

GOAL Post

Recession obsession and chasing your tail risk

- With elevated inflation, the Fed tightening cycle accelerating and the US yield curve inverting, investors are increasingly worried about the risk of a recession. While rising inflation and rates have pushed investors to higher strategic allocations to real assets including equities, a recession could change that playbook materially on a tactical basis.
- **Forecasting recessions is difficult - while the yield curve has historically inverted ahead of recessions, it has been less useful for timing them.** Current high inflation might drive an earlier and deeper inversion. Looking at a broader range of market indicators, including cyclicals vs. defensives valuations, credit spreads and Fed funds pricing, might help gauge future recession risk. Currently they send a mixed message, with cyclicals vs. defensives valuations and the yield curve more bearish, and other indicators less so.
- **Low inflation and gradual monetary policy tightening since the Great Moderation has resulted in cycles becoming longer and lower macro volatility.** In fact, often imbalances in the economy that grew due to lack of macro volatility drove recession risk. Before then recessions were more frequent and often related to sharply higher rates and oil price shocks, similar to now.
- Most recessions triggered, or occurred around, equity bear markets, but not all of them – some equity drawdowns were smaller. Broadly, cross-asset performance during recessions since WW2 has been mixed, with poor returns in equities, credit and cyclicals vs. defensives the most consistent pattern. In part this is as recessions differed materially in terms of macro and market conditions, in particular in function of inflation.
- **Timing bear markets is even more difficult than forecasting recessions.** Often equities perform well into bear markets, correct sharply early on and can recover quickly if macro conditions improve. And timing the market competes with time in the market. In many cases it was better to stay invested in the early stages of an equity drawdown and manage risks on the way down. **With more equity drawdown risk we look for 'safe assets' to diversify portfolios better and option overlays to reduce portfolio risk in the coming months.**

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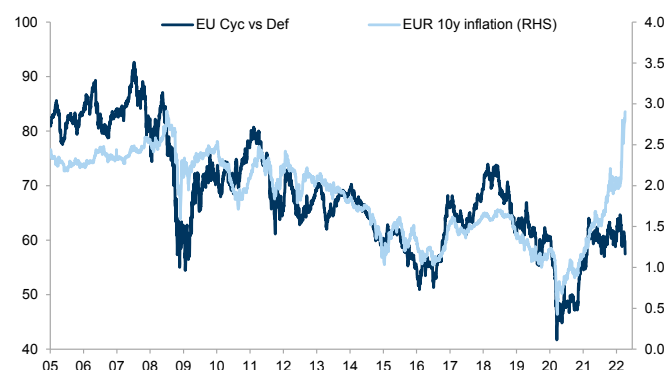
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Recession obsession — cross-asset performance and signals

Stagflation fears linger with growing recession concerns

Risky assets have recovered most of their YTD losses despite elevated inflation and lingering growth risks. The swift recovery increases vulnerability to growth shocks and negative macro surprises – our economists remain below consensus on growth across the regions, and in particular expect growth in Europe to dip into negative territory in Q2 and see downside risks in China. Stagflation concerns remain high, especially in Europe, amid the energy crisis due to the ongoing Russia/Ukraine war. As inflation expectations have continued to increase YTD, cyclicals have struggled vs. defensives ([Exhibit 1](#)). With the Fed embarking on one of the steepest hiking cycles since the 1990s, there are growing concerns over recession risk – **the US yield curve, the 2s10s spread, inverted last week** ([Exhibit 2](#)).

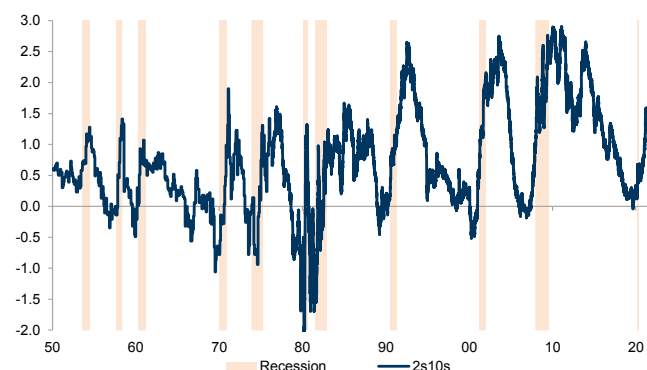
Exhibit 1: A large gap between cyclicals vs. defensives and breakeven inflation in Europe



Source: Datastream, Goldman Sachs Global Investment Research

Exhibit 2: US yield curves have now inverted, which historically has pointed to increased recession risk

US yield curve slope



Source: Haver Analytics, Goldman Sachs Global Investment Research

Market pricing of recession risk currently sending mixed signals

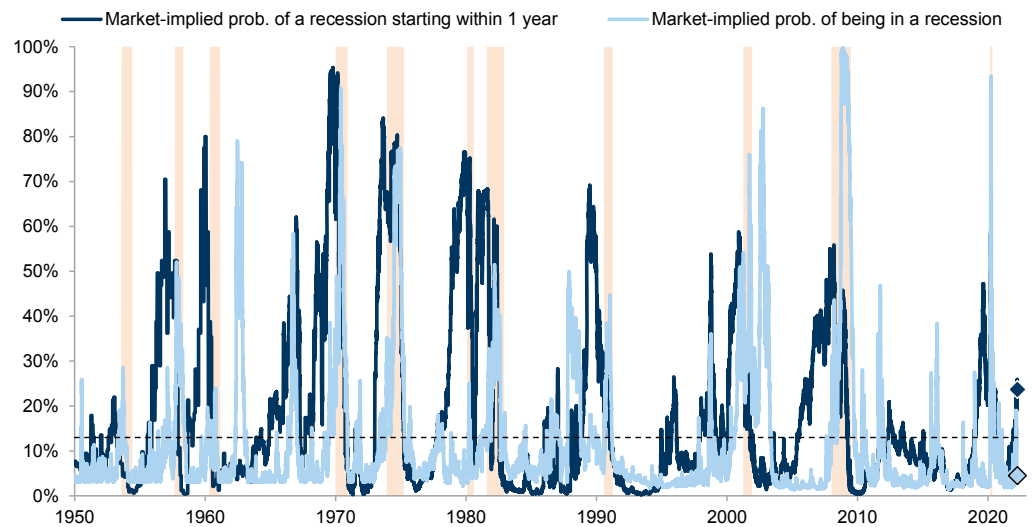
Market indicators for recession risk can send false signals. As we wrote before, since the late 1980s the time lag between US yield curve inversion and US recessions has been on average 20 months – so it can be an early warning signal. That said, there are often wrong signals – risky assets can correct sharply for reasons other than a recession and regularly overshoot. And, as our rates strategy team has highlighted, in periods of high inflation the yield curve has inverted between 100bp and 200bp before a recession and a mild inversion might generate a wrong signal.

Some market-based indicators are leading, most famously the yield curve, while others, such as risky assets, react mostly during or at the onset of recessions. We screen a wide range of indicators and pick those that, since 1950, have anticipated a recession in the next 12m but also those that are more coincident and reprice sharply when entering a recession (see Appendix for details). **Combining indicators might provide a better signal – on average both the leading and coincident indicators have picked up YTD but are currently not pricing much recession risk** ([Exhibit 3](#) & [Exhibit 4](#)):

- For the coincident indicators we use the S&P 500 1-year drawdown, the excess bond premium, USD HY credit spreads and the VIX – these increased sharply in Q1 due to Fed tightening fears and the Russia/Ukraine war. However, they have declined again materially – the likelihood of an imminent recession is priced very low now at 4%, which increases the risk of disappointment in the event of a sharp growth slowdown.
- For the leading indicators we use the 2s10s yield curve, the 12m forward implied change in the Fed funds rate, cyclicals vs. defensives P/E ratios and MBS spreads. Only the 2s10s yield curve and cyclicals vs. defensives P/E ratios are pointing to higher than normal recession risk – the others point to very little risk.

Exhibit 3: Market-based indicators have priced a higher probability of a recession in the next year

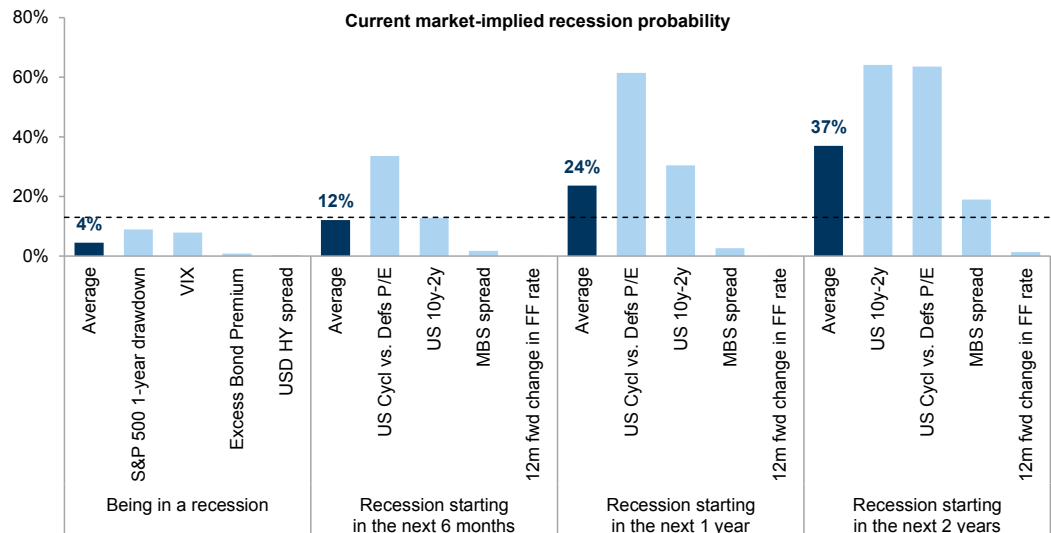
Market-implied US recession risk (average of univariate logit models). Orange shade: NBER recession. Dashed line: unconditional probability



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

Exhibit 4: US 10y-2y yield curve and cyclicals/defensives point to highest probability of a recession

Market-implied US recession probability based on an univariate logit model. Maximum history since 1950

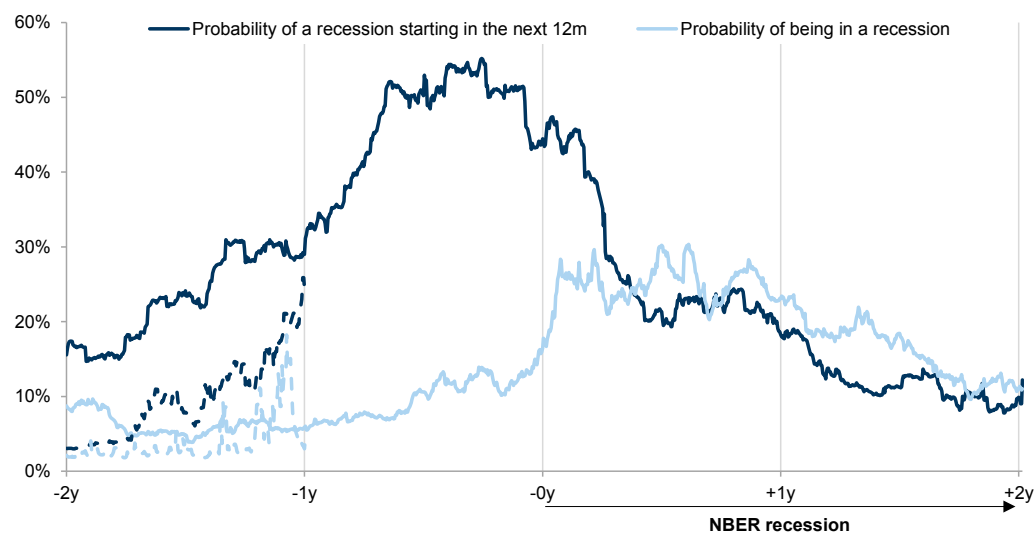


Source: Haver Analytics, Datastream, Worldscope, Bloomberg, Goldman Sachs Global Investment Research

Current market-implied recession probabilities are still below the levels that would normally indicate a recession. Our markets strategists found, when combining different segments of the yield curve a low probability of recession in the next 12m is priced, but a 38% probability in 24m. And cyclicals vs. defensive valuations historically gave some wrong signals – recently they have likely also suffered due to rising commodity prices and supply chain disruptions rather than only recession risk.

Recession probabilities do not have to go to 100% – levels close to 40-50% for *leading* indicators and around 20-30% for *coincident* indicators gave a strong signal that we may be facing or are in a recession. Based on the average of the leading and coincident indicators, current market-implied recession risk does not appear to be very high – especially after the strong recovery in risky assets recently, coincident indicators suggest markets have faded imminent recession risk.

Exhibit 5: Indicators are still low compared with where they were historically ahead of recessions
Dashed line = current. Average market-implied probability around recessions since 1950



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

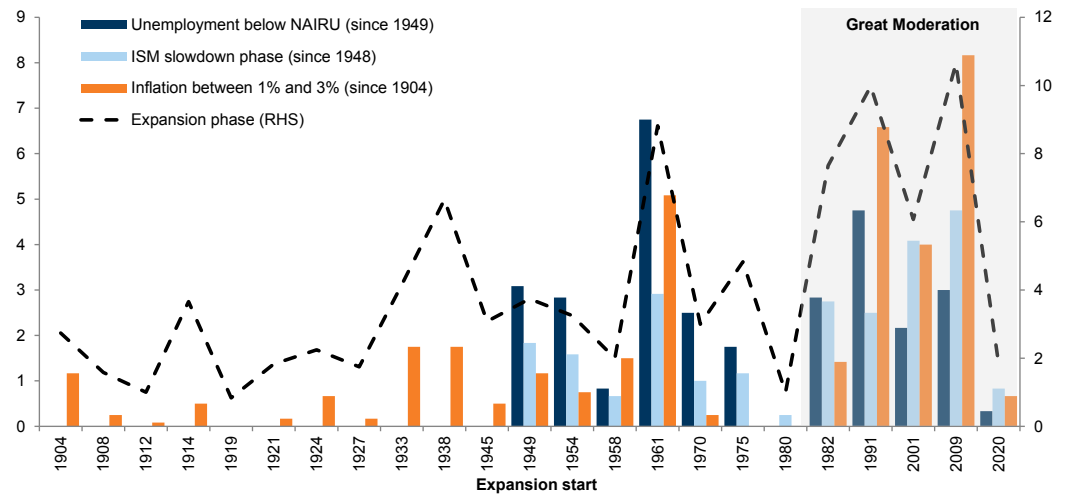
And those market-based indicators do not incorporate macro conditions. Our economists' recession risk model includes the yield curve (0-6 quarter) spread, the excess bond premium, as well as current levels of growth, overheating risk via core inflation and the private sector financial balance. While they see recession risk as above average this year, they think a recession would likely be mild by historical standards as the economy lacks major financial imbalances and labour markets remain strong. Our economists' baseline forecast also assumes that further service sector reopening and spending from excess savings will keep real GDP growth positive in the coming quarters – **but uncertainty around the outlook is higher than normal, and they assess the risk of a recession at 20-35% (above the unconditional average of 15%).**

High macro uncertainty as inflation volatility might drive growth risk

After the Great Moderation US cycles have become longer due to more anchored inflation since the 1990s, which has allowed central banks to err on the side of caution and buffer growth shocks. The same was true in the 1950s and 1960s. Since

the 1990s it has been mainly growth volatility driving rates volatility and equity/bond correlations have been negative. As a result unemployment has been below NAIURU for longer, ISM slowdowns have lasted longer, the yield curve has inverted earlier and inflation has been between 1% and 3% for longer (Exhibit 6).

Exhibit 6: With the 'Great Moderation' late-cycle periods have become longer
Time spent (years)

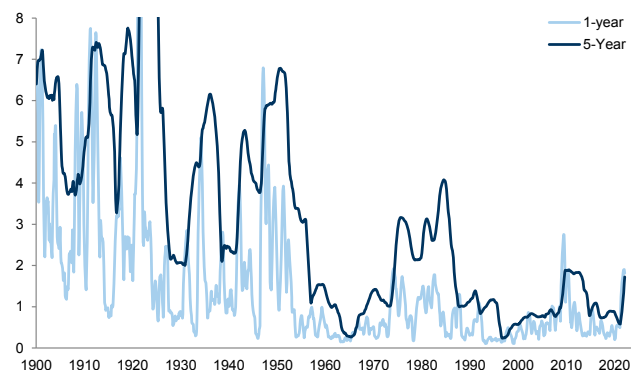


Source: NBER, Haver Analytics, Datastream, Goldman Sachs Global Investment Research

However, inflation volatility has increased sharply since the COVID-19 crisis and is back to levels last seen in the 1970s (Exhibit 7). While inflation volatility was also elevated during the GFC, this was due to sharp declines in inflation – currently, inflation is overshooting on the upside driven by a combination of a strong consumer recovery due to reopening, labour cost inflation and supply-side shocks from commodities and global supply chains. This, coupled with the ongoing monetary policy normalisation, increases the potential for more macro volatility – inflation and rates volatility might drive higher growth volatility and a more positive equity/bond correlation. **Macro uncertainty has remained very high in the recovery from the COVID-19 recovery (Exhibit 8).**

Exhibit 7: Inflation volatility has increased materially, nearing levels from the 1970s

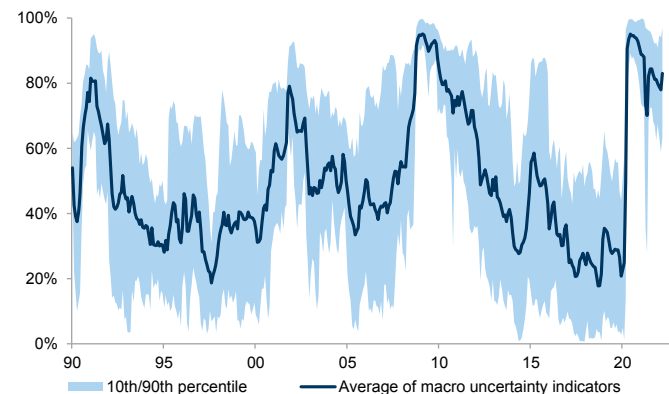
Volatility of US CPI yoy inflation



Source: Shiller, Goldman Sachs Global Investment Research

Exhibit 8: Macroeconomic uncertainty remains very elevated despite decreasing since the covid recession

Percentiles of dispersion & std of revisions for cons. GDP/inflation; volatility of NPF, unemployment & inflation; 3m chg in EPU index



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

Most recessions triggered bear markets but mixed cross-asset response
Not all equity bear markets occur during recessions but most recessions triggered large equity drawdowns. The depth of US recessions varied materially as well as the source, i.e., a supply or demand shock. Many pre-WW2 recessions originated in the financial sector, whereas many post-WW2 recessions were caused by oil shocks and monetary policy tightening due to inflation, as well as sentiment-driven swings in borrowing and investment. With longer business cycles and lower macro volatility since the 1990s, the build-up of such imbalances has become more frequent.

Exhibit 9: Recessions have been very different in terms of broader macro conditions

US recessions			Fed Funds rate		Real GDP		ISM		CPI		Core CPI		Unemployment	
Start	End	Length (months)	At start	Change	YoY at start	Peak to trough	At start	Change	At start	Change	At start	Change	At start	Change
Jul-1953	May-1954	10			6.8	-2.4%	46	3.8	0.4	0.4			2.6	3.3
Aug-1957	Apr-1958	8	3.2	-2.0	3.1	-3.0%	45	-6.2	3.6	0.1			4.1	3.3
Apr-1960	Feb-1961	10	3.9	-1.4	2.0	-0.3%	45	-1.7	1.9	-0.5	2.0	-1.3	5.2	1.7
Dec-1969	Nov-1970	11	9.0	-3.4	2.1	-0.2%	52	-12.3	5.9	-0.3	5.9	0.7	3.5	2.4
Nov-1973	Mar-1975	16	10.0	-4.5	4.0	-3.1%	68	-36.5	8.3	2.2	4.7	6.6	4.8	3.8
Jan-1980	Jul-1980	6	13.8	-4.8	1.4	-2.2%	46	-11.2	13.9	-0.7	12.0	0.4	6.3	1.5
Jul-1981	Nov-1982	16	19.0	-9.8	4.4	-2.5%	47	-7.5	10.8	-6.3	11.1	-5.9	7.2	3.6
Jul-1990	Mar-1991	8	8.2	-2.0	1.7	-1.3%	47	-5.9	4.8	0.0	5.1	0.1	5.5	1.3
Mar-2001	Nov-2001	8	5.3	-3.2	2.3	0.5%	43	1.0	3.0	-1.1	2.6	0.1	4.3	1.2
Dec-2007	Jun-2009	18	4.2	-4.0	1.9	-4.3%	49	-3.2	4.1	-5.3	2.4	-0.7	5.0	4.5
Feb-2020	Apr-2020	2	1.6	-1.5	2.5	-10%	50	-8.6	2.2	-1.7	2.3	-0.8	3.5	11.3
Current			0.2		3.9		57		7.9		6.4		3.6	

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

The trigger for a recession determines the subsequent growth/inflation mix – during the 1970s stagflation and the 1990s Gulf War, inflation pressures remained high during recessions (Exhibit 9). Low and anchored inflation since the 1990s has allowed swift and aggressive central bank easing to buffer the business cycle while lingering inflation constrains policy responses. Finally, unemployment was much higher during the 1970s compared to now – as our economists have highlighted, current strong payroll growth and wage gains are likely to help offset the commodity price shock. And real rates are broadly still very negative, which is a big difference to historical recessions.

Exhibit 10: Cross-asset performance during recessions varied materially

NBER recession			Real performance during the S&P 500 drawdown												
Peak	Trough	Length	S&P 500	MSCI Europe	TOPIX	MSCI EM	US 10Y	DJ Corp (TR)	Gold	Oil	GSCI	DXY	JPY	Value vs Growth	Cycl vs Defs
Jul-53	May-54	0.8	-13%	9%	-8%	1%	-2%	-3%	-	9%	-10%	-	-	-7%	-6%
Aug-57	Apr-58	0.7	-21%	-14%	4%	-5%	8%	-10%	-	0%	5%	-	-	-4%	-18%
Apr-60	Feb-61	0.8	-12%	32%	36%	17%	8%	7%	-	-2%	-5%	-	-	-4%	-11%
Dec-69	Nov-70	0.9	-38%	-16%	9%	7%	-14%	-8%	-	-4%	5%	-	-	3%	-2%
Nov-73	Mar-75	1.3	-54%	-49%	-42%	-36%	-16%	-16%	100%	189%	101%	-22%	-16%	44%	11%
Jan-80	Jul-80	0.5	-16%	-14%	-8%	-7%	-20%	-22%	14%	22%	-8%	0%	-17%	-4%	5%
Jul-81	Nov-82	1.3	-30%	-5%	-6%	-41%	5%	4%	-53%	-23%	-31%	20%	-29%	47%	-32%
Jul-90	Mar-91	0.7	-21%	-19%	-33%	-19%	-3%	-1%	6%	134%	50%	-13%	14%	-3%	-16%
Mar-01	Nov-01	0.7	-38%	-42%	-41%	-52%	17%	13%	-2%	-12%	4%	4%	-12%	76%	-30%
Dec-07	Jun-09	1.5	-56%	-58%	-57%	-61%	19%	-1%	22%	-42%	-49%	12%	16%	-32%	-33%
Feb-20	Apr-20	0.2	-33%	-35%	-22%	-31%	8%	-11%	-3%	-56%	-35%	3%	1%	-23%	-17%
Average	0.9	-30%	-19%	-15%	-21%	1%	-4%	12%	19%	2%	0%	0%	-6%	8%	-14%
Median	0.8	-30%	-16%	-8%	-19%	5%	-3%	6%	-2%	-5%	3%	-12%	-4%	-16%	
Hit ratio		0%	18%	27%	27%	55%	27%	57%	36%	45%	57%	43%	36%	18%	

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

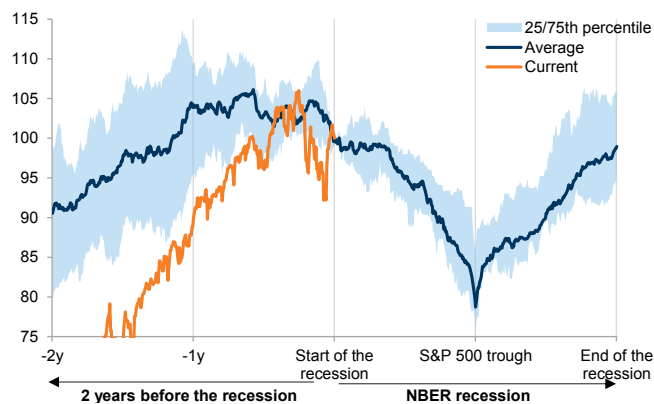
Not all recessions drove deep, prolonged equity bear markets and cross-asset performance varied (Exhibit 10). The most severe real equity drawdowns were during the 1970s as well as the Tech Bubble burst and during the GFC due to the unwind of imbalances. But several equity drawdowns were smaller, especially during the 1950s/1960s. Bonds had a mixed track record: during the 1970s and the 1991 Gulf War

they did not provide much of a buffer. Commodities were the mirror image, pointing to diversification benefits during supply-side shocks in the 1970s and early 1990s. During most recessions, cyclicals have underperformed defensives and credit has delivered poor real returns.

Equity/bond momentum fades and credit spreads widen into recessions

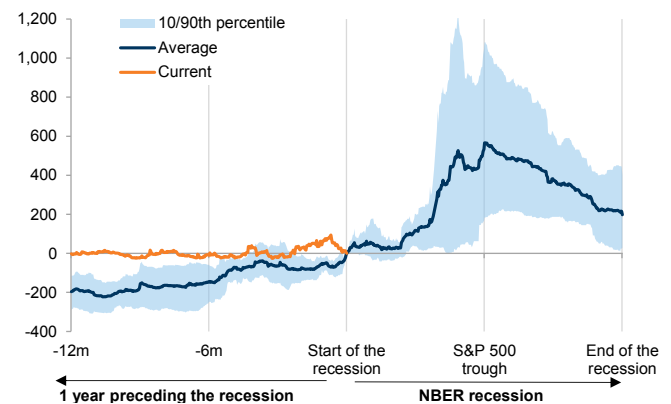
Positive equity momentum tends to fade into a recession, although material negative price momentum only appeared after the recession started. Still, with worsening macro momentum, equities are more range-bound and volatile – they become stuck in a ‘fat and flat’ range for a few months (Exhibit 11). Credit spreads usually also widened into a recession – since the 1990s USD HY credit spreads widened around 200bp on average ahead of the recession (Exhibit 12). But, similar to equities, most of the risk repricing tends to be during the recession. Bond yields had a mixed response into recessions depending on the level of inflation – again, the response differed before the 1990s and since, with bond yields usually declining into recessions due to deflationary risk (Exhibit 13). Commodities, as spot assets, have seldom declined into recessions and before the 1990s they often increased further in the early stages of recessions due to supply disruptions (Exhibit 14).

Exhibit 11: Equity momentum fades before a recession
Indexed S&P 500 performance around recessions since 1950



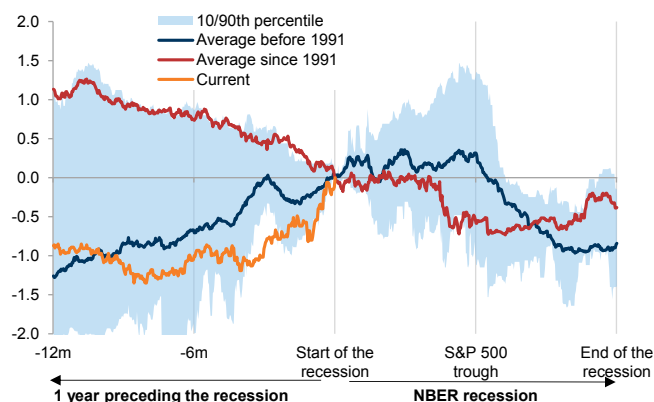
Source: Bloomberg, Goldman Sachs Global Investment Research

Exhibit 12: HY credit spreads widen well ahead of recessions
Change in USD HY spread (bps) around recessions since 1990



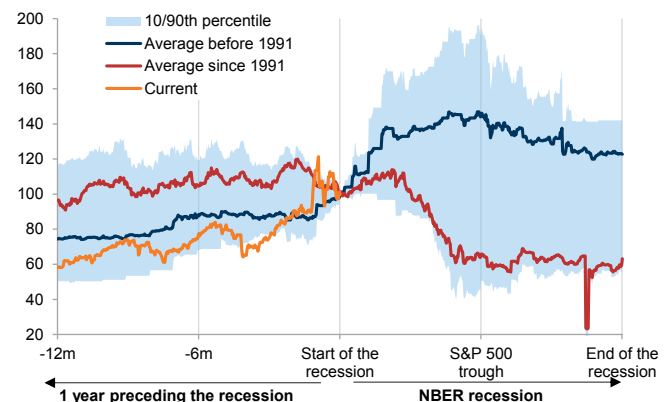
Source: Haver Analytics, Goldman Sachs Global Investment Research

Exhibit 13: US 10-year yields mixed ahead of recessions
Change in US 10Y rate (%) around recessions since 1950



Source: Haver Analytics, Goldman Sachs Global Investment Research

Exhibit 14: Oil prices often rallied into recessions
Indexed oil price around recessions since 1973



Source: Bloomberg, Goldman Sachs Global Investment Research

Asset allocation implications and chasing your tail risk

In our asset allocation are OW equities and commodities, and UW bonds & credit.

We prefer real to nominal assets and would manage duration risk both across and within assets. Given the hawkish pivot from global central banks YTD, sharply higher and volatile commodities prices and the Russia/Ukraine crisis, we acknowledge that headwinds for most assets have increased. We are also OW cash, owing to more competition from cash for fixed income assets due to central bank tightening and to reduce portfolio risk given the more challenging macro conditions. While we think equities have a good chance of beating inflation in the long run, they might be stuck in a 'fat and flat' range for some time with more opportunities for market timing.

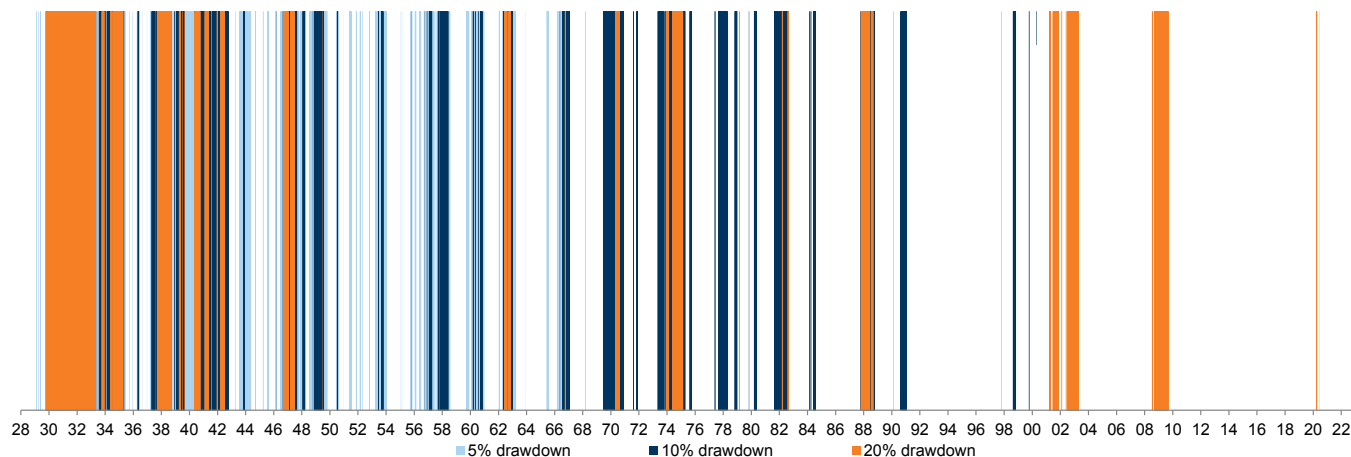
Timing the market vs. time in the market

We think that equity drawdown risk has increased since the recovery, especially as macro data and earnings seasons in Q2 could surprise negatively.

Before the 1990s, and especially during the 1970s, equity drawdowns were more frequent, and in particular equity corrections (10-20%) ([Exhibit 15](#)) – and equities were mostly range-bound, i.e., stuck in a 'fat and flat' range. There were unsurprisingly large benefits from avoiding deep bear markets. As we [wrote](#) before, since 1900 it has taken on average c.3 years to recover from a normal S&P 500 bear market (drawdown >20%).

Exhibit 15: While there have been several large drawdowns since the GFC, there was no bear market until the Covid crisis

Occurrence of S&P 500 drawdowns within a 12-month window

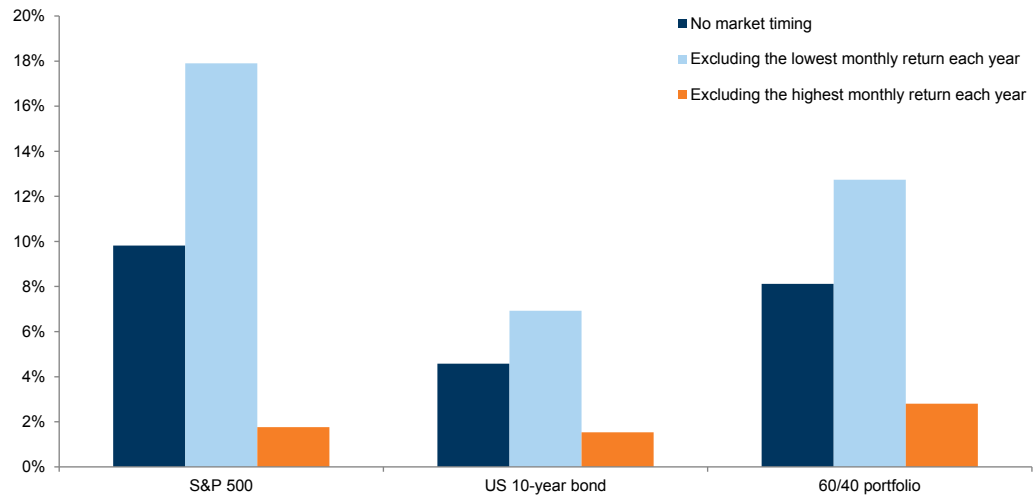


Source: Bloomberg, Goldman Sachs Global Investment Research

Avoiding equity drawdowns would unsurprisingly improve returns materially

relative to buy-and-hold. Since 1900 the S&P 500 has delivered a c.10% return p.a. ([Exhibit 16](#)) but returns would likely have been much higher if investors had avoided the most negative return month each year – close to 18% p.a. However, timing the market always competes with time in the market: it has also been costly not to be invested in the highest return month each year – returns would have fallen to 1.5% only, removing all of the equity risk premium and resulting in lower returns than for US 10-year bonds.

Exhibit 16: Timing the market - avoiding the worst months adds roughly the same as missing the best
 Annualised, cumulative total return since 1900 (nominal)

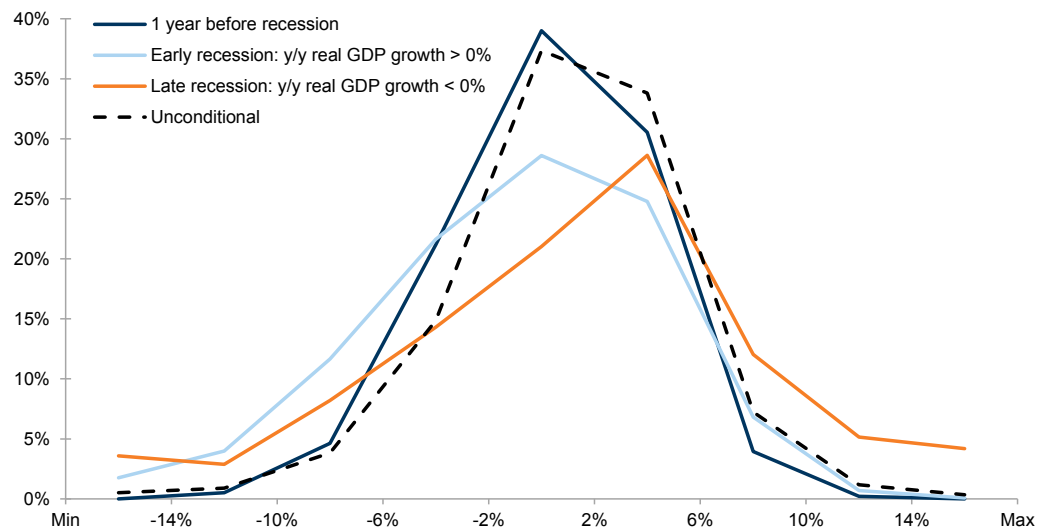


Source: Haver Analytics, Goldman Sachs Global Investment Research

Timing bear markets when a recession is expected is difficult

Market timing around recessions is particularly difficult. Once a recession starts equity returns turn more negative on average and show negative skew, but 1-year before a recession the distribution of equity returns is usually similar to the unconditional one (Exhibit 17). On average equities tend to have the lowest monthly returns in the ‘early recession’ phase, which is when growth momentum turns negative but levels are still positive. But during late recession there are some of the most positive equity returns as the market anticipates the recovery, again well before a recession ends.

Exhibit 17: The right tail flattens in the year preceding the recession
 1-month S&P 500 nominal return (data since 1950). Based on NBER recessions

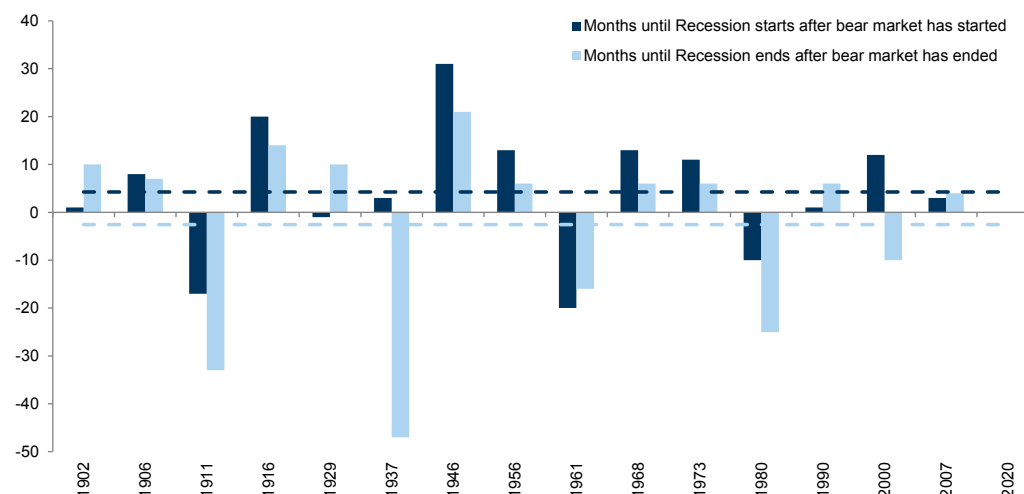


Source: Bloomberg, Haver Analytics, Goldman Sachs Global Investment Research

Equities are forward-looking, peaking before recessions start and troughing before they end (Exhibit 18). As we noted above, equity momentum turns more negative before a recession – equities usually peak a few months before a recession starts. And if there is an external shock, which drives a sharp tightening in financial conditions, negative equity momentum can build very quickly and increase recession risk. Equities also tend to trough on average well before the recession ends, often in function of policy support or if the shock that caused the recession eases.

Exhibit 18: In the majority of cases equity bear markets start before recessions

Bear market timing around recessions since 1900



Source: Bloomberg, NBER, Goldman Sachs Global Investment Research

Chasing your tail risk and when to worry

Market-implied recession probabilities might help market timing – if leading indicators point to a higher probability of a recession, equity drawdown risk increases, whereas if coincident indicators signal being in a recession, right-tail risk picks up owing to the potential for recovery.

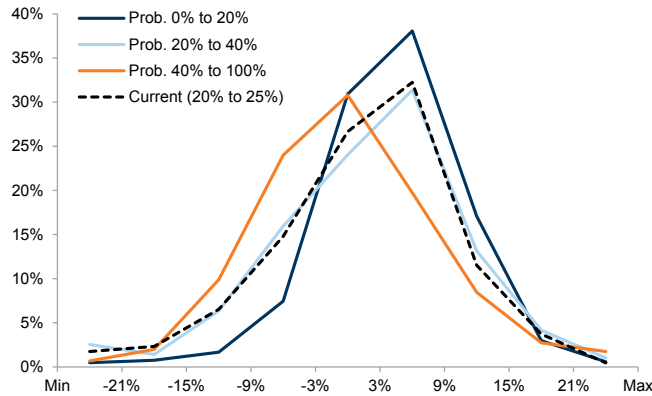
Exhibit 19 and Exhibit 21 show that once the probability of a recession in the next 12 months (*leading*) increases above 30%, similar to now, the risk of corrections is higher than normal. However, the risk of larger and more frequent drawdowns increases in particular once that probability is above 40%.

On the flip side, as Exhibit 20 and Exhibit 22 show, the probability of being in a recession (*coincident*) can eventually act as a contrarian signal – if it is above 20%, tail risk in both directions is elevated. However, if the probability of being in a recession is above 40%, right-tail risk is very elevated and well above the risk of further large drawdown.

In both cases current probabilities do not send a clear signal – the probability of a recession in the next 12m is 24% and the probability of being in a recession is currently just 3%.

Exhibit 19: Correction risk is elevated with 20-25% probability of recession risk in 12m

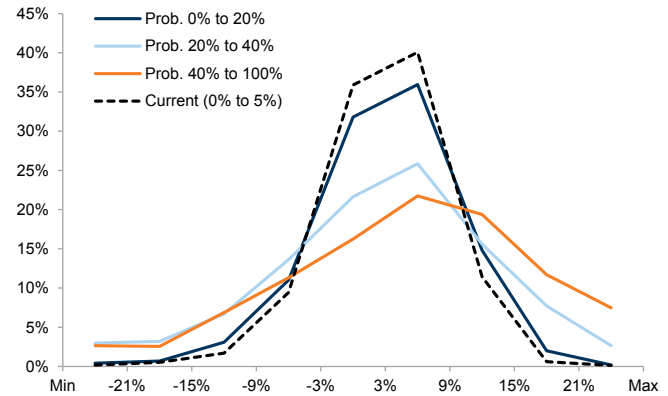
S&P 500 3m returns conditional on average market-implied probability of a recession starting within 1 year (data since 1950)



Source: Haver Analytics, Goldman Sachs Global Investment Research

Exhibit 20: Low probability of being in a recession means return distribution is close to unconditional

S&P 500 3m returns conditional on average market-implied probability of being in a recession (data since 1950)



Source: Haver Analytics, Goldman Sachs Global Investment Research

Exhibit 21: Once leading indicators point to more than 20% recession risk, equity drawdown risk increases

Based on leading recession probability indicators (since 1950)

Probability of a recession starting within 1 year			Avg. S&P 500 fwd return			Avg. S&P 500 fwd hit ratio			Avg. S&P 500 fwd drawdown			Avg. S&P 500 fwd melt-up		
From	To	Freq	3-month	6-month	1-year	3-month	6-month	1-year	3-month	6-month	1-year	3-month	6-month	1-year
60%	100%	7%	-1.4%	-1.3%	1.9%	41%	34%	47%	-7.5%	-10.8%	-16.2%	5.2%	7.8%	13.3%
40%	60%	10%	1.0%	2.4%	3.9%	52%	53%	47%	-5.8%	-8.5%	-13.7%	6.2%	9.6%	15.4%
30%	40%	7%	1.7%	2.9%	8.2%	60%	57%	66%	-5.8%	-8.3%	-11.9%	6.0%	9.9%	16.1%
20%	30%	8%	1.7%	4.7%	11.1%	65%	70%	78%	-6.2%	-8.7%	-10.5%	6.9%	10.6%	18.1%
10%	20%	19%	4.3%	7.9%	14.6%	78%	86%	89%	-3.3%	-4.1%	-5.2%	6.8%	11.2%	19.2%
5%	10%	23%	4.0%	8.3%	17.3%	75%	85%	92%	-3.5%	-4.7%	-5.4%	6.8%	11.5%	21.1%
0%	5%	28%	4.0%	7.8%	14.9%	79%	81%	87%	-3.3%	-4.1%	-5.1%	6.8%	11.5%	19.8%
Unconditional			3.1%	6.3%	12.7%	71%	75%	80%	-4.2%	-5.7%	-7.6%	6.6%	10.8%	18.8%

Source: Haver Analytics, Goldman Sachs Global Investment Research

Exhibit 22: If coincident recession risk is high, it usually points to better asymmetry for equity returns

Based on coincident recession risk indicators (since 1950)

Probability of being in a recession			Avg. S&P 500 fwd return			Avg. S&P 500 fwd hit ratio			Avg. S&P 500 fwd drawdown			Avg. S&P 500 fwd melt-up		
From	To	Freq	3-month	6-month	1-year	3-month	6-month	1-year	3-month	6-month	1-year	3-month	6-month	1-year
60%	100%	3%	6.0%	16.1%	29.4%	68%	84%	95%	-9.4%	-10.3%	-11.0%	12.1%	20.5%	35.5%
40%	60%	3%	4.0%	9.8%	20.7%	70%	76%	84%	-6.6%	-8.2%	-10.1%	9.6%	15.3%	26.2%
30%	40%	4%	1.9%	6.4%	16.8%	65%	65%	75%	-7.6%	-9.6%	-12.6%	8.0%	13.5%	24.4%
20%	30%	6%	2.8%	3.4%	10.2%	62%	56%	66%	-5.7%	-9.7%	-14.0%	7.2%	11.5%	19.6%
10%	20%	15%	3.3%	6.2%	10.3%	66%	67%	68%	-4.6%	-6.7%	-9.9%	7.2%	12.0%	19.8%
5%	10%	24%	3.1%	5.4%	10.7%	69%	72%	78%	-4.0%	-5.4%	-6.9%	6.8%	10.3%	16.8%
0%	5%	45%	3.0%	6.2%	13.0%	75%	81%	86%	-3.3%	-4.3%	-5.6%	5.5%	9.5%	17.3%
Unconditional			3.1%	6.3%	12.7%	71%	75%	80%	-4.2%	-5.7%	-7.6%	6.6%	10.8%	18.8%

Source: Haver Analytics, Goldman Sachs Global Investment Research

The 'safe' choice(s) — we like US 2yr, Gold, US\$ and possibly Yen later on
Instead of timing the market, investors can create more robust multi-asset portfolios by adding safe assets. While in the last 30 years bonds were the most reliable 'risk off' hedge, as we wrote in our [Balanced Bear research](#), the buffer from bonds and equity/bond correlations becomes less reliable with low bond yields and

elevated inflation. Which assets are 'safe' or can provide a 'hedge' for the portfolio or

specific assets very much depends on the shock or driver of a drawdown, i.e., a negative growth or inflation shock (or both).

Before the late 1990s, bonds were not good hedges for S&P 500 bear markets although outside the 1970s they kept their value in real terms (there was some benefit from international bond diversification although currency risk mattered). Gold was a good hedge during the higher inflation periods of the 1970s but had sharp drawdowns in the early 1980s. 'Safe haven' FX generally performed well but history is limited given fixed exchange rates under the Bretton Woods agreement until 1968.

Since the 1990s, safe haven FX and Gold have been consistent mostly increased in 'risk off' episodes but bonds have provided the best buffer, especially US 30-year bonds. Both during the GFC and the COVID-19 crisis, US 10-year TIPS initially had an 8% and 11% drawdown respectively. Gold has been more volatile as a result – during the COVID-19 crisis it first sold off 12% (before rallying materially afterwards). Unsurprisingly a higher cash allocation consistently helped during equity drawdowns, even when few safe havens worked.

Exhibit 23: Most traditional safe havens had mixed performance during the largest S&P 500 bear markets

Performance of safe haven assets during S&P 500 bear markets (real total return in US\$)

S&P 500 bear markets			Performance of 'safe assets' (real return)												
Start	End	Length	Real return	US 10Y	US 30Y	US 10Y TIPS	Germany 10Y	Japan 10Y	T-Bills	Gold	JPY/US D	CHF/US D	DXY	Resi. real estate	
Aug-56	Oct-57	1.2	-21%	-7%	-10%		-1%	4%	0%						
Dec-61	Jun-62	0.5	-27%	2%	3%	3%	3%	18%	1%						
Feb-66	Oct-66	0.7	-23%	-2%	-8%	0%	-3%	6%	0%						
Nov-68	May-70	1.5	-38%	-15%	-12%	-12%	-9%	1%	1%	-21%	-8%	-11%			
Jan-73	Oct-74	1.7	-53%	-15%	-35%	12%	-7%	-21%	-4%	103%	-15%	6%	-21%	14%	
Sep-76	Mar-78	1.5	-21%	-2%	-2%	2%	34%	46%	-1%	42%	12%	20%	-18%	19%	
Nov-80	Aug-82	1.7	-30%	4%	1%	-7%	-33%	-12%	10%	-54%	-30%	2%	18%	1%	
Oct-87	Dec-87	0.2	-32%	5%	7%	4%	13%	20%	1%	5%	9%	3%	-9%	2%	
Jul-90	Oct-90	0.2	-21%	-3%	-6%	7%	3%	6%	0%	5%	12%	0%	-10%	-2%	
Jul-98	Aug-98	0.1	-19%	4%	7%	0%	5%	3%	0%	-7%	-1%	2%	-1%	2%	
Mar-00	Oct-02	2.5	-51%	29%	24%	29%	16%	-10%	4%	5%	-19%	3%	-5%	30%	
Oct-07	Mar-09	1.4	-56%	20%	28%	3%	2%	24%	2%	23%	16%	12%	12%	-11%	
Apr-11	Oct-11	0.4	-20%	14%	35%	8%	1%	7%	-1%	6%	4%	5%	7%	0%	
Sep-18	Dec-18	0.3	-19%	2%	3%	0%	1%	3%	0%	5%	2%	0%	3%	3%	
Feb-20	Mar-20	0.1	-34%	7%	16%	-1%	-1%	-2%	0%	-4%	0%	0%	2%	2%	
			Average	3%	3%	3%	2%	6%	1%	9%	-1%	4%	-2%	5%	
			Median	2%	3%	3%	1%	4%	0%	5%	1%	2%	-1%	2%	
			Average before 1990	-31%	-4%	-7%	0%	8%	1%	15%	-6%	4%	-7%	9%	
			Average since 1990	-31%	11%	15%	7%	4%	4%	5%	2%	3%	1%	4%	
			Hit ratio	0%	60%	60%	57%	60%	73%	67%	67%	50%	83%	45%	82%

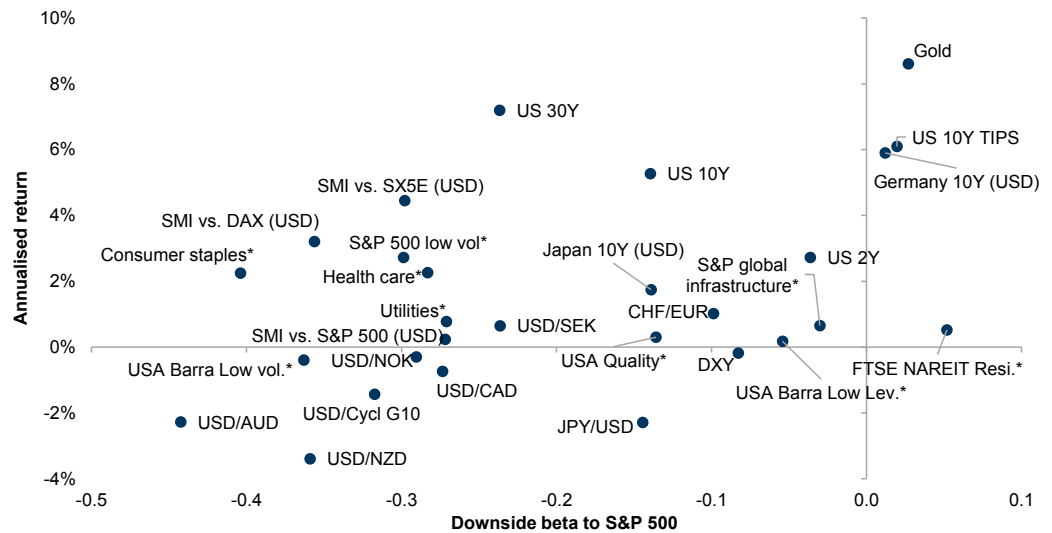
Source: Datastream, Haver Analytics, Goldman Sachs Global Investment Research

Similar to the trade-off between risk and return, there is a trade-off between risk reduction potential and performance through cycle. Assets with the highest downside beta to the S&P 500, such as USD vs. procyclical FX, have generally had lower compound returns since 2000 (Exhibit 24). Besides adding 'risk reducing' assets to a balanced portfolio investors could also reduce risk within equities – for example, low vol, quality stocks¹ or defensive indices like SMI (in USD) have outperformed with less risk since 2000. Only bonds, especially 30-year, were the outlier, delivering strong (risk-adjusted) returns and risk reduction but this was mainly due to tailwinds from falling yields, which are unlikely from here.

¹ For example: S&P 500 low volatility, MSCI Quality, MSCI Barra low vol, MSCI Barra low leverage. To further enhance the prospective risk/reward, our US strategy team has developed a High Sharpe Ratio basket (Bloomberg ticker GSTHSHRP), which combines upside to price target with a measure of implied volatility.

Exhibit 24: Avoiding safety at any price - trade-off between downside beta and long-term return

Data since 2000 (weekly returns, * denotes performance vs. S&P 500)



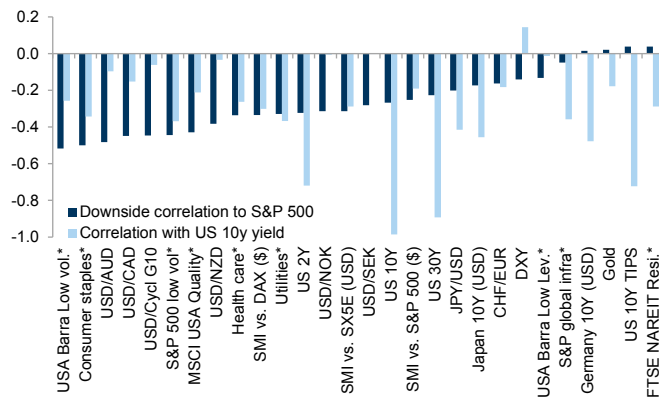
Source: Datastream, Goldman Sachs Global Investment Research

Many 'safe assets' now face headwinds from rising rates – managing duration risk embedded in safe havens becomes more important in periods of elevated inflation.

Exhibit 25 shows that many of the 'safe assets' with the highest downside correlation to the S&P 500 also had a very negative correlation with the US 10-year yield. The US Dollar is the main exception and since the COVID-19 crisis it has been a more attractive 'risk off' hedge, as we have highlighted; however, with already hawkish Fed pricing and bullish positioning it might be a less good hedge for a US recession in the coming months. The Yen has sold off sharply due to a widening rate differential with the US but, as our FX team has highlighted, it could provide a better hedge during a US-specific growth shock (US growth/yield down).

Exhibit 25: Dollar and selective defensive equity overlays have been less linked to US 10-year yields

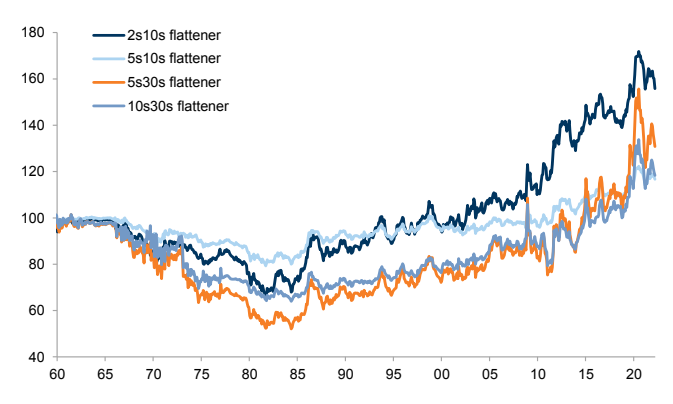
Data since 2000 (weekly returns, *denotes performance vs. S&P 500)



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

Exhibit 26: During the 1970s steepeners generally performed better

Total return performance



Source: Haver Analytics, Goldman Sachs Global Investment Research

Bonds are likely to rally in the event of a US recession but yield curves could steepen in the recovery with lingering inflation. Historically inflation volatility drove more rates volatility and lower risk-adjusted returns for long-duration bonds. Flatteners

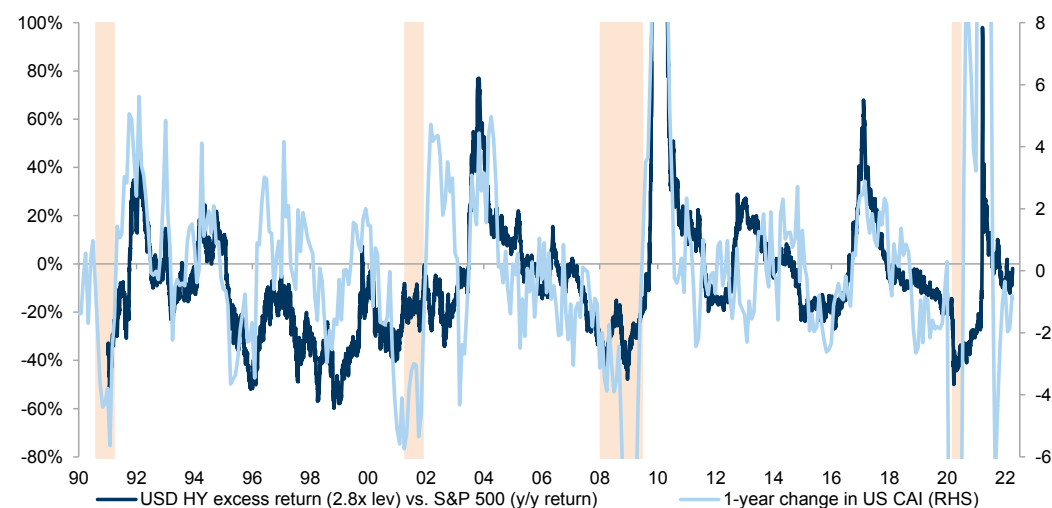
have performed well since the 1980s, while before that, with high and rising inflation, steepeners were a better strategy ([Exhibit 26](#)). While our rates team thinks it is too early for steepeners, shorter-duration bonds might offer a better risk reduction/cost trade-off than US 10-year bonds – US 2-year yields are at 2.4% and would likely decline due to recession risk but increase gradually in a recovery. Alternatively, combining long-duration bond exposure with curve cap spreads could mitigate steepening pressure later on.

Credit vs. equity into recessions — avoid credit tail risks

Credit and equity are procyclical assets and therefore closely linked to the business cycle and recession risk. However, while the level of growth has historically mattered the most for equities, our analysis suggests that credit is more sensitive to changes in growth momentum. In fact, levering up USD HY credit to match the volatility of the S&P 500 reveals that credit sees much larger drawdowns than equity in periods of sharp growth deceleration, as measured by yoy changes in our US Current Activity Indicator (CAI) ([Exhibit 27](#)). This is due to the higher convexity of credit, but also to the risk of ratings downgrades and defaults, which tend to increase and cluster around recessions. On the flip side, credit tends to outperform vs. equity in periods of strong growth acceleration, such as the recovery from a recession.

Exhibit 27: Growth acceleration/deceleration tends to matter most for equity vs. credit performance

Shadings are NBER recessions



Source: Datastream, Goldman Sachs Global Investment Research

Credit spreads tend to be very sensitive to growth as measured by the ISM, especially during slowdowns ([Exhibit 28](#)) – it is fairly unusual to see major spikes in spreads outside of recessions. After fully re-tracing the post-Ukraine war widening, credit spreads are now back to the lower end of their range. Under our economists’ baseline scenario of growth slowing down from here, we see risks for spreads as skewed to the wider side once weaker data come through – widening tends to be fairly coincident.

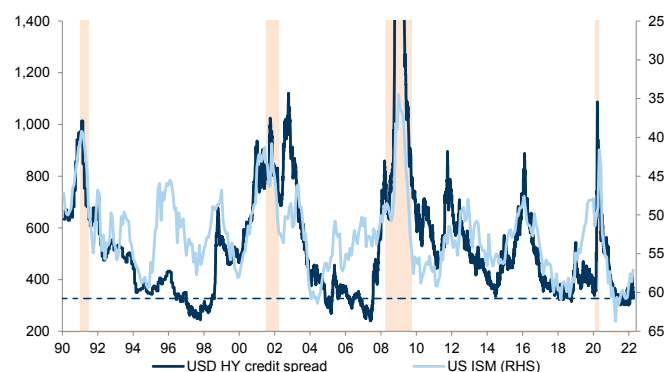
Credit spreads also tend to be closely linked to equity volatility as they are similar to equity option premia: they typically increase sharply around VIX spikes, while they remain tight in low volatility regimes. This creates negative (and positive) convexity for

riskier credit as volatility spikes can be fast and large (and reverse quickly). While VIX spikes have generally been larger and more frequent than increases in credit spreads, especially since the GFC, the gap between the two is particularly large now, even after the volatility reset.

We remain UW credit – our credit strategy team thinks spreads have likely reached the low end of their range and would tactically use the recent rally to reduce risk and move up the quality spectrum within HY. That said, they have highlighted that strong corporate fundamentals make a deep default cycle less likely, which could provide a cap for any increase in spreads compared with previous slowdowns in economic activity.

Exhibit 28: Credit spreads are sensitive to growth, especially in a slowdown

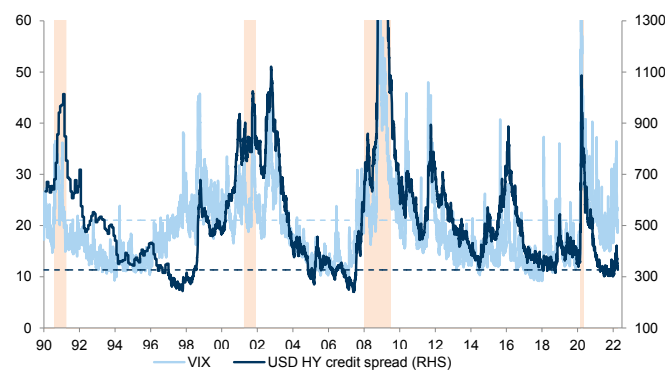
Shadings are NBER US recessions



Source: Datastream, Goldman Sachs Global Investment Research

Exhibit 29: Credit spreads been closely related to equity volatility

Shadings are NBER US recessions



Source: Datastream, Goldman Sachs Global Investment Research

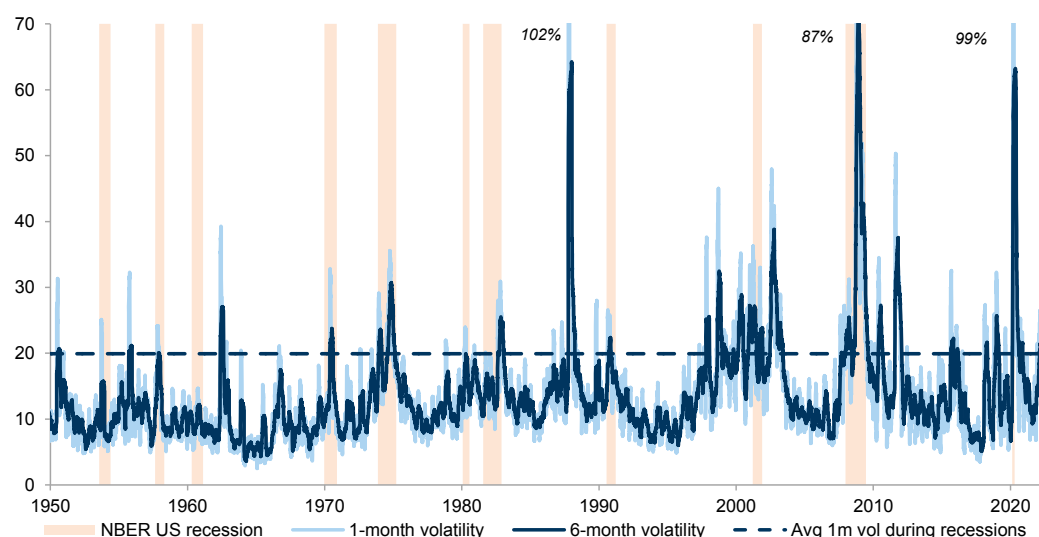
Considering all options — prefer equity puts vs. receivers

Equity volatility is countercyclical: as the cycle matures, inflation tends to pick up and recession risk increases, both of which can drive increased volatility. Not every vol spike is driven by the US business cycle – examples include corrections such as ‘Black Monday’ in 1987, when volatility spiked primarily due to technical factors. But during recessions equity volatility tends to be most elevated. Since 1950, equity volatility also increased ahead of recessions: when growth starts to slow down, there is usually a shift to a higher vol regime.

During recessions cross-asset volatility tends to increase and tail risk hedges become more attractive (Exhibit 31). Equity volatility has been particularly elevated during the recessions since the 1990s –before then, realised S&P 500 volatility was less extreme during recessions. However, as we have highlighted before, vol of vol has increased, with S&P 500 vol spikes becoming larger and faster since the 1990s – in part this has been due to the build-up and subsequent unwinds of imbalances but also due to changes in the market microstructure, with more cyclical liquidity provision and hedging (partially intraday).

Exhibit 30: S&P 500 volatility usually spikes around recessions and increases before

Realised volatility of daily returns



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

Exhibit 31: Cross-asset volatility tends to be elevated during recessions but has been extreme during the GFC and COVID-19 crisis

Volatility of daily returns

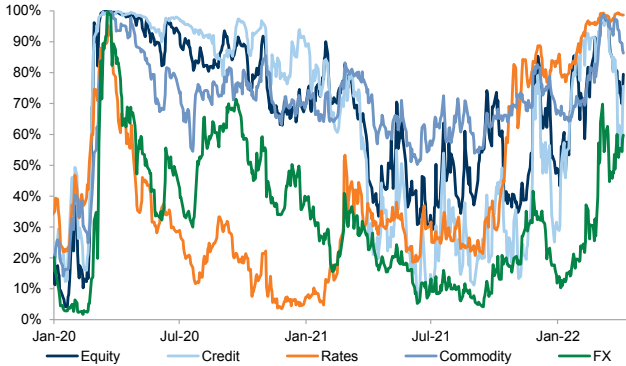
NBER recession			Realised volatility										
Peak	Trough	Length	S&P 500	MSCI Europe	TOPIX	MSCI EM	US 10Y	DJ Corp (TR)	Gold	Oil	GSCI	DXY	JPY
Jul-53	May-54	0.8	10%	-	15%	-	-	2%	-	-	-	-	-
Aug-57	Apr-58	0.7	14%	-	10%	-	-	3%	-	-	-	-	-
Apr-60	Feb-61	0.8	9%	-	14%	-	-	2%	-	-	-	-	-
Dec-69	Nov-70	0.9	15%	-	15%	13%	6%	4%	-	-	10%	-	-
Nov-73	Mar-75	1.3	21%	14%	14%	19%	4%	4%	32%	-	23%	7%	9%
Jan-80	Jul-80	0.5	16%	9%	7%	11%	17%	13%	50%	-	18%	8%	12%
Jul-81	Nov-82	1.3	17%	11%	11%	14%	13%	10%	33%	-	12%	9%	12%
Jul-90	Mar-91	0.7	18%	17%	29%	22%	6%	4%	19%	92%	41%	10%	12%
Mar-01	Nov-01	0.7	21%	24%	23%	17%	8%	6%	14%	48%	24%	8%	9%
Dec-07	Jun-09	1.5	38%	34%	37%	38%	12%	9%	30%	63%	39%	12%	15%
Feb-20	Apr-20	0.2	72%	53%	38%	45%	15%	20%	27%	243%	65%	12%	18%
Unconditional since 1950			15%	15%	17%	17%	7%	5%	19%	41%	19%	8%	10%
Average			23%	23%	19%	22%	10%	7%	26%	111%	29%	9%	13%
Median			17%	15%	15%	17%	8%	4%	30%	63%	23%	9%	12%
% above unconditional			64%	57%	36%	63%	63%	45%	63%	100%	63%	71%	71%

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

Since mid-March, cross-asset implied volatility has reset, especially shorter-dated, but it remains relatively elevated across assets (Exhibit 32). The largest vol reset from the peak in early March has been for risky assets – ranking tail risk hedges shows that those in equity and credit currently appear most attractive (Exhibit 33). But, as our credit strategy team has highlighted, implied equity and credit vol for the next 6m is still near recessionary levels, pointing to a more selective approach for tail risk hedges. While the lack of financial imbalances could prevent a sharp and prolonged increase in volatility, such as during the bear markets since the 1990s, on the flip side higher vol of vol may still justify some premium on convex tail hedges.

Exhibit 32: Equity and credit volatility have declined sharply while rates and commodities remain elevated

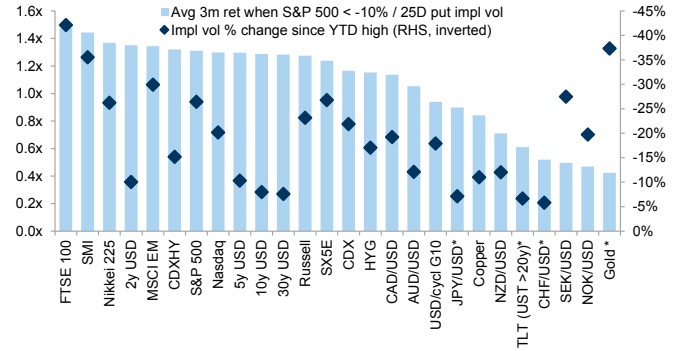
Average 10-year percentile of 3m ATM implied volatility



Source: Bloomberg, Goldman Sachs Global Investment Research

Exhibit 33: Equity tail hedges have repriced more than credit - rates vol remains particularly sticky

Average drawdown since 2000. *call implied vol and return changed in sign



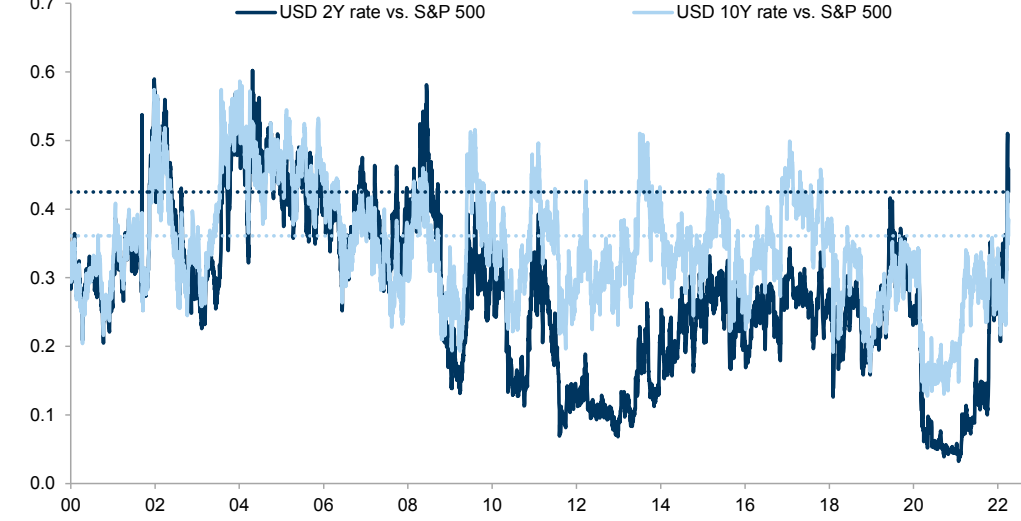
USD 2y/5y/10y/30y: receiver swaption with strike ATM - 25bp

Source: Bloomberg, Goldman Sachs Global Investment Research

Rates volatility appears high vs. implied equity volatility (Exhibit 34). With the COVID-19 crisis equity volatility increased sharply, while rates volatility remained low due to the proximity to the zero lower bound and central banks easing – early last year we recommended long rates volatility exposure, e.g., payers, funded by equity puts. Since then rates volatility has re-rated materially due to sticky, elevated inflation and the sharp hawkish shifts of global central banks. While we think that uncertainty on rates remains high, especially front-end rates, we would now have a bias for selling rates vs. equity vol. In the near term, with elevated inflation, large declines in rates are unlikely without recession risk and growth risks, which might weigh more on equities – **selling receivers on USD rates could help finance equity downside hedges.**

Exhibit 34: Rates volatility now looks expensive relative to equity, especially for 2-year rates

3m ATM implied volatility



Source: Bloomberg, Goldman Sachs Global Investment Research

Appendix: Modelling market-implied recession probabilities

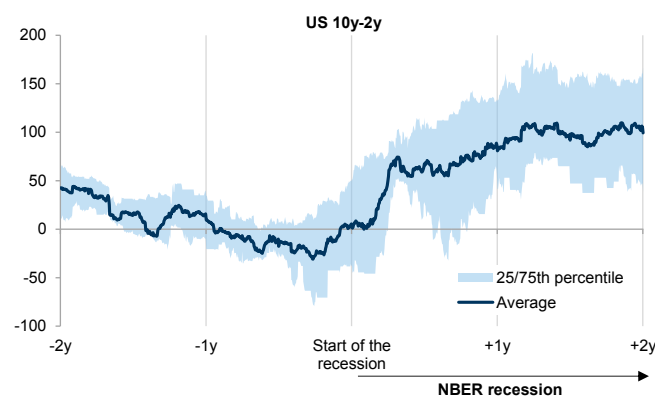
Several variables may help predict recessions, including current economic growth, macroeconomic variables and asset prices (see [US Economics Analyst - Recession Risk: Still Moderate](#) for a review). We focus on the market-implied probability of a recession using univariate logit models. We screen a wide range of market-based indicators since 1950²:

- **Rates:** we include the yield curve slope, in the front end (12m forward market-implied change in the Fed funds rate, US 18m3m-3m, US 2y-3m) and back end (US 10y-2y, US 10y-3m), and the [US real rate and breakevens 10y-2y yield curve](#).
- **Credit:** we include the credit spread across instruments and ratings (Moody's BAA-AAA, USD HY, MBS and TED spreads) and the Excess Bond Premium of Gilchrist and Zakrajsek (2012). We also include the z-score of the USD HY spread and Excess Bond Premium to reflect changes in credit momentum.
- **Equity:** we include several valuation metrics to capture lower expected growth/higher required premia ahead of a recession (US Cycl vs. Defs P/E, Shiller P/E, Shiller EY - US 10y real rate, S&P 500 ERP) and momentum measures to capture a change of trend (z-score of prices and valuations, S&P 500 price vs. its 200-day MA, the S&P 500 1-year drawdown). We consider also the VIX as volatility tends to increase during recessions.

The indicators can be split into *leading*, for which recession pricing increases and peaks before the start of the recession, and *coincident*, whose recession pricing peaks during recessions. The US 10y-2y slope of the yield curve is a well-known example of a leading indicator, which has historically inverted well before the recession and had already steepened before the recession started ([Exhibit 35](#)). On the other hand, USD HY spreads are more of a coincident indicator: they tend to widen into a recession, but most of the risk repricing usually happens during the recession ([Exhibit 36](#)).

Exhibit 35: The yield curve inverts before the recession...

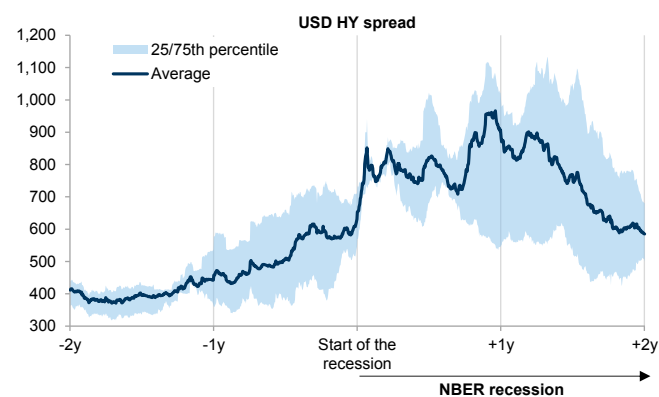
Average US 10y-2y around NBER recessions since 1950



Source: Haver Analytics, Goldman Sachs Global Investment Research

Exhibit 36: ...while the USD HY spread peaks during the recession

Average USD HY spread around NBER recessions since 1990



Source: Haver Analytics, Goldman Sachs Global Investment Research

² Where possible, we use proxies to backcast the time series further back in time.

Because of this difference in timing, we assess the probability of a recession starting within the next 12m and the probability of being in a recession at that particular point in time.³ Exhibit 37 shows the t-stat and the pseudo R2 for the two logit models estimated across indicators. The pseudo R2 highlights the split among the leading and coincident variables: the leading variables are those with the highest R2 in the model for the probability of a recession starting within 1 year (such as the slope of the yield curve, MBS spreads, and the Cyclical vs. Defensives P/E), while the coincident variables are those with the highest R2 in the model for the probability of being in a recession (such as credit spreads, the VIX and equity momentum).

The precision measures the fraction of times when a high level of the market-implied probability has been followed by a recession – i.e., a higher precision means that the variable gives fewer false signals. On the flip side, the recall is the fraction of recessions which have been anticipated correctly. The slope of the yield curve has both high precision and recall, while MBS spreads have similar recall compared with the US 10y-2y, but tend to give more false signals (= lower precision). Looking at the probability of being in a recession, USD HY spreads have the widest gap between precision and recall: in almost all recessions USD HY spreads widened materially but only in 1 out of 3 instances of very wide credit spreads did a recession actually occur.

Exhibit 37: T-stat and goodness-of-fit measures for the univariate logit models estimated on the maximum available history since 1950

To compute precision and recall, we consider each variable to indicate a recession if its market-implied probability is above the 75th percentile

	Start date	Probability of a recession starting within 1 year					Probability of being in a recession				
		t-stat	Ps. R2	Precision	Recall	AUC	t-stat	Ps. R2	Precision	Recall	AUC
Rates											
12m fwd change in FF rate	1962	-45.6	47%	53%	87%	0.92	-28.6	8%	26%	55%	0.71
US 18m3m - 3m	1961	-42.8	41%	46%	77%	0.90	-2.9	0%	11%	24%	0.51
US 10y-3m	1950	-48.0	40%	53%	76%	0.90	-1.2	0%	12%	23%	0.49
US 10y-2y	1950	-48.5	39%	52%	75%	0.90	-9.9	1%	18%	35%	0.54
US 2y-3m	1950	-37.4	14%	33%	47%	0.73	6.9	0%	14%	27%	0.54
US breakeven 2s10s	1961	-36.8	14%	30%	51%	0.75	-12.2	1%	21%	45%	0.60
US real 2s10s	1961	-13.0	2%	18%	30%	0.60	6.9	0%	15%	32%	0.57
Credit											
MBS spread	1988	35.5	35%	37%	74%	0.90	31.3	27%	28%	80%	0.87
USD HY spread z-score	1989	23.6	10%	32%	61%	0.74	27.2	18%	24%	66%	0.83
Excess Bond Premium	1973	21.1	5%	26%	41%	0.64	39.7	28%	38%	77%	0.86
TED spread	1986	14.9	3%	22%	47%	0.67	24.3	12%	22%	69%	0.77
Excess Bond Premium z-score	1973	11.5	1%	26%	40%	0.59	19.6	4%	19%	38%	0.65
USD HY spread	1989	8.1	1%	22%	42%	0.59	31.3	52%	35%	98%	0.96
Moody's BAA-AAA spread	1950	3.7	0%	11%	16%	0.52	41.3	15%	27%	52%	0.72
Equity											
US Cycl vs. Defs P/E	1973	-34.5	23%	44%	69%	0.83	-25.0	9%	20%	41%	0.71
S&P 500 vs. 200MA	1950	-23.3	4%	30%	43%	0.67	-47.2	23%	38%	73%	0.82
Shiller EY - 10Y real rate z-score	1959	20.9	4%	26%	39%	0.63	43.2	21%	34%	67%	0.83
S&P 500 z-score	1950	-21.6	3%	29%	41%	0.64	-50.5	23%	40%	78%	0.82
S&P 500 1-year drawdown	1950	-10.9	1%	28%	40%	0.64	-52.3	28%	41%	79%	0.85
Shiller P/E	1950	-9.1	1%	20%	28%	0.59	-32.1	9%	25%	48%	0.73
VIX	1990	4.3	0%	16%	32%	0.57	30.1	28%	27%	73%	0.87
US Cycl vs. Defs price z-score	1973	-4.3	0%	21%	33%	0.54	-22.9	6%	25%	49%	0.67
S&P 500 ERP	1968	4.0	0%	15%	21%	0.53	15.8	2%	16%	30%	0.61
Shiller EY - 10Y real rate	1959	1.0	0%	16%	25%	0.47	29.9	8%	25%	49%	0.68
Avg. prob. of selected leading indicators			68%	82%	0.94			26%	51%	0.67	
Avg. prob. of selected coincident indicators			29%	28%	0.66			41%	80%	0.88	

AUC is the area under the Receiver Operating Characteristic curve and measures the trade-off between the precision and the recall of each variable. The higher the AUC, the better the signal from that variable, with an AUC of 0.5 associated with an uncorrelated variable.

Source: Goldman Sachs Global Investment Research

For each of the two models we select the best 4 variables in terms of performance,

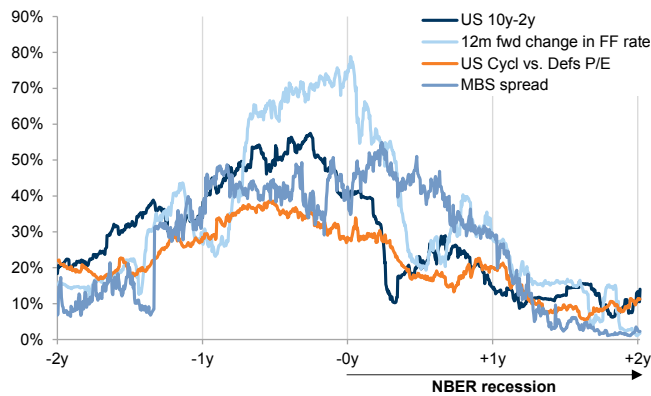
³ We consider a recession to be the period starting in the month following an NBER peak and ending in the month of the next NBER trough (included). When we estimate the probability of being in a recession within 1 year, we drop the recession periods from our sample and thus estimate the probability of going into a recession conditional on not already being in one. This is consistent with our split among the two models (leading and coincident) and also avoids picking up the wrong signal from coincident indicators as their recession pricing peaks during the recession, when the probability of a new recession starting in 1 year is the lowest.

taking into consideration also the length of the available history. Among leading indicators we choose the US 10y - 2y curve, the 12m forward market-implied change in Fed Fund rate, the US Cyclicals vs. Defensives P/E, and MBS spreads; among coincident indicators we choose the Excess Bond Premium, the USD HY spread, the VIX, and the S&P 500 1-year drawdown.⁴ The recession probability implied by these 8 variables (4 leading and 4 coincident) that we chose follows the same leading/coincident pattern around recessions that we described earlier ([Exhibit 38](#) and [Exhibit 39](#)).

We aggregate these variables into two cross-asset implied probabilities - one for a recession starting within 1 year and one for being in a recession - by taking the simple average of the probabilities implied by the four leading variables for the former and coincident variables for the latter ([Exhibit 3](#)). Combining the pricing implied by each financial variable into the two aggregates provides a better signal in terms of forecasting power - [Exhibit 37](#) shows that the precision of the average probability is higher than any of the individual ones for both leading and coincident variables. Moreover, combining multiple univariate models rather than using the same variables in a multivariate model also allows us to use series starting in different years and reduces the risk of overfitting.

Exhibit 38: Leading indicators peak in the year before the recession...

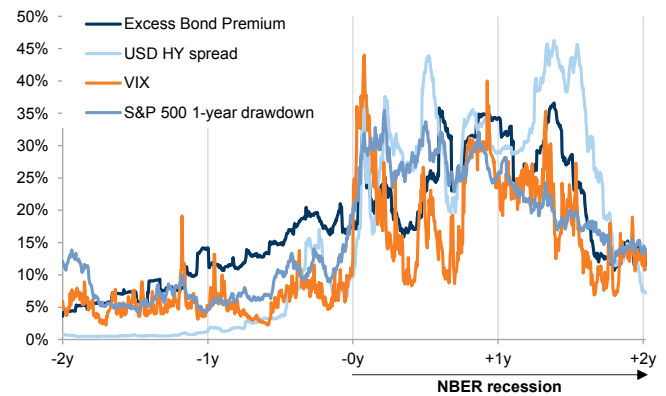
Market-implied probability of a recession starting in 1 year. Average around recessions since 1950



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

Exhibit 39: ...while coincident indicators peak during the recession

Market-implied probability of being in a recession. Average around recessions since 1950



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

⁴ We found that, historically, cyclicals have been at a large discount to defensives before almost all recessions and that a low relative valuation has been correlated with lower ISM since 1980. The relative de-rating of cyclicals likely reflects a shift from the strong growth in the initial rebound out of a recession towards a more subdued late-cycle growth rate, rather than towards more recession risk. As a consequence, the market-implied probability of recession that we estimate from it tends to increase earlier and might give more false signals compared with other indicators - that said, it retains some predictive power.

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Reg AC

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