GOAL - Global Opportunity Asset Allocator

Protection before inflection - near-term cautious but improving asymmetry for 12m

- After the large ‘risk off’ moves, the asymmetry to add risk with a longer investment horizon has improved. Our Risk Appetite Indicator (RAI) has dropped below GFC levels, and valuations and positioning have also declined materially. But this is a necessary albeit insufficient condition for a recovery: for a sustained ‘risk on’ move, a positive shift in macro momentum is needed, which likely requires an improvement in newsflow around the coronavirus. Although easier monetary policy has reduced left-tail risk, we do not think that alone it will boost risk appetite in the near term - a more forceful, global fiscal response might help.
- While recoveries after the RAI moved below -2 suggest a procyclical move across assets over 12m, results over 3m have been more mixed; during the GFC the S&P 500 fell another 20-30% before troughing. Owing to still-growing uncertainty around the coronavirus impact on growth and financial markets, we expect volatility to remain high. And the timing of a recovery will be difficult due to the speed of the moves, with vol of vol being elevated.
- We would be OW cash in the near term as we see more downside in risky assets and diversification is increasingly difficult, with bonds providing less of a buffer and as a lot of safe havens are more positioned. We still like Yen and Gold to protect portfolios. Finally, most ‘risk off’ trades in volatility appear expensive - longer-dated equity vol is relatively low, and forward vol and longer-dated options appear attractive.

Christian Mueller-Glissmann, CFA
+44(20)7774-1714 | christian.mueller-glissmann@gs.com
Goldman Sachs International

Alessio Rizzi
+44(20)7552-3976 | alessio.rizzi@gs.com
Goldman Sachs International

Cecilia Mariotti
+44(20)7552-0450 | cecilia.mariotti@gs.com
Goldman Sachs International

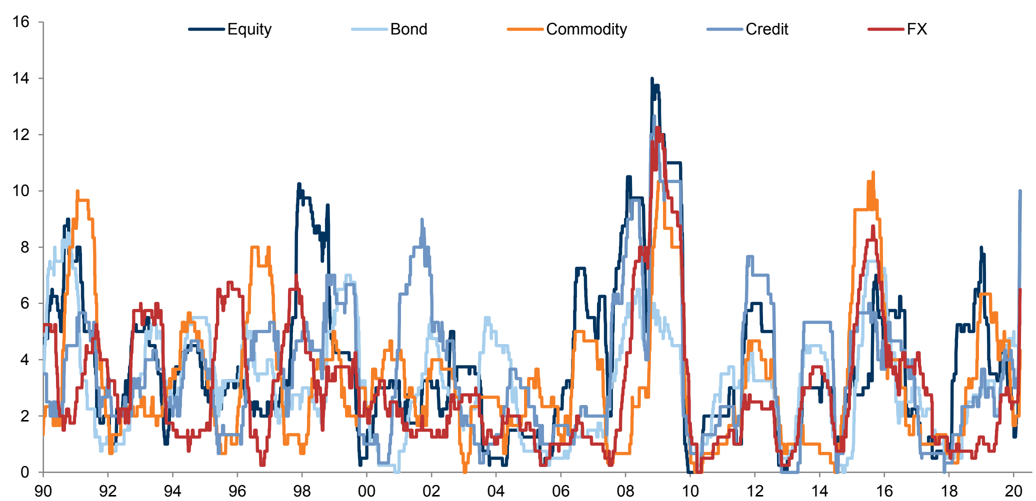
Peter Oppenheimer
+44(20)7552-5782 | peter.oppenheimer@gs.com
Goldman Sachs International

Asset allocation: Near-term still cautious, improved asymmetry for 12m

1. **After the large 'risk off' moves, the asymmetry to add risk with a longer investment horizon is improving**. But lower valuations, more bearish positioning and sharp declines in risk appetite are a necessary albeit insufficient condition for a recovery - for a more sustained 'risk on' move, a positive shift in the perception of macro momentum is needed. Our economists now forecast a global recession, with global GDP growth for 2020 dropping to 1¼%, and while they expect a recovery in H2, the risks remain on the downside. Improving newsflow on the coronavirus will be critical for a stabilisation in risk appetite and confidence in a 2H recovery.

While easier monetary policy has reduced left-tail risk, e.g., from stress in USD funding markets, we do not think it will boost risk appetite in the near term. A more forceful fiscal response might help, including measures to prevent private sector defaults and large increases in unemployment. But the timing of any recovery will be difficult due to the speed of the moves, with vol of vol being elevated - across asset classes the number of 3 standard deviation days has spiked to GFC levels, with the largest moves in credit (Exhibit 1).

Exhibit 1: More 3 standard deviation days across assets highlight current elevated market fragility
Sum of 3 standard deviation years over a 12-month rolling window (19 assets included)



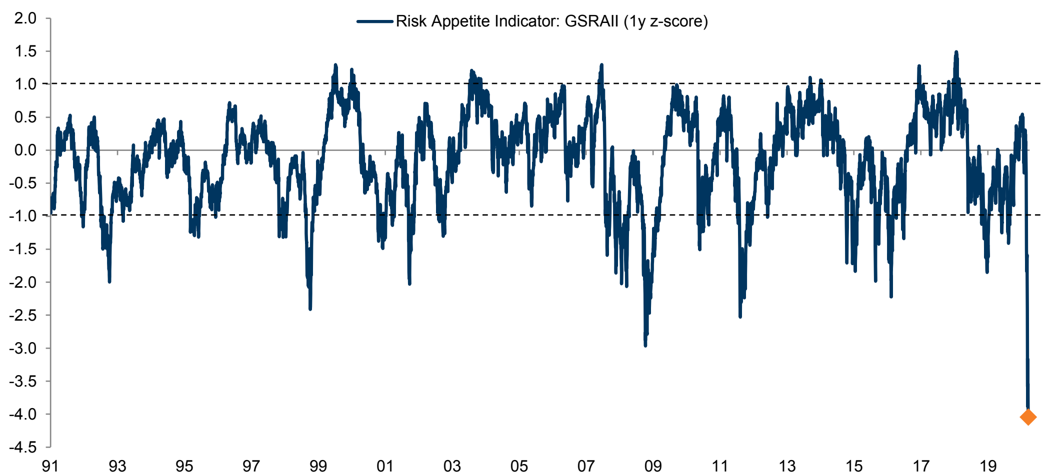
Source: Datastream, Goldman Sachs Global Investment Research

Volatility tends to cluster and while we see value in 'risky assets' emerging we remain cautious near term. We think near-term volatility is likely to remain elevated due to the high uncertainty on the virus impact on growth but also as liquidity remains very low. Our US equity strategy team has highlighted material near-term downside risk with a potential S&P 500 trough at 2000. We recommend increased cash allocations near term as diversification is increasingly difficult, with bonds providing less of a buffer and as a lot of safe havens are well positioned. Finally, most 'risk off' trades in volatility appear expensive, which makes managing portfolio risk more difficult as well.

2. **Our Risk Appetite Indicator (RAI) has fallen below GFC trough levels, indicating**

an unprecedented, sharp increase in risk premia across assets. The declines in risky assets have been much smaller than during the GFC or the Tech Bubble, but the RAI has fallen more owing to the speed of the moves: it is based on 1-year rolling z-scores and thus looks at both how much and how fast risk premia or pair trades move away from trend. This suggests investors had to endure a very large VaR shock across asset classes, which has likely forced significant de-risking across portfolios.

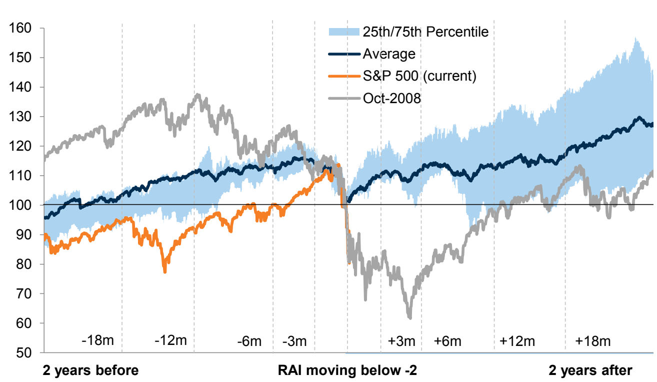
Exhibit 2: Our RAI has dropped below the GFC trough levels during the recent 'risk off'



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

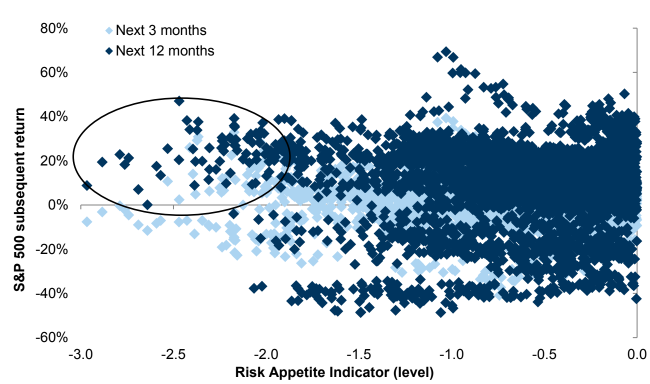
Historically, when our RAI dropped below -2 it signalled a good asymmetry to add risk for a 12m horizon (see Global Strategy Paper: Disentangling Risk Appetite). The hit ratio for positive S&P 500 returns over the subsequent 12 months from levels below -2 is 91% and returns have been strong on average (Exhibit 3). From -2.5, there were no negative S&P 500 returns in the next 12 months. But over a 3m horizon investors sometimes faced further large losses, e.g., during the GFC when the S&P 500 had a large drawdown even after the RAI fell below -2. **This suggests that in the near term there is still elevated left-tail risk.** However, the size of the drawdowns, even over a 3m horizon, tends to decline with a more negative RAI level (Exhibit 4).

Exhibit 3: After the RAI falls below -2 the S&P 500 has historically recovered
Performance of S&P 500 (rebased to 100)



Source: Datastream, Goldman Sachs Global Investment Research

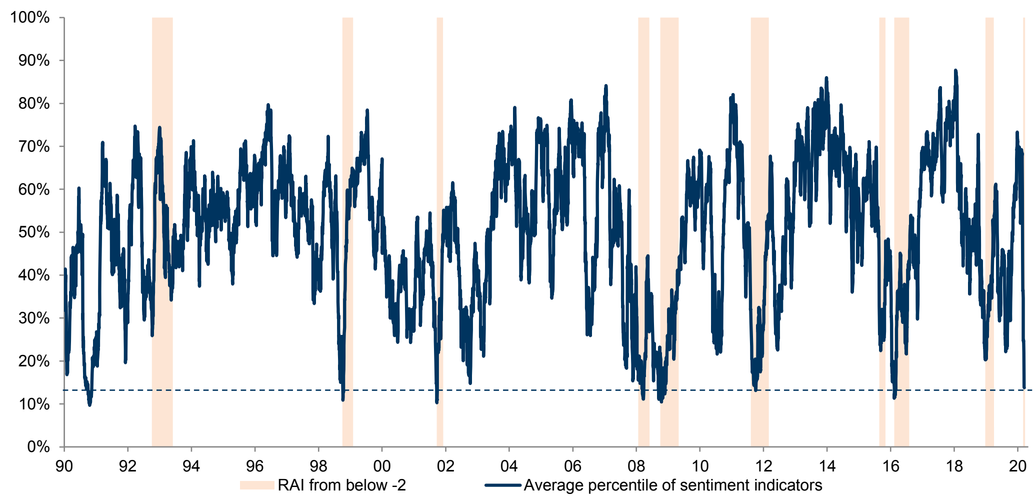
Exhibit 4: Our RAI suggests positive asymmetry to add risk for 12m but there is still left-tail risk for 3m



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

3. **While our RAI had shifted to very negative levels already early last week, not all positioning and sentiment indicators were at their lows.** However, there has been a large de-risking since then. The average percentile of the positioning and sentiment indicators we track is close to historical trough levels. During deep bear markets such as when the 2001 Tech Bubble burst and the GFC, the average percentile dropped to 10%. But also during the 'risk off' episodes around the Euro area crisis (2011) and EM/ oil crisis (2016), positioning and sentiment turned more bearish before stabilising. However, currently some of the data included are lagging or not available yet considering the speed of the moves.

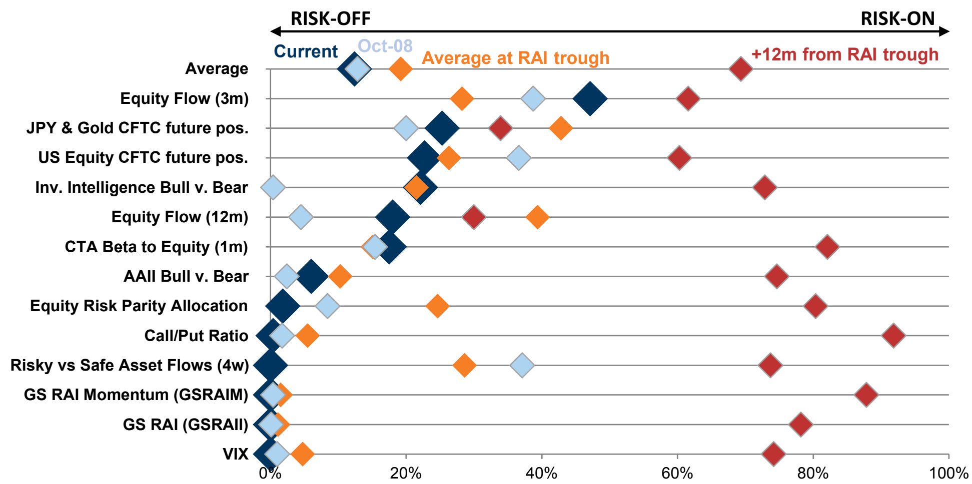
Exhibit 5: On average there has been a sharp decline in positioning and sentiment



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

As we highlighted at the beginning of the recent 'risk off' move, positioning from systematic investors, retail activity and options positioning was very bullish. We think that a large part of that has unwound now, with CTA beta to equity and risk parity allocations close to their lows. Also, the rotation from risky to safe assets in the last week is the largest since the GFC and equity futures positioning has declined sharply. While positioning and sentiment are not yet as bearish as in previous troughs, current levels already indicate less downside risk from positioning (Exhibit 6).

Exhibit 6: Positioning also turned much more bearish last week

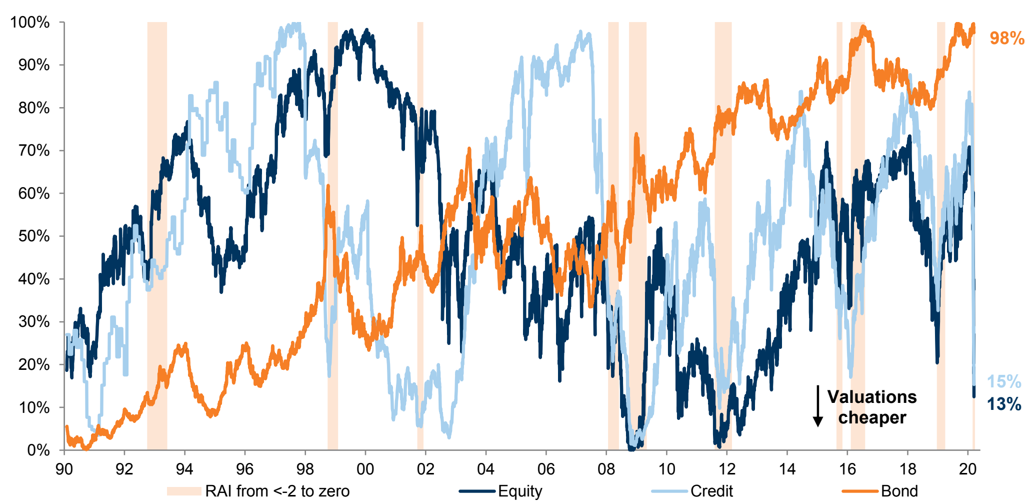


Source: Datastream, Haver Analytics, Goldman Sachs Global Investment Research

4. **Similar to positioning and sentiment, valuations of risky assets have declined sharply** (Exhibit 7). Before the start of the drawdown, valuations of risky assets were close to the levels from before the 2015/16 and 2018 drawdowns, but there has been a sharp de-rating now. Both equity and credit valuations shifted to the bottom quartile, with equity valuations well below the trough of the EM/ oil crisis in 20215/16 - although they are above GFC and Euro area crisis trough. The MSCI World ERP is heading to all-time highs, although the search for yield has not been much of a support for valuations recently.

Exhibit 7: Valuations for risky assets are above GFC trough levels but nearing those of previous bear markets

Average valuation percentile since 1990

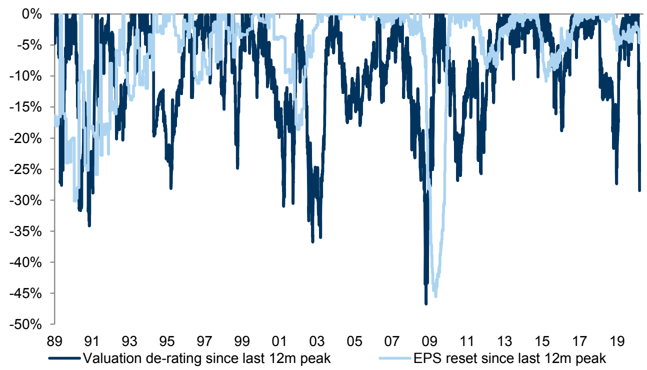


Note: Equity: NTM P/E of S&P 500, MSCI Europe, MSCI EM; Credit: spread of US HY, IG, EUR HY IG, EMBI. Bond: 10y yield of US, Germany, Japan.

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

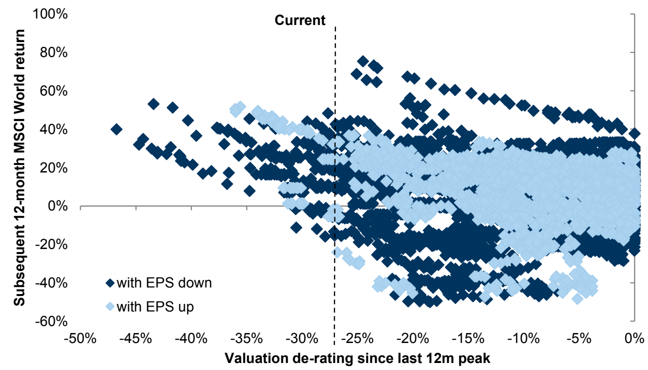
So far the valuation de-rating for global equities has been smaller than in previous bear markets (Exhibit 8). The valuation reset in Q4 2018 was similar to the current one but at the time earnings revisions and growth were more positive. However, we would expect earnings revisions to turn sharply negative from here, which means the valuation de-rating so far could actually be smaller. Our equity strategy teams expect much weaker earnings growth across regions for 2020 - in all cases they are well below bottom-up consensus forecasts. That said, we are nearing the level of valuation de-rating from which historically the downside risk on a 12m horizon was increasingly limited (Exhibit 9).

Exhibit 8: The valuation de-rating so far is smaller compared with previous bear markets
MSCI World 12-month forward P/E



Source: Datastream, Goldman Sachs Global Investment Research

Exhibit 9: With the current valuation de-rating, the risk of a very large drawdown in the next 12m is smaller, even with falling profits

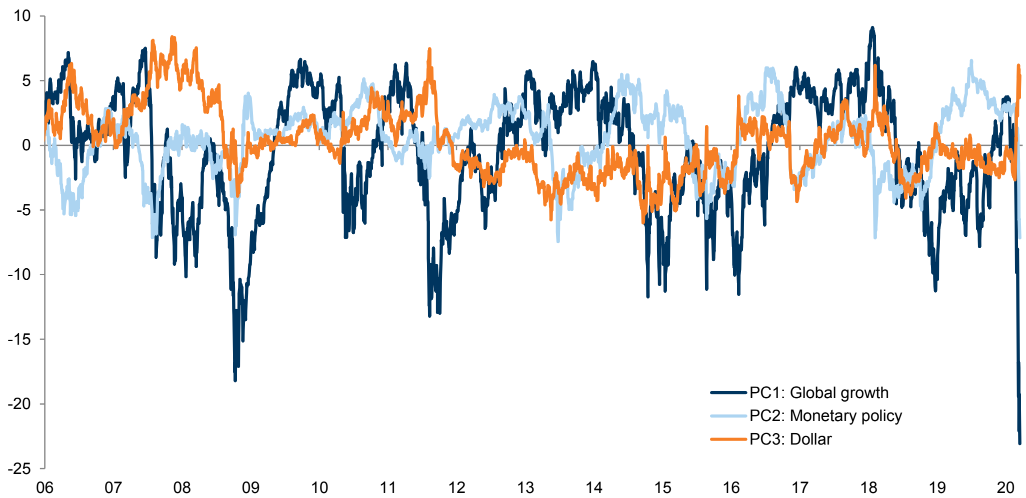


Source: Datastream, Haver Analytics, Goldman Sachs Global Investment Research

5. **The decline in risk appetite was due to both a sharp repricing of growth expectations *and* an unwind of the search for yield.** The decline in RAI PC1 'Global Growth' was the most important driver and it is now close to GFC levels - this is again in part due to the speed of the moves (Exhibit 10). However, what has added to downward pressure in the second leg of the current 'risk off' is the unwind of the search for yield alongside weaker growth expectations - easier monetary policy has so far not stabilised risk appetite.

There was some support from a weaker Dollar initially but it has strengthened again since then. With the recent narrowing of rate and growth differentials between the US and the RoW, and potential declines in US shale oil production, there could be more potential for Dollar weakness from here. However, due to a continued safe-haven bid, our FX team looks for narrow Dollar downside concentrated against up-in-quality currencies with limited policy space (JPY, CHF, EUR, and possibly SEK) —and to broaden out only once the global virus shock has passed.

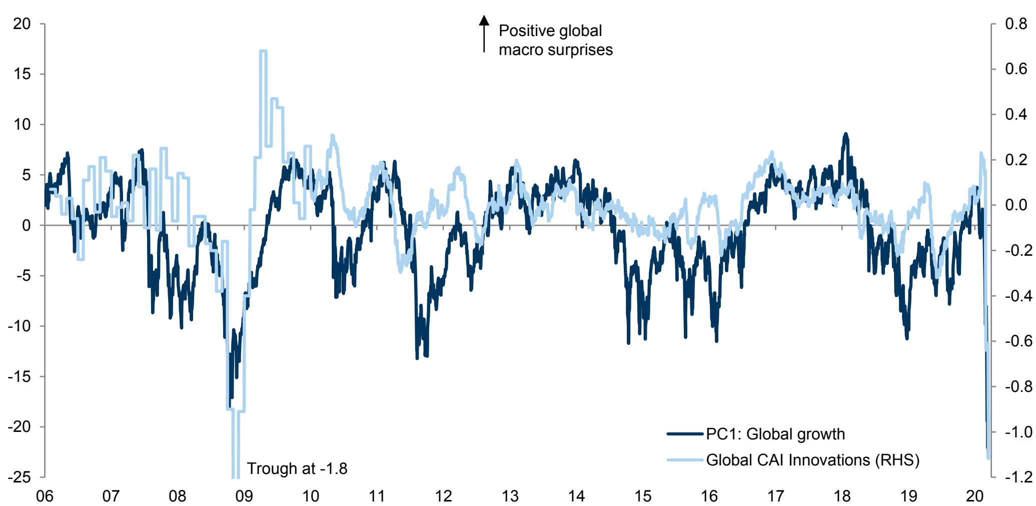
Exhibit 10: Sharp repricing of growth expectations across assets as search for yield unwinds - weaker Dollar a positive
RAI principal components



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

6. **Our RAI PC1 'Global Growth' has declined alongside our CAI Innovations, an estimate of macro surprises relative to statistical models** (Exhibit 11). With the growth shock from the coronavirus, oil price declines and the sharp tightening of financial conditions, risks to global growth remain skewed to the downside. Before the virus shock, global growth was just starting to recover and macro surprises had turned positive, but now they have fallen to GFC levels. As our Asia Economics team has noted, the pace of contraction in China on the back of the coronavirus is likely the most rapid seen in a large economy in modern times.

Exhibit 11: RAI PC1 has reached new lows, as have macro surprises as measured by our CAI innovations

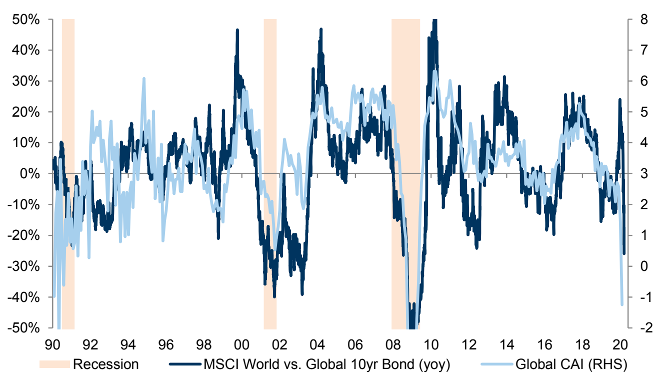


Source: Datastream, Goldman Sachs Global Investment Research

Part of the reason for the sharp repricing is the starting point - earlier this year, markets were pricing a large acceleration in global growth (Exhibit 12). After the recent reversal markets are pricing global growth closer to 0% - however, our global CAI has already fallen more sharply, to a post-crisis low of -1% in March. Usually global growth troughs 3-6m post the RAI (Exhibit 13). Our economists expect that DM growth will also slow sharply, and the length and depth of the slowdown depends most importantly on whether health officials can materially slow the spread of the virus.

For the US they now expect real GDP growth of 0% in Q1 (from +0.7%), -5% in Q2 (from 0%), +3% in Q3 (from +1%), and +4% in Q4 (from +2¼%), with further strong gains in early 2021. This takes their 2020 GDP forecast down to +0.4% (from 1.2%). In previous periods once the RAI moved below -2, it usually took 3-6 months until global growth picked up (Exhibit 13). However, uncertainty on a 2H recovery remains very high - a more forceful fiscal response might help stabilise growth sentiment, including measures to prevent private sector defaults and large increase in unemployment.

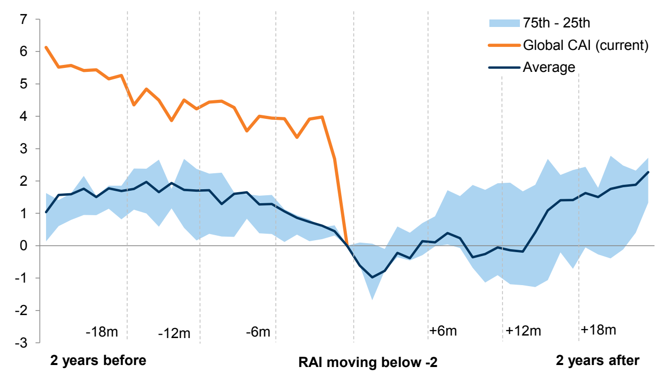
Exhibit 12: Equity vs. bond performance was pricing a strong acceleration of global growth before



Source: Datastream, Goldman Sachs Global Investment Research

Exhibit 13: Global growth tends to recover a few months after the RAI has moved below -2

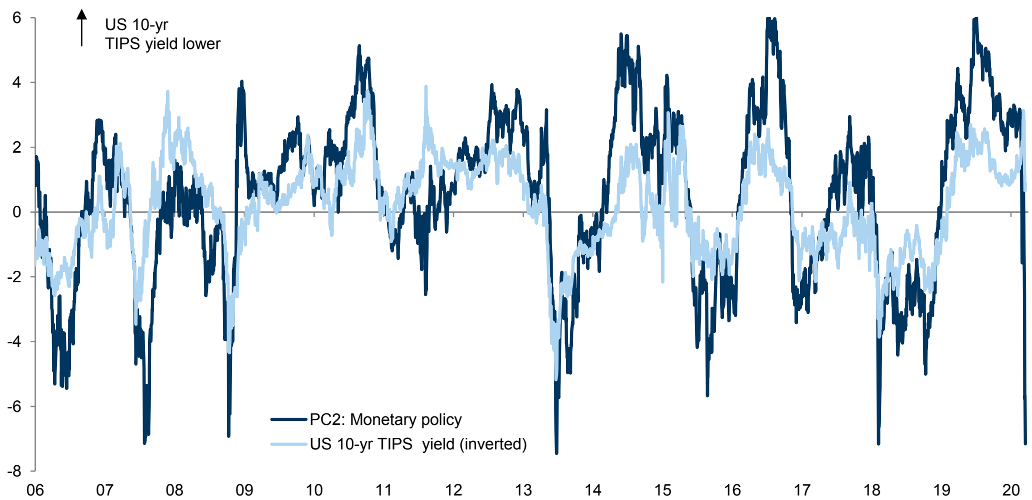
Change in Global CAI



Source: Datastream, Goldman Sachs Global Investment Research

7. **Much in contrast to recent history, in the past few weeks the search for yield has reversed despite lower bond yields** (Exhibit 14). Historically, RAI PC2 'Monetary Policy', which indicates how central banks boost the search for yield, had a close link with US 10-year TIPS yields. However, in the recent 'risk off' RAI PC2 declined sharply despite lower yields - the only other time this was the case was in the Euro area crisis. In other words, the 'central bank put' has been less effective. This is likely due to an unwind of the strong search for yield throughout 2019. That said, the Fed's emergency measures have eased stress in USD funding markets. **But while easier policy might reduce left-tail risk, with high uncertainty on growth it is unlikely to boost risk appetite.**

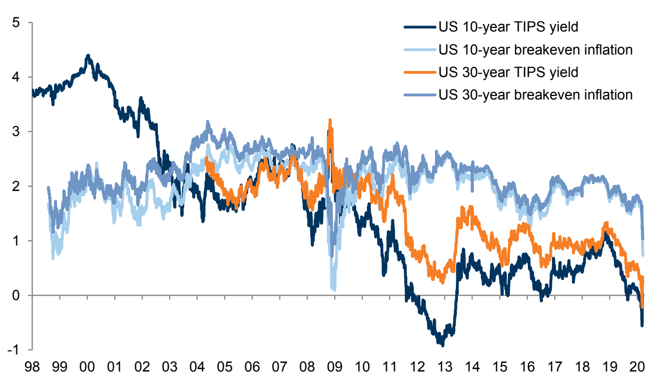
Exhibit 14: The search for yield is unwinding despite lower US 10-year TIPS yields - the only other time this occurred was the Euro area crisis



Source: Datastream , Goldman Sachs Global Investment Research

Global bond yields have declined sharply but have been more rangebound since last week (Exhibit 15). While the initial declines have been driven by both real yields and breakeven inflation, more recent declines were mostly due to the latter. Indeed, US 10-year TIPS yields increased from -0.85bp intraday on Monday last week to zero on Friday. Our rates team expect yields to trough in 2Q2020, but the lows are lower than their current forecasts - and downside risk might be higher for breakevens. They see US 10-year yields bottoming out at 40bp before ending the year at 75bp (Germany: -0.75. UK: 0.45, Japan: -0.15). Historically US 10-year yields often declined further after the RAI moved below -2, but mainly if a recession followed (Exhibit 16).

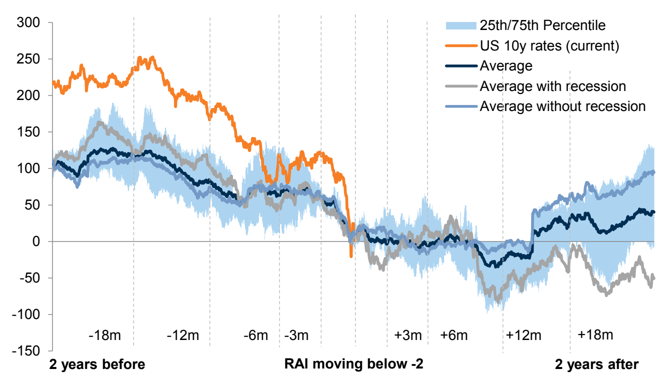
Exhibit 15: Bond yields have declined sharply, both real yields and breakevens



Source: Datastream, Goldman Sachs Global Investment Research

Exhibit 16: Bond yields have declined further post the RAI moving below -2 if a recession followed

Change in US 10-year yields

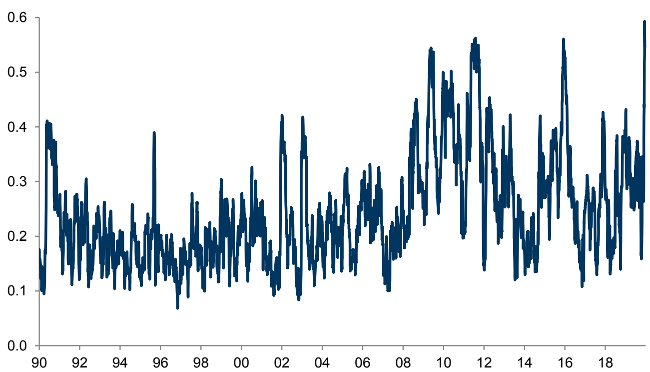


Source: Datastream, Goldman Sachs Global Investment Research

8. **Markets have to deal with a twin shock from the coronavirus and the sharp decline in oil prices.** Correlations with oil prices are at the 2015/16 and GFC peak levels, indicating that oil has become a key cross-asset driver (Exhibit 17). Most assets do not have a strong, persistent link with oil prices outside of supply shocks, such as the Gulf

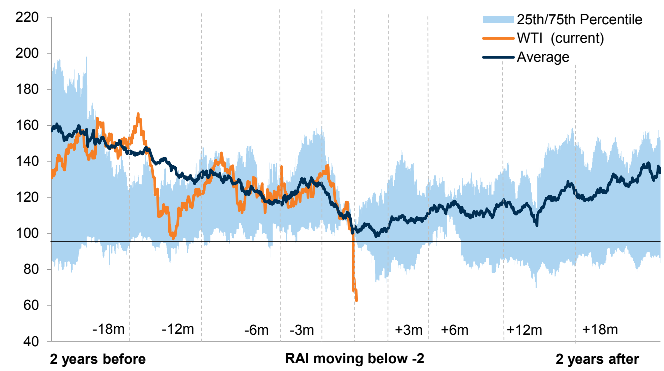
war in the 1990s, or demand shocks, like recessions, e.g., the GFC. But during periods of high oil price volatility, correlations with oil tend to increase. Historically oil prices have gradually recovered once the RAI moved below -2 (Exhibit 18). Our commodities team now forecasts $20/bbl Brent for Q2 and commodities broadly down 25% - this can create further negative shocks for oil-related assets.

Exhibit 17: Cross-asset correlation with oil has increased to all-time highs again
3-month absolute correlation across 32 assets with WTI oil prices (weekly returns)



Source: Datastream, Goldman Sachs Global Investment Research

Exhibit 18: Oil has historically struggled to recovery after RAI trough
Rebased to 100

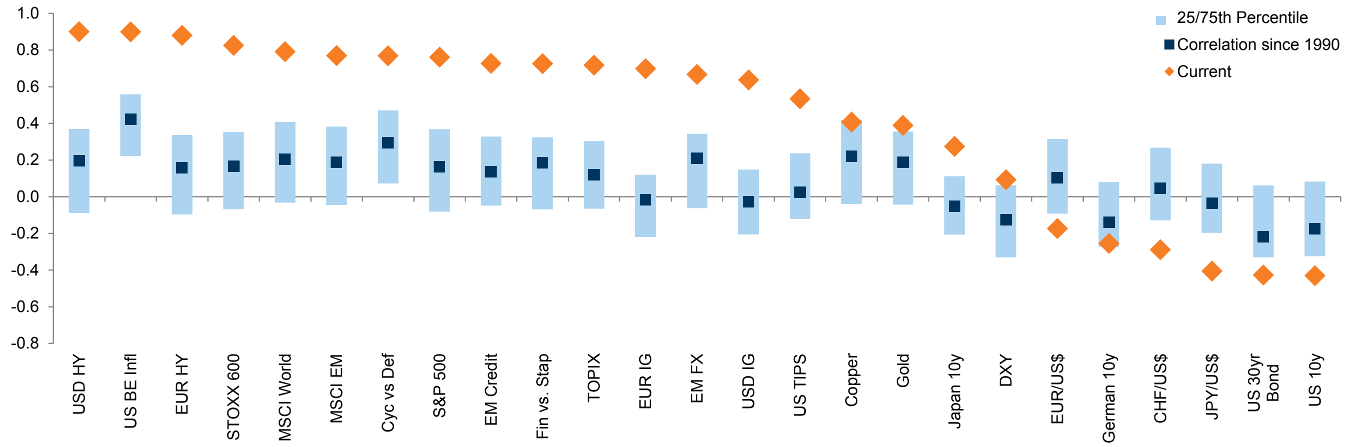


Source: Datastream, Goldman Sachs Global Investment Research

Some assets currently look particularly sensitive to oil, with correlations well above long-term averages in the last 12 months (Exhibit 19). US 10-year breakeven inflation had the strongest positive correlation with oil, which has by extension boosted global bond markets. Risky assets have also been more correlated with oil prices over the last 12 months compared with historical averages since 1990, in particular for HY credit. Our credit team has highlighted that the energy sector weight for USD HY is c.12%, for USD IG c.8% - for comparison, for the S&P 500 it is just c.3%, and for MSCI World it is c.4.5%.

An outlier compared with history has been the Dollar - historically the Dollar/oil correlation has been much more negative due to the US being a net oil importer. However, that has changed in recent years with the shale revolution and a narrowing oil trade deficit, and recent Dollar-negative developments might have been more important. EM credit has been in line until recently when spreads widened sharply - as our EM team has highlighted, its sensitivity to oil prices is non-linear and increased during the GFC.

Exhibit 19: HY credit and US breakeven inflation have unsurprisingly been most positively correlated with oil prices
3-month correlation with WTI oil (weekly returns). Data since 1990 where available

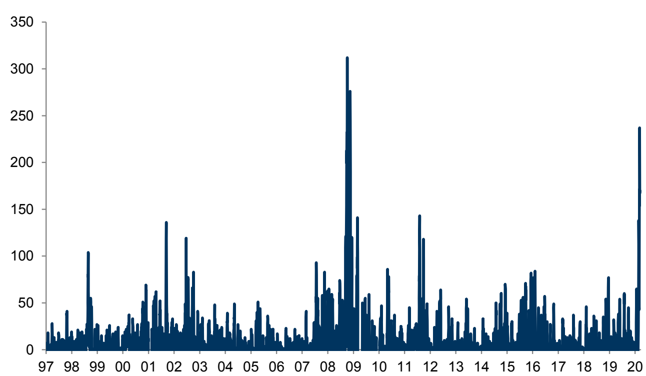


Source: Datastream, Goldman Sachs Global Investment Research

9. **Credit has already repriced most aggressively in the second leg of the 'risk off' due to the twin shock of the coronavirus and lower oil prices.** Last week the widening in USD HY credit spreads was the largest outside the GFC (Exhibit 20). As we highlighted at the start of the 'risk off', credit appeared vulnerable in the event of a large, sustained drawdown as valuations seemed particularly expensive, both relative to growth and equities. Valuations now provide a better buffer for potential defaults.

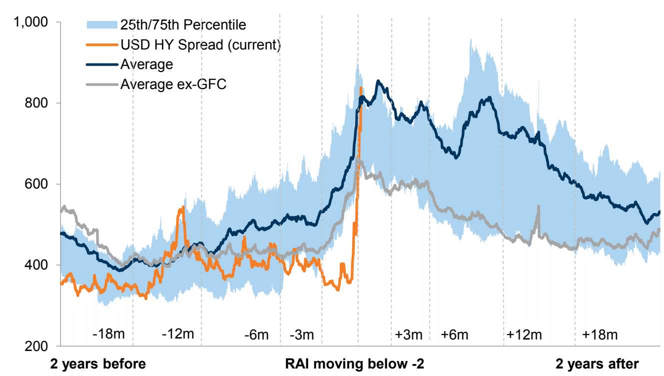
Our credit strategy team increased their credit spread forecasts for the remainder of the year across markets - they expect spreads to remain in their new wider range in Q2 before flattening in Q3 and tightening in Q4. This is consistent with the historical experience when the RAI moved below -2 - initially credit spreads remained wide before tightening after 3-6 months (Exhibit 21). However, they have also highlighted increased risks from low liquidity, which could exacerbate volatility in the near term.

Exhibit 20: Credit repricing has been the sharpest outside of the GFC
Weekly changes for USD HY credit spreads



Source: Haver Analytics, Goldman Sachs Global Investment Research

Exhibit 21: Credit spreads tend to tighten 3-6m after the RAI move below -2
USD HY credit spreads



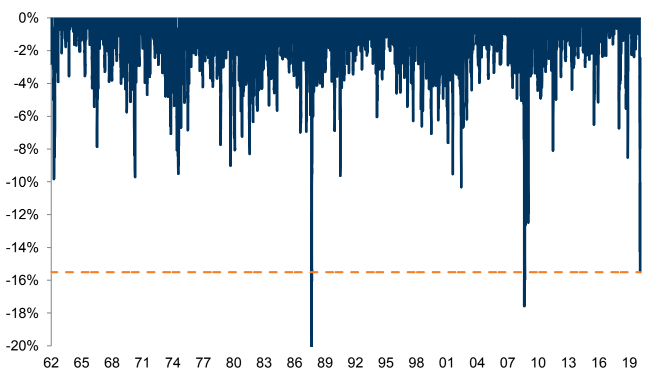
Source: Datastream, Goldman Sachs Global Investment Research

10. **Last week's equity sell-off has been particularly painful for balanced and multi-asset portfolios as few assets buffered losses.** The monthly drawdown for a US

60/40 portfolio was the largest outside the GFC and 1987 (Exhibit 22). Of course, this follows 2019, which was of the best years for balanced portfolios in history. But even outside of bonds there were few places to hide during the large equity drawdown last week. This can drive unwinds of multi-asset strategies that rely on diversification, such as risk parity or balanced funds, in part due to outflows.

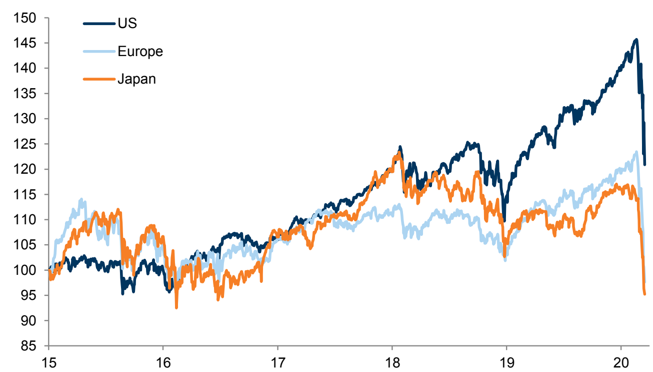
In the last decade, a 60/40 portfolio had the highest Sharpe ratio for more than a century. This was due to negative equity/bond correlations since the late 1990s, which improved diversification in balanced equity/bond portfolios. Bonds have also been in the longest bull market since 1900. But, as we have highlighted in our ***Balanced Bear*** research, with equities, bonds and credit expensive at the same time, the potential for diversification in drawdowns is increasingly limited (see The Balanced Bear - Part 1 for details and The Balanced bear - Part 2 for strategies). After the recent drawdown, a US 60/40 portfolio is back to the 2018 trough in Europe and Japan cumulative performance is back to 2016 levels (Exhibit 23).

Exhibit 22: The current 60/40 drawdown is the largest since the GFC
Monthly drawdowns for a US 60/40 portfolio



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

Exhibit 23: A US 60/40 portfolio has lost all of the 2019 performance but in Europe and Japan they are back to 2016 lows
Performance (rebased to 100)



Source: Datastream, Goldman Sachs Global Investment Research

At current low yields a large proportion of global bonds are less effective hedges for equities. US 10-year bonds did offer a buffer, but less so compared with history - to buffer losses from here, bond yields would need to turn deeply negative (Exhibit 24). Our rates team has highlighted that the equity beta of bonds is lower as yields move closer to the effective lower bound - they like some smaller G10 economies such as Canada, Norway and New Zealand, where there appears to be relatively greater space. It is also important to keep in mind that there could be a large increase in yields in the event of an eventual stabilisation of growth sentiment.

Exhibit 24: To provide a buffer for further equity losses, bond yields would have to turn deeply negative

Orange shade indicates a lower return, light orange shade indicates a higher return.

S&P 500 drawdown				US 10-year yield				US 30-year yield				German 10-year yields				Japan 10-year yield			
Start	End		Return	Start	End	Change	Return	Start	End	Change	Return	Start	End	Change	Return	Start	End	Change	Return
Jul-90	Oct-90	2.9	-19	8.4	8.9	0.5	-1	8.5	9.1	0.6	-4	8.5	9.1	0.6	-2	6.8	7.5	0.7	-3
Oct-97	Oct-97	0.7	-11	5.9	5.9	0.0	1	6.2	6.2	0.0	0	5.4	5.6	0.2	-1	2.0	1.9	-0.1	1
Jul-98	Aug-98	1.5	-19	5.5	5.0	-0.5	4	5.7	5.4	-0.4	6	4.7	4.2	-0.5	4	1.7	1.3	-0.4	4
Jul-99	Oct-99	3.0	-12	5.7	6.1	0.4	-2	5.9	6.3	0.4	-5	4.7	5.4	0.7	-4	1.8	1.7	0.0	0
Mar-00	Oct-02	30.5	-47	6.2	3.6	-2.6	34	6.0	4.7	-1.3	37	5.2	4.3	-0.9	21	1.9	1.1	-0.8	13
Nov-02	Mar-03	3.4	-14	4.2	3.6	-0.6	7	5.1	4.7	-0.4	8	4.5	3.8	-0.7	7	0.9	0.7	-0.2	3
Oct-07	Mar-09	17.0	-55	4.7	2.9	-1.8	23	4.9	3.6	-1.3	31	4.3	2.9	-1.4	18	1.7	1.3	-0.4	7
Apr-10	Jul-10	2.3	-16	3.8	3.0	-0.8	8	4.7	3.9	-0.7	14	3.1	2.6	-0.5	5	1.3	1.1	-0.2	3
Apr-11	Oct-11	5.1	-19	3.3	1.8	-1.5	16	4.4	2.8	-1.6	37	3.2	1.8	-1.4	14	1.2	1.0	-0.2	3
Apr-12	Jun-12	2.0	-10	2.2	1.5	-0.7	8	3.3	2.5	-0.8	18	1.8	1.2	-0.6	7	1.0	0.8	-0.2	2
Jul-15	Aug-15	1.2	-12	2.4	2.1	-0.3	3	3.1	2.8	-0.3	6	0.7	0.8	0.0	0	0.4	0.4	-0.1	1
Dec-15	Feb-16	1.4	-12	2.3	1.6	-0.7	6	3.0	2.5	-0.5	10	0.6	0.2	-0.5	5	0.3	0.0	-0.2	3
Jan-18	Feb-18	0.4	-10	2.7	2.8	0.2	-1	2.9	3.1	0.2	-4	0.6	0.7	0.1	-1	0.1	0.1	0.0	0
Sep-18	Dec-18	3.1	-19	3.1	2.7	-0.3	4	3.2	3.0	-0.2	5	0.5	0.2	-0.2	2	0.1	0.0	-0.1	1
Feb-20	Mar-20	0.9	-29	1.6	0.7	-0.8	9	2.0	1.3	-0.7	18	-0.4	-0.5	0.0	0	0.0	0.0	0.1	-1
	Average	**5.3**	**-20**	**4.3**	**3.7**	**-0.6**	**8**	**4.8**	**4.3**	**-0.5**	**11**	**3.4**	**3.1**	**-0.4**	**5**	**1.5**	**1.4**	**-0.2**	**2**
Yield scenario to have a 10% bond return in a 1-year period																			
Current level				0.7	**-0.3**	-1.0	10	1.3	**1.0**	-0.4	10	-0.5	**-1.5**	-1.1	10	0.0	**-1.0**	-1.0	10

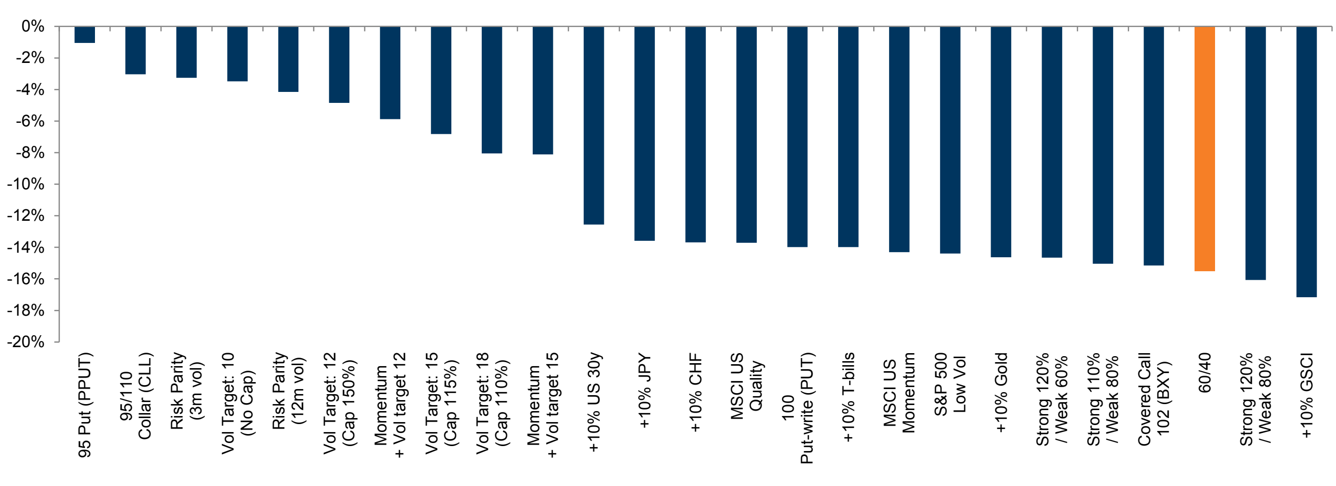
Note: Yield scenario is only based on duration and includes no convexity adjustment.

Source: Datastream, Goldman Sachs Global Investment Research

In particular, vol target and momentum overlays have worked well to protect US 60/40 portfolios in the current 'risk off'. Exhibit 25 shows how different strategies to reduce equity risk in multi-asset portfolios from our Balanced Bear Part 2 fared during the recent correction - most strategies, such as broader diversification and tail risk management approaches, have lowered the drawdown. Put overlays and scaling out of equities with rising volatility (both via risk parity on 3m vol and vol targeting) materially reduced losses. Moving up in quality in equities also reduced drawdowns but not by as much as historically - long-duration bonds and Yen helped buffer equity losses best.

Exhibit 25: Most of our Balanced Bear strategies would have outperformed but few materially

Performance of different strategies from our Balanced Bear Part 2 report



Source: Datastream, Bloomberg, Goldman Sachs Global Investment Research

Cross-asset volatility: A fast shift to a high vol regime

With one of the sharpest corrections for equities in history, cross-asset implied volatility has increased to historical highs. Even FX volatility, which had lagged volatility in other assets, has spiked materially. Only European rates volatility has not increased given the proximity to the effective lower bound (Exhibit 28).

As risky assets lost ground, investor demand for risk-off hedges increased further. The average of cross-asset skew, the cost of downside protection vs upside, reached a historical high (Exhibit 27). And with the VIX at levels close to the GFC or 1987 crash, option hedges have become very expensive, in particular in equity (Exhibit 28).

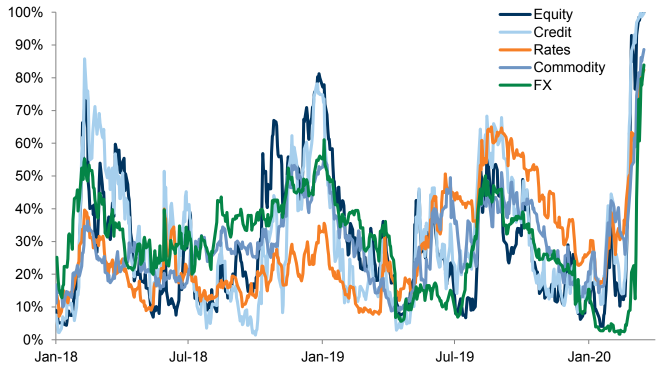
From current levels it is, unsurprisingly, more likely we will see volatility falling, eventually. Historically, after our Risk Appetite Indicator reached -2, the VIX tended to decline (Exhibit 29). However, during the GFC the VIX stayed at elevated levels for several months before normalising. On the flipside, with the interconnectedness of volatility, liquidity and systematic strategy flows creating a self-reinforcing loop, our option strategists think there is the potential to see volatility declining faster than in previous instances.

Across assets, long-dated equity vol seems to have lagged the sharp repricing of short-term maturities both in Europe and US (Exhibit 31). For a long volatility trade, despite very high implied levels, investors could look at forward volatility, which is still relatively low as vol curves are very inverted across assets (Exhibit 32). And with risk appetite indicators at historical lows, long-dated equity calls appear cheap vs history, and look attractive for taking exposure for a market rebound.

Cross-asset volatility is mostly in line with historical cross-asset sensitivities during drawdowns (Exhibit 33). HSCEI implied vol looks cheap, while that for S&P 500 low vol stocks appears expensive. S&P 500 low vol stocks have underperformed their normal beta during drawdowns - the median beta of US low vol stocks is usually around 0.5-0.6, while in the current correction it was around 0.8-0.9. We like selling puts on low vol stocks to fund protection on higher beta indices.

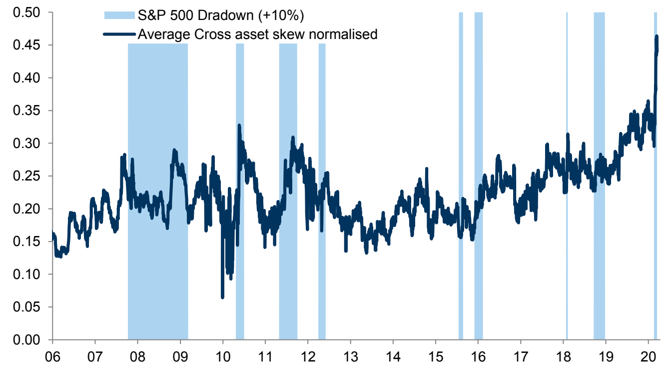
After being a laggard within safe assets in the first leg of the 'risk off' move, the Yen has performed strongly during the second leg. We continue to like JPY/USD as a risk-off hedge, but after the increase in FX volatility and the more expensive levels of skew, in particular relative to Gold, the case for USD/JPY puts looks less compelling than previously (Exhibit 34). Similarly, OTM HYG puts have become more expensive and now look less attractive at this level of vol and spreads (Exhibit 35). The skew on HYG puts looks particularly expensive currently (Exhibit 36).

Exhibit 26: Implied volatilities are at historical highs across assets
3m implied volatility percentile (last 10y)



Source: Goldman Sachs Global Investment Research

Exhibit 27: 'Risk off' skew across assets is very high now
Assets included: S&P 500, EURO STOXX 50, HYG, WTI, Gold, JPY/USD



Source: Goldman Sachs Global Investment Research

Exhibit 28: Most of the cross asset volatility is at historical highs
Percentile 10y

	Equities						Rates				Credit			Commodities			Currencies		
	S&P 500	EURO STOXX 50	Nikkei 225	FTSE 100	MSCI EM	MSCI EAFE	USD 2-year	USD 10-year	EUR 2-year	EUR 10-year	CDX IG	CDX HY	iTraxx Europe	WTI	Gold	Copper	EUR/ USD	JPY/ USD	GBP/ USD
Implied (3-month ATM, %)																			
Current:	60.6	57.3	52.2	56.4	52.7	52.3	5.4	9.0	2.0	4.3	101.9	87.7	110.5	101.5	27.2	24.6	10.1	16.5	11.6
Percentile:	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*98%*	*100%*	*59%*	*73%*	*100%*	*99%*	*100%*	*100%*	*98%*	*68%*	*65%*	*100%*	*87%*
1M change:	48.5	45.1	38.2	44.7	36.7	41.3	1.8	4.9	1.0	1.8	58.1	54.8	69.8	69.7	16.4	7.6	5.4	11.5	5.5
Average:	15.4	19.3	19.8	15.2	21.1	17.3	3.2	5.0	2.2	3.8	50.3	46.1	56.8	30.9	15.4	22.6	9.1	9.4	9.0
95th:	25.3	29.7	26.8	23.9	32.5	29.7	5.0	7.2	5.3	6.2	72.3	69.5	87.0	47.1	22.3	36.8	14.1	12.8	13.0
5th:	10.0	12.3	13.8	10.3	15.2	10.4	1.5	3.5	0.9	2.2	38.7	30.7	40.3	17.1	9.7	15.2	5.2	5.8	5.8
Realised (%)																			
1-month:	80.8	58.6	34.4	53.5	42.1	43.9	5.9	9.6	2.1	3.6	190.4	161.5	162.2	118.9	31.4	16.4	11.3	22.2	13.5
Percentile:	*100%*	*100%*	*94%*	*100%*	*100%*	*100%*	*99%*	*100%*	*71%*	*68%*	*100%*	*100%*	*100%*	*100%*	*97%*	*32%*	*82%*	*99%*	*96%*
Average:	13.6	18.2	19.4	14.0	14.3	13.4	2.8	4.6	1.6	3.3	37.3	32.7	43.2	30.9	14.7	20.2	8.2	8.6	8.3

Source: Goldman Sachs Global Investment Research

Exhibit 29: During the current risk off move, the VIX has spiked to GFC levels

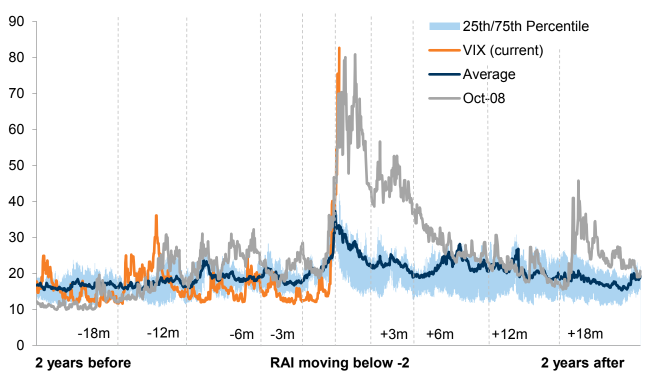
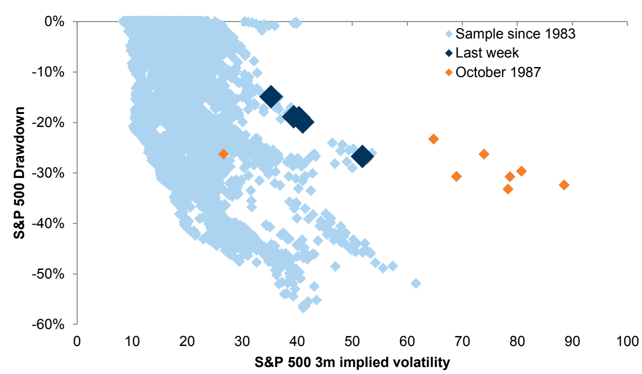
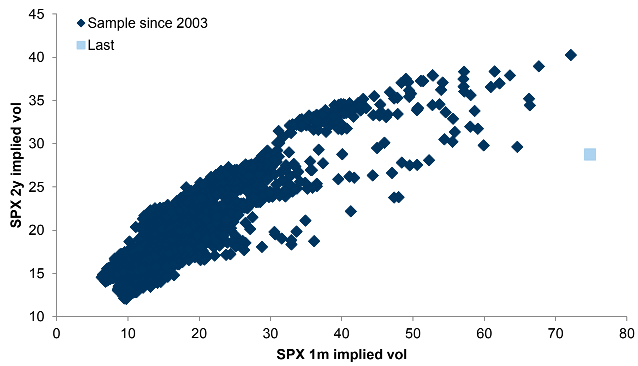


Exhibit 30: Volatility has increased more relative to the magnitude of equity drawdown



Source: Goldman Sachs Global Investment Research

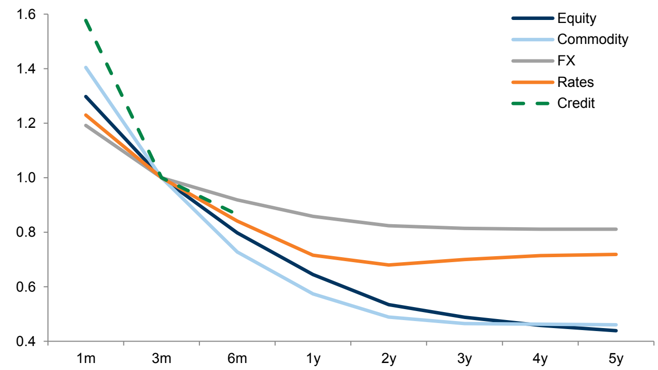
Exhibit 31: S&P 500 long-dated vol is trading at discount vs 1m implied volatility



Source: Goldman Sachs Global Investment Research

Exhibit 32: Long-dated volatility is much cheaper

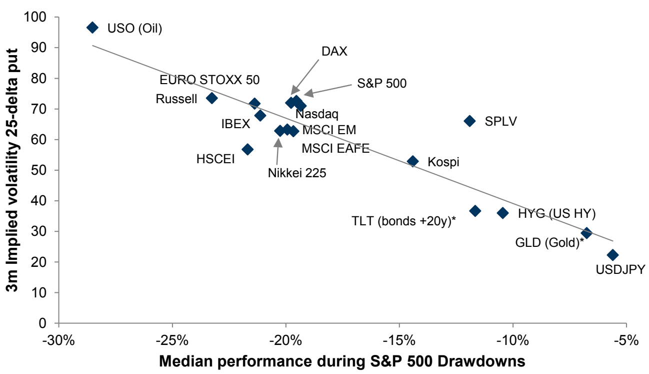
Volatility at different maturities as a ratio of 3m volatility level



Source: Goldman Sachs Global Investment Research

Exhibit 33: Most volatilities are trading in line with historical performance sensitivities during equity drawdowns

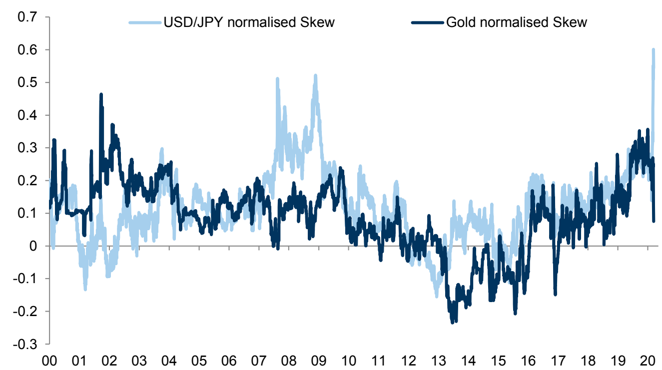
3m 50-delta vol during S&P 500 drawdowns more than 10%.



Note: Gold and TLT median performance during S&P 500 drawdowns are with inverted sign

Source: Datastream, Goldman Sachs Global Investment Research

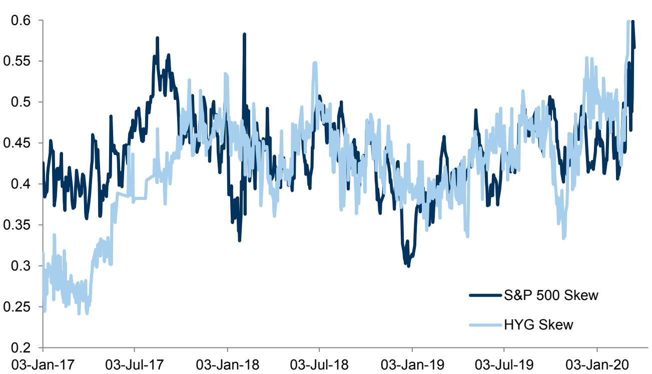
Exhibit 34: USD/JPY risk reversal has become expensive



Source: Goldman Sachs Global Investment Research

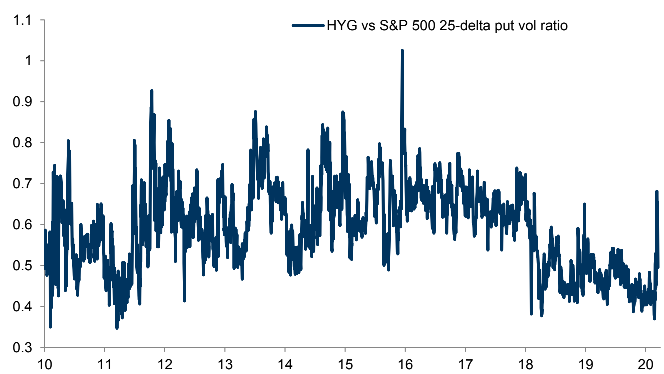
Exhibit 35: Equity skew has now caught up with HYG skew ...

3m normalised Skew



Source: Goldman Sachs Global Investment Research

Exhibit 36: ... and the ratio of implied volatility has increased materially



Source: Goldman Sachs Global Investment Research

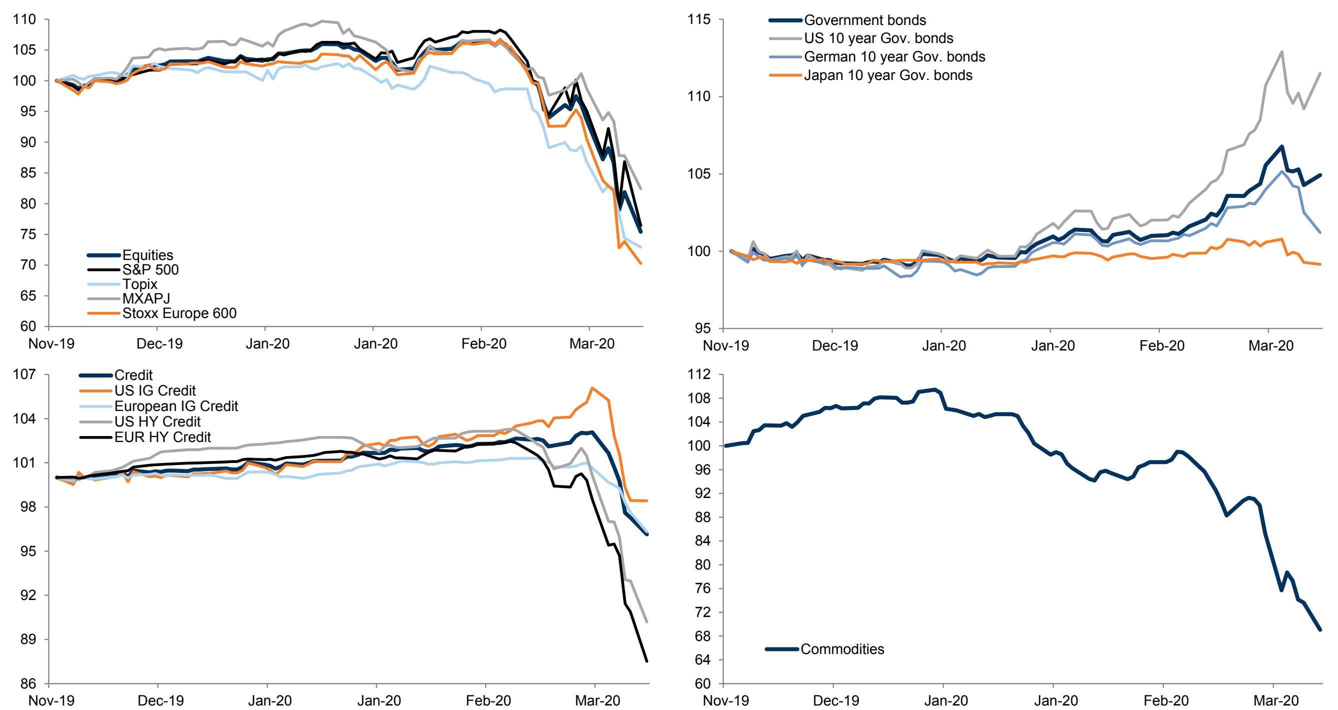
Asset class forecast returns and performance

Exhibit 37: Goldman Sachs' 3-, 6- and 12-month return forecasts by asset class

Asset Class	Benchmark Weight	3-month Total Return		6-month Total Return		12-month Total Return	
		Local currency	In USD	Local currency	In USD	Local currency	In USD
Equities	**35**	**4.6**	**3.5**	**17.7**	**17.3**	**34.5**	**36.1**
S&P 500	40	3.3	3.3	18.7	18.7	41.0	41.0
STOXX Europe 600	30	6.7	3.5	22.0	20.5	35.2	39.6
MSCI Asia Pac ex Japan	20	3.1	3.5	10.6	11.4	21.2	22.6
TOPIX	10	6.0	4.7	14.9	13.5	32.8	33.6
10 yr. Government Bonds	**45**	**3.7**	**2.4**	**3.2**	**2.4**	**1.0**	**2.2**
US	40	3.3	3.3	2.5	2.5	-0.5	-0.5
Germany	30	4.9	1.8	4.6	3.3	2.3	5.7
Japan	30	3.1	1.8	2.7	1.4	1.7	2.3
Corporate Bonds	**10**	**3.9**	**-0.1**	**4.7**	**3.0**	**9.6**	**10.6**
Bloomberg Barclays US IG	50	5.1	-1.1	5.5	5.5	8.4	8.4
Bloomberg Barclays US HY	20	2.6	2.6	3.9	-2.5	15.6	15.6
iBoxx EUR IG	20	3.2	0.0	3.8	2.5	6.0	9.5
BAML EUR HY	10	2.2	-0.9	3.7	2.4	10.7	14.3
Commodities (GSCI Enhanced)	**5**	**-25.2**	**-25.2**	**-13.1**	**-13.1**	**7.0**	**7.0**
Cash	**5**	**0.1**	**-1.5**	**0.2**	**-0.4**	**0.5**	**2.1**
US	50	0.2	0.2	0.6	0.6	1.4	1.4
Euro area	50	-0.1	-3.1	-0.2	-1.5	-0.4	2.8
FX		**3m target**	**Return**	**6m target**	**Return**	**12m target**	**Return**
EUR/$		1.08	-3.0	1.10	-1.2	1.15	3.2
$/YEN		107	1.3	107	1.3	105	-0.6

Source: Goldman Sachs Global Investment Research

Exhibit 38: Performance of asset classes since 2020 outlook (November 28, 2019)



Source: Datastream, Goldman Sachs Global Investment Research

Key macro forecasts

Exhibit 39: GS forecasts across asset classes

	Return in % over last				Current	Forecasts				Up/ (downside) in %		
	12 m	3 m	1 m	YTD	Level	3m	6m	12m	Unit	3m	6m	12m
S&P 500 ($)	-13.8	-24.9	-29.3	-2.5	2386	2450	2800	3300	Index	2.7	17.3	38.3
Stoxx Europe 600 (€)	-22.7	-31.5	-33.7	-12.2	285	300	340	370	Index	5.4	19.5	30.0
MSCI Asia-Pacific Ex-Japan ($)	-15.8	-20.6	-22.6	-7.0	429	440	470	510	Index	2.6	9.6	18.9
Topix (¥)	-20.9	-28.7	-27.4	-15.1	1236	1300	1400	1600	Index	5.1	13.2	29.4
10 Year Government Bond Yields												
US	21.6	12.5	9.3	23.5	0.73	0.43	0.53	0.88	%	-30 bps	-20 bps	15 bps
Germany	5.7	2.0	0.5	8.0	-0.46	-0.88	-0.86	-0.67	%	-42 bps	-40 bps	-21 bps
Japan	-0.1	-0.3	-0.4	0.4	0.01	-0.24	-0.21	-0.11	%	-25 bps	-22 bps	-12 bps
UK	8.4	3.8	1.8	9.2	0.44	0.21	0.28	0.53	%	-23 bps	-15 bps	10 bps
Corporate Bonds												
Bloomberg Barclays US IG	8.6	-1.6	-4.3	12.4	209	190	186	139	Bps	-19 bps	-23 bps	-70 bps
Bloomberg Barclays US HY	-5.2	-11.0	-12.5	1.1	726	725	717	481	Bps	-1 bps	-9 bps	-245 bps
iBoxx EUR IG	-0.1	-3.9	-4.8	2.4	188	185	179	134	Bps	-3 bps	-9 bps	-54 bps
BAML EUR HY	-8.0	-13.2	-14.4	-3.6	634	650	633	495	Bps	16 bps	-1 bps	-139 bps
Commodities												
WTI	-51.0	-52.3	-44.9	-36.5	29	20	28	41	$/bbl	-30.3	-2.4	42.9
Brent	-55.2	-54.4	-47.7	-43.6	30	20	30	45	$/bbl	-33.3	0.1	50.1
Copper	-18.1	-14.8	-8.3	-11.3	5276	4900	5600	6000	$/mt	-7.1	6.1	13.7
Gold	15.4	1.9	-5.0	17.2	1502	1600	1650	1800	$/troy oz	6.5	9.8	19.8
FX												
EUR/USD	-1.7	0.0	2.7	-2.6	1.11	1.08	1.10	1.15		-3.0	-1.2	3.2
USD/JPY	-5.3	-3.6	-3.7	-3.7	106	107	107	105		1.3	1.3	-0.6
GBP/USD	-7.5	-7.9	-5.7	-3.6	1.23	1.27	1.29	1.35		3.4	5.1	10.0
USD/BRL	30.6	22.3	15.6	28.6	4.98	4.5	4.4	4.3		-9.7	-11.7	-13.7
USD/RUB	13.6	18.4	16.3	6.6	73.93	68	65	61		-8.0	-12.1	-17.5
USD/INR	7.4	4.6	4.1	6.4	74.27	72	71	71		-3.7	-4.4	-4.4
USD/CNY	4.3	-0.1	0.3	1.9	7.00	7.05	7.00	6.90		0.7	0.0	-1.4

Source: Bloomberg, Datastream, iBoxx, S&P, BAML, Goldman Sachs Global Investment Research

Exhibit 40: GS real GDP growth forecasts vs. consensus

% yoy	2018	2019E	2020E	
	Realised	GS	GS	Consensus*
USA	2.9	2.3	0.4	1.5
Japan	0.8	0.7	-2.1	-0.5
Euro area	1.9	1.2	-1.7	0.8
China	6.6	6.1	3.0	5.5
World	3.7	3.1	1.3	2.8

** Bloomberg Consensus*

Source: Bloomberg, Goldman Sachs Global Investment Research

Disclosure Appendix

Reg AC

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

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Selling Options - Investors who sell calls on securities they do not own risk unlimited loss of the security price less the strike price. Investors who sell covered calls (sell calls while owning the underlying security) risk having to deliver the underlying security or pay the difference between the security price and the strike price, depending on whether the option is settled by physical delivery or cash-settled. Investors who sell puts risk loss of the strike price less the premium received for selling the put. Investors who sell put or call spreads risk a maximum loss of the difference between the strikes less the premium received, while their maximum gain is the premium received. For options settled by physical delivery, the above risks assume the options buyer or seller, buys or sells the resulting securities at the settlement price on expiry.

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