

## GOAL Kickstart

## Asset allocation into 2023 - tactically defensive but looking to re-risk

Last week, [Nov FOMC minutes](#) confirmed a slower pace of hiking due to uncertainty around lag effects and incoming data. Fed participants now see a recession over the next year 'almost as likely' as its baseline forecast of below trend-growth. On Nov 30, 2022, Chair Powell's speech at the Brookings Institute will indicate how the Fed thinks about the recent FCI easing. Also, in a data-heavy week, we have GDP and JOLTS Job Openings on Wednesday, ISM and PCE on Thursday and US Non-Farm Payrolls on Friday.

In our GOAL Outlook for 2023: From Inflation to growth frustration, we remain defensive in our asset allocation for the 3m horizon with further headwinds from rising real yields and lingering growth uncertainty. We expect US 2yr yields to peak at 5% (and the 10yr yield at 4.5%). But, a resilient US economy and sticky inflation would mean a higher US real yield peak, which could weigh on equities based on current correlations ([Exhibit 1](#)). With risk premia relatively low, especially after the recent relief rally, near-term we would focus on yield, and remain up-in-quality and selective on procyclical exposure. We expect opportunities to add risk in 2023 and are N across assets/OW commodities over 12m ([Exhibit 7](#)).

The valuation starting point has improved - while late last year [equities and bond valuations were near all-time highs](#), there has been a material reset YTD ([Exhibit 2](#)). Yet equity risk premia appear too low considering elevated recession risk and uncertainty around the growth/inflation mix - this points more to opportunities in fixed income ([Exhibit 3](#)). Our economists see only a 35% probability of a US recession, and think any recession would likely be mild. Still, recession risk remains elevated and might increase with renewed FCI tightening - [our market-implied recession probability](#) for the next 12m is at 38% currently ([Exhibit 4](#)).

We expect rates volatility to re-set lower next year - this year tail risks were mainly due to rate shocks, but past the peak in inflation and in CB hawkishness investors should face more growth volatility ([Exhibit 5](#)). With the large skew decline, collaring strategies currently look very attractive ([Exhibit 6](#)) - even outright equity puts look more attractive after the VIX re-set. Longer-dated puts or collars appear very attractive considering the large forward premium to spot. The divergence in US and Japan rates has widened the gap between longer-dated S&P 500 and Nikkei calls: selling 1 5yr S&P 500 call can fund nearly 2 Nikkei calls.

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# Asset allocation into 2023 - tactically defensive but looking to re-risk

**Exhibit 1: Equities have again become very negatively correlated with US 10Y real yields**

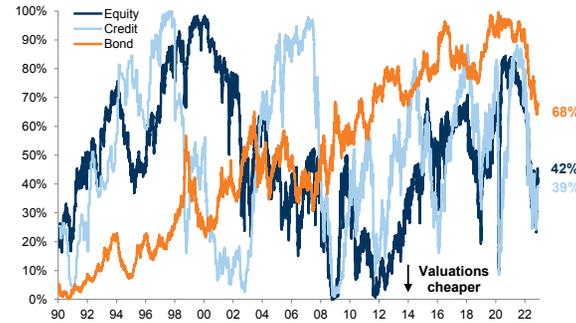
12-month correlation of weekly changes with S&P 500



Source: Bloomberg, Goldman Sachs Global Investment Research

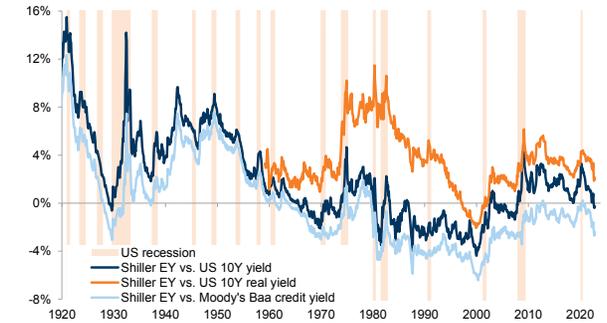
**Exhibit 2: Valuations across assets have de-rated in 2022**

Average valuation percentile since 1990. 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, I/B/E/S, Goldman Sachs Global Investment Research

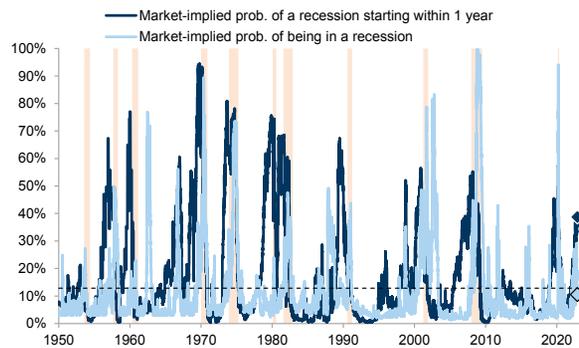
**Exhibit 3: Equities are increasingly yielding to bonds - equities have de-rated vs. bonds**



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

**Exhibit 4: Our market-implied US recession probability has moved to 40% this year to new post-COVID highs**

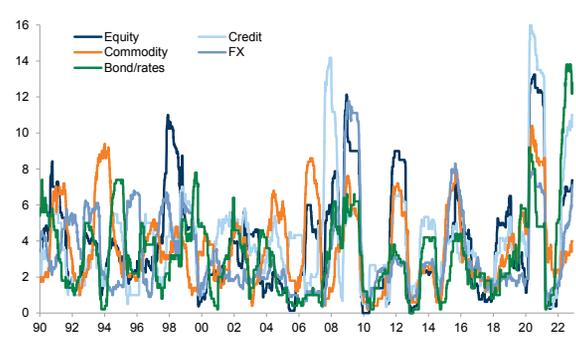
Orange shade: US recession. Dotted line: unconditional probability



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

**Exhibit 5: Rates had the most tail risk this year, much in contrast to the last 30 years**

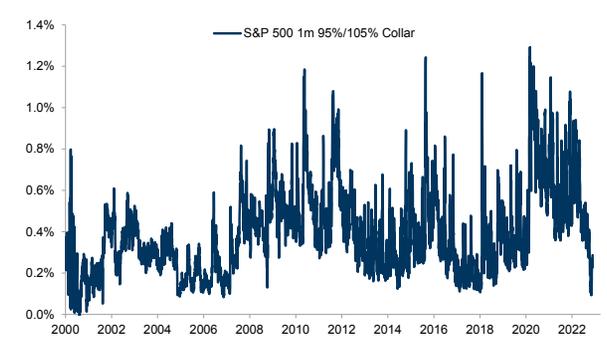
1-year rolling number of 3 standard deviation daily moves



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

**Exhibit 6: Short-dated collars on the S&P 500 have cheapened significantly due to lower skew and higher rates**

Price as % of spot



Source: Goldman Sachs, Goldman Sachs Global Investment Research

*We would like to thank Marcus von Scheele for his contributions to this report.*

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## Cross-asset: Forecasts

Exhibit 7: GOAL asset allocation recommendations and GS cross-asset forecasts

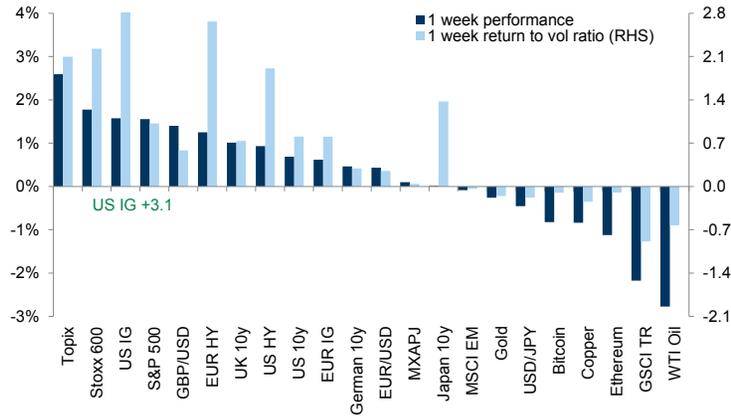
	Allocation Weighting		Current Level	Forecasts			Forecast Upside/Downside (%)		
	3m	12m		3m	6m	12 m	3m	6m	12 m
<b>Equities</b>	<b>UW</b>	<b>N</b>			<b>Index level</b>			<b>Total Return</b>	
S&P 500 (\$)	UW	UW	4026	3600	3600	4000	-10.2	-9.7	1.1
Stoxx Europe 600 (€)	UW	N	441	390	410	450	-10.6	-5.2	5.7
MSCI Asia-Pacific Ex-Japan (\$)	OW	OW	494	510	525	550	5.0	7.5	12.8
Topix (¥)	OW	OW	2018	2000	2050	2200	-0.7	2.0	9.8
<b>10 Year Government Bonds</b>	<b>UW</b>	<b>N</b>			<b>Yield (%)</b>			<b>Total Return</b>	
US	N	OW	3.70	4.25	4.44	4.34	-3.8	-4.4	-1.7
Germany	N	UW	1.97	2.65	2.75	2.75	-5.4	-5.7	-4.7
Japan	N	UW	0.25	0.25	0.25	0.25	0.3	0.3	0.4
UK	-	-	3.12	3.90	4.00	4.00	-5.8	-5.8	-4.2
<b>Corporate Bonds</b>	<b>OW</b>	<b>N</b>			<b>Spread</b>			<b>Total Return</b>	
Bloomberg Barclays US IG	OW	N	130	168	174	154	-5.6	-6.1	-2.1
Bloomberg Barclays US HY	UW	N	435	556	585	520	-5.2	-5.5	-0.4
iBoxx EUR IG	OW	N	193	230	231	212	-4.5	-4.5	-2.8
BAML EUR HY	UW	N	492	618	633	560	-5.1	-4.9	-1.1
JP Morgan EMBI Div.	UW	N	480	485	490	500	-3.0	-3.2	0.1
<b>Commodities</b>	<b>N</b>	<b>OW</b>			<b>Spot price</b>			<b>Spot Return</b>	
WTI (\$/bbl)	-	-	78	110	100	105	41.3	28.5	34.9
Brent (\$/bbl)	-	-	84	115	105	110	36.7	24.9	30.8
Copper (\$/mt)	-	-	7,975	6,700	7,600	9,000	-16.0	-4.7	12.9
Gold (\$/troy oz)	-	-	1,750	1,850	1,950	1,950	5.7	11.4	11.4
<b>FX</b>	<b>-</b>	<b>-</b>			<b>Spot rate</b>			<b>Spot Return</b>	
EUR/USD	-	-	1.04	0.94	0.97	1.05	-9.7	-6.8	0.9
USD/JPY	-	-	139.3	155.0	155.0	140.0	11.3	11.3	0.5
GBP/USD	-	-	1.21	1.07	1.11	1.22	-11.5	-8.2	0.9
AUD/USD	-	-	0.67	0.62	0.67	0.71	-8.1	-0.7	5.2
USD/BRL	-	-	5.36	5.20	5.20	5.00	-3.0	-3.0	-6.7
USD/INR	-	-	81.7	84.0	83.0	82.0	2.8	1.6	0.4
USD/CNY	-	-	7.16	7.20	7.00	6.90	0.5	-2.3	-3.7
<b>Cash</b>	<b>OW</b>	<b>N</b>			<b>Spot rate</b>			<b>Total Return</b>	
US 3-month Tbill	-	-	-	-	-	-	1.08	2.35	4.76
Germany 3-month Bubills	-	-	-	-	-	-	0.36	0.97	2.31

Source: Bloomberg, Datastream, Bloomberg-Barclays, ICE-BAML, iBoxx, Goldman Sachs Global Investment Research

# Cross-asset: Weekly and YTD performance, absolute and risk-adjusted

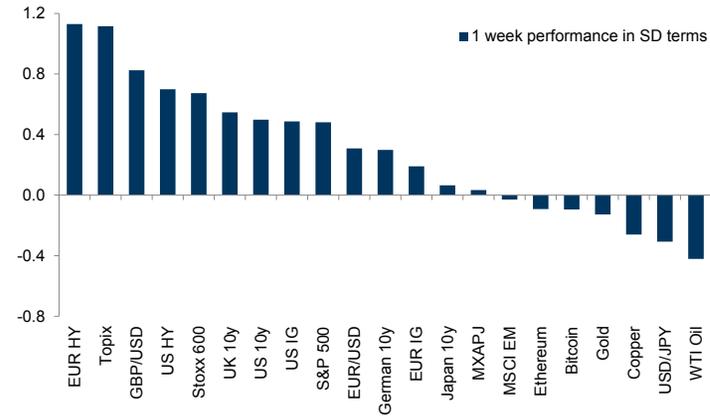
**Exhibit 8: Local currency total returns and return to vol ratios over the past week**

Weekly returns, return to vol ratios based on weekly volatility



**Exhibit 9: Local currency total returns in standard deviation terms**

1-week performance in rolling 12m standard deviation terms

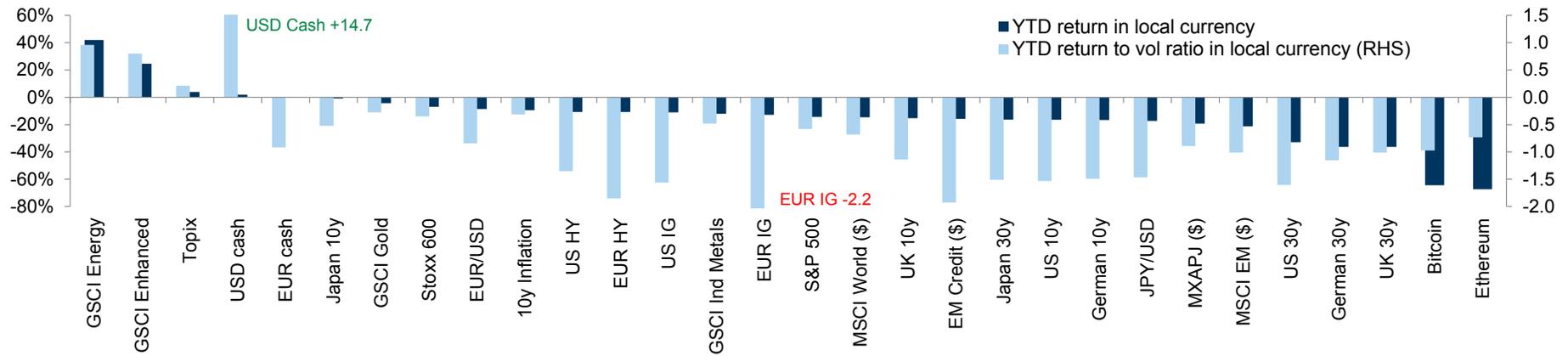


Source: Datastream, iBoxx, Goldman Sachs Global Investment Research

Source: Datastream, iBoxx, Goldman Sachs Global Investment Research

**Exhibit 10: Local currency returns and return to vol ratios**

YTD returns



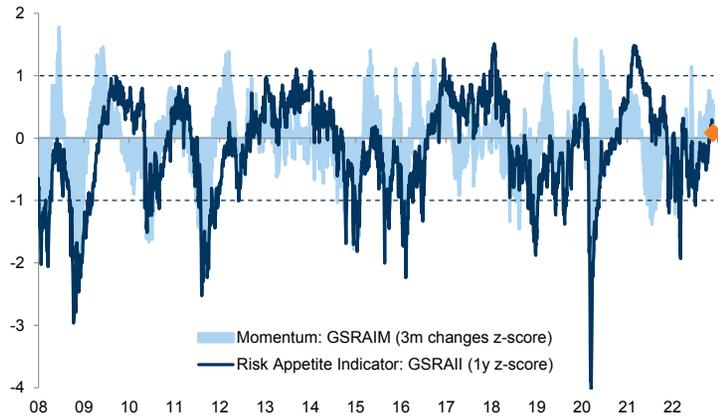
Source: Datastream, iBoxx, Goldman Sachs Global Investment Research

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# Cross-asset: Risk appetite indicator

**Exhibit 11: Risk appetite indicator level and momentum factors**

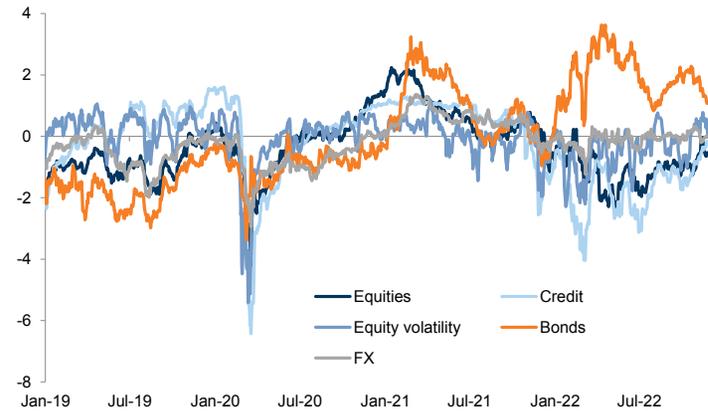
See July 2016 GOAL for construction details



Source: Goldman Sachs Global Investment Research

**Exhibit 12: Risk appetite indicators for different asset classes**

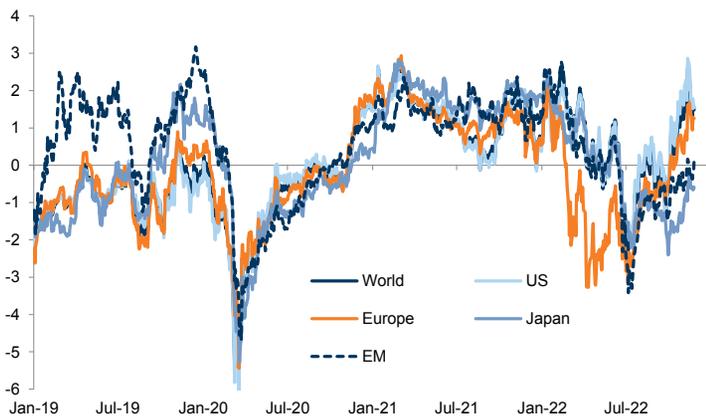
See July 2016 GOAL for construction details



Source: Goldman Sachs Global Investment Research

**Exhibit 13: Cyclical vs. defensives 1-year rolling z-score across regions**

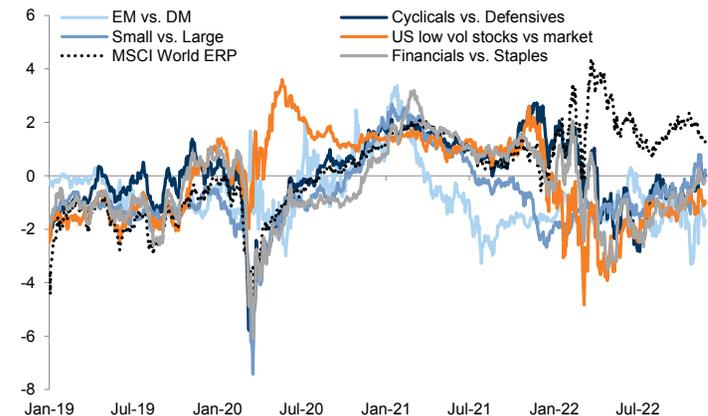
See July 2016 GOAL for construction details



Source: Goldman Sachs Global Investment Research

**Exhibit 14: Sub-components of equity risk appetite indicator**

See July 2016 GOAL for construction details



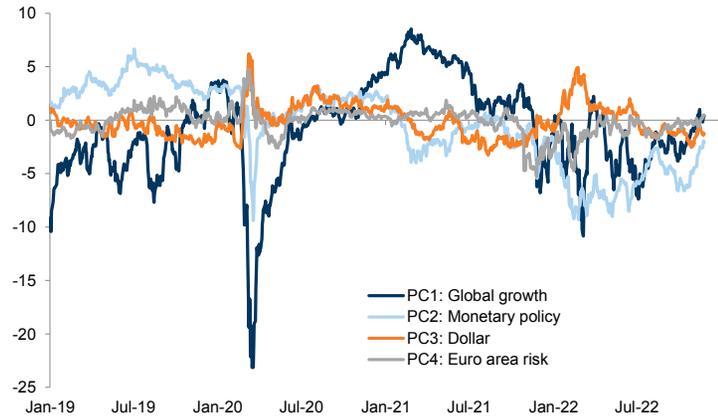
Source: Goldman Sachs Global Investment Research

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# Cross-asset: Risk Appetite principal component analysis

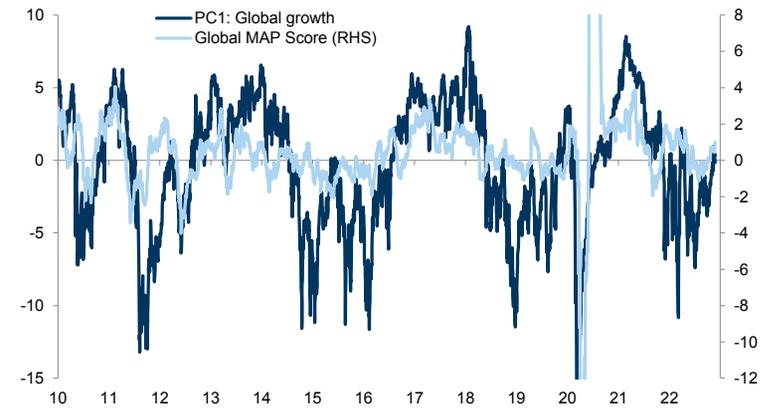
**Exhibit 15: GS RAI principal component**

See April 2019 GOAL for construction details



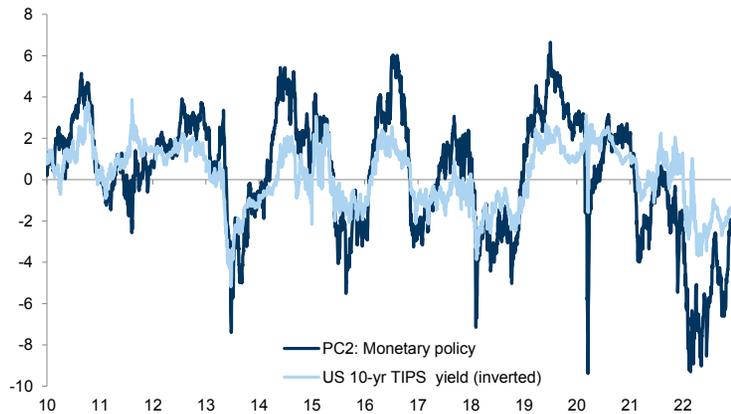
Source: Datastream, Goldman Sachs Global Investment Research

**Exhibit 16: PC1: Global growth factor vs. Global MAP Score**



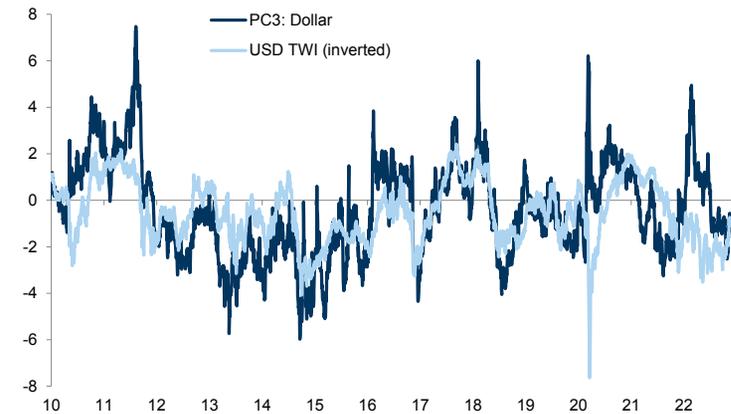
Source: Datastream, Goldman Sachs Global Investment Research

**Exhibit 17: PC2: Monetary policy factor vs. US 10-year TIPS yield**



Source: Datastream, Goldman Sachs Global Investment Research

**Exhibit 18: PC3: Dollar factor vs. USD TWI**



Source: Datastream, Goldman Sachs Global Investment Research

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# Cross-asset: Balanced portfolios and dynamic allocation strategies performance

**Exhibit 19: 60/40 equity/bond portfolio performance across regions last 12m**  
Relative total return performance indexed to 100 12m ago (data since 2010)



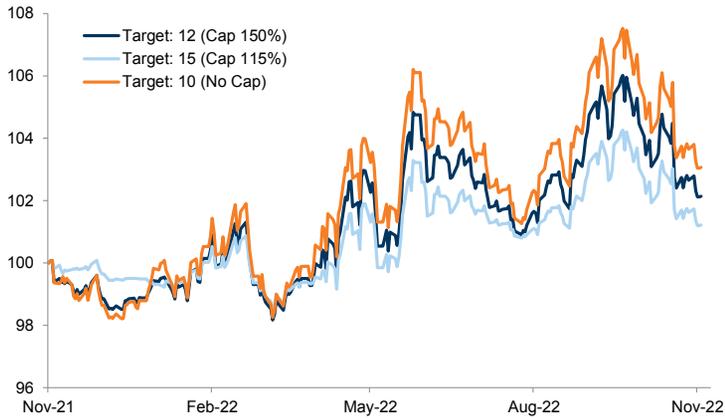
Source: Datastream, Goldman Sachs Global Investment Research

**Exhibit 20: Risk parity portfolio performance across regions last 12m**  
Weighted inversely by 3m realised volatility of equity and 10y bonds



Source: Datastream, Goldman Sachs Global Investment Research

**Exhibit 21: 60/40 portfolio with volatility target strategies overlay vs. US 60/40 portfolio**  
60% S&P 500, 40% US 10y bond; based on 1m realised S&P 500 volatility



Source: Datastream, Goldman Sachs Global Investment Research

**Exhibit 22: 60/40 portfolio with volatility target strategies and momentum overlay vs. US 60/40**  
60% S&P 500, 40% US 10y bond; Strategy methodology see: GOAL: The Balanced Bear - Part 2



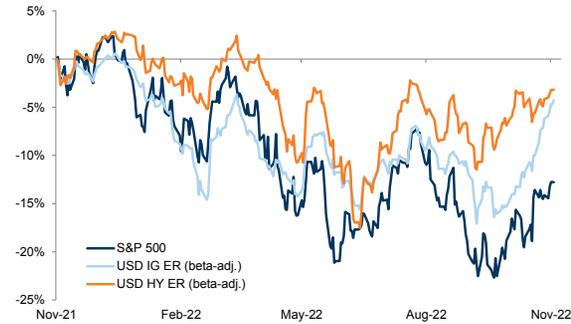
Source: Datastream, Goldman Sachs Global Investment Research

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# Cross-asset: Equity vs. credit monitor

**Exhibit 23: USD cash credit vs. US equity**

Cash credit excess returns (beta-adjusted) vs. S&P 500 total returns



Source: Datastream, Goldman Sachs Global Investment Research

**Exhibit 24: USD synthetic credit vs. US equity**

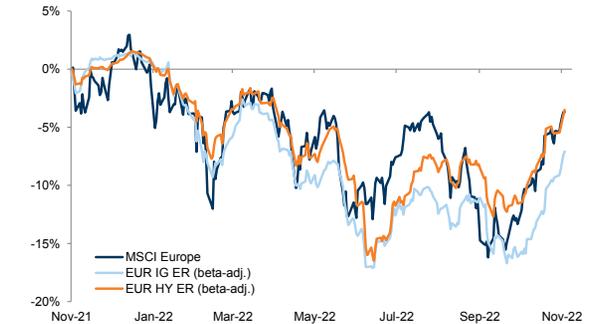
Synthetic credit excess returns (beta-adjusted) vs. S&P 500 total returns



Source: Datastream, Goldman Sachs Global Investment Research

**Exhibit 25: EUR cash credit vs. European equity**

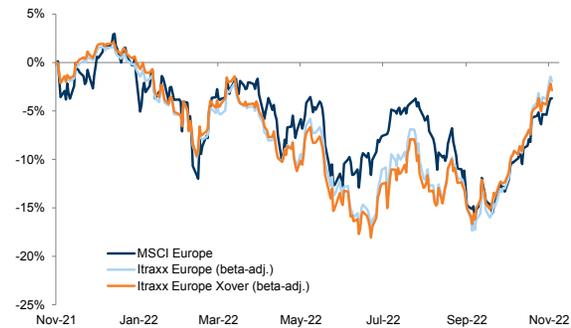
Cash credit excess returns (beta-adjusted) vs. MSCI Europe total returns



Source: Datastream, Goldman Sachs Global Investment Research

**Exhibit 26: EUR synthetic credit vs. European equity**

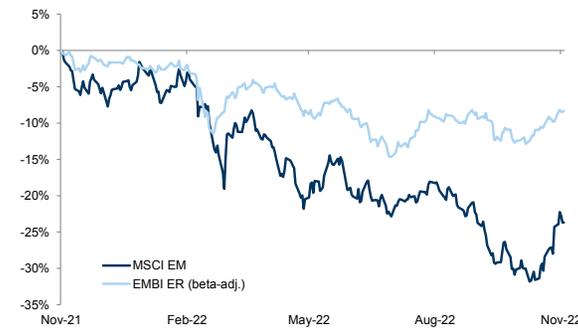
Synthetic credit excess returns (beta-adjusted) vs. MSCI Europe total returns



Source: Datastream, Goldman Sachs Global Investment Research

**Exhibit 27: EM cash credit vs. EM equity**

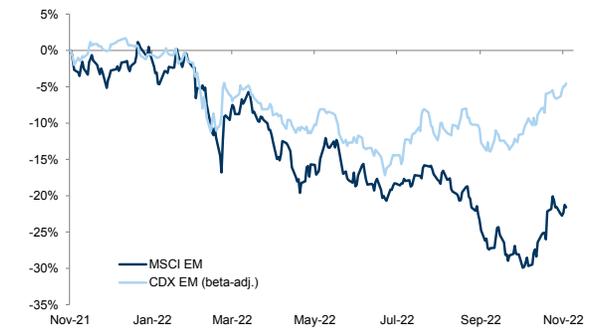
Cash credit excess returns (beta-adjusted) vs. MSCI EM total returns



Source: Datastream, Goldman Sachs Global Investment Research

**Exhibit 28: EM synthetic credit vs. EM equity**

Synthetic credit excess returns (beta-adjusted) vs. MSCI EM total returns



Source: Datastream, Goldman Sachs Global Investment Research

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# Cross-asset: Valuation and risk premia

## Exhibit 29: Cross-asset valuation table

A higher percentile means more expensive relative to 10y history

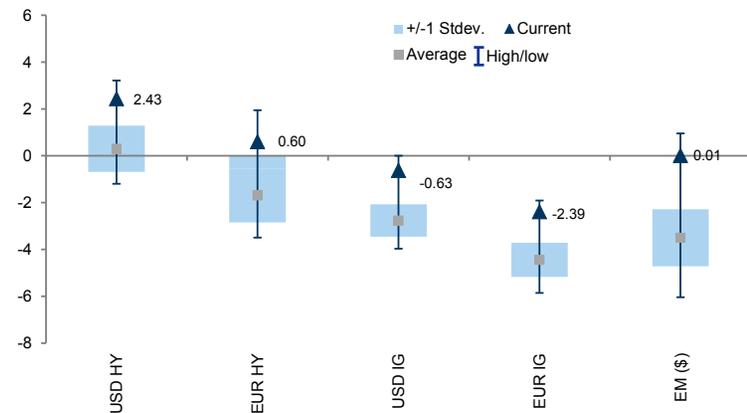
	Equity					Government bonds				Credit					FX	
	S&P 500	Stoxx 600	MXAPJ	Topix	MSCI EM	US 10y	German 10y	Japan 10y	UK 10y	US IG	US HY	EUR IG	EUR HY	EM (\$)	EUR/USD	USD/JPY
<b>Valuation metric</b>	<b>12m forward P/E ratio</b>					<b>Yield</b>				<b>Spread</b>					<b>Actual - GS fair value</b>	
<b>Current:</b>	17.7x	12.2x	12.4x	12.7x	11.1x	3.7%	2.0%	0.2%	3.1%	146bp	452bp	193bp	492bp	480bp	-0.14 €//\$	41.9 \$/¥
<b>Expensiveness (last 10y percentile):</b>	<b>69%</b>	<b>10%</b>	<b>38%</b>	<b>21%</b>	<b>35%</b>	<b>2%</b>	<b>2%</b>	<b>34%</b>	<b>2%</b>	<b>44%</b>	<b>41%</b>	<b>6%</b>	<b>20%</b>	<b>8%</b>	<b>41%</b>	<b>2%</b>
<b>3M change:</b>	0.4x	0.5x	-0.1x	0.1x	-0.1x	0.7%	0.6%	0.0%	0.5%	-9bp	-13bp	-16bp	-44bp	-11bp	0.06 €//\$	4.2 \$/¥
<b>Average:</b>	17.3x	14.4x	13.1x	14.0x	11.8x	2.1%	0.4%	0.2%	1.5%	145bp	449bp	133bp	407bp	-24bp	-0.10 €//\$	13.9 \$/¥
<b>95th:</b>	22.1x	17.4x	16.2x	17.3x	14.8x	3.1%	1.8%	0.7%	2.8%	192bp	693bp	202bp	591bp	508bp	0.12 €//\$	31.9 \$/¥
<b>5th:</b>	13.9x	11.8x	11.4x	12.0x	10.1x	0.7%	-0.5%	-0.1%	0.3%	102bp	324bp	96bp	279bp	272bp	-0.21 €//\$	-1.9 \$/¥

Note: GSDEER is our fair value macro model for exchange rates. US IG spread is from iBoxx. EM (\$) is JPM EMBI.

Source: Datastream, I/B/E/S, iBoxx, Goldman Sachs Global Investment Research

## Exhibit 30: Credit spread minus equity risk premium estimates across markets

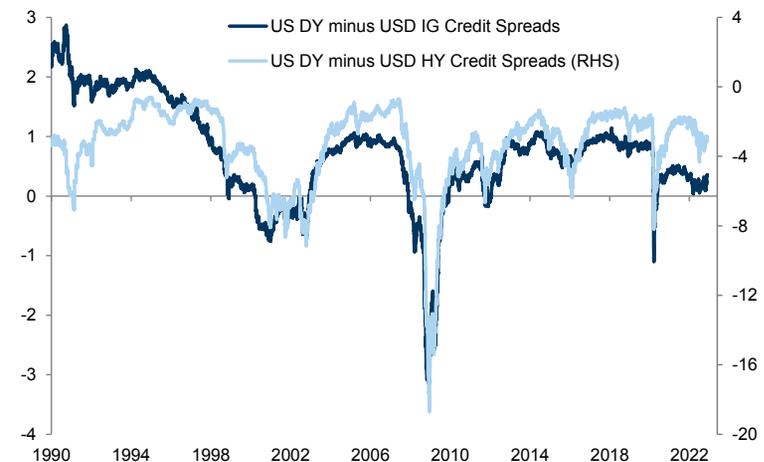
Equity risk premia based on 1-stage DDM using local 10-year yields and LT GDP consensus estimates. Using past 10 years of data.



Source: Datastream, iBoxx, Goldman Sachs Global Investment Research

## Exhibit 31: Equity vs. credit relative valuation

US Dividend Yield minus Credit spreads



Source: Datastream, Goldman Sachs Global Investment Research

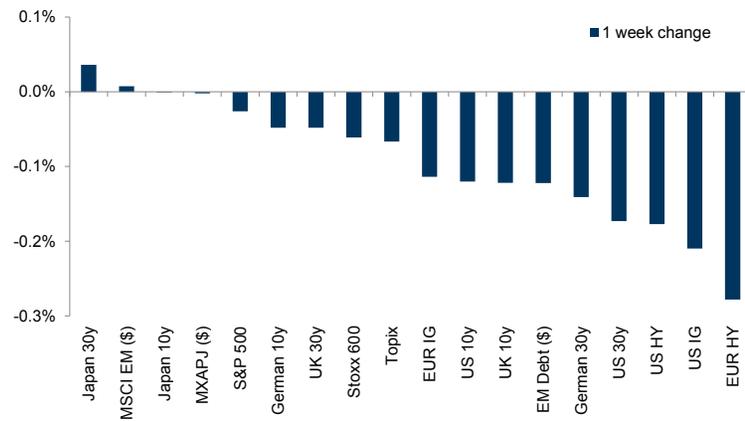
# Cross-asset: Yields

Exhibit 32: Current yields across assets and their percentile to the past 10 years

Valuation metric	Equity					Government bonds				Credit				
	S&P 500	Stoxx 600	MXAPJ (\$)	Topix	MSCI EM (\$)	US 10y	German 10y	Japan 10y	UK 10y	US IG	EUR IG	US HY	EUR HY	EM Debt (\$)
<b>Current:</b>	1.7%	3.6%	3.2%	2.6%	3.5%	3.7%	2.0%	0.2%	3.1%	5.3%	4.0%	8.7%	7.2%	8.6%
<b>Percentile (-10y):</b>	<b>18%</b>	<b>43%</b>	<b>63%</b>	<b>84%</b>	<b>96%</b>	<b>99%</b>	<b>98%</b>	<b>67%</b>	<b>98%</b>	<b>99%</b>	<b>99%</b>	<b>95%</b>	<b>98%</b>	<b>98%</b>
<b>Average:</b>	2.0%	3.6%	3.1%	2.2%	3.0%	2.1%	0.4%	0.2%	1.5%	2.7%	1.2%	6.6%	4.4%	5.7%
<b>95th:</b>	2.4%	4.1%	3.6%	2.7%	3.4%	3.1%	1.8%	0.7%	2.8%	4.2%	2.5%	8.7%	6.5%	7.5%
<b>5th:</b>	1.4%	3.0%	2.4%	1.8%	2.5%	0.8%	-0.5%	-0.1%	0.3%	1.4%	0.2%	4.8%	3.0%	4.6%
<b>3m real. ret. vol:</b>	27.2%	18.0%	18.2%	24.2%	22.0%	11.9%	12.1%	1.0%	18.3%	10.7%	6.0%	8.8%	6.3%	10.0%
<b>Percentile (-10y):</b>	<b>95%</b>	<b>75%</b>	<b>58%</b>	<b>96%</b>	<b>92%</b>	<b>97%</b>	<b>97%</b>	<b>5%</b>	<b>99%</b>	<b>97%</b>	<b>94%</b>	<b>94%</b>	<b>95%</b>	<b>95%</b>
<b>Yield/vol ratio</b>	0.06	0.20	0.18	0.11	0.16	0.31	0.16	0.25	0.17	0.49	0.66	0.99	1.14	0.85

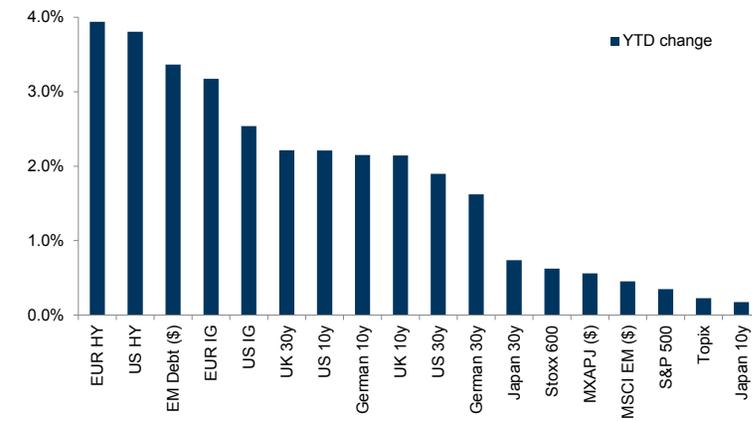
Source: Datastream, iBoxx, Goldman Sachs Global Investment Research

Exhibit 33: Past week change in yields across assets



Source: Datastream, iBoxx, Goldman Sachs Global Investment Research

Exhibit 34: YTD change in yields across assets

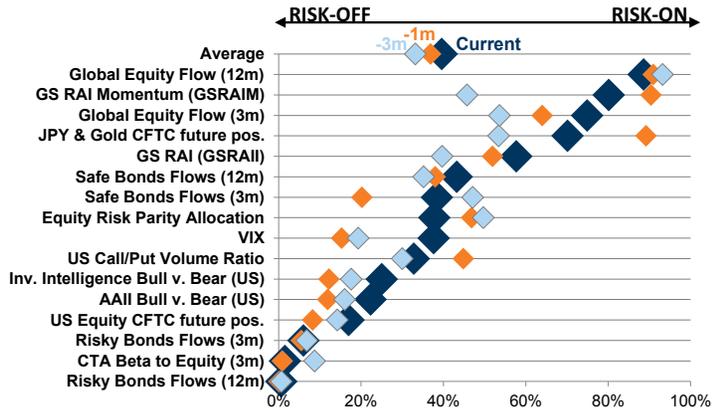


Source: Datastream, iBoxx, Goldman Sachs Global Investment Research

# Cross-asset: Sentiment and Positioning

**Exhibit 35: Percentile of sentiment indicators**

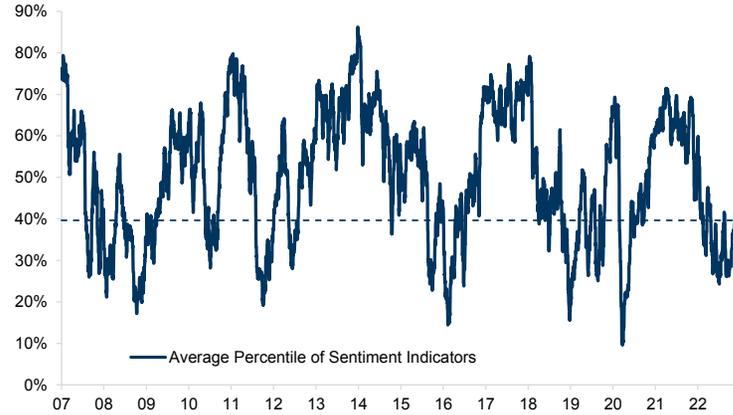
Data since 2007



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

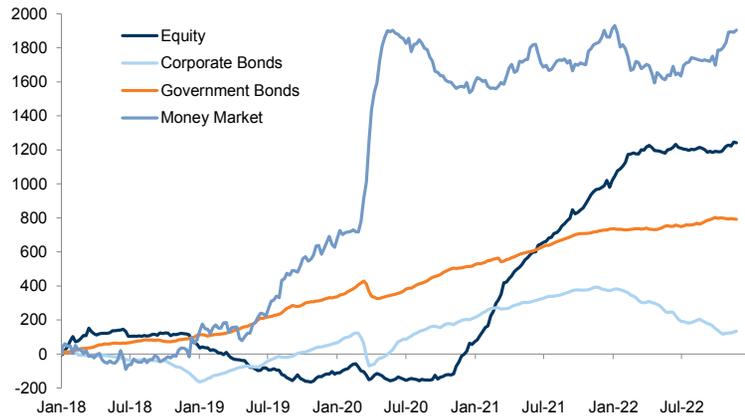
**Exhibit 36: Average percentile of sentiment indicators**

Data since 2007



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

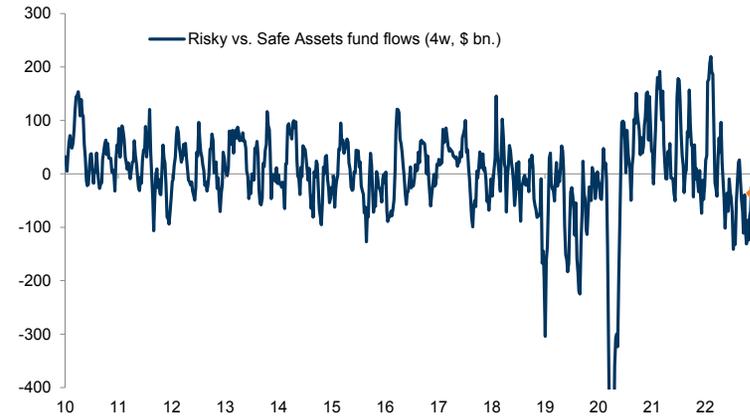
**Exhibit 37: Cumulative fund flows across assets**



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

**Exhibit 38: Risky vs. safe assets fund flows**

4 weeks rolling flows, USD bn

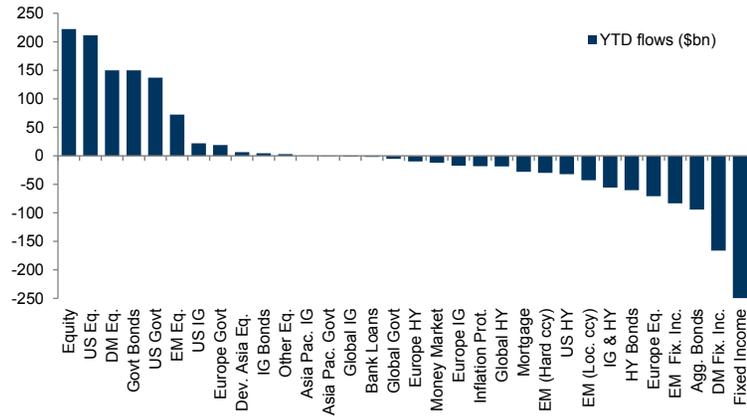


Source: Datastream, Haver Analytics, EPFR, Goldman Sachs Global Investment Research

# Cross-asset: Global Funds Flows

**Exhibit 39: YTD cross-asset global fund flows**

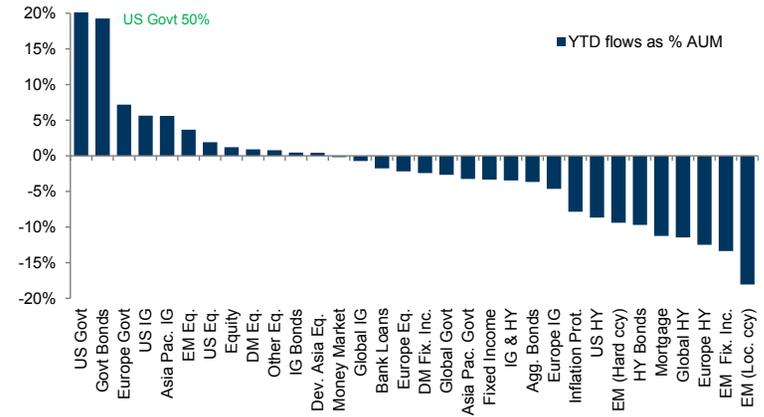
All reporting funds. \$ Bn



Source: EPFR, Goldman Sachs Global Investment Research

**Exhibit 40: YTD cross-asset global fund flows**

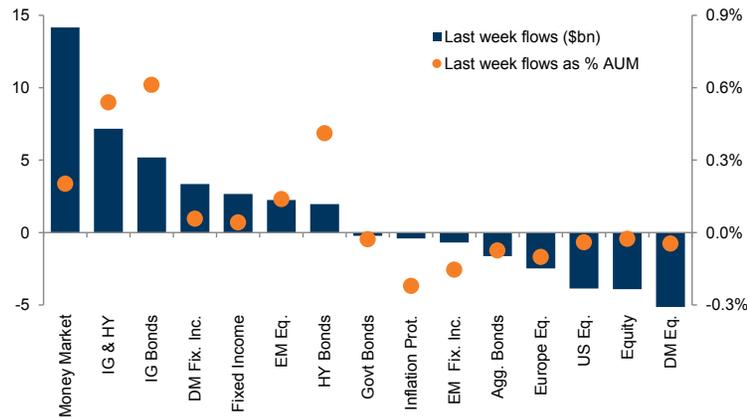
All reporting funds. % of AUM



Source: EPFR, Goldman Sachs Global Investment Research

**Exhibit 41: 1-week cross-asset global fund flows**

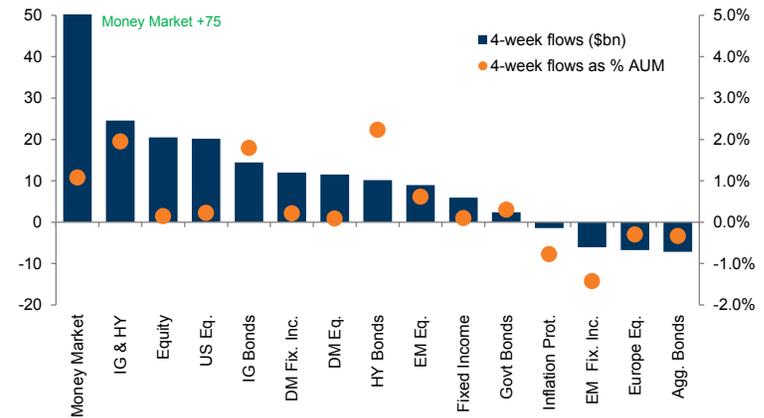
All reporting funds



Source: EPFR, Goldman Sachs Global Investment Research

**Exhibit 42: 4-week cross-asset global fund flows**

All reporting funds



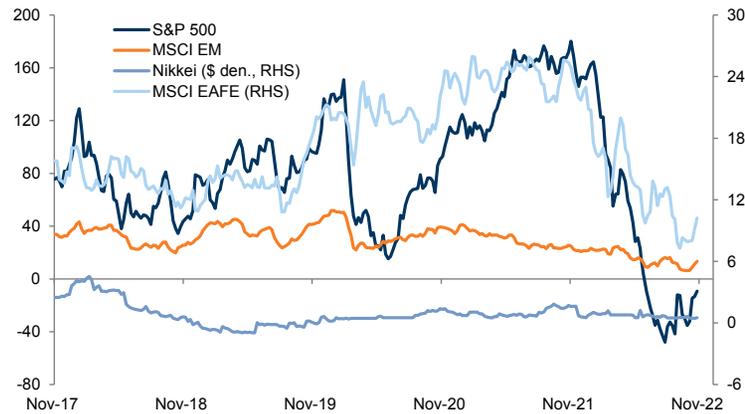
Source: EPFR, Goldman Sachs Global Investment Research

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# Cross-asset: CFTC positioning

**Exhibit 43: Equity net long positioning**

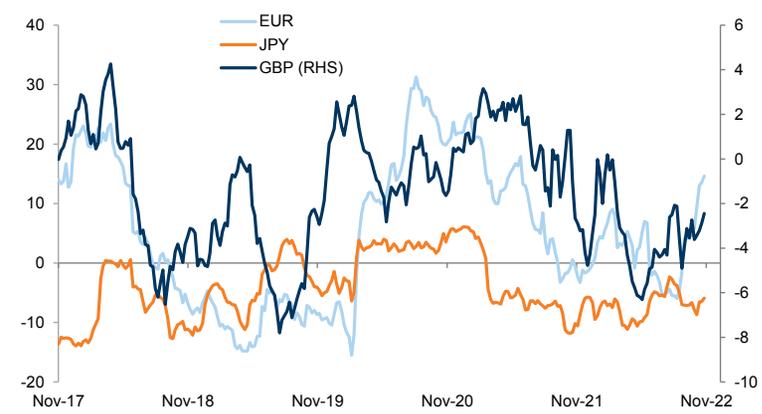
Leveraged funds and asset managers net future positions (\$ bn)



Source: Bloomberg, CFTC, Goldman Sachs Global Investment Research

**Exhibit 44: Currency net long positioning**

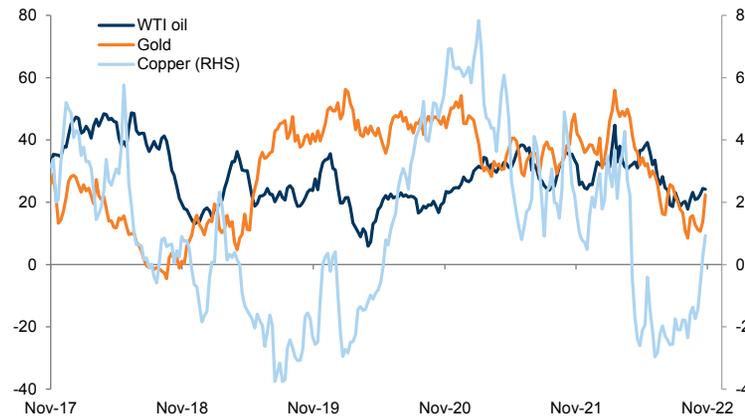
Net non-commercial positions (\$ bn)



Source: Bloomberg, CFTC, Goldman Sachs Global Investment Research

**Exhibit 45: Commodity net long positioning**

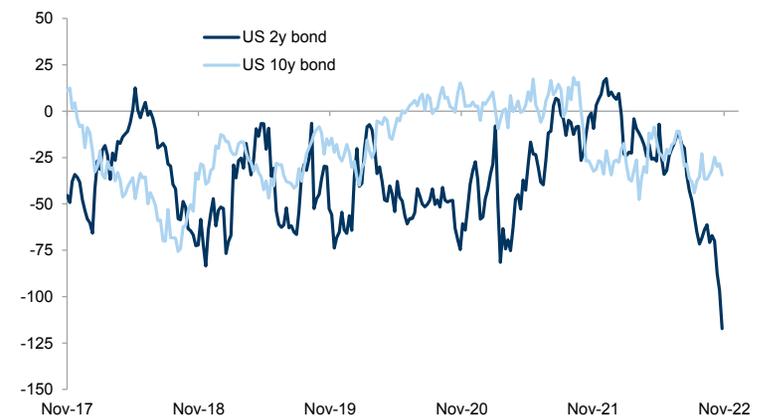
Net non-commercial positions (\$ bn)



Source: Bloomberg, CFTC, Goldman Sachs Global Investment Research

**Exhibit 46: US Treasury net long positioning**

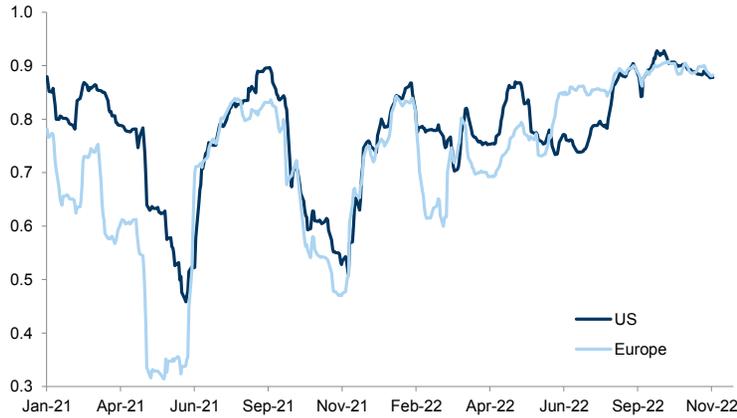
Net non-commercial positions (\$ bn)



Source: Bloomberg, CFTC, Goldman Sachs Global Investment Research

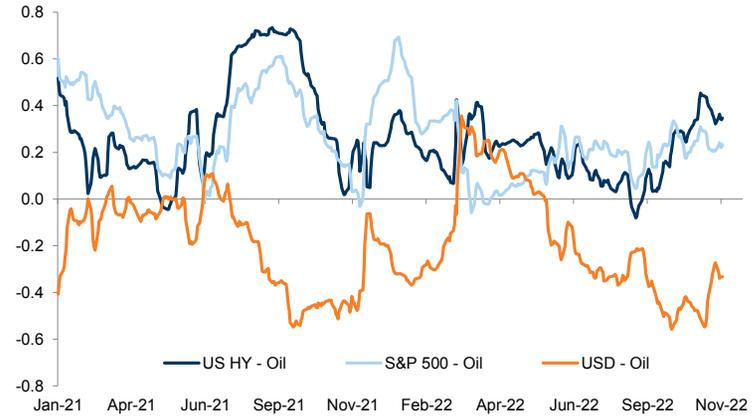
# Cross-asset: Correlations: Equity vol/CDS, commodity prices/credit & FX, equity/bond, equity/FX

**Exhibit 47: 3m rolling equity vol/CDS correlation of weekly level changes**  
 CDX HY for the US, iTraxx Xover for Europe; ATM implied vol for S&P 500 and Euro Stoxx 50



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

**Exhibit 48: 3m rolling commodity price correlations of weekly % changes with different assets**



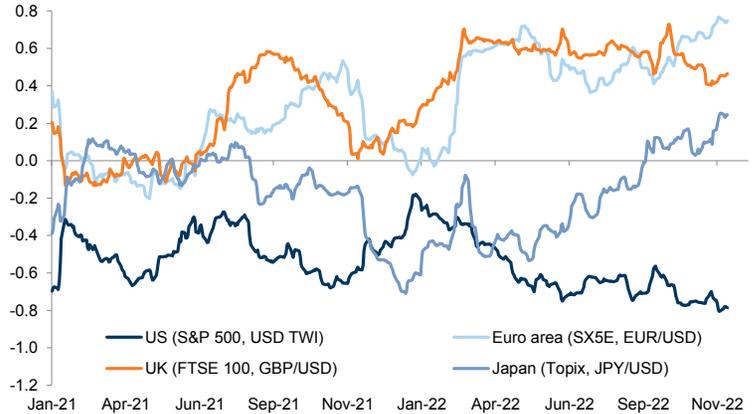
Source: Datastream, Goldman Sachs, Goldman Sachs Global Investment Research

**Exhibit 49: 3m rolling equity/bond correlation of weekly returns**



Source: Datastream, Goldman Sachs Global Investment Research

**Exhibit 50: 3m rolling equity/FX correlation of weekly returns**



Source: Datastream, Goldman Sachs Global Investment Research

# Cross-asset: Correlation matrix

## Exhibit 51: Cross-asset correlation matrix

Upper half of matrix: current 1-year correlation (black shading = more/less than 0.50/-0.50); lower half of matrix: percentile since 2001 (dark grey shading indicates above 75th percentile, orange shading indicates below 25th percentile); correlations are calculated on weekly, local currency returns.

	S&P 500	STOXX 600	MXAPJ	TOPIX	MSCI EM	US 10 yr	Germany 10 yr	Japan 10 yr	UK 10 yr	EUR/USD	USD/JPY	AUD/USD	iBoxx US IG	iBoxx EUR IG	BAML US HY	BAML EUR HY	EM Credit (\$)	WTI Crude Oil	Copper	Gold	VIX
<b>Current 1y correlation of weekly returns</b>																					
<b>S&amp;P 500</b>		0.70	0.48	0.58	0.45	0.18	0.28	0.02	0.37	0.51	-0.31	0.62	0.47	0.50	0.80	0.61	0.62	0.15	0.20	0.18	-0.68
<b>STOXX 600</b>	0.11		0.58	0.55	0.55	0.12	0.14	-0.10	0.24	0.50	-0.23	0.49	0.41	0.45	0.65	0.69	0.72	-0.13	0.17	0.13	-0.60
<b>MXAPJ</b>	0.17	0.31		0.70	0.98	0.22	0.08	0.03	0.14	0.53	-0.43	0.68	0.46	0.39	0.50	0.61	0.59	0.11	0.48	0.48	-0.36
<b>TOPIX</b>	0.58	0.28	0.73		0.67	-0.04	-0.08	-0.17	-0.01	0.38	-0.05	0.52	0.31	0.26	0.51	0.57	0.45	0.16	0.23	0.16	-0.47
<b>MSCI EM</b>	0.12	0.17	0.80	0.75		0.20	0.06	0.03	0.13	0.49	-0.40	0.64	0.44	0.37	0.49	0.59	0.58	0.11	0.51	0.45	-0.34
<b>US 10 yr</b>	1.00	1.00	0.98	0.99	0.95		0.84	0.61	0.72	0.21	-0.64	0.21	0.84	0.74	0.40	0.34	0.46	-0.01	0.18	0.20	0.05
<b>Germany 10 yr</b>	1.00	1.00	0.94	0.88	0.93	0.93		0.55	0.85	0.06	-0.58	0.19	0.73	0.88	0.42	0.36	0.37	0.11	0.04	0.12	-0.02
<b>Japan 10 yr</b>	0.82	0.66	0.72	0.72	0.73	0.87	0.64		0.44	-0.17	-0.38	0.06	0.48	0.48	0.32	0.21	0.19	-0.08	0.19	0.18	0.15
<b>UK 10 yr</b>	1.00	1.00	0.99	0.95	0.98	0.23	0.54	0.35		0.21	-0.51	0.26	0.68	0.76	0.42	0.38	0.42	0.09	0.10	0.09	-0.12
<b>EUR/USD</b>	0.95	1.00	0.89	0.86	0.74	0.65	0.66	0.14	0.74		-0.47	0.59	0.39	0.19	0.45	0.41	0.58	-0.10	0.25	0.38	-0.34
<b>USD/JPY</b>	0.03	0.00	0.10	0.12	0.09	0.18	0.15	0.30	0.30	0.35		-0.52	-0.66	-0.60	-0.43	-0.47	-0.55	-0.14	-0.37	-0.47	0.04
<b>AUD/USD</b>	0.76	0.69	0.61	0.78	0.59	0.84	0.90	0.70	0.94	0.54	0.12		0.45	0.41	0.64	0.58	0.51	0.32	0.46	0.61	-0.42
<b>iBoxx US IG</b>	0.95	0.95	0.95	0.95	0.94	0.50	0.71	0.63	0.55	0.86	0.02	0.95		0.80	0.68	0.63	0.73	-0.07	0.17	0.14	-0.16
<b>iBoxx EUR IG</b>	0.95	0.95	0.85	0.80	0.85	0.90	0.73	0.80	0.77	0.76	0.01	0.89	0.79		0.66	0.70	0.62	0.09	0.18	0.20	-0.22
<b>BAML US HY</b>	0.94	0.69	0.29	0.64	0.26	0.90	0.97	0.91	0.99	0.90	0.01	0.87	0.94	0.92		0.79	0.75	0.09	0.26	0.26	-0.45
<b>BAML EUR HY</b>	0.87	0.90	0.61	0.67	0.63	0.98	0.99	0.90	1.00	0.87	0.00	0.79	0.95	0.91	0.43		0.76	-0.02	0.34	0.25	-0.36
<b>EM Credit (\$)</b>	0.84	0.95	0.59	0.81	0.49	0.72	0.72	0.52	0.84	0.94	0.02	0.65	0.84	0.83	0.92	0.93		-0.17	0.23	0.24	-0.40
<b>WTI Crude Oil</b>	0.40	0.13	0.19	0.48	0.15	0.68	0.88	0.46	0.88	0.07	0.21	0.65	0.36	0.71	0.26	0.24	0.05		0.43	0.41	-0.03
<b>Copper</b>	0.24	0.20	0.58	0.42	0.59	0.97	0.92	0.95	0.94	0.41	0.01	0.52	0.88	0.86	0.46	0.72	0.47	0.76		0.55	-0.05
<b>Gold</b>	0.79	0.71	0.89	0.85	0.82	0.46	0.44	0.62	0.35	0.32	0.40	0.86	0.38	0.64	0.71	0.83	0.49	0.88	0.92		-0.14
<b>VIX</b>	0.86	0.83	0.81	0.54	0.91	0.07	0.02	0.58	0.00	0.12	0.88	0.34	0.11	0.16	0.40	0.62	0.33	0.71	0.96	0.22	
<b>Current correlation's percentile since 2001</b>																					

Source: Datastream, iBoxx, Goldman Sachs Global Investment Research

# Cross-asset: Implied and realised vol, call and put skew

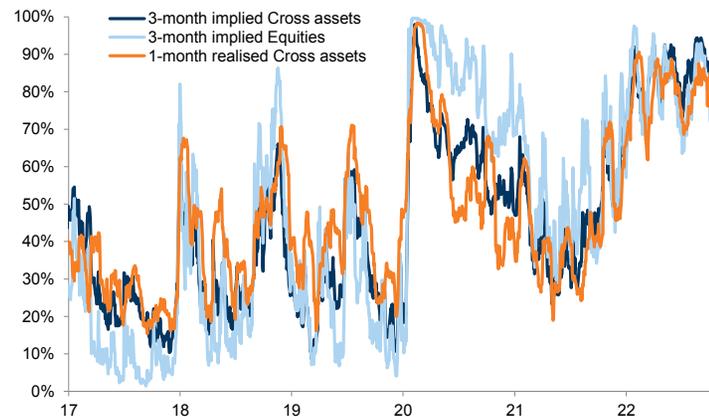
**Exhibit 52: Cross-asset volatility, current and historical percentiles, implied 3m and realised 1m**

	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
<b>Implied (3-month ATM, %)</b>																			
<b>Current:</b>	20.2	18.2	17.3	13.7	22.0	19.4	9.0	8.1	8.2	8.2	49.6	50.2	55.3	50.2	14.4	29.0	10.2	12.5	11.7
<b>Percentile:</b>	<b>83%</b>	<b>55%</b>	<b>28%</b>	<b>48%</b>	<b>75%</b>	<b>84%</b>	<b>96%</b>	<b>98%</b>	<b>95%</b>	<b>97%</b>	<b>59%</b>	<b>71%</b>	<b>61%</b>	<b>91%</b>	<b>48%</b>	<b>93%</b>	<b>86%</b>	<b>93%</b>	<b>89%</b>
<b>1M change:</b>	-4.4	-5.2	-3.9	-4.0	-2.7	-3.6	0.1	-0.8	-1.2	-1.8	-5.9	-6.8	-10.5	2.1	-2.7	-1.1	-0.3	-0.1	-0.6
<b>Average:</b>	15.8	18.3	19.7	15.0	20.0	15.6	3.4	4.8	2.1	3.5	50.0	45.6	53.5	34.2	14.7	21.3	7.7	8.8	8.8
<b>95th:</b>	25.2	26.1	26.7	22.6	26.7	22.6	8.4	7.4	7.9	6.9	69.7	65.7	70.0	54.5	20.4	29.4	11.3	12.8	13.0
<b>5th:</b>	10.0	12.3	13.8	10.3	15.2	10.4	1.2	3.5	0.9	2.2	38.5	30.7	38.7	17.1	9.7	15.2	5.1	5.6	5.9
<b>Realised (%)</b>																			
<b>1-month:</b>	27.0	16.0	17.1	11.4	26.6	21.9	10.0	9.4	7.1	8.1	53.9	54.6	45.0	41.0	16.0	37.4	15.3	16.7	20.3
<b>Percentile:</b>	<b>92%</b>	<b>52%</b>	<b>44%</b>	<b>42%</b>	<b>97%</b>	<b>92%</b>	<b>98%</b>	<b>98%</b>	<b>96%</b>	<b>97%</b>	<b>89%</b>	<b>94%</b>	<b>67%</b>	<b>70%</b>	<b>71%</b>	<b>98%</b>	<b>98%</b>	<b>97%</b>	<b>98%</b>
<b>Average:</b>	14.7	17.7	19.8	14.3	14.4	12.9	3.1	4.6	1.5	3.2	39.6	33.8	42.5	37.6	14.4	19.8	7.7	8.3	8.7

Source: Goldman Sachs, Goldman Sachs Global Investment Research

**Exhibit 53: 10y percentile for cross-asset average volatility**

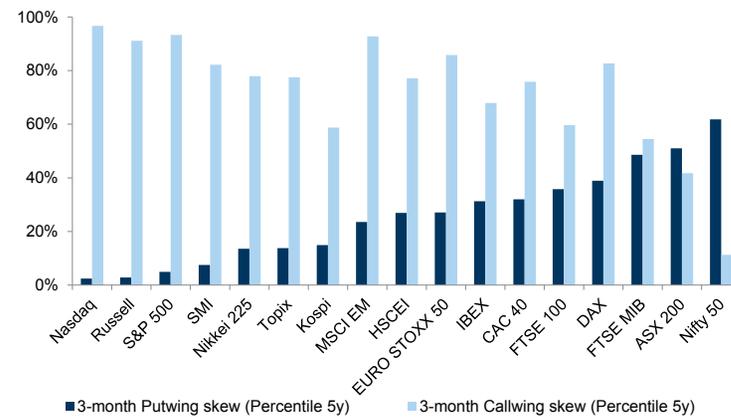
Using 16 assets across equity, government bonds, credit, commodities and FX



Source: Goldman Sachs, Goldman Sachs Global Investment Research

**Exhibit 54: Putwing and Callwing normalised skew 5y percentile**

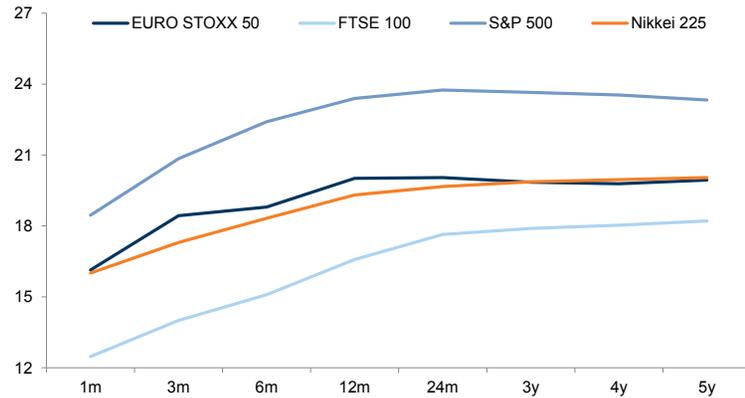
Normalised skew = (impl. vol 25 delta put/call minus implied vol 50 delta call)/50 delta call



Source: Goldman Sachs, Goldman Sachs Global Investment Research

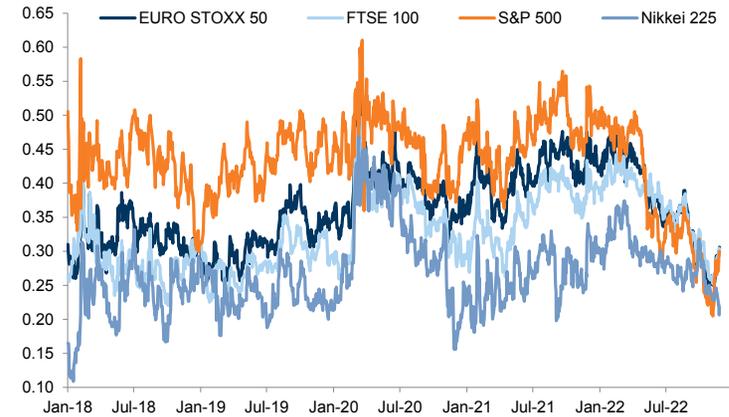
# Cross-asset: Volatility, skew, CDS with equity vol, rate vol

**Exhibit 55: ATM implied volatility term structure for equity indices**



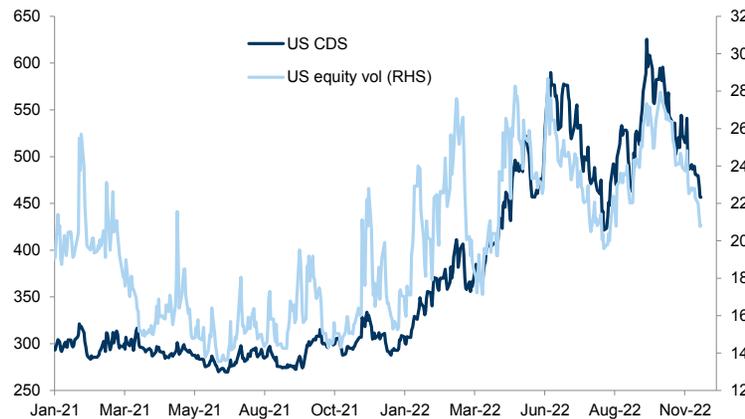
Source: Goldman Sachs, Goldman Sachs Global Investment Research

**Exhibit 56: Normalised implied volatility skew across regions**  
3m 25 delta put vol minus 25 delta call vol scaled by ATM implied vol



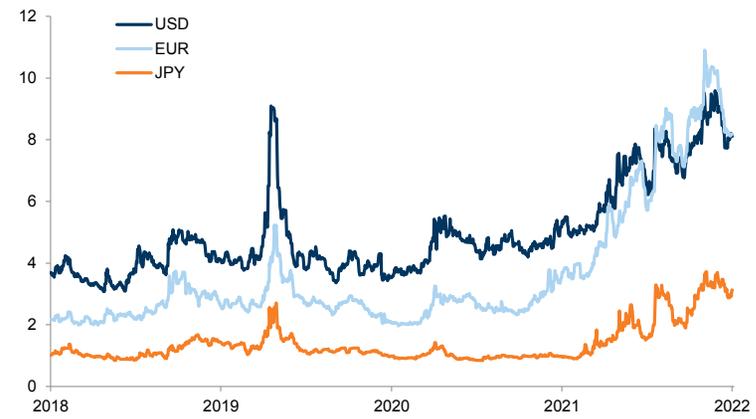
Source: Goldman Sachs, Goldman Sachs Global Investment Research

**Exhibit 57: CDS and equity vol levels in the US**  
CDX HY, 3m ATM S&P 500 implied vol



Source: Goldman Sachs, Goldman Sachs Global Investment Research

**Exhibit 58: 3m ATM implied rate volatility across regions**  
3-month implied volatility of 10-year rates (bp/day)



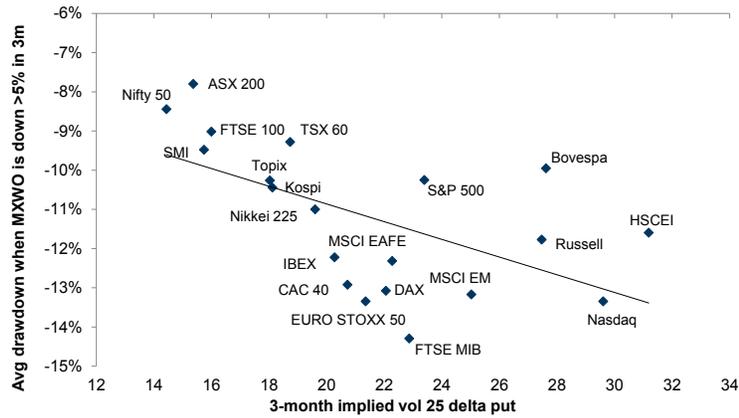
Source: Goldman Sachs, Goldman Sachs Global Investment Research

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# Cross-asset: Alternatives and option strategies

**Exhibit 59: Implied volatility (3-month 25 delta put) vs. average drawdown during MXWO corrections**

3m put 25 delta put option implied vol vs. average performance during a 5% MXWO drawdown



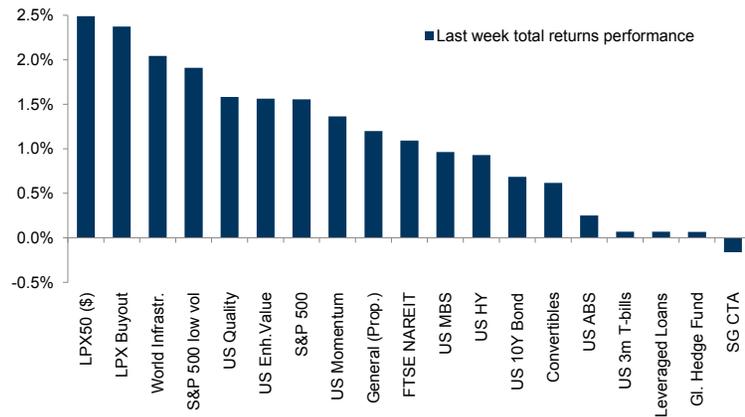
Source: Goldman Sachs Global Investment Research

**Exhibit 60: Systematic option strategies vs. S&P 500 performance**  
CBOE Strategies vs. S&P 500 performance



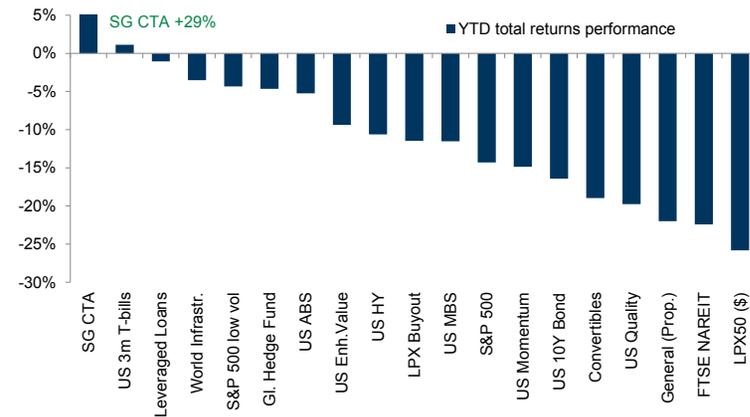
Source: Bloomberg, Goldman Sachs Global Investment Research

**Exhibit 61: Last week performance of alternative assets or strategies**



Source: Bloomberg, Datastream, Goldman Sachs Global Investment Research

**Exhibit 62: YTD performance of alternative assets or strategies**



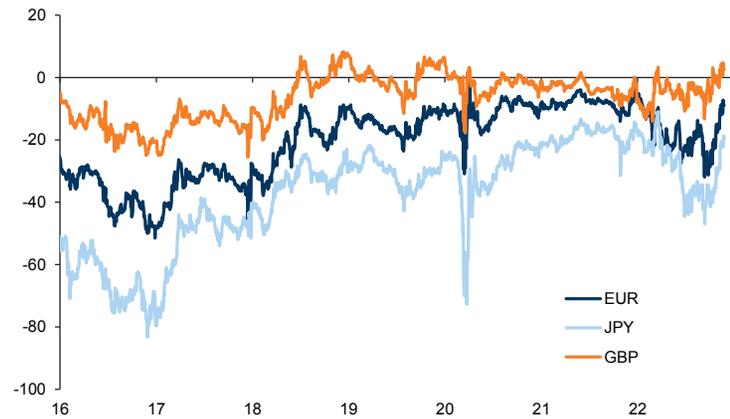
Source: Bloomberg, Datastream, Goldman Sachs Global Investment Research

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# Cross-asset: Liquidity indicators

**Exhibit 63: 1-year cross-currency basis**

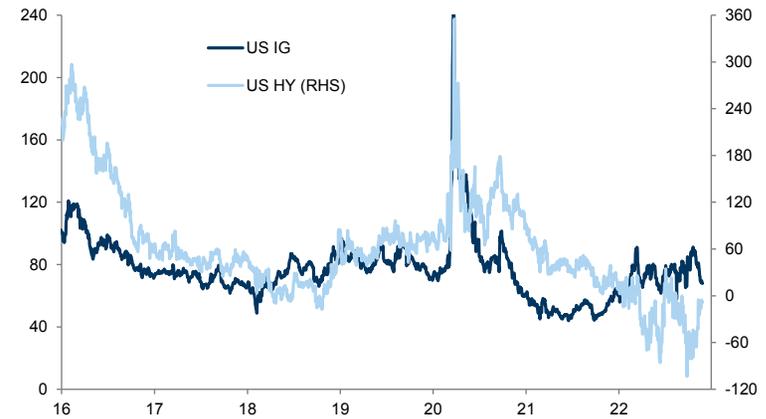
Basis points



Source: Goldman Sachs Group Inc., Goldman Sachs Global Investment Research

**Exhibit 64: Cash credit versus CDS spread**

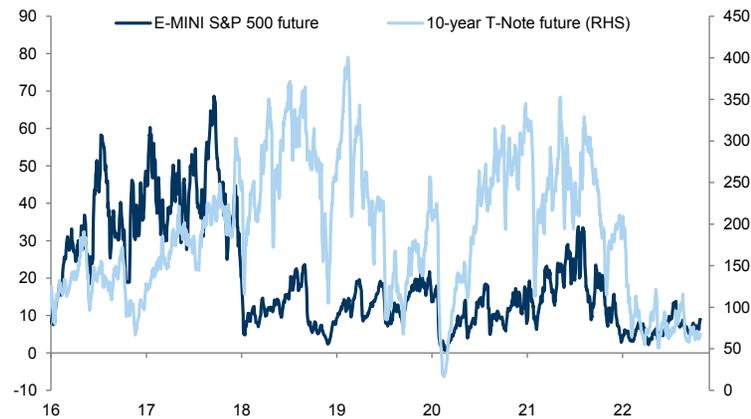
Basis points



Source: Goldman Sachs Group Inc., Haver Analytics, Goldman Sachs Global Investment Research

**Exhibit 65: Top-of-book depth**

5-day average, \$ mln

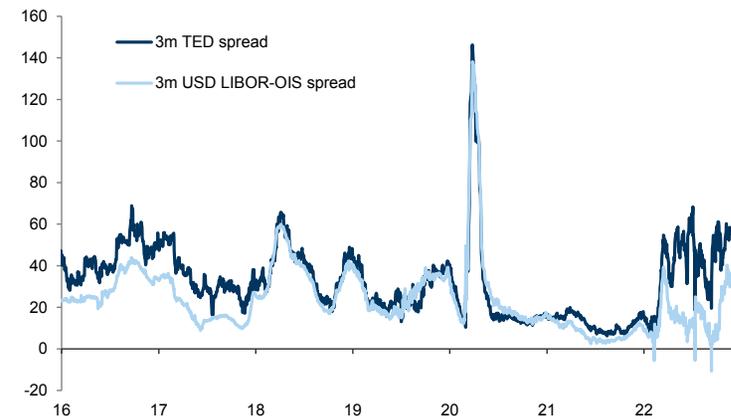


E-MINI S&P 500 = 5d avg. # of contracts \* S&P 500 price \* \$50. 10-year T-note = 5d avg. # of contracts \* \$100,000

Source: Goldman Sachs Group Inc., Bloomberg, Goldman Sachs Global Investment Research

**Exhibit 66: Interbank spread**

Basis points



TED spread = 3m USD LIBOR rate - 3m T-bill rate

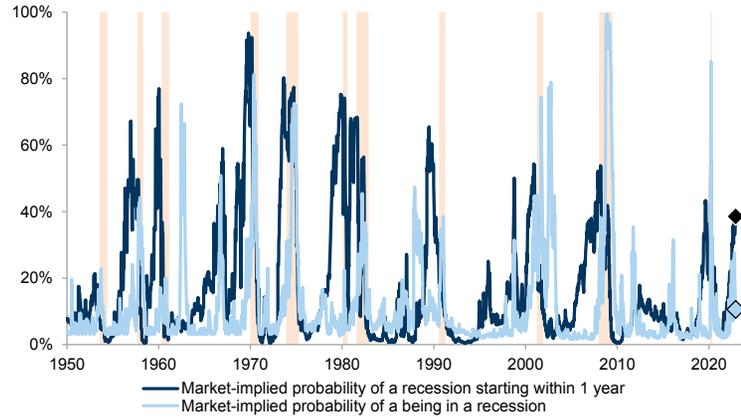
Source: Bloomberg, Goldman Sachs Global Investment Research

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# Cross-asset: Market pricing of US recession risk

**Exhibit 67: Market-implied US recession probability**

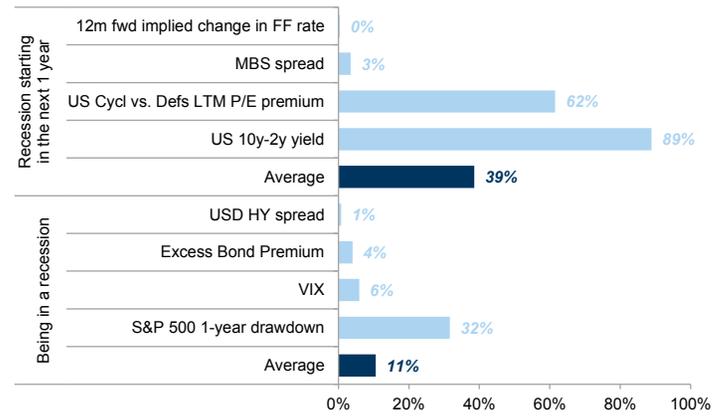
Average of univariate logit models on the right. Orange shade: NBER recession



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

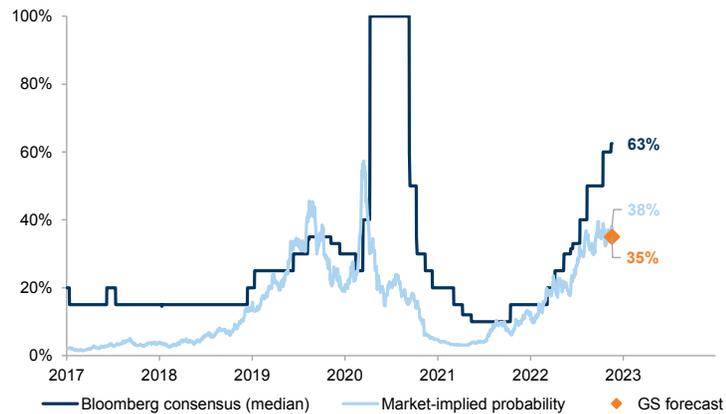
**Exhibit 68: Market-implied US recession probability by indicator**

Univariate logit models. Maximum history since 1950



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

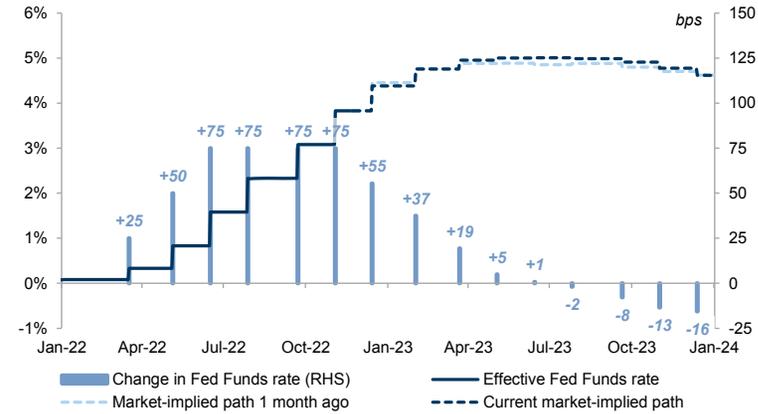
**Exhibit 69: Probability of a US recession in the next 1 year**



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

**Exhibit 70: Market-implied path of the Fed Funds rate**

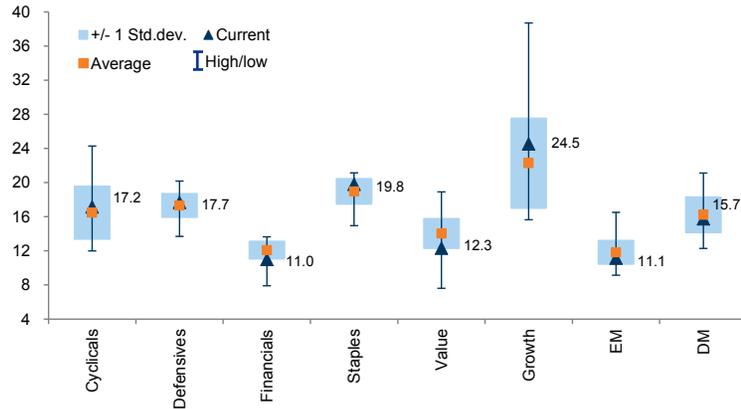
Based on 30-day Fed Funds futures



Source: Haver Analytics, Goldman Sachs Global Investment Research

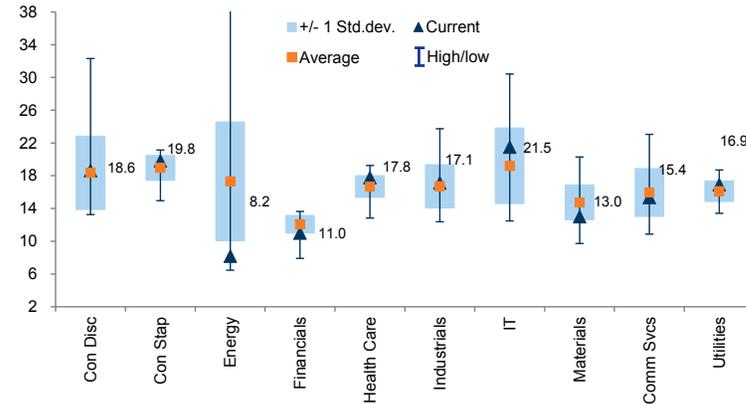
# Equity: Valuation and styles

**Exhibit 71: Valuation ranges of MSCI World styles indices**  
12-month forward P/Es relative to the last 10 years



Source: Datastream, I/B/E/S, Goldman Sachs Global Investment Research

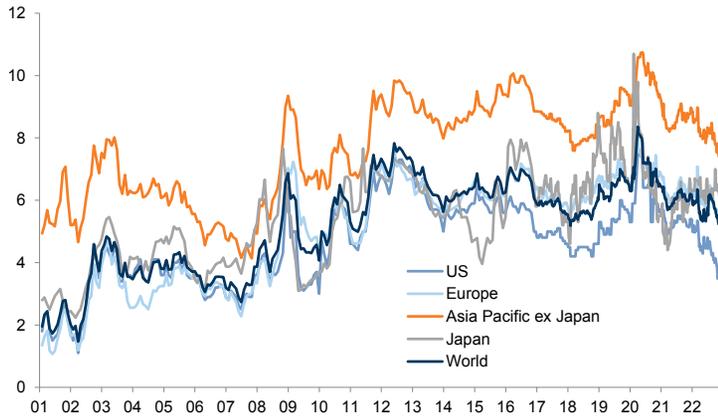
**Exhibit 72: MSCI World sector valuations**  
12-month forward P/Es relative to the last 10 years



Source: Datastream, I/B/E/S, Goldman Sachs Global Investment Research

**Exhibit 73: Global market implied ERPs (%)**

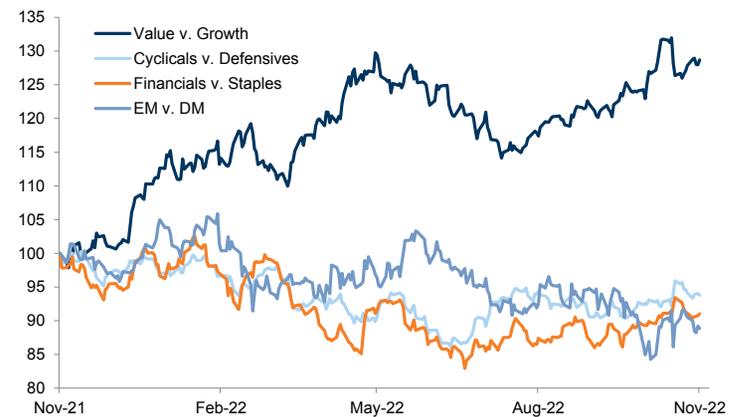
Implied ERPs are calculated by each regional strategy team. While specific assumptions differ between regions, all are calculated using similar frameworks



Source: Datastream, Goldman Sachs Global Investment Research

**Exhibit 74: MSCI World style index performance**

Performance indexed to 100 12m ago



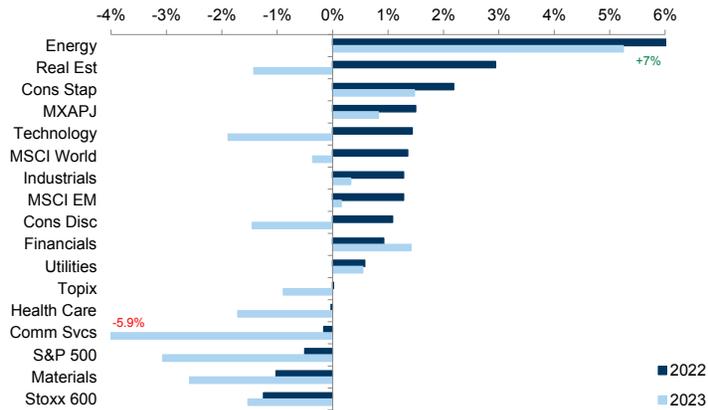
Source: Datastream, Goldman Sachs Global Investment Research

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# Equity: Earnings

**Exhibit 75: 1-month revision to I/B/E/S consensus earnings**

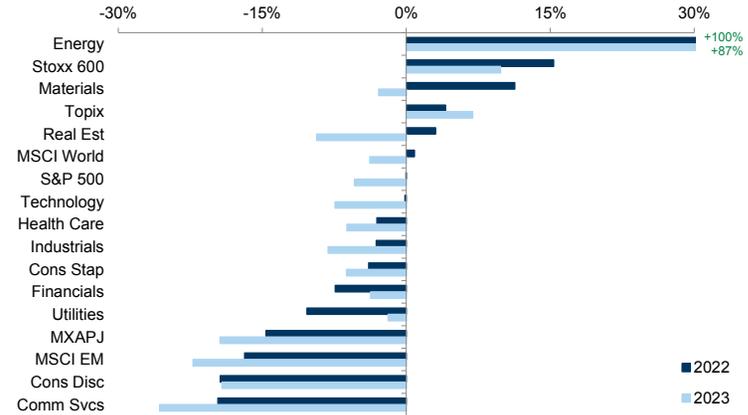
MSCI World sectors, other global equity index aggregates. TOPIX: FY 2022/2023



Source: Datastream, I/B/E/S, Goldman Sachs Global Investment Research

**Exhibit 76: 12-month revision to I/B/E/S consensus earnings**

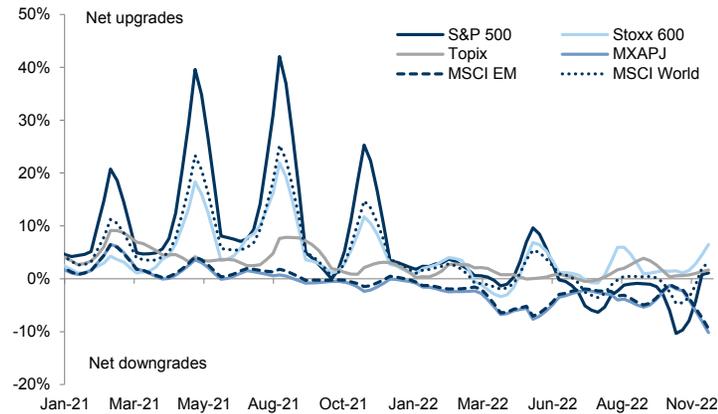
MSCI World sectors, other global equity index aggregates. TOPIX: FY 2022/2023



Source: Datastream, I/B/E/S, Goldman Sachs Global Investment Research

**Exhibit 77: Earnings sentiment: Analyst upgrades minus downgrades (scaled by total analysts) across markets**

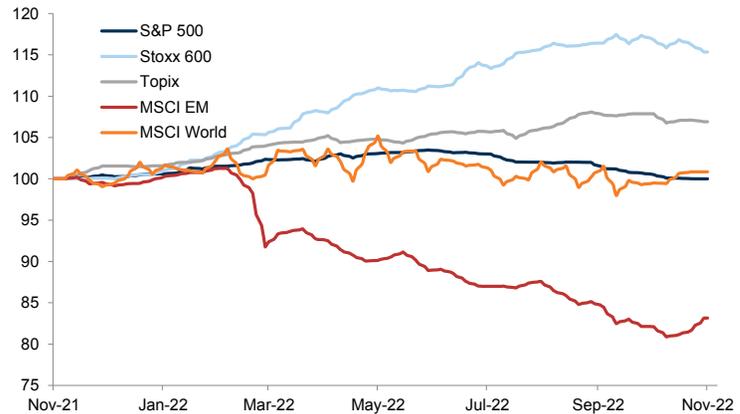
1-month moving average of net monthly upgrades



Source: Datastream, I/B/E/S, Goldman Sachs Global Investment Research

**Exhibit 78: 2022 consensus earnings expectations over the past 12 months**

Earnings indexed to 100 12 months ago. TOPIX: FY 2023

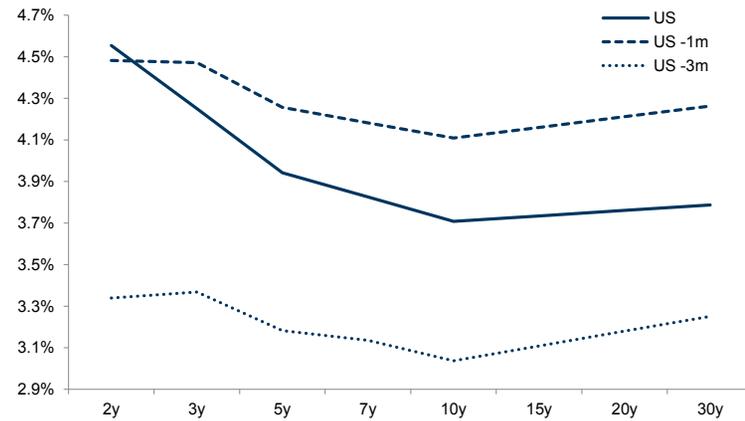


Source: Datastream, I/B/E/S, Goldman Sachs Global Investment Research

# Government bonds: Yield curve

**Exhibit 79: US yield curve dynamics**

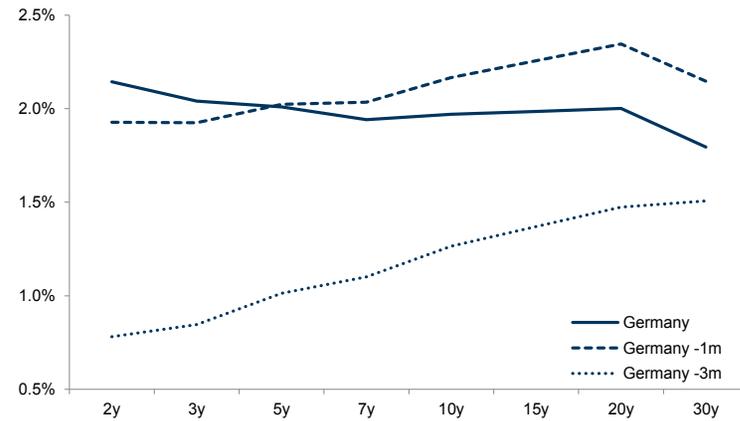
Current relative to 1 month and 3 months ago



Source: Datastream, Goldman Sachs Global Investment Research

**Exhibit 80: German yield curve dynamics**

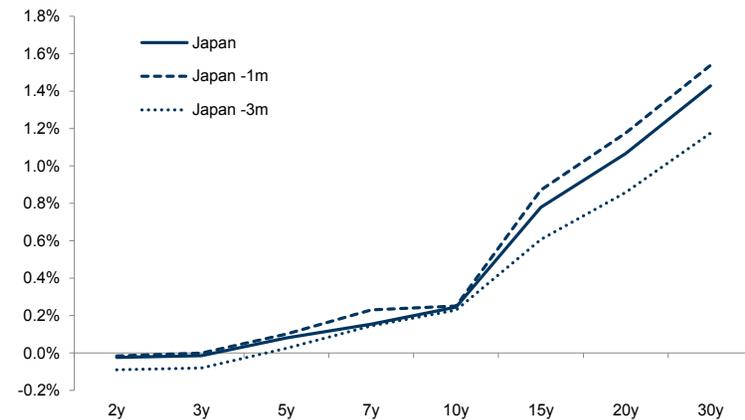
Current relative to 1 month and 3 months ago



Source: Datastream, Goldman Sachs Global Investment Research

**Exhibit 81: Japan yield curve dynamics**

Current relative to 1 month and 3 months ago



Source: Goldman Sachs Global Investment Research

**Exhibit 82: Yield curve term slope across regions**



Source: Goldman Sachs Global Investment Research

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# Government bonds: Real yields, inflation, breakevens, 10y IR differentials

**Exhibit 83: 10y real yields across regions**

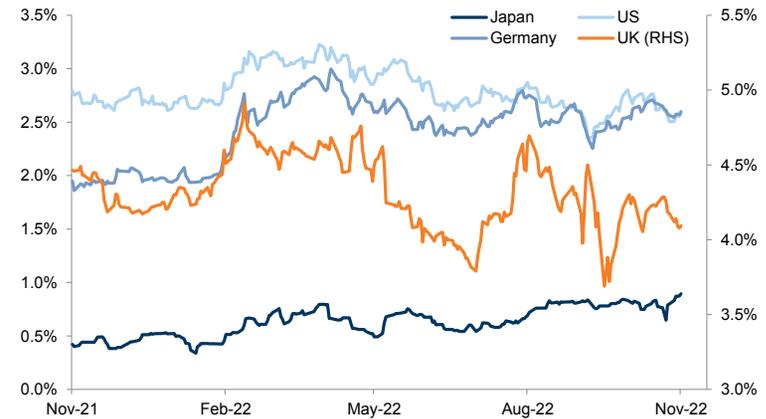
Nominal bond yield minus CPI inflation swap (RPI for the UK)



Source: Goldman Sachs, Goldman Sachs Global Investment Research

**Exhibit 84: 10y inflation swaps across regions**

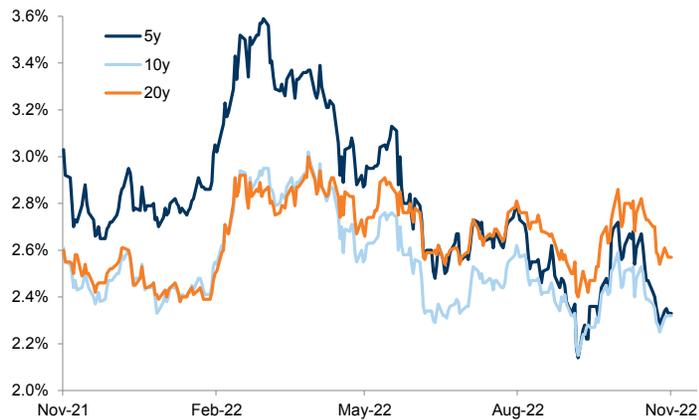
CPI inflation swap (RPI for the UK)



Source: Goldman Sachs, Goldman Sachs Global Investment Research

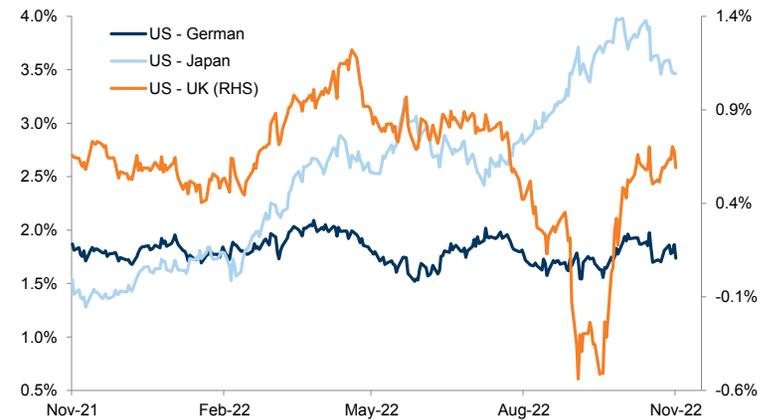
**Exhibit 85: US breakeven inflation**

Nominal yield minus TIPS yield



Source: Datastream, Goldman Sachs Global Investment Research

**Exhibit 86: 10y nominal bond yield differentials**



Source: Datastream, Goldman Sachs Global Investment Research

# Credit: Spreads - history and forecasts

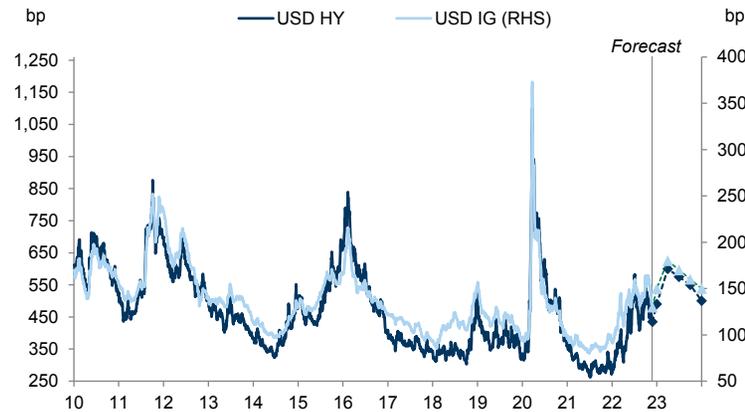
## Exhibit 87: Credit spread forecasts

Yieldbook Citi US IG, iBoxx EUR IG, BAML US HY and EUR HY

Sector	Updated through Nov 25, 2022					
	Current	2022Q4	2023Q1	2023Q2	2023Q3	2023Q4
<b>USD spreads</b>						
IG	130	150	180	170	160	150
IG Fin	142	164	190	178	166	155
IG Non-Fin	121	142	170	165	155	148
High Yield	435	490	600	575	550	500
<b>EUR spreads</b>						
IG	193	215	240	225	215	210
IG Fin	240	265	295	270	240	230
IG Non-Fin	166	180	200	190	185	180
High Yield	492	555	660	615	575	550

Source: Bloomberg-Barclays, ICE-BAML, iBoxx, Goldman Sachs Global Investment Research

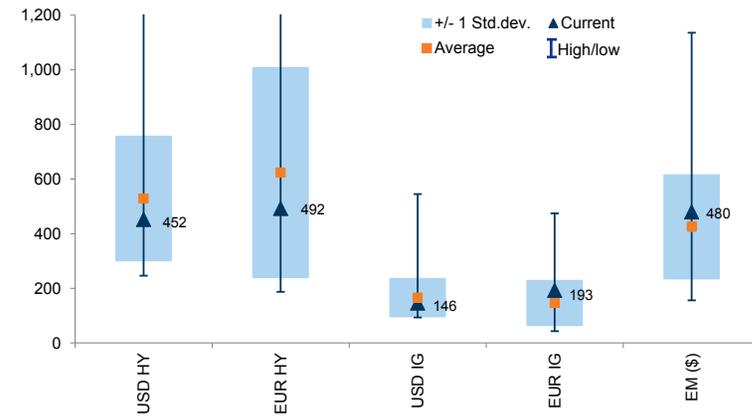
## Exhibit 89: Our USD spread forecast for IG vs. HY



Source: Bloomberg-Barclays, Goldman Sachs Global Investment Research

## Exhibit 88: Current credit spreads relative to their historical ranges

Credit spreads (US HY and IG since 1985, EUR IG since 1997, EUR HY and EM since 1998)



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

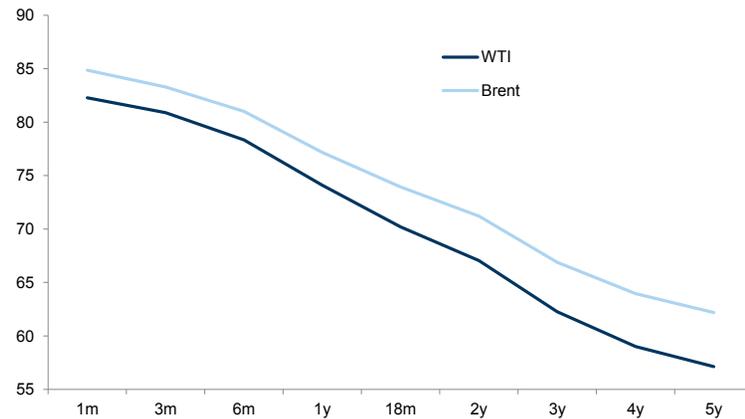
## Exhibit 90: Our EUR spread forecast for IG vs. HY



Source: ICE-BAML, iBoxx, Goldman Sachs Global Investment Research

# Commodities: Curve shapes and roll yields

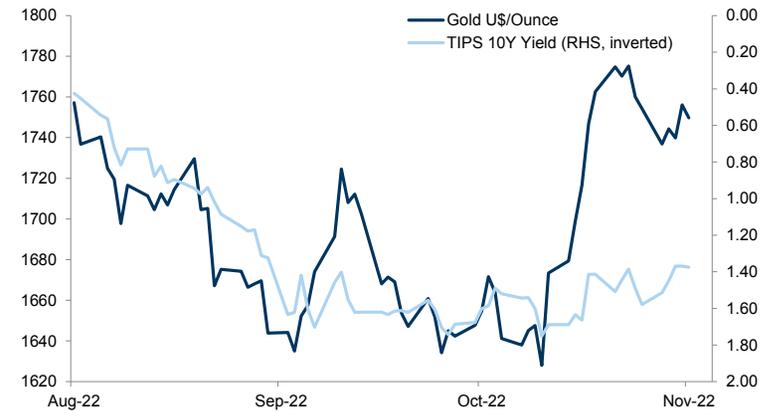
**Exhibit 91: WTI and Brent oil forward curves**



Source: Goldman Sachs, Goldman Sachs Global Investment Research

**Exhibit 92: Gold price and US real yields**

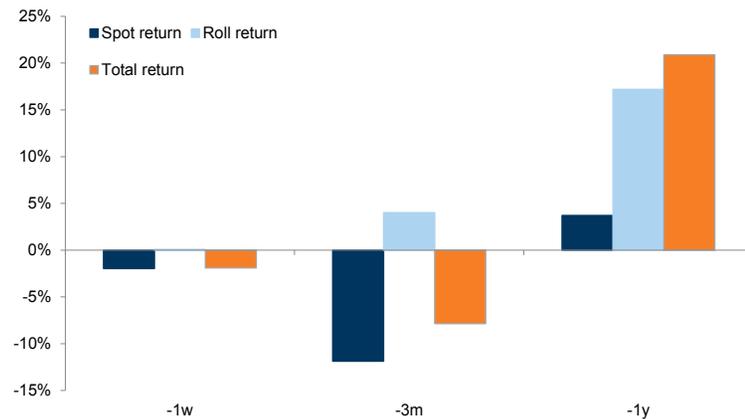
US 10-year TIPs yield, Gold US/ounce



Source: Datastream, Goldman Sachs Global Investment Research

**Exhibit 93: GSCI® Enhanced spot, roll and total returns**

Returns over the past 1 week, 3 months and 1 year



Source: Datastream, Goldman Sachs Global Investment Research

**Exhibit 94: Recent performance of GSCI® Enhanced sectors**

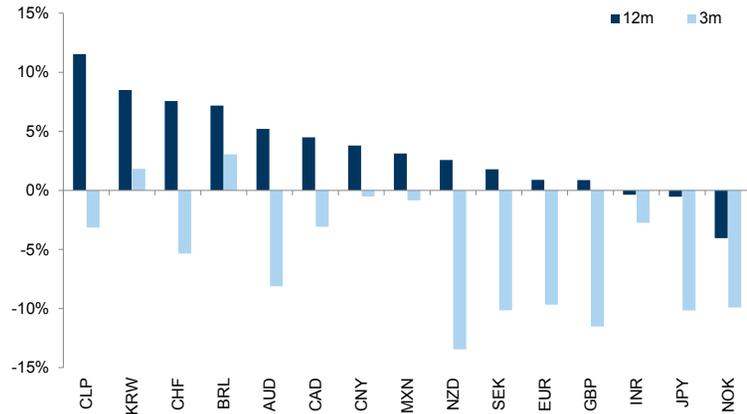
Weight signifies contribution to the GSCI® Enhanced index

	Current Weight	Returns (%)		
	(%)	-1w	-1m	-1y
<b>S&amp;P GSCI Enhanced</b>	<b>100.0</b>	<b>-1.9</b>	<b>-4.6</b>	<b>29.9</b>
Energy	60.5	-2.6	-8.4	51.4
Industrial Metals	9.9	-1.7	4.2	-7.0
Precious Metals	4.3	0.3	6.1	-2.6
Agriculture	18.6	-0.6	-0.2	9.2
Livestock	6.7	-0.5	0.5	4.1

Source: Goldman Sachs, Goldman Sachs Global Investment Research

# FX: Forecasts and forwards, recent performance and positioning

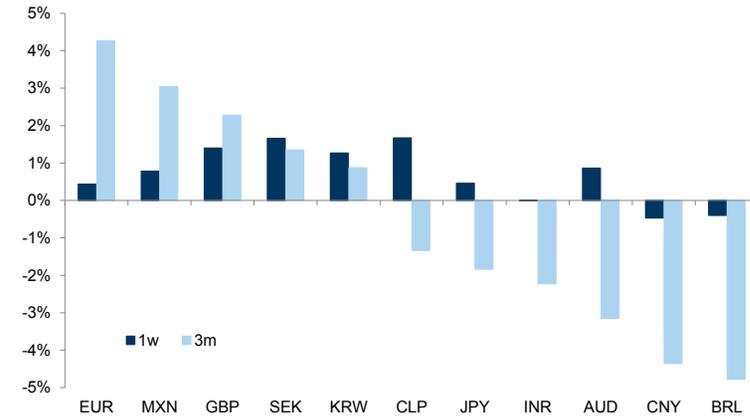
**Exhibit 95: Our 3- and 12-month forecasts for dollar crosses**



Source: Datastream, Goldman Sachs Global Investment Research

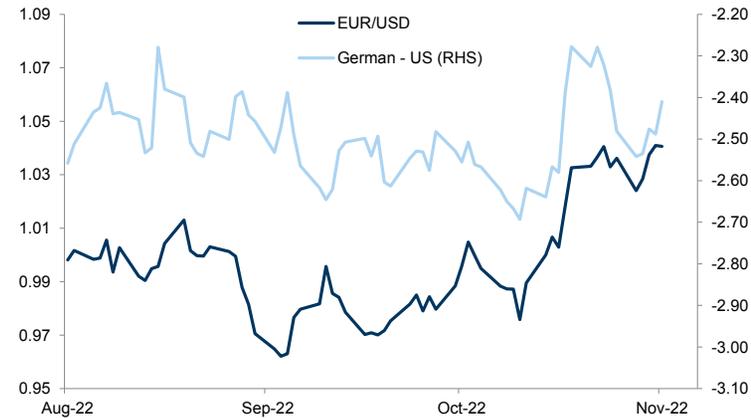
**Exhibit 96: Recent performance of dollar crosses**

Percentage change over past 1 week, 3 months



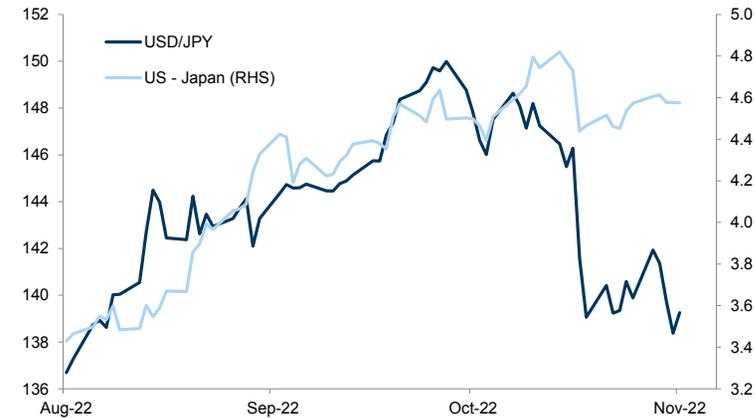
Source: Datastream, Goldman Sachs Global Investment Research

**Exhibit 97: EUR/USD against German - US 2y interest rate differentials past 3m**



Source: Datastream, Goldman Sachs Global Investment Research

**Exhibit 98: USD/JPY against US - Japan 2y interest rate differentials past 3m**



Source: Datastream, Goldman Sachs Global Investment Research

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