks and portfolios are more tilted to the US. Even if non-US equities may not offer a much better risk/reward, there could be more diversification benefits – regional equity and bond correlations are likely to be lower going forward. There is also more potential for diversification within bonds, e.g., with Chinese government bonds.*

**We expect more benefits from regional diversification – this strategy combines broader diversification and market timing as it requires active management of country skews.** Solnik (1974) first highlighted potential benefits from international equity diversification. However, in the last 30 years there has been little benefit from regional diversification within equities or bonds, while diversification across assets was very effective (Exhibit 38). In part this was due to increasing global economic and capital markets integration since the 1990s and to companies becoming more international, with a larger proportion of revenues derived outside home markets.

**Exhibit 38: Little benefit from diversification within assets, more from across assets since 1990**  
10-year rolling correlation of monthly returns



Note: Across assets = S&P 500 with US10Y, Gold, Commodities, Yen, CHF; Across equities: S&P 500 with DAX, FTSE, Europe, Japan, EM; Across bonds: US 10Y with US 30Y, German 10Y, UK 10Y, Italy 10Y, Spain 10Y, Japan 10Y.

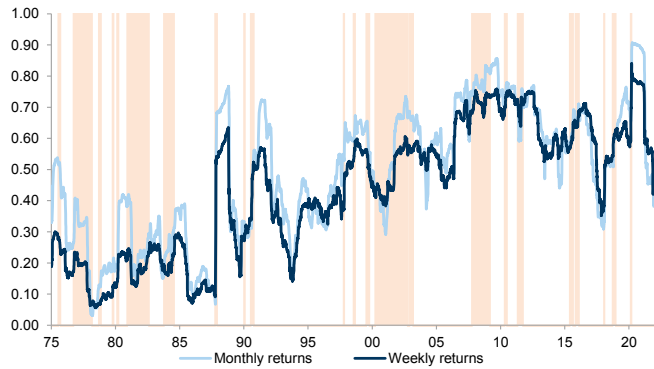
Source: GFD, Goldman Sachs Global Investment Research

With little inflation but several large global growth shocks, global equity markets have been more linked, as indicated by the increase in average pair-wise correlations, especially during episodes of 'risk off'<sup>2</sup> (Exhibit 39). And monetary policy was more aligned, often responding to global growth shocks – global 10-year bond yields were more correlated (Exhibit 40). **However, since the COVID-19 crisis there has been a large decline in regional equity correlations. This reflects less synchronised**

<sup>2</sup> Several academic studies on equity correlations have documented such asymmetric correlations across equity markets; see for example Erb et. al. (1994) and Longin and Solnik (2001). Page and Panariello (2018) recently analysed correlations in 'risk on' and 'risk off' episodes since 1970 and found that during crises diversification within risky assets mostly failed, leaving bonds as the main diversifier in portfolios.

**business cycles, in part due to local COVID-19 waves and different lockdown policies, but also due to diverging fiscal and monetary policies.**

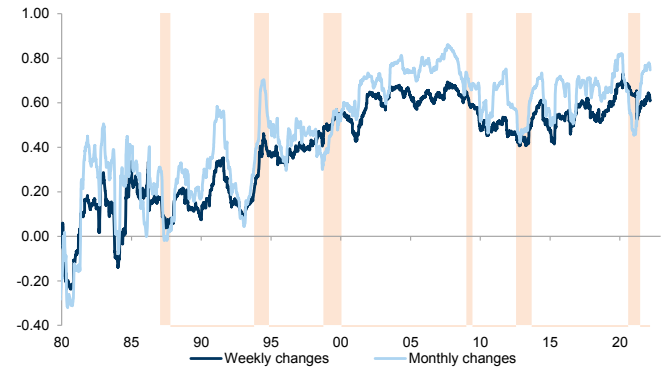
**Exhibit 39: Regional equity correlations have declined sharply**  
Average pair-wise 1-year rolling correlation of equity markets - orange shading denotes >10% S&P 500 drawdown



Equity markets included: Australia, Austria, Belgium, Canada, Denmark, France, Germany, Hong Kong, Ireland, Italy, Japan, Malaysia, Netherlands, Norway, Singapore, South Africa, Sweden, Switzerland, UK, US.

Source: Datastream, Goldman Sachs Global Investment Research

**Exhibit 40: Global bonds remain very correlated**  
Average pair-wise 1-year rolling correlation of 10-year bond yields - orange shading denote >100bp increase in US 10-year yields



Bond markets included: Australia, Canada, France, Germany, Japan, New Zealand, Spain, Sweden, Switzerland, UK, US.

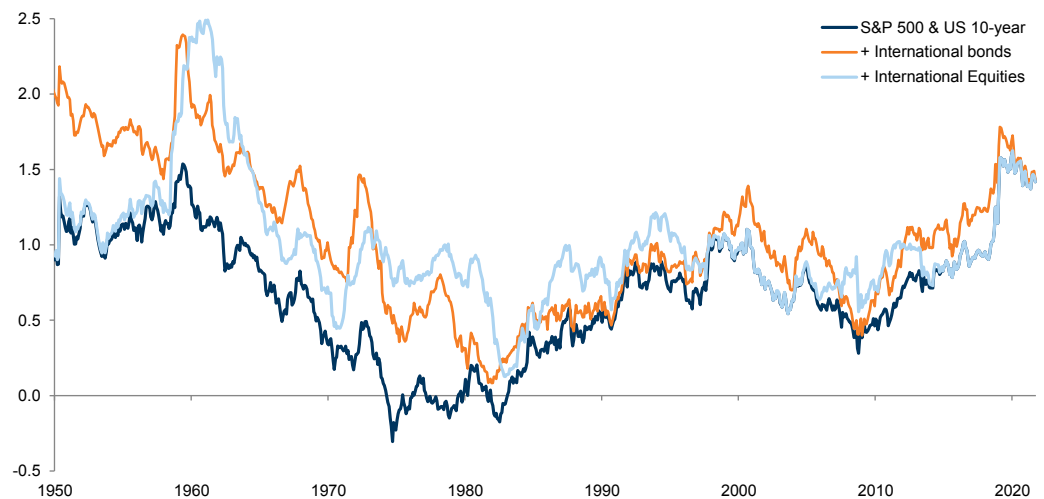
Source: Haver Analytics, Goldman Sachs Global Investment Research

**Less desperation with regional diversification (across assets)**

**International diversification has enhanced risk-adjusted returns in balanced portfolios most of the time but less so since the 1990s.**

Since WW2 the Sharpe ratio of the optimal portfolio was mostly higher if international bonds or equities were included in the investment universe. Especially during the 1970s, there were benefits from allocations to international markets but these have been broadly smaller since the 1990s, especially for equities – with little regional diversification benefits and the US offering much better Sharpe ratios, an allocation to non-US markets had little merit.

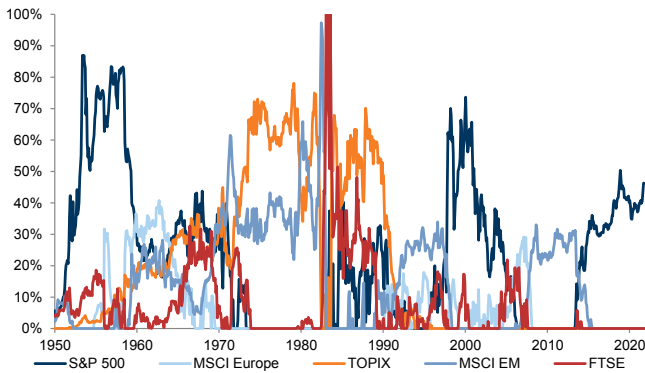
**Exhibit 41: Adding international bonds and equities has historically enhanced Sharpe ratios**  
10-year rolling Sharpe ratio of the optimal portfolio (in US\$, monthly returns)



Source: Datastream, Goldman Sachs Global Investment Research

**During the 1970s stagflation there were significant benefits from international equity diversification.** Non-US equities, EM and Japan received most of the equity allocation in the optimal portfolio (Exhibit 43).<sup>3</sup> Since 1950, the average optimal weight has been 5% for Europe, 8% for the UK, 19% for Japan and 15% for EM – for the US it was 23%. Since the GFC, the optimal portfolio has mostly been allocated to US equities, in line with the large outperformance vs. non-US markets (Exhibit 43).

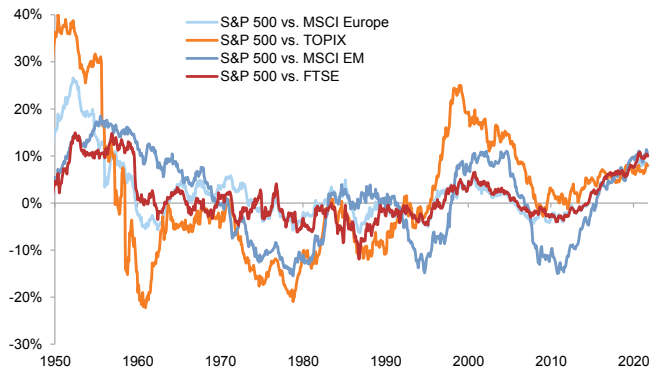
**Exhibit 42: US equities dominated non-US markets post GFC**  
Optimal weight in equity regions (in US\$, 10-year rolling, monthly returns)



Note: MSCI Europe from 1970, TOPIX from 1973, FTSE from 1986, MSCI EM from 1988.

Source: Datastream, Goldman Sachs Global Investment Research

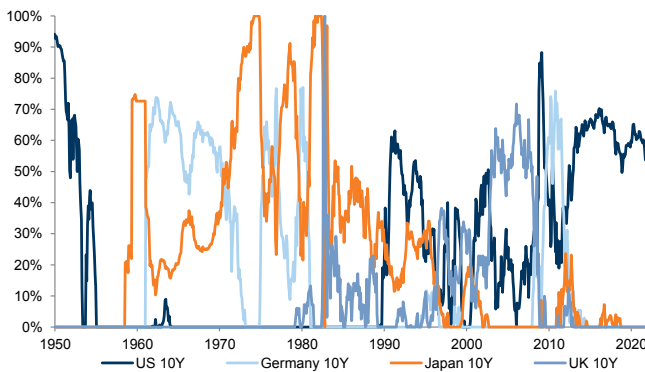
**Exhibit 43: Post GFC US equities outperformed non-US markets**  
10-year rolling relative equity return (total return, US\$)



Source: Datastream, Goldman Sachs Global Investment Research

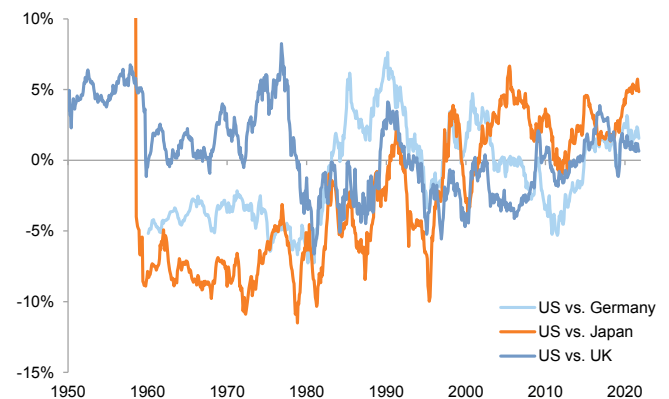
**Although for a US balanced portfolio during the 1970s the optimal equity weight was close to 100%, international bonds would have received some allocation and provided diversification benefits.** Allocations to Japan, German and later UK 10-year bonds would have enhanced Sharpe ratios – the average optimal allocation to non-US bonds since 1950 have been larger than for US treasuries (Exhibit 44). Post GFC, similar to equities, albeit less marked, US 10-year bonds outperformed non-US markets and dominated bond allocations (Exhibit 45).

**Exhibit 44: Last cycle US 10-year bonds had the largest allocation**  
Optimal regional bond allocations in a balanced portfolio (in US\$, 10-year rolling, monthly returns)



Source: Datastream, Goldman Sachs Global Investment Research

**Exhibit 45: US treasuries outperformed other main DM bond markets last cycle but less consistently before that**  
10-year rolling relative return of 10-year bonds (in US\$)



Source: Haver Analytics, Goldman Sachs Global Investment Research

<sup>3</sup> Admittedly there might have been restrictions and large costs to cross-border investments and international capital flows, especially before the 1970s.



## Diversification opportunities in non-US equities and Chinese government bonds

**Higher non-US equity allocations can improve diversification due to different duration, less synchronised business cycles and policy divergence, as well as geopolitical risks.** Also, as we wrote in [Global Strategy Paper: The Equity Duration puzzle](#),

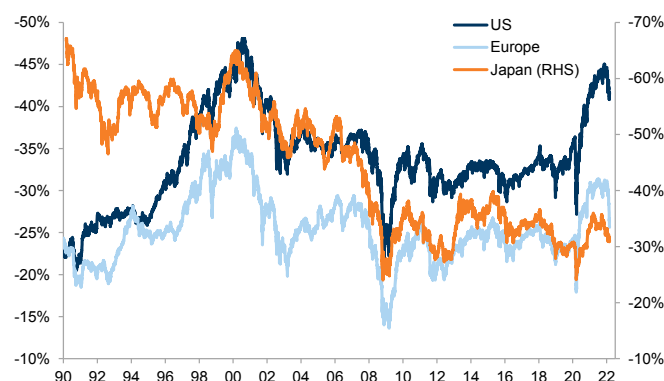
US equity duration increased materially during the COVID-19 crisis due to concentration in low-yielding growth stocks ([Exhibit 46](#)). In Europe equity duration has also increased but is much lower, and in Japan it has actually declined in recent years. In periods of elevated rates volatility in particular, allocations to non-US equities help diversify rate shock risk – this has been the case since the start of this year.

**We also expect less US equity outperformance in the coming years compared with the last cycle.** Higher equity valuations and margins in the US could become headwinds for returns while weaker growth for non-US equities is better discounted or

trend growth might pick up ([Exhibit 47](#)). We would expect regional earnings and dividend growth differentials to narrow in the Post-Pandemic Cycle. More granular regional views may make sense too – for example, given the large weight of Chinese stocks in broad EM equity indices, it will be increasingly important to consider diversification opportunities in EM ex-China equities separately.

**Exhibit 46: US equity duration is the highest across markets while in Japan it has declined since the late 1990s**

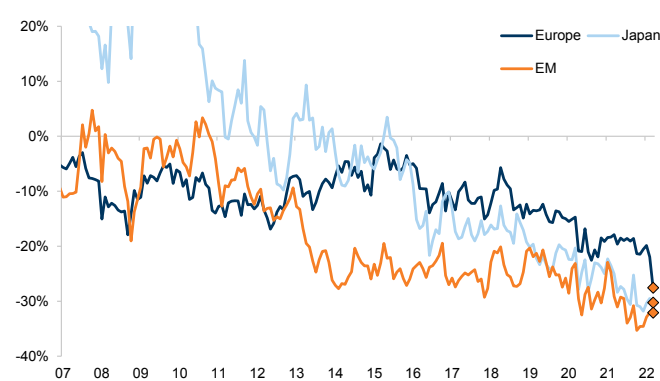
Equity duration estimate for +100bp in discount rate



Source: Datastream, Goldman Sachs Global Investment Research

**Exhibit 47: Non-US equities have de-rated even on a sector-neutral basis since the GFC**

24m sector-neutral P/E premium vs. US (based on MSCI Indices, GICS sector classification)



Source: FactSet, Goldman Sachs Global Investment Research

**While the opportunity set in DM fixed income is limited, there are opportunities from international bond diversification.** Post the recent bond sell-off US 10-year yields are among the highest across markets ([Exhibit 48](#)) but sticky, elevated inflation coupled with unusually flat yields and low forward rates reduces the attraction of DM sovereign bonds.

As our markets team has [highlighted](#), in an environment of high nominal growth, low starting yield levels, and synchronised central bank tightening, risks to G10 forward rates are likely still skewed to the upside.

**With higher inflation and desynchronised monetary policy across regions, there is more potential for return dispersion across global bond markets.** Our EM team has [highlighted](#) Chinese government bonds (CGBs) as a potentially attractive diversifier to international bond portfolios – they have a low correlation to US 10-year bonds and to the S&P 500 ([Exhibit 49](#)).

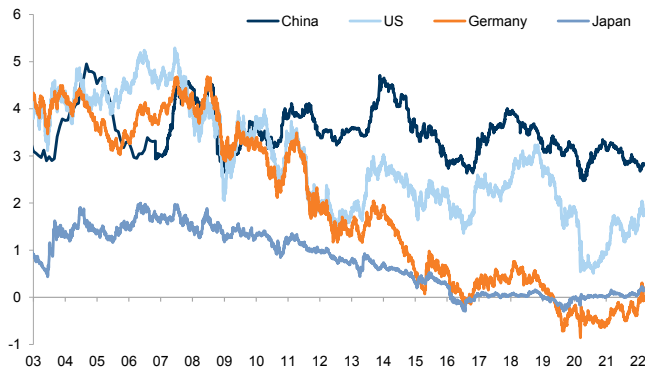
On the flip side, CGBs have reliably responded to shifts in



domestic macroeconomic conditions and can hedge China growth shocks. The yield/vol ratio for CGBs is relatively high and real yields are positive – our FX strategists are also constructive on the Yuan in the medium term.

**Exhibit 48: Chinese 10-year bonds have decoupled from major DM bond markets recently**

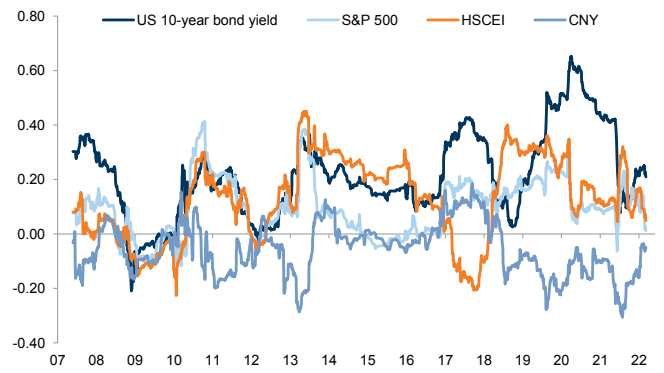
10-year yields (%)



Source: Datastream, Bloomberg, Goldman Sachs Global Investment Research

**Exhibit 49: Chinese government bonds are less correlated with US assets and linked to the local cycle**

1-year rolling correlation of Chinese 10-year yields with other assets (weekly changes)



Source: Bloomberg, Goldman Sachs Global Investment Research

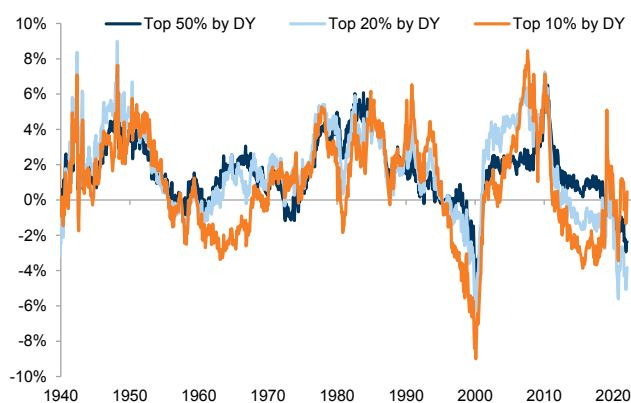
## (4) Equity-like bonds and bond-like equities

***A balanced portfolio is likely to perform better if it has cheap stocks with growth and bonds that offer attractive yields after inflation. But growth stocks are expensive and there are few bonds with positive real yields and the potential to buffer equities. In the search for capital growth and yield, multi-asset investors can reverse roles and look at equity-like bonds, such as convertibles, or bond-like equities, such as defensive, high dividend yield stocks.***

**With investors preferring cash flows in the near term compared with uncertain capital gains, the so-called bird-in-the-hand theory, high dividend yield stocks have been historically popular.** However, last cycle they broadly underperformed the market ([Exhibit 50](#)). In equities there is a trade-off between dividend yield and growth – investors demand a higher yield upfront to compensate for less potential for capital gains. If companies are paying out more earnings and reinvesting less, that often means lower growth and possibly higher leverage.

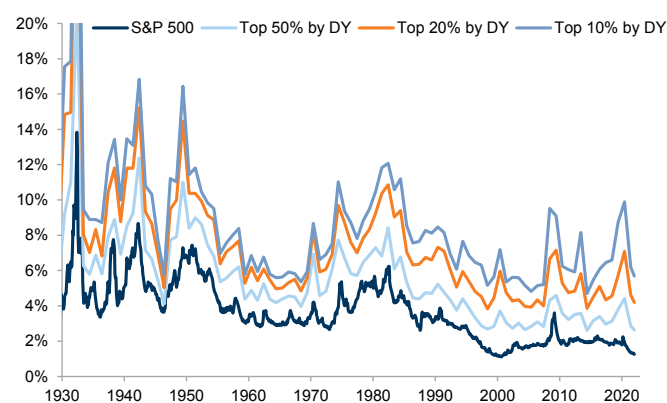
**Last cycle and during the COVID-19 crisis, high-yielding stocks underperformed as a lot of them turned out to be ‘value traps’ while falling bond yields boosted longer duration stocks.** However, during the 1970s stagflation high dividend yield stocks outperformed, as they also did during the 2000s, starting when the Tech Bubble burst. Also, US stocks with the highest dividend yields (top 10%) have underperformed to a lesser extent recently and their yield advantage is material – the top decile offers in excess of 5% yield.

**Exhibit 50: Last cycle and during the Tech Bubble high dividend yield stocks underperformed sharply but less otherwise**  
10-year rolling return of high dividend yield stocks vs. S&P 500



Source: Bloomberg, Kenneth French, Goldman Sachs Global Investment Research

**Exhibit 51: The yield advantage for high dividend yield stocks is substantial**  
Dividend yield



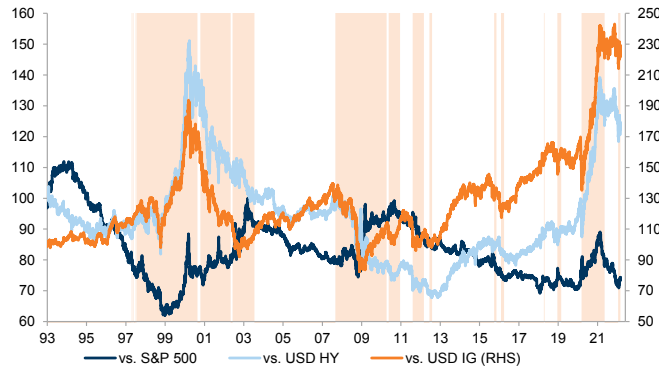
Source: Kenneth French, Goldman Sachs Global Investment Research

**Investors can move down-in-quality in bonds towards credit in order to improve potential for real yield and capital growth.** There are some areas within credit that can generate equity-like returns and potentially attractive risk/reward in the portfolio context – these include high yield credit, hybrids such as AT1s, CLOs, and convertibles. Often these assets do not have clear end-investors and thus may offer better risk/reward due to investor segmentation and supply/demand imbalances.

**Convertibles can provide upside exposure to equity through their embedded call**

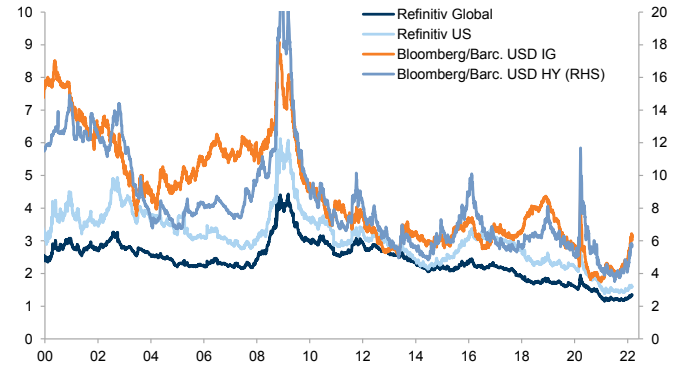
**option.** They have outperformed credit through cycle and particularly from midcycle – credit tends to perform best in the recovery from a recession and convertibles are usually relatively low duration. They have also outperformed equities more late cycle and during bear markets as they have an element of downside protection. Rising volatility acts as a tailwind for convertible valuations as it may increase the value of the embedded option. Of course, that optionality comes at a cost – convertible yields have been lower than USD HY credit but not much more than IG ([Exhibit 53](#)).

**Exhibit 52: Convertibles outperformed equities late cycle**  
Relative total return of ICE BofA US Convertibles (orange shading = 3m average VIX above 20. Indexed to 100)



Source: Bloomberg, Datastream, Goldman Sachs Global Investment Research

**Exhibit 53: The yield disadvantage of convertibles vs. IG credit is relatively small**  
Yield-to-maturity

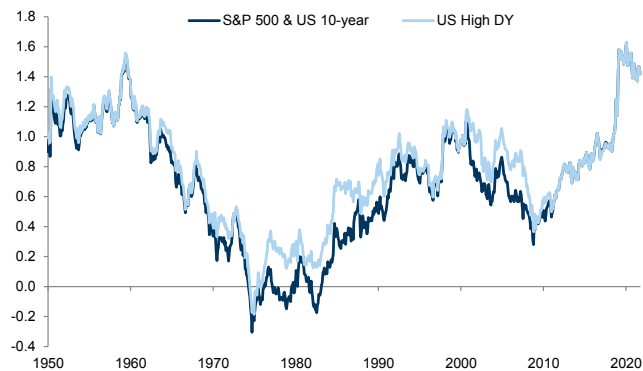


Source: Bloomberg, Datastream, Thomson Reuters Eikon, Goldman Sachs Global Investment Research

**Equity-like bonds and bond-like equities in the portfolio**

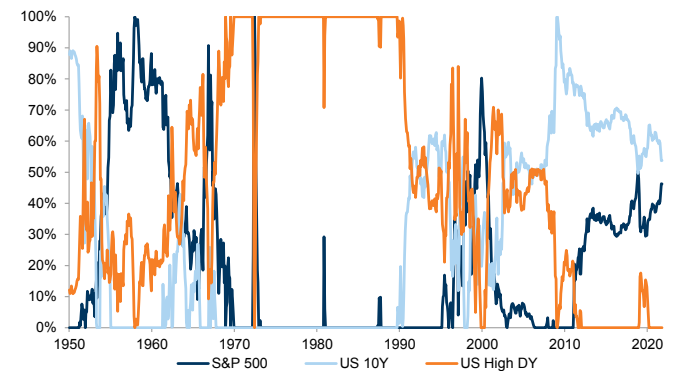
Owing to their overlap with value, high dividend yield stocks had a similar impact to Sharpe ratios for the optimal balanced portfolio in the 1970s and 2000s ([Exhibit 54](#)). The average allocation since 1950 has been 51% vs. just 26% for the S&P 500 ([Exhibit 55](#)). As we wrote in [Global Strategy Paper: The Equity Duration Puzzle](#), the dividend yield is often a good indicator of equity duration – higher yields point to lower sensitivity to changes in interest rates and the equity risk premium. Since the GFC the optimal allocation to high dividend yield stocks has been low, similar to value.

**Exhibit 54: High dividend yield stocks improved the risk/reward during the 1970s and 2000s**  
10-year rolling Sharpe ratio for the optimal portfolio (monthly returns)



Source: Datastream, Kenneth French, Goldman Sachs Global Investment Research

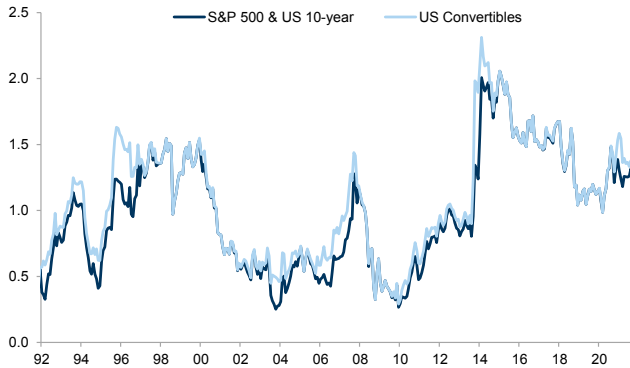
**Exhibit 55: Both in the 1970s and 2000s a large allocation to high dividend yield stocks improved the risk/reward**  
10-year rolling optimal weight (monthly returns)



Source: Datastream, Kenneth French, Goldman Sachs Global Investment Research

**Allocations to convertibles have also improved Sharpe ratios, albeit more marginally, but in particular around bear markets** (Exhibit 56). Convertibles received a larger allocation when moving late cycle, often dominating the S&P 500 – the average weight since 1987 was around 26% (vs. 22% for the S&P 500, due to limited history we look at 5-year rolling data, Exhibit 57). Last cycle direct equity investments dominated convertibles on a risk-adjusted basis – as a result the optimal allocation has been very low since the GFC. But it has picked up since the COVID-19 crisis.

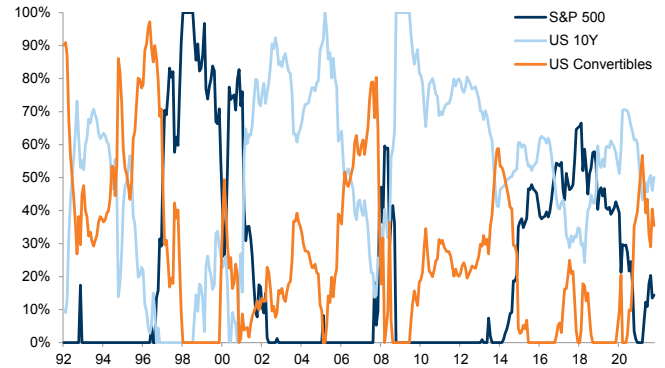
**Exhibit 56: Especially late cycle convertibles have improved the Sharpe ratio of balanced portfolios**  
5-year rolling Sharpe ratio of the optimal portfolio (monthly returns)



Note: Refinitiv US Focus Convertible index from 1997, ICE BofA US convertible index before.

Source: Bloomberg, Goldman Sachs Global Investment Research

**Exhibit 57: Convertibles often had a larger weight midcycle, dominating the S&P 500**  
5-year rolling optimal weight (monthly returns)

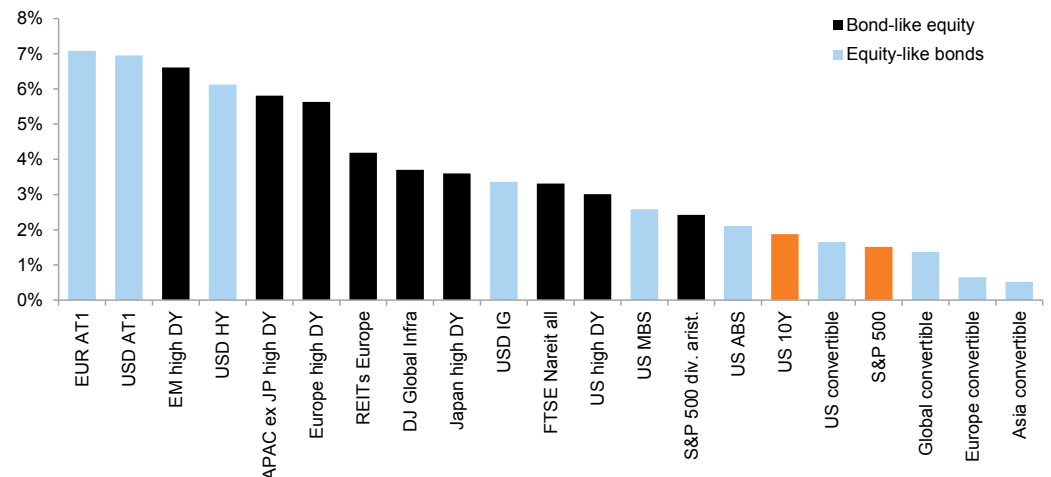


Source: Bloomberg, Datastream, Goldman Sachs Global Investment Research

**Yielding to high dividend yield stocks and convertibles**

**Bond-like equities can offer more attractive yields while convertibles do not sacrifice much considering equity optionality** (Exhibit 58). EM and European high yield stocks offer a material yield pick-up relative to a US 60/40 portfolio – and they also appear attractive relative to HY credit yields. Convertible yields are lower due to the cost of the embedded call option – but relative to the 60/40 yield this is not a large yield sacrifice considering the incremental optionality on equities.

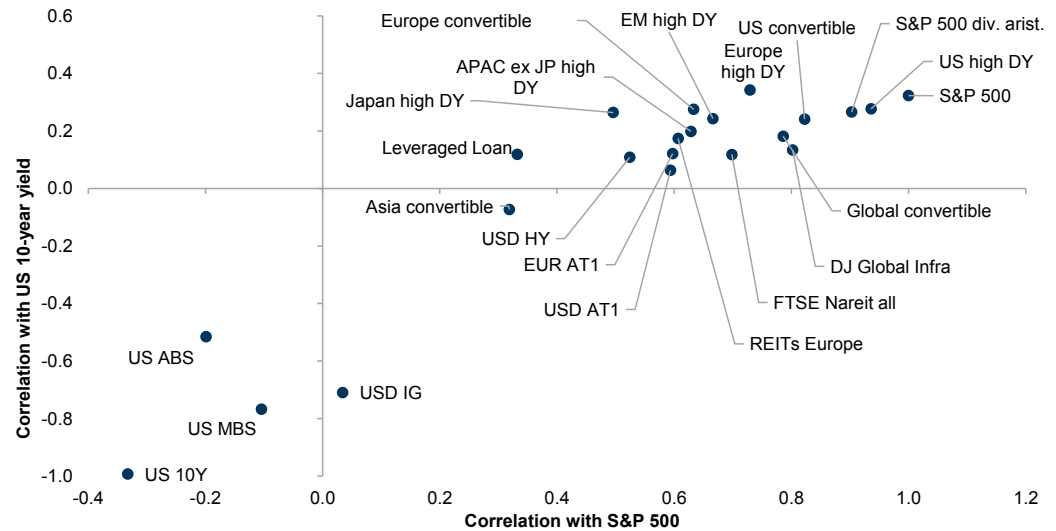
**Exhibit 58: Higher yielding stocks offer material yield pick-up while yield sacrifice for convertibles is small**



Source: Datastream, Haver Analytics, Thomson Reuters Eikon, Goldman Sachs Global Investment Research

**Both high dividend yield stocks and convertibles are short duration and positively correlated with US 10-year yields – the correlation with the S&P 500 was usually well below 1** (Exhibit 59). This points to some diversification benefits for US balanced portfolios. Of course, the correlations do not capture left tail risk and downside beta – in contrast to credit high dividend yield stocks and convertibles tend not to have higher downside than upside correlations.

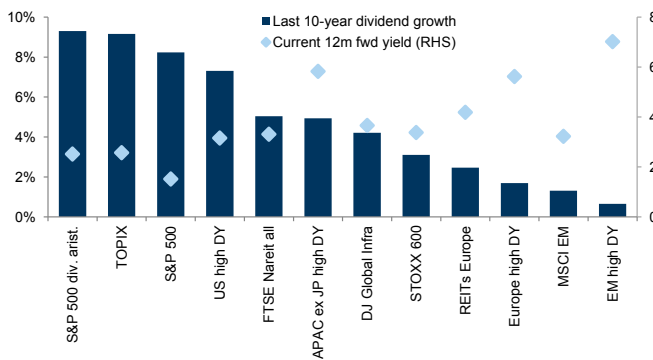
**Exhibit 59: Convertibles and high dividend yield stocks are less correlated with yields and the S&P 500**  
Data since 2000



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

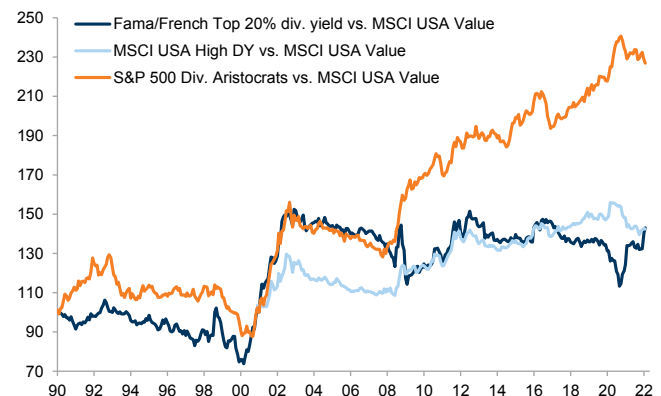
**High dividend yield stocks are more attractive in multi-asset portfolios, especially for investors focused on income.** However, investors need to balance the growth/yield trade-off – the highest yielding stocks often have weak long-term growth prospects and could end up as ‘value traps’. This was the case with poor dividend growth in Europe and EM in the last decade, resulting in a de-rating of valuations (Exhibit 60). However, companies with high dividend yields and growth outperformed materially vs. value (Exhibit 61). With higher dividend yields in Europe and Japan, there should more opportunities to find stocks with attractive growth/yield trade-offs.

**Exhibit 60: US dividend growth was much stronger in the last cycle compared to Europe/EM**



Source: Datastream, Bloomberg, Goldman Sachs Global Investment Research

**Exhibit 61: High dividend yield stocks with growth (Dividend Aristocrats) outperformed vs. value**



Source: Bloomberg, Kenneth French, Goldman Sachs Global Investment Research

**Allocations to convertibles can be attractive for multi-asset portfolios as they allow more equity exposure with lower drawdown risk.** US convertibles delivered nearly the same return as the S&P 500 since 2000 but better risk-adjusted performance. Convertibles have a shorter duration than USD IG credit and lower left tail risk and downside correlations compared with equity. And with rising equity prices, convertibles become more equity-like due to a rising delta. As a negative, convertible markets are relatively small and less liquid compared with equity and credit markets.

**Exhibit 62: Convertibles have matched returns of the S&P 500 since 2000 but with lower risk**  
Performance comparison (data since 2000, daily returns)

	S&P 500	USD IG	USD HY	Refinitiv Convertible indices			
				Global	US	Europe	Asia
Yield		3.4%	6.1%	1.4%	1.7%	0.7%	0.5%
Implied volatility				40%	45%	30%	28%
Delta				50.8	57.8	35.2	32.8
Market Cap (USD bn)				400.7	270.2	65.8	46.4
Annualised return	7%	6%	7%	5%	6%	3%	3%
Volatility	19%	5%	5%	9%	12%	7%	8%
Return / volatility	0.4	1.1	1.3	0.6	0.5	0.5	0.4
1-month hit ratio	64%	67%	68%	61%	62%	62%	59%
1-month 5% CVaR	-12%	-4%	-7%	-8%	-10%	-6%	-5%
Max drawdown	-55%	-17%		-42%	-48%	-38%	-26%
Correlation with S&P 500	1.0	0.0	0.5	0.8	0.8	0.6	0.3
Downside correl. S&P 500	1.0	0.1	0.5	0.7	0.7	0.5	0.2
Correlation vs. US 10Y yield	0.3	-0.7	0.1	0.2	0.2	0.3	-0.1

Source: Bloomberg, Datastream, Thomson Reuters Eikon, Goldman Sachs Global Investment Research

**Convertible indices also have different sector exposures from equity benchmarks.**

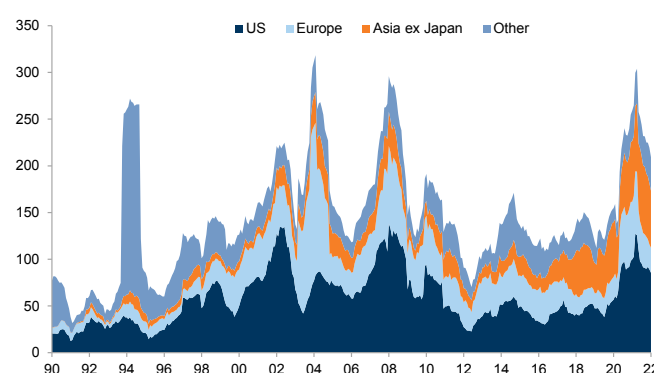
By virtue of offering capital to often un-rated, riskier issuers, the dominant sectors are usually growth-related, either cyclical or structural (Exhibit 63). This points to a more active management approach to convertible allocations. The rising cost of debt, both due to higher rates and wider credit spreads, coupled with elevated equity volatility, could drive increased issuance and opportunities in convertibles (Exhibit 64). With no natural investor base, having elements of both equities and credit, more issuance increases the potential for supply/demand imbalances and attractive risk premia.

**Exhibit 63: Tech has a large weight in most convertible indices**  
Current sector weight in regional ICE BofA convertible indices

	US	Europe	Japan	Asia ex JP	China
Automotive	3%	2%	1%	5%	9%
Basic Industry	2%	10%	27%	4%	2%
Consumer Goods	2%	1%	3%	1%	0%
Energy	2%	4%	3%	0%	0%
Financials	12%	12%	8%	14%	13%
Healthcare	17%	7%	7%	6%	6%
Industrials	4%	12%	4%	3%	3%
Leisure	5%	2%	1%	5%	6%
Retail	5%	15%	7%	14%	23%
Technology	29%	11%	9%	14%	13%
Telecoms & Media	10%	11%	6%	27%	21%
Transportation	2%	6%	18%	4%	1%
Utilities	6%	6%	5%	1%	2%

Source: Bloomberg, Goldman Sachs Global Investment Research

**Exhibit 64: The issuance of convertibles has increased during the COVID-19 crisis**  
12-month rolling convertible bond issuance (US\$ bn)



Source: Bloomberg, Goldman Sachs Global Investment Research

## (5) Searching for returns in private (markets)

***Selective private equity, real estate and debt investments can enhance the risk/reward of multi-asset portfolios. With lower returns and less diversification potential in public markets, private markets have grown materially. A key problem, however, is that they often have limited available transparent and comparable history, which makes it difficult to assess their risks and diversification benefits – they can also increase duration, leverage and illiquidity risk in the portfolio.***

**Allocations to private markets can enhance the real risk/reward for balanced portfolios by broadening diversification.** Investing in private markets has elements of market timing (both manager selection and allocation to different private markets and on account of the manager, who selects investments), there is leverage on the investment level and illiquidity risk. Over time fees can have a large impact on performance and cash flow management is different to public markets as investors need to commit capital but capital calls are uncertain in timing and size – as a result illiquidity risk can be high both on exit and entry.

**Owing to low frequency performance reporting, risks can be underestimated and diversification benefits overestimated.** There is likely some diversification benefit, e.g., due to sector and style differences and market timing, but private equity is still equity and private credit is still credit, with similar fundamental risks. Much of the demand for private markets is exactly because investors are looking to smooth returns – this could mean that they are overpaying and don't demand enough illiquidity risk premium. The counter-argument could be that public markets are too volatile, exacerbating fundamental volatility.

**Endowment investors<sup>4</sup> first embraced higher allocations to alternatives, including private markets.** Their long-term nature gave endowments more flexibility to invest in illiquid assets. Chambers, Dimson & Kaffe (2020) have shown how US University Endowments have increased allocations to alternatives from zero in the 1980s to currently more than 50%, and outperformed traditional assets on a risk-adjusted basis. Recently, other long-term investors such as pension funds and insurance companies have also increased allocations to private markets.<sup>5</sup>

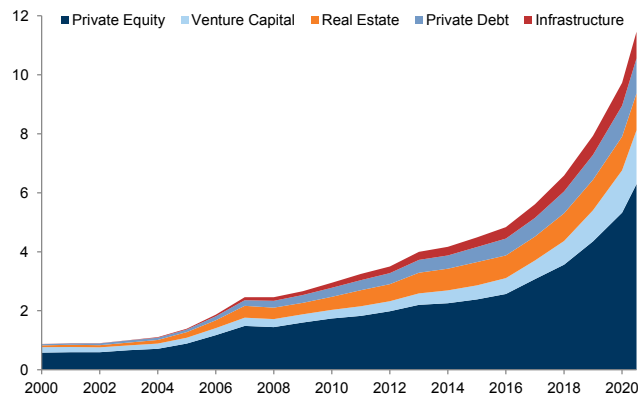
**AuM in private equity, credit, real estate and infrastructure combined are now near US\$12trn (Exhibit 65).** Private equity is the largest and oldest private market segment – however, private debt and real estate have seen sharp growth post the GFC. As our credit strategy team has highlighted, a higher bar for borrowers in the debt capital markets has allowed the private debt market to establish itself as a distinct asset class. The strong growth in private markets has resulted in a large amount of dry power, waiting to be deployed (currently US\$1.5trn in private equity alone, Exhibit 66), and eventually that will increase the risk of lower returns with more cash competing for investments.

<sup>4</sup> See Swensen (2009) for details on and the case for endowment style investing.

<sup>5</sup> See Preqin investor survey and GSAM Insurance Survey.

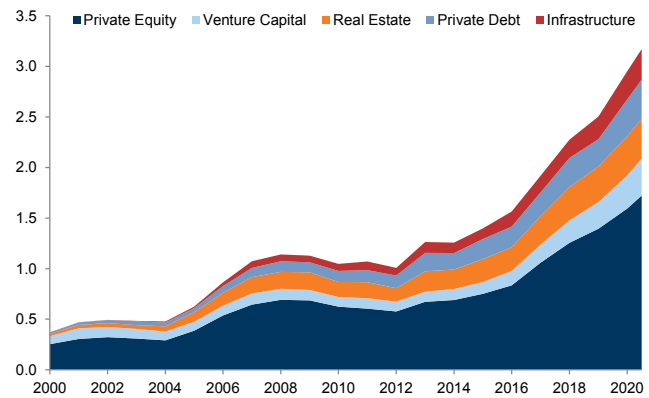


**Exhibit 65: US\$12trn assets under management in private markets**  
AuM (unrealised value + dry powder) in US\$ trillions, global



Source: Prequin, Goldman Sachs Global Investment Research

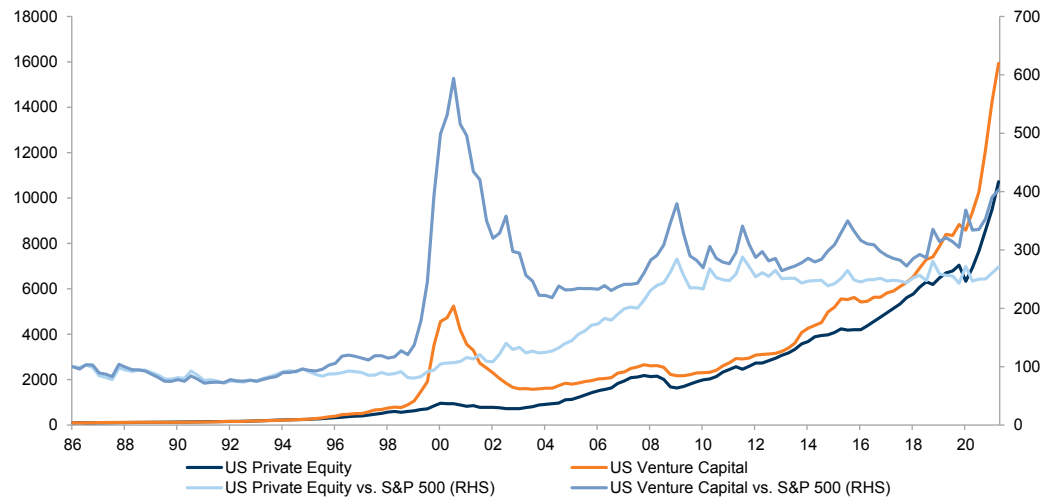
**Exhibit 66: Record high dry powder in private markets**  
US\$ trillions, global



Source: Pitchbook, Goldman Sachs Global Investment Research

**Since the 1980s private equity (PE) and venture capital (VC) have offered attractive returns vs. the S&P 500, albeit mixed over time.** PE broadly comprises leveraged buyouts, venture capital (early stage PE), growth capital, distressed investments and mezzanine capital. PE outperformed the S&P 500 in the 2000s but much less post GFC – VC performed particularly strongly in the run-up to the Tech Bubble ([Exhibit 67](#)).

**Exhibit 67: Broad private equity indices outperformed the S&P 500 in the 2000s, less post GFC**  
Total return performance (quarterly returns, Cambridge Associates PE index until Q2 2020, Prequin PE index after)



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

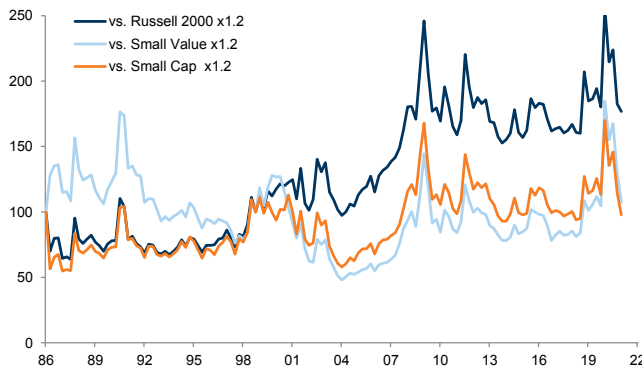
**Benchmarking PE returns to public markets is difficult due to embedded leverage and potentially riskier investments.**<sup>6</sup> Stafford (2022) recently showed that broad US PE performance could historically be replicated with leveraged exposure to US small/cap value stocks. Also, performance is measured as Return on Investment (ROI), which does not take into account the investment horizon, or Internal Rate of Return (IRR), which is annualised but holding periods can vary materially. Secondly, there can be large sector and style mismatches compared to equity benchmarks and embedded leverage.

<sup>6</sup> For an overview of different approaches to model risk and return of private equity, see Illmanen (2020).



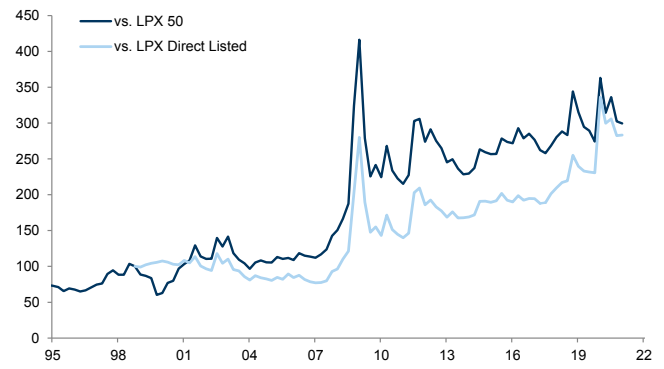
**The value bias at least in explains why PE outperformed in the 2000s and less since the GFC, when value mostly underperformed growth** (Exhibit 68). But either way performance dispersion in private markets tends to be high - specific PE funds can still outperform by market timing, use of leverage etc. - but this requires successful manager selection. For example, private equity has outperformed listed private equity (LPX 50 and LPX Direct Listed), which admittedly includes asset managers (Exhibit 69).

**Exhibit 68: PE outperformed less vs. leveraged small cap value**  
Total return performance



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

**Exhibit 69: Private equity has outperformed listed private equity**  
Total return performance of US private equity

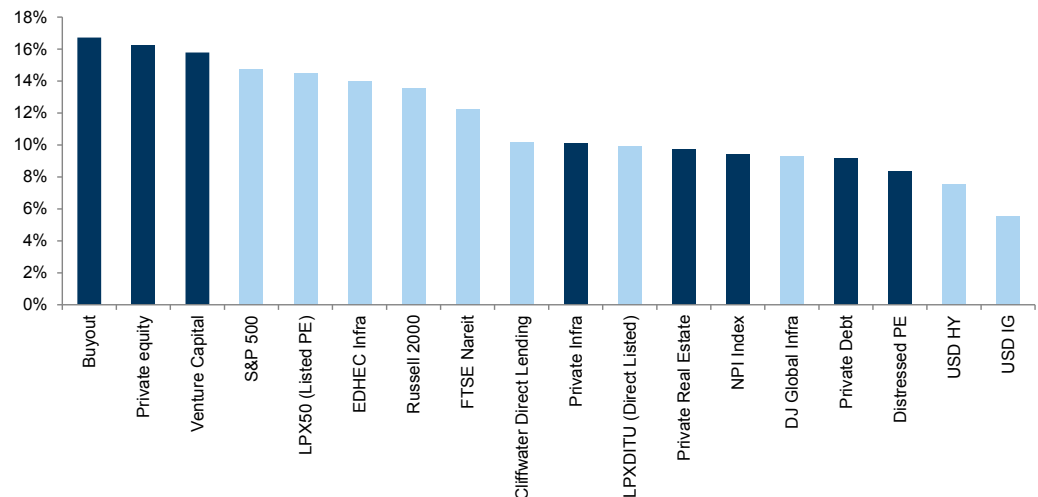


Source: Bloomberg, Haver Analytics, Goldman Sachs Global Investment Research

**Allocating in private in the Post-Pandemic Cycle**

**Private markets performed well compared vs. public market post GFC (after fees), although outperformance was small** (Exhibit 70). We think private markets can offer selective, attractive investment opportunities for multi-asset investors, especially those that benefit from smoothed performance, e.g., due to regulations. Also, private asset managers might be able to identify attractive assets that are not available in public markets. However, with increased competition there is risk of lower returns, making manager selection more important.

**Exhibit 70: Private markets have generally outperformed public markets post GFC, albeit narrowly**  
Annualised return since 2010

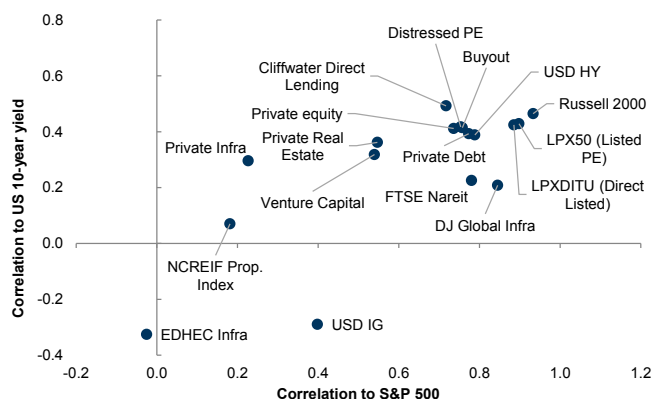


Source: Preqin, Datastream, Bloomberg, Goldman Sachs Global Investment Research

**Lack of comparable history makes portfolio modelling difficult – standard approaches to measuring risk and correlations are less suitable.** As our credit strategy team has [highlighted](#), in private markets there is a clear trade-off between lower volatility and the correlation to public markets but illiquidity risk. Estimating correlations and betas based on quarterly returns reveals some – albeit still relatively low – beta to the S&P 500 or US 10-year bonds for most private markets ([Exhibit 71](#)). Similarly, drawdowns in private equity, which has a long enough history to cover some recessions, seem low on quarterly returns ([Exhibit 71](#)). However, both are likely to be underestimated on quarterly data.

### Exhibit 71: Private markets have been less sensitive to public markets

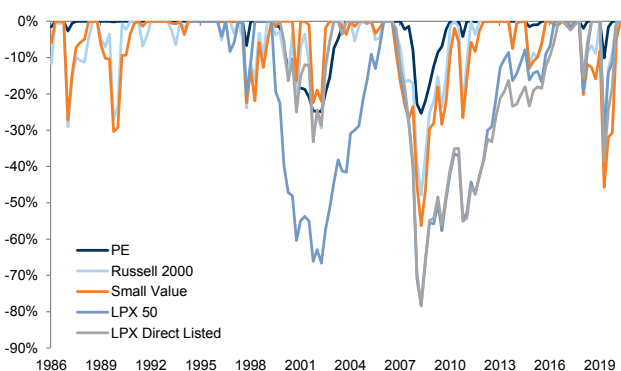
Data since 2010 (based on quarterly returns)



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

### Exhibit 72: Private equity had relatively small drawdowns to public markets

Maximum drawdown



Source: Haver Analytics, Goldman Sachs Global Investment Research

**Our credit strategy team [thinks](#) that post the COVID-19 crisis private debt markets should continue to offer attractive risk-adjusted returns.** The asset class has grown to over US\$1trn AuM and offers different sector and economic exposures. During the COVID-19 crisis defaults were broadly in line with public markets and there was relatively little distress among the investor base. A higher entry barrier for issuers in public markets and emphasis on greater flexibility from corporate managements should support growth. Also, liquidity has also declined in public credit markets in recent years. Across funds, direct lending strategies remain the largest category within private debt by AUM, followed by distressed debt and mezzanine funds.

**Private real estate and infrastructure investments are supported by growing demand for real assets and yield** (see also Strategy No. 1). An advantage of private relative to listed real estate or infrastructure is potential access to assets exposed to secular growth trends, such as warehouses, data centres, etc. or assets that offer more predictable cash flows, which are useful for asset liability management, such as long lease real estate. Pension and insurance regulation might allow for more private real estate and infrastructure investments – the [UK has recently investigated potential changes to its Solvency II regulation](#).

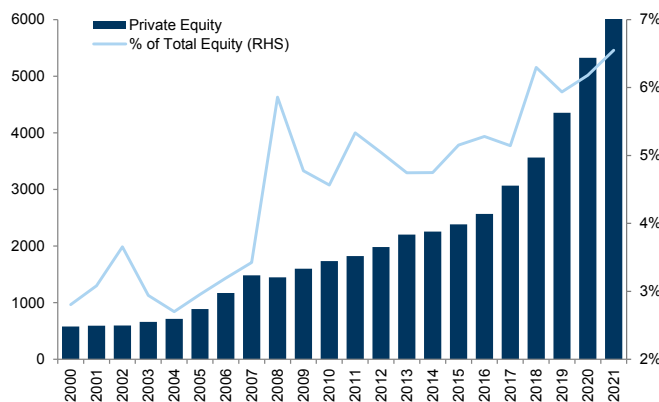
**Private equity (PE) can offer attractive investment opportunities.** PE as a percentage of listed market capitalisation is growing ([Exhibit 73](#)). The number of US listed companies has declined despite a record number of IPOs recently ([Exhibit 74](#)) – in part this is because of more stringent listing requirements but it is also due to more

M&A and larger buyout deals (Exhibit 75).<sup>7</sup> Companies staying private for longer means PE can offer more mature investment opportunities that carry less risk than VC or LBOs. This increases valuation risk, especially for growth equity investments - but SPACs and more active secondary markets could provide more exit opportunities going forward.

**PE can offer a wider opportunity set than public markets.** While in the last cycle there was more focus on growth equity investments (which led to higher LBO multiples), in the Post-Pandemic Cycle there might be more focus on value assets – the average LBO multiple could decline again vs. the broader market (Exhibit 76). We would also expect a broadening of sectors away from Technology to Financials, Education, Retail and Commodities, for example. PE might give access to sectors or companies that are not yet available in public markets, which have become more concentrated in large cap Tech, and thus offer diversification. Finally, PE might allow investors to guide companies more directly on ESG issues.

**Exhibit 73: PE still represents a small share of the equity market, but it is increasing**

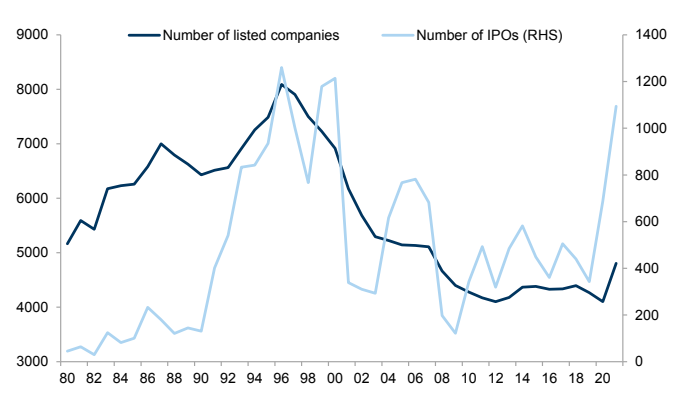
Global (compared with MSCI World market cap)



Source: Prequin, Datastream, Goldman Sachs Global Investment Research

**Exhibit 74: Number of listed companies has declined but record number of IPOs recently**

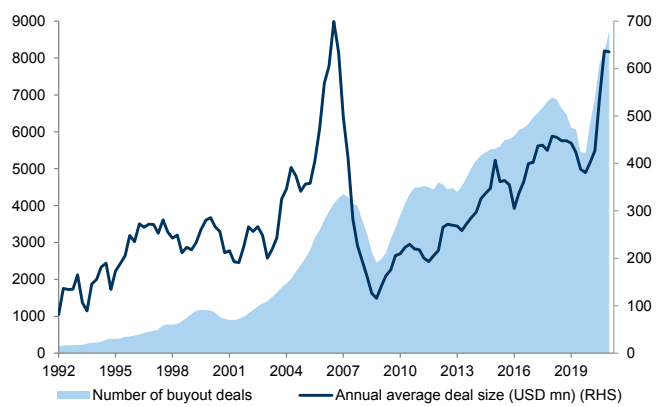
Data for US



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

**Exhibit 75: Number and average size of buyout deals has increased**

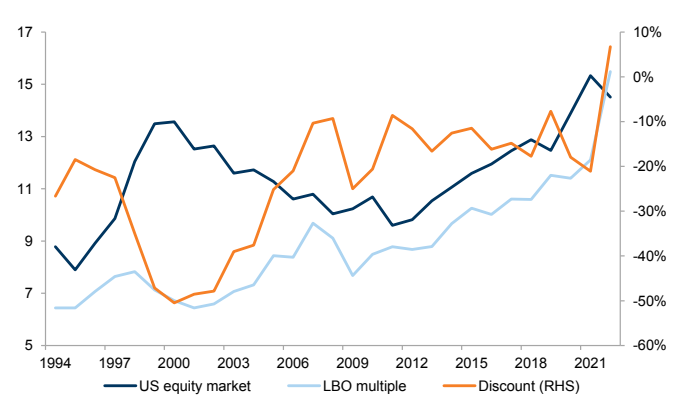
Data for US



Source: Prequin, Goldman Sachs Global Investment Research

**Exhibit 76: LBO multiples have been high since the COVID-19 crisis**

EV/EBITDA for US market



Source: S&P LCD, Datastream, Goldman Sachs Global Investment Research

<sup>7</sup> The passage of the Sarbanes-Oxley Act in 2002 increased reporting and governance standards, making it more burdensome to be a public company. However, Stulz (2017) has investigated the drivers of falling numbers of listed companies and while part might be due to more stringent listing requirements (and thus firm size) it is unlikely to be the only driver.

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