GOAL KICKSTART

Below zero – Risk Appetite Indicator negative as Tech dominates cross-asset moves

Last week, US PMIs were roughly unchanged, while Euro Area flash PMIs declined below expectations. Our Risk Appetite Indicator (RAI) fell to -0.5, its lowest level since April 2025 (Exhibit 10). Historically, readings below -1 and in particular near -2 have been useful contrarian signals. The current level is not yet negative enough to send that signal but suggests less-constrained upside for risky assets than at the end of the summer. As in previous weeks, credit components drove most of the decline and weighed on our PC1 "Global growth" factor, while the bond yield rally supported our PC2 "Monetary policy" factor (Exhibit 14).

Credit excess returns saw another multi-standard-deviation sell-off last week, while G4 10y bonds rallied, providing some protection against the AI sell-off (Exhibit 1). Most Euro Area-exposed assets also underperformed their betas to global growth and monetary policy pricing as OAT-Bund spreads widened beyond fundamentals (Exhibit 2). Within equities, defensive/quality styles and Value outperformed their growth- and policy-implied returns, helping buffer broad equity markets against the Tech-driven momentum unwind.

Tech has become an increasingly important driver of risk appetite. The correlation between our cross-asset RAI and Nasdaq 100 performance relative to the S&P 500 equal weight has risen over recent years, reaching almost 1 in recent weeks (Exhibit 3). Differences in sensitivity to Semiconductor stocks help explain cross-asset performance over the past 3 weeks (Exhibit 4), more so than sensitivity to oil prices (Exhibit 5). The Dollar has also behaved in a more pro-cyclical fashion.

Option markets price more uncertainty over the next 2 weeks than in the subsequent month, consistent with a busy catalyst calendar (Exhibit 6). Nasdaq 100 and other equity markets price larger moves this week, when Microsoft, Alphabet and Amazon report. Long-dated USTs and HY credit instead price larger moves next week around the US mid-term elections. Investors will also follow the Fed (our economist expect a hold followed by a hike in December), BoJ and ECB this week.

We remain modestly pro-risk in our asset allocation: OW Equities for 3m/12m, balanced by UW Credit (for 3m/12m), OW Cash for 3m and OW Bonds for 12m. AI concerns,

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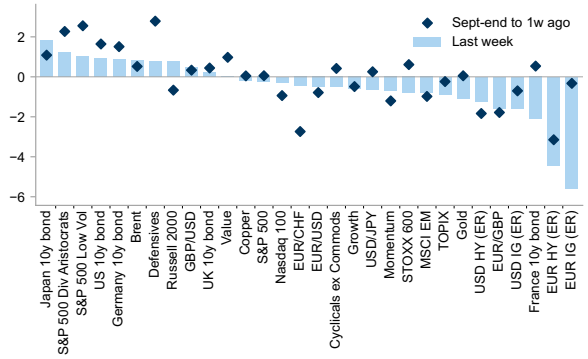
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Middle East tensions and mid-term elections could sustain near-term volatility. That said, we think earnings support, lighter positioning and lower valuations should help equities into year-end.

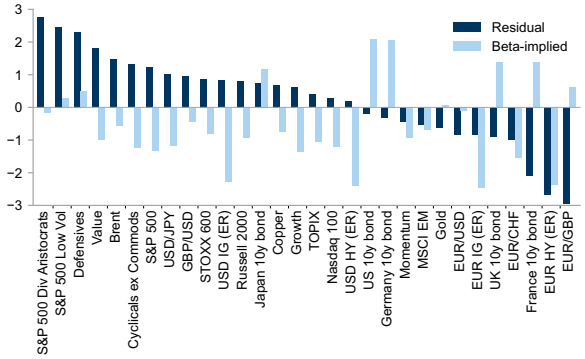
Below zero – Risk appetite turns negative as Tech drives cross-asset moves

Exhibit 1: Credit excess returns saw another sharp sell-off last week
Return in standard deviation terms



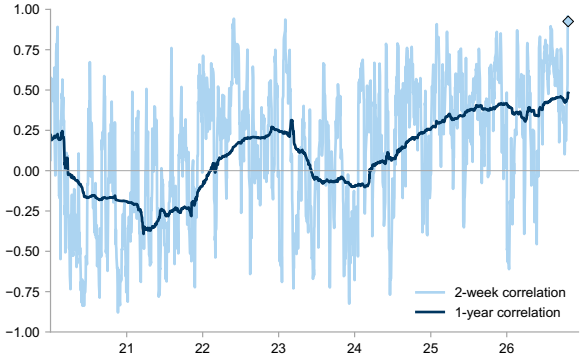
Source: Haver Analytics, Datastream, Goldman Sachs FICC and Equities

Exhibit 2: While Euro Area-exposed assets lagged their beta to global macro pricing
MTD return in standard deviation terms vs. implied by the beta to PC1 "Global growth" and PC2 "Monetary policy" factors



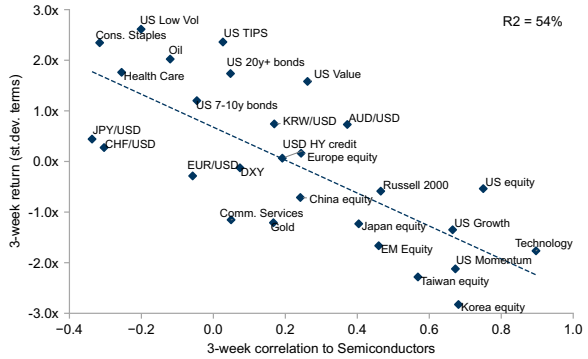
Source: Haver Analytics, Datastream, Goldman Sachs FICC and Equities

Exhibit 3: Cross-asset sentiment has been driven more and more by Tech
Correlation between our Risk Appetite Indicator and Nasdaq 100 vs. S&P 500 equal weight



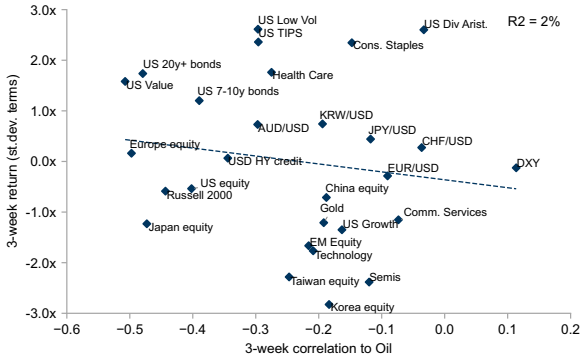
Source: Datastream, Goldman Sachs Global Investment Research

Exhibit 4: Sensitivity to Semiconductor stocks can explain most of the cross-asset moves



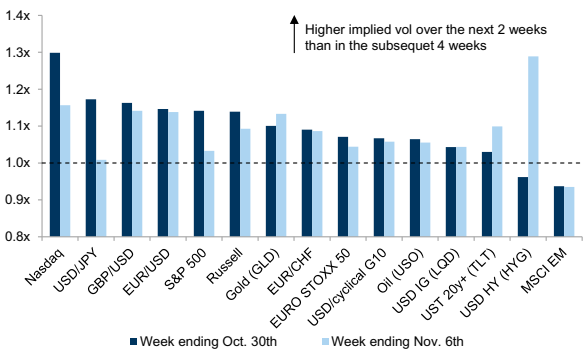
Source: LSEG Data & Analytics, Goldman Sachs Global Investment Research

Exhibit 5: ...more so than the sensitivity to oil prices



Source: LSEG Data & Analytics, Goldman Sachs Global Investment Research

Exhibit 6: Forward implied vol over the next 2 weeks / implied vol over the subsequent 4 weeks
Subsequent 4 weeks: Nov. 6th to Dec 4th



Source: LSEG Data & Analytics, Goldman Sachs FICC and Equities, Goldman Sachs Global Investment Research

Cross-asset: Forecasts

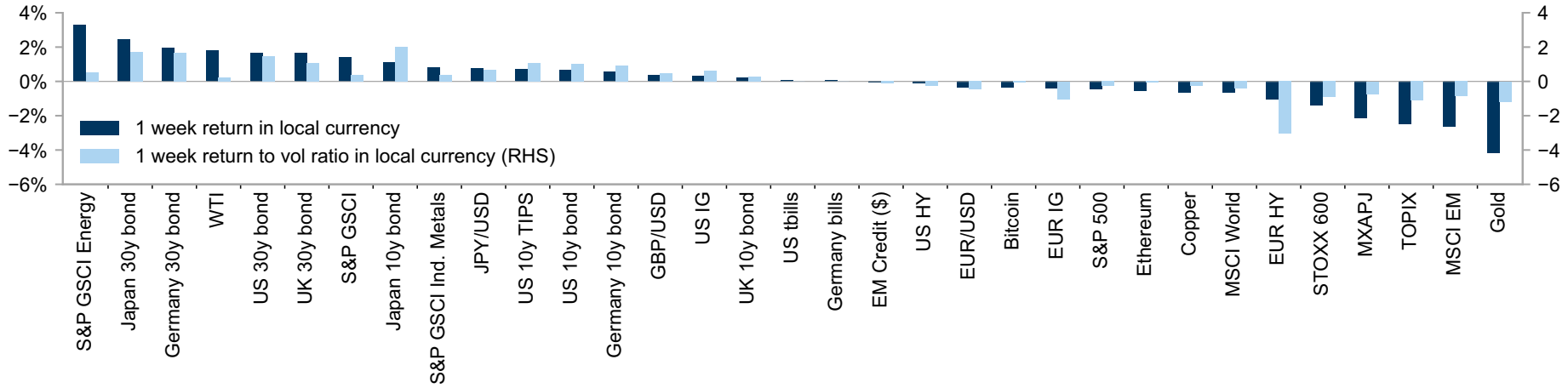
Exhibit 7: GOAL asset allocation recommendations and GS cross-asset forecasts

	Allocation Weighting		Current	Forecasts			Forecast Upside/Downside (%)		
	3m	12m	Level	3m	6m	12 m	3m	6m	12 m
Equities	**OW**	**OW**			**Index level**			**Total Return**	
S&P 500 ($)	OW	OW	7624	8000	8300	8700	5.2	9.4	15.3
Stoxx Europe 600 (€)	UW	UW	636	670	680	695	6.2	8.7	12.7
MSCI Asia-Pacific ex. JP ($)	OW	OW	814	880	960	1040	9.0	19.1	29.6
Topix (¥)	OW	OW	3966	4400	4500	4600	11.5	14.7	18.4
10 Year Government Bonds	**N**	**OW**			**Yield (%)**			**Total Return**	
US	OW	OW	5.00	4.73	4.63	4.44	3.5	5.6	9.8
Germany	OW	OW	3.34	3.25	3.25	3.25	1.7	2.6	4.5
Japan	UW	UW	2.80	2.99	2.94	2.83	-0.6	0.8	3.7
UK	N	OW	5.36	5.00	4.98	4.89	4.3	6.0	9.7
Corporate Bonds	**UW**	**UW**			**Spread**			**Total Return**	
Bloomberg USD IG	OW	OW	89	82	80	78	3.8	6.1	10.6
Bloomberg USD HY	OW	OW	337	294	288	280	4.1	6.4	11.1
Bloomberg EUR IG	UW	UW	109	88	86	84	2.4	3.6	5.9
Bloomberg EUR HY	UW	UW	396	314	309	305	4.7	6.4	9.7
EM Hard Currency Sovereign	N	N	202			200	3.4	5.8	10.5
Commodities	**N**	**N**			**Spot price**			**Spot Return**	
WTI ($/bbl)	N	N	110	80	76	70	-27.1	-30.7	-36.2
Brent ($/bbl)	N	N	117	88	83	75	-24.6	-28.8	-35.7
Copper ($/mt)	N	N	14,472	15,055	15,315	15,565	4.0	5.8	7.6
Gold ($/troy oz)	OW	OW	3,996	4,715	4,850	5,235	18.0	21.4	31.0
FX	**-**	**-**			**Spot rate**			**Spot Return**	
EUR/USD	-	-	1.12	1.14	1.12	1.12	1.7	0.0	0.0
USD/JPY	-	-	156.8	158	155	150	0.8	-1.1	-4.3
GBP/USD	-	-	1.34	1.33	1.29	1.28	-0.6	-3.6	-4.4
AUD/USD	-	-	0.70	0.72	0.73	0.74	2.4	3.8	5.2
USD/BRL	-	-	5.04	4.70	4.75	4.80	-6.8	-5.8	-4.8
USD/INR	-	-	94.9	96.0	97.0	97.0	1.1	2.2	2.2
USD/CNY	-	-	6.67	6.70	6.60	6.40	0.4	-1.1	-4.1
Cash	**OW**	**N**			**Spot rate**			**Total Return**	
US 3-month Tbill	-	-	-	-	-	-	1.03	2.16	4.41
Germany 3-month Bubills	-	-	-	-	-	-	0.64	1.35	2.92

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

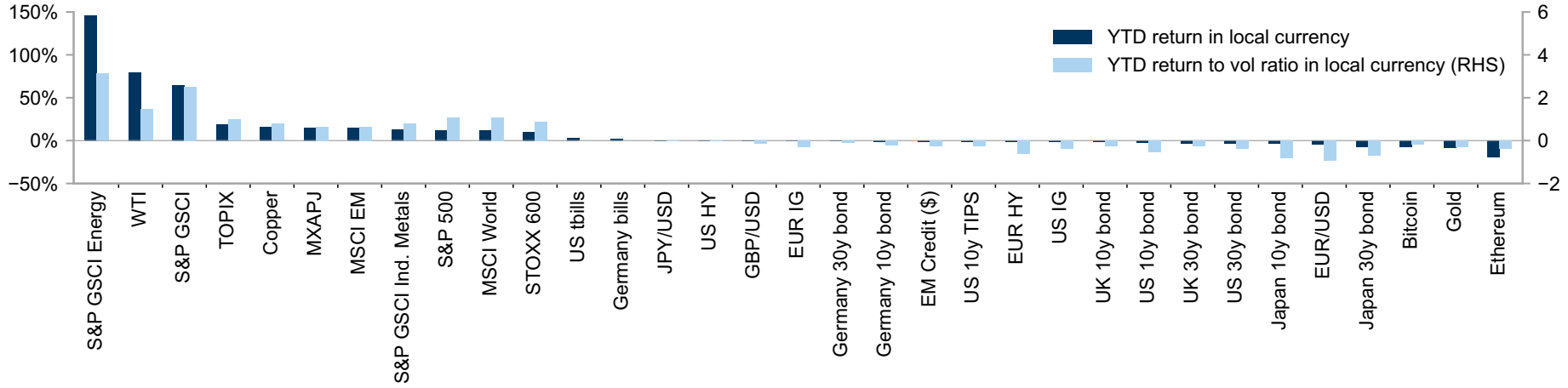
Cross-asset: Weekly and YTD performance, absolute and risk-adjusted

Exhibit 8: Local currency returns and return to vol ratios
1 week returns. Volatility of weekly returns in the previous 12m



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

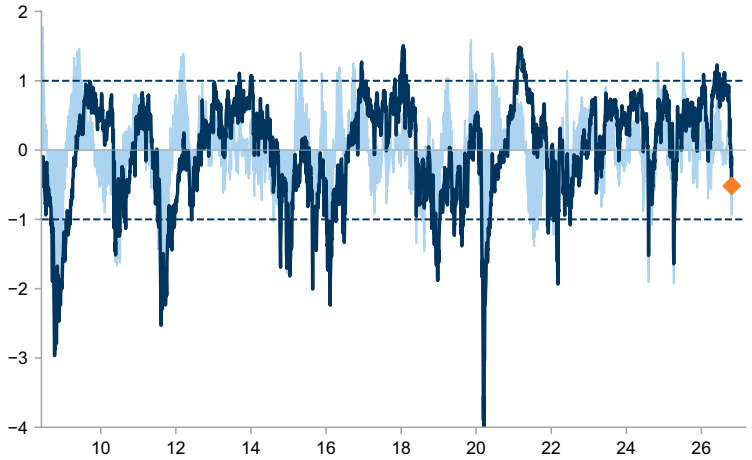
Exhibit 9: Local currency returns and return to vol ratios
YTD returns



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

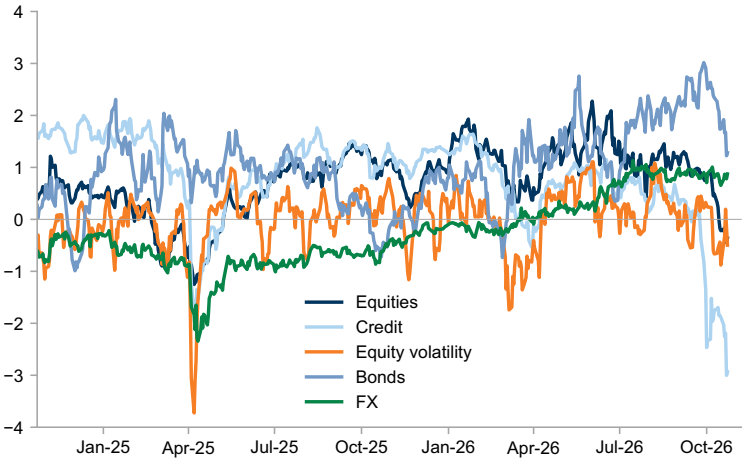
Cross-asset: Risk appetite indicator

Exhibit 10: Risk appetite indicator level and momentum factors
See July 2016 GOAL for construction details



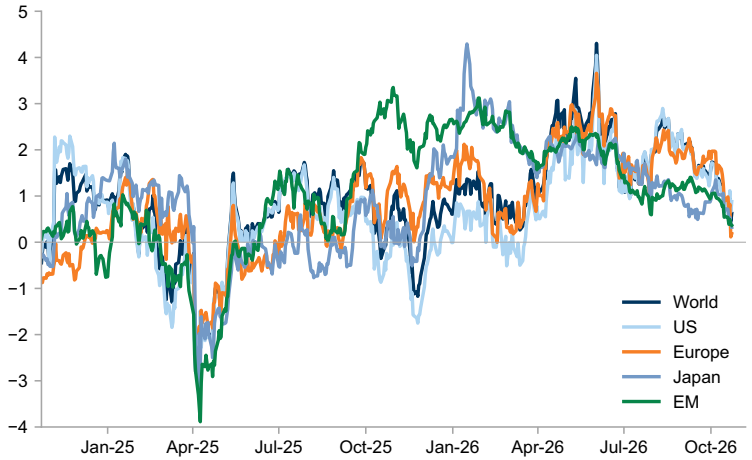
Source: Goldman Sachs Global Investment Research

Exhibit 11: Risk appetite indicators for different asset classes
See July 2016 GOAL for construction details



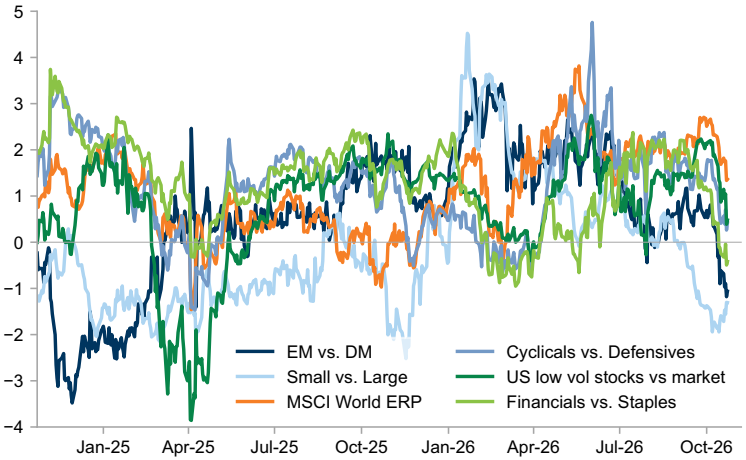
Source: Goldman Sachs Global Investment Research

Exhibit 12: Cyclicals vs. defensives 1-year rolling z-score across regions
See July 2016 GOAL for construction details



Source: Goldman Sachs Global Investment Research

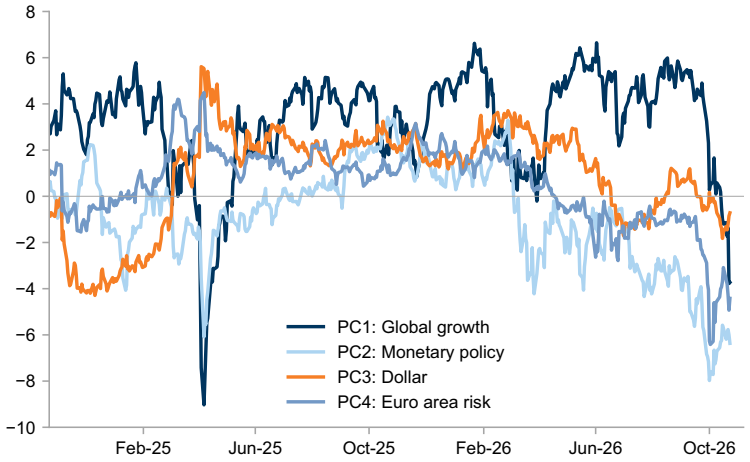
Exhibit 13: Sub-components of equity risk appetite indicator
See July 2016 GOAL for construction details



Source: Goldman Sachs Global Investment Research

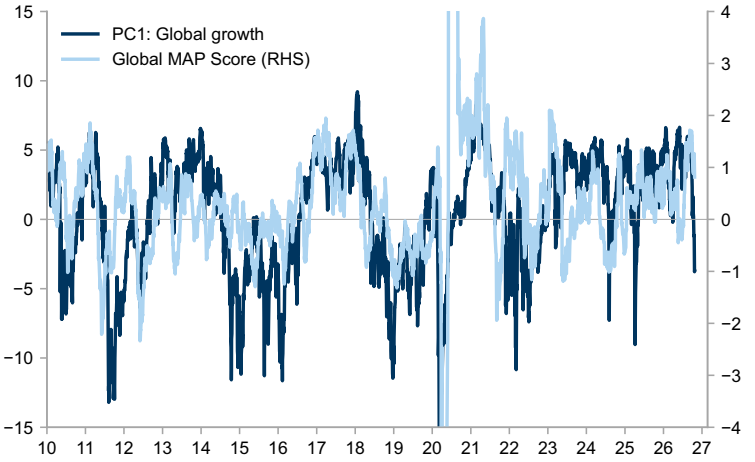
Cross-asset: Risk Appetite principal component analysis

Exhibit 14: GS RAI principal component
See April 2019 GOAL for construction details



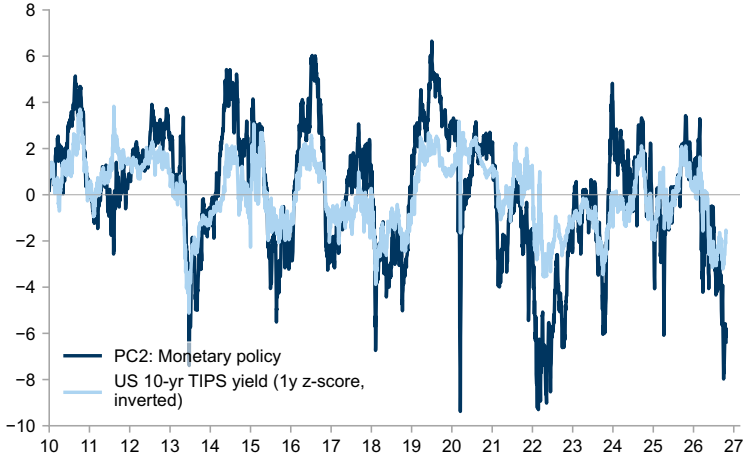
Source: Datastream, Goldman Sachs Global Investment Research

Exhibit 15: PC1: Global growth factor vs. Global MAP Score



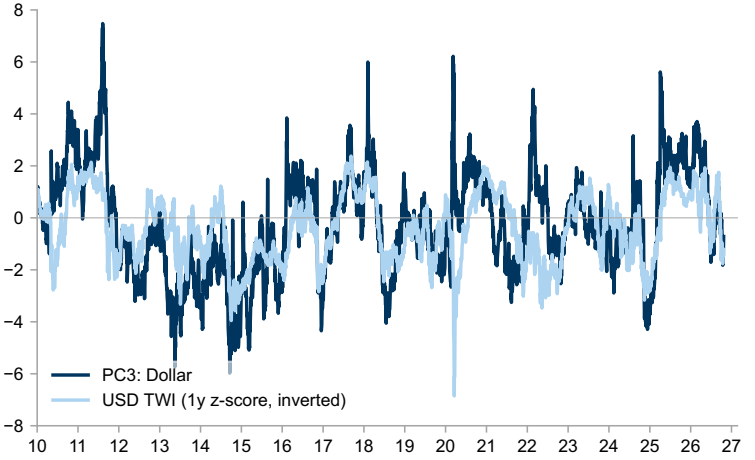
Source: Datastream, Goldman Sachs Global Investment Research

Exhibit 16: PC2: Monetary policy factor vs. US 10-year TIPS yield



Source: Datastream, Goldman Sachs Global Investment Research

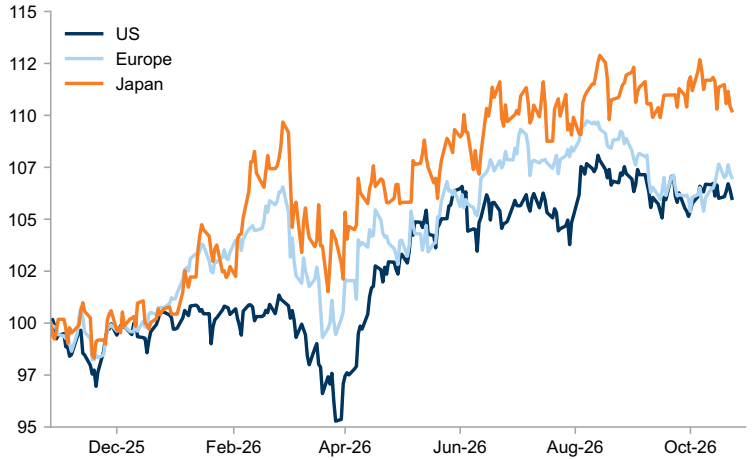
Exhibit 17: PC3: Dollar factor vs. USD TWI



Source: Datastream, Goldman Sachs Global Investment Research

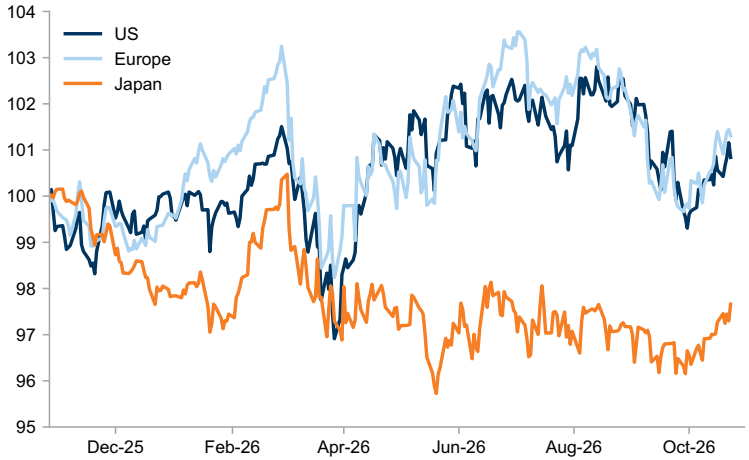
Cross-asset: Balanced portfolios and dynamic allocation strategies performance

Exhibit 18: 60/40 equity/bond portfolio performance across regions last 12m
Relative total return performance indexed to 100 12m ago



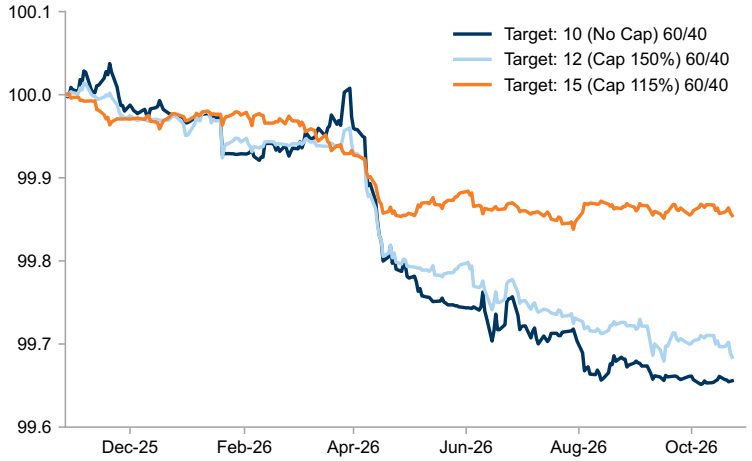
Source: Datastream, Goldman Sachs Global Investment Research

Exhibit 19: Risk parity portfolio performance across regions last 12m
Weighted inversely by 3m realised volatility of equity and 10y bonds



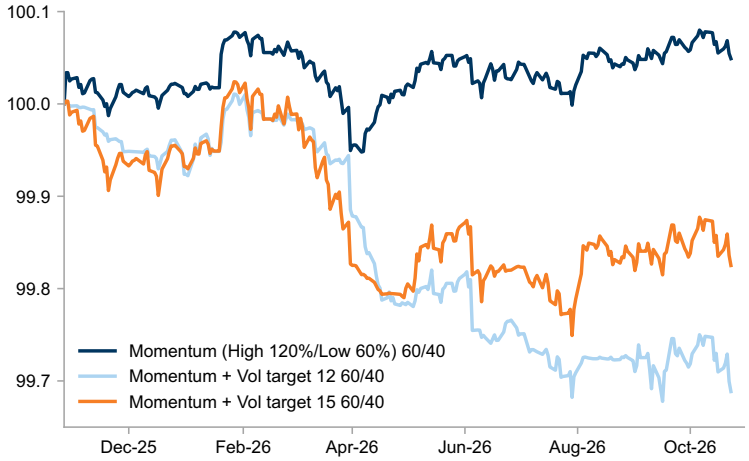
Source: Datastream, Goldman Sachs Global Investment Research

Exhibit 20: 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

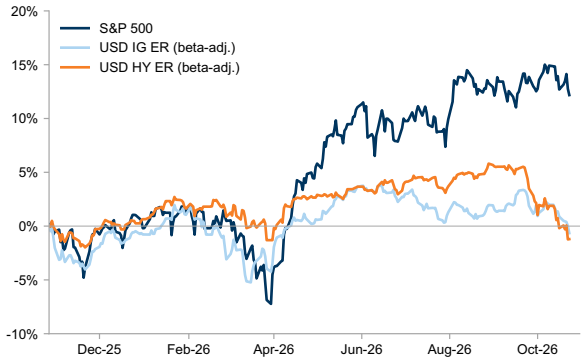
Exhibit 21: 60/40 portfolio with volatility target strategies and momentum overlay vs. US 60/40
60% S&P 500, 40% US 10y bond; Strategy methodology see: GOAL: The Balanced Bear - Part 2



Source: Datastream, Goldman Sachs Global Investment Research

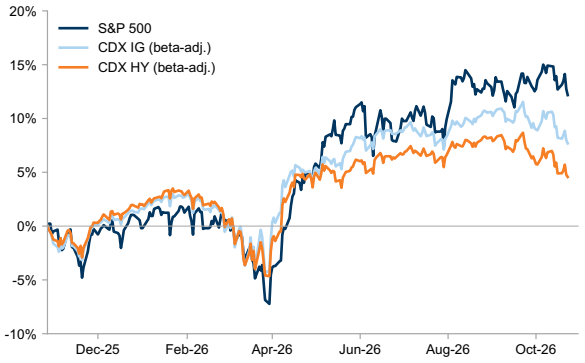
Cross-asset: Equity vs. credit monitor

Exhibit 22: USD cash credit vs. US equity
Cash credit excess returns (beta-adjusted) vs. S&P 500 total returns



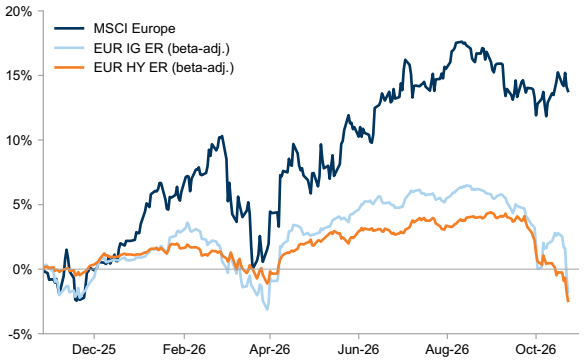
Source: Datastream, Goldman Sachs Global Investment Research

Exhibit 23: USD synthetic credit vs. US equity
Synthetic credit excess returns (beta-adjusted) vs. S&P 500 total returns



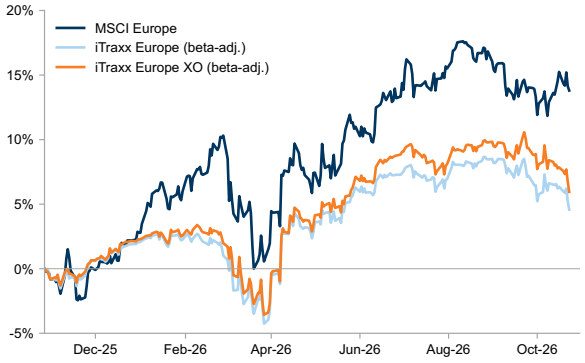
Source: Datastream, Goldman Sachs Global Investment Research

Exhibit 24: EUR cash credit vs. European equity
Cash credit excess returns (beta-adjusted) vs. MSCI Europe total returns



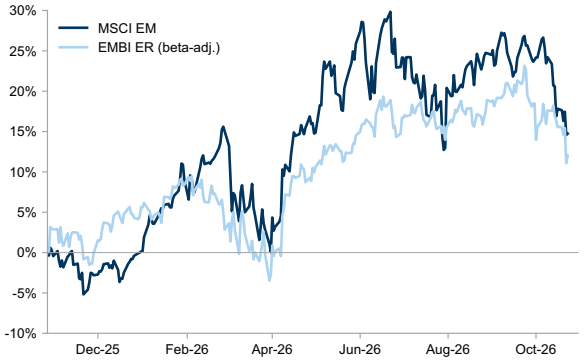
Source: Datastream, Goldman Sachs Global Investment Research

Exhibit 25: EUR synthetic credit vs. European equity
Synthetic credit excess returns (beta-adjusted) vs. MSCI Europe total returns



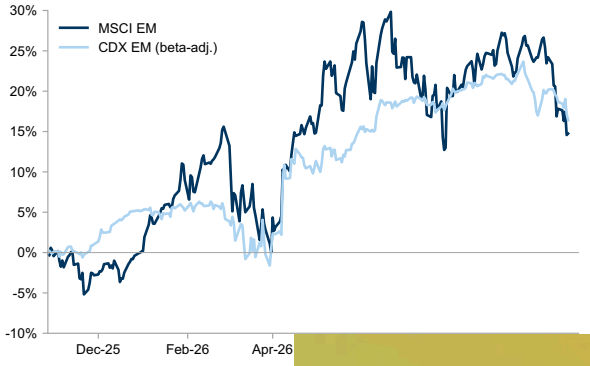
Source: Datastream, Goldman Sachs Global Investment Research

Exhibit 26: 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 27: EM synthetic credit vs. EM equity
Synthetic credit excess returns (beta-adjusted) vs. MSCI EM total returns



Source: Datastream, Goldman Sachs

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Cross-asset: Valuation and risk premia

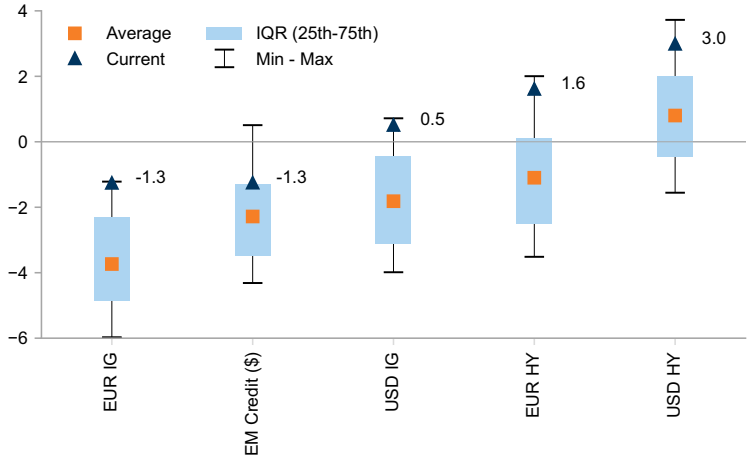
Exhibit 28: Cross-asset valuation table
A higher percentile means more expensive relative to 10y history

	Equity					Government bonds				Credit					FX (vs. USD)	
	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	JPY
Valuation metric	12m forward P/E ratio					Yield				Spread					Actual - GS fair value	
Current:	18.6x	13.7x	9.5x	14.8x	8.8x	5.0%	3.3%	2.8%	5.4%	89bp	337bp	109bp	396bp	202bp	-5.4%	-38.8%
Expensiveness (last 10y percentile):	***47%***	***37%***	***0%***	***68%***	***0%***	***1%***	***1%***	***2%***	***1%***	***74%***	***58%***	***51%***	***33%***	***91%***	***61%***	***14%***
3M change:	-1.0x	-1.0x	-1.5x	-1.2x	-1.2x	0.4%	0.2%	0.1%	0.3%	9bp	55bp	30bp	106bp	27bp	-1.5%	2.0%
Average:	19.2x	14.2x	13.5x	14.2x	12.3x	2.9%	1.1%	0.5%	2.4%	109bp	370bp	117bp	380bp	332bp	-7.2%	-22.0%
95th:	22.4x	17.4x	16.2x	17.3x	14.8x	4.6%	3.0%	2.4%	4.9%	150bp	523bp	192bp	564bp	457bp	-1.3%	-8.1%
5th:	16.0x	11.9x	11.5x	12.0x	10.5x	0.7%	-0.5%	-0.1%	0.3%	77bp	266bp	78bp	276bp	178bp	-13.7%	-40.3%

Note: GSDEER is our fair value macro model for exchange rates.

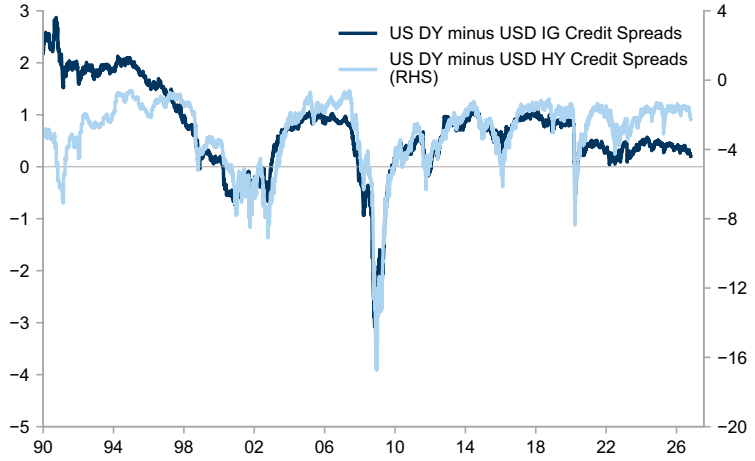
Source: Datastream, I/B/E/S, iBoxx, Goldman Sachs Global Investment Research

Exhibit 29: 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 30: Equity vs. credit relative valuation
US Dividend Yield minus Credit spreads



Source: Datastream, Goldman Sachs Global Investment Research

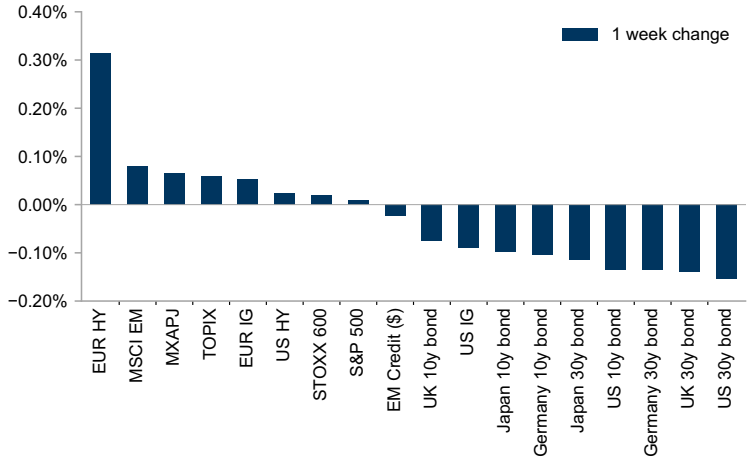
Cross-asset: Yields

Exhibit 31: Current yields across assets and their percentile to the past 10 years

	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 ($)
Valuation metric	Dividend Yield (NTM)					Yield				Yield				
Current:	1.2%	3.4%	3.0%	2.4%	3.2%	5.0%	3.3%	2.8%	5.4%	5.9%	4.2%	8.6%	7.5%	7.0%
Percentile (-10y):	***3%***	***32%***	***57%***	***49%***	***84%***	***99%***	***99%***	***98%***	***99%***	***97%***	***9%***	***89%***	***71%***	***73%***
Average:	1.7%	3.5%	2.9%	2.4%	2.9%	2.9%	1.1%	0.5%	2.4%	4.0%	6.6%	7.0%	6.8%	6.2%
95th:	2.2%	4.0%	3.4%	2.7%	3.4%	4.6%	3.0%	2.4%	4.9%	5.7%	8.8%	8.8%	8.8%	8.3%
5th:	1.2%	3.0%	2.3%	2.1%	2.4%	0.7%	-0.5%	-0.1%	0.3%	2.0%	3.6%	4.8%	4.8%	4.3%
3m real. ret. vol:	11.0%	9.0%	22.5%	16.6%	22.9%	6.3%	4.8%	4.2%	6.2%	5.0%	2.8%	2.9%	2.3%	4.6%
Percentile (-10y):	***35%***	***10%***	***80%***	***65%***	***84%***	***56%***	***53%***	***64%***	***50%***	***52%***	***64%***	***55%***	***32%***	***56%***
Yield/vol ratio	0.11	0.38	0.13	0.14	0.14	0.80	0.70	0.67	0.86	1.18	1.54	2.96	3.25	1.53

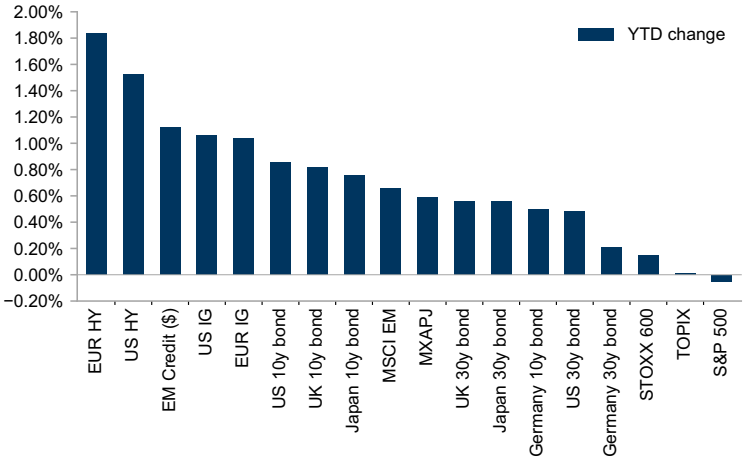
Source: Datastream, iBoxx, Goldman Sachs Global Investment Research

Exhibit 32: Past week change in yields across assets



Source: Datastream, iBoxx, Goldman Sachs Global Investment Research

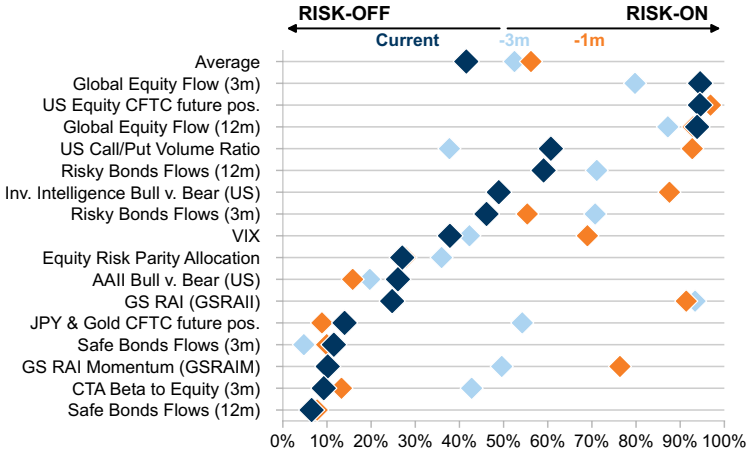
Exhibit 33: YTD change in yields across assets



Source: Datastream, iBoxx, Goldman Sachs Global Investment Research

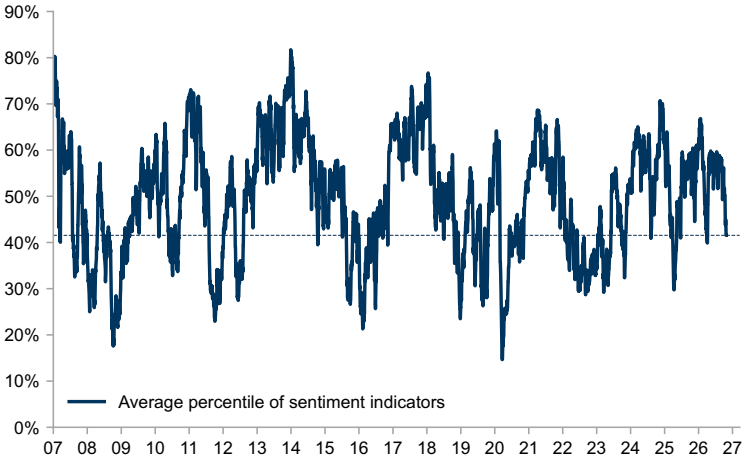
Cross-asset: Sentiment and Positioning

Exhibit 34: Percentile of sentiment indicators
Data since 2007



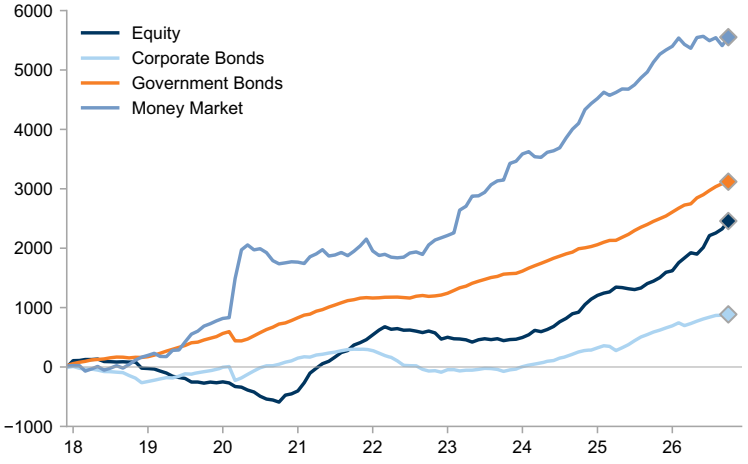
Source: Datastream, Haver Analytics, EPFR, Goldman Sachs Global Investment Research

Exhibit 35: Average percentile of sentiment indicators
Data since 2007



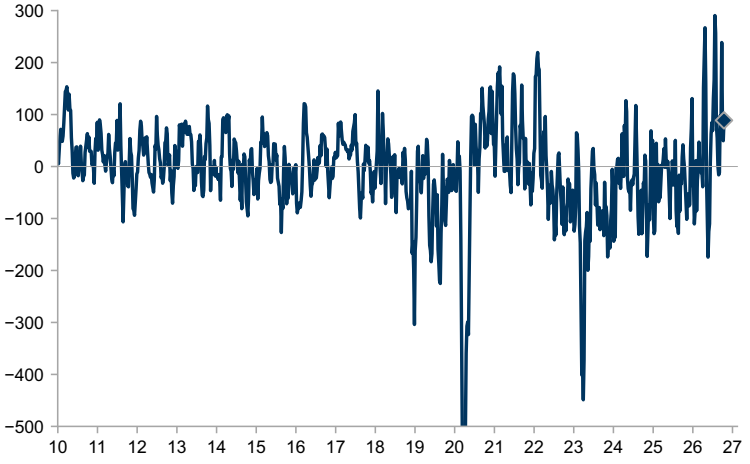
Source: Datastream, Haver Analytics, EPFR, Goldman Sachs Global Investment Research

Exhibit 36: Cumulative fund flows across assets
Monthly flows ($bn). MTD sum of weekly flows when monthly not yet available



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

Exhibit 37: Risky vs. safe assets fund flows
4 weeks rolling flows, USD bn



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

Source: EPFR, Goldman Sachs Global Investment Research

Source: EPFR, Goldman Sachs Global Investm

Cross-asset: Global Funds Flows

Exhibit 38: YTD cross-asset globalund flows

All funds reporting monthly. MTD sum of weekly flows when monthly not yet available ($bn)

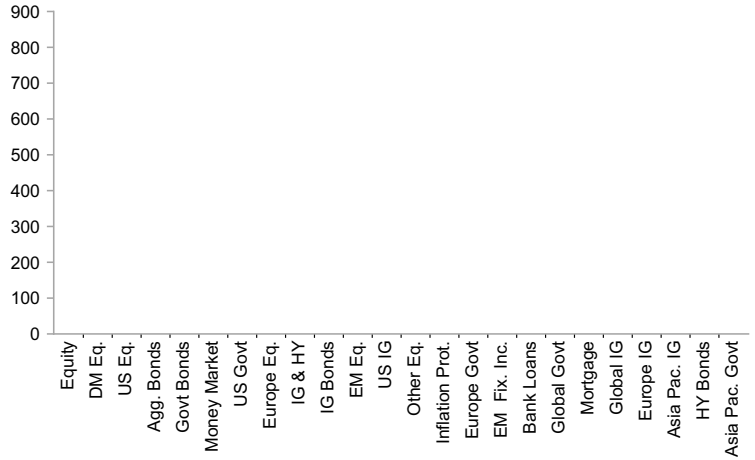
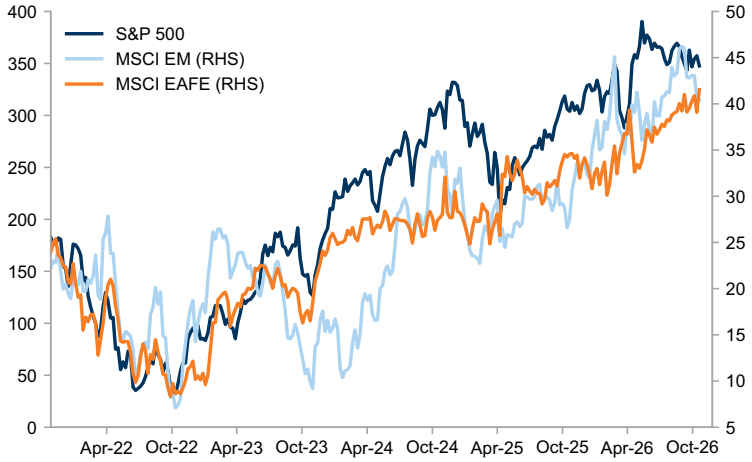


Exhibit 39: YTD cross-asset globalund flows

All funds reporting monthly. MTD sum of weekly flows when monthly not yet available (% of AUM)

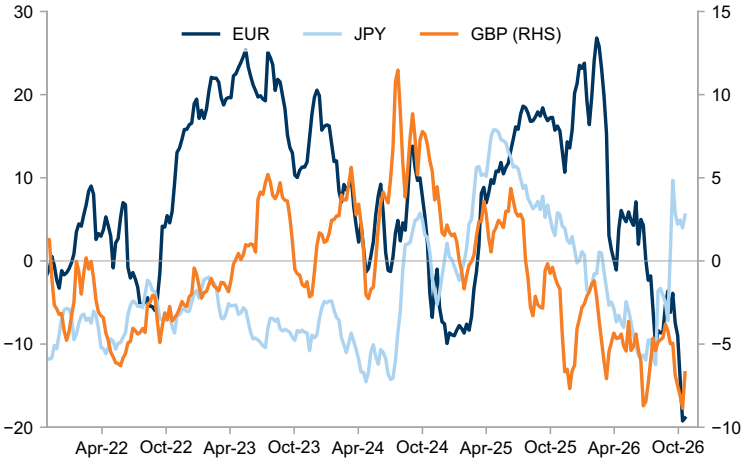
Cross-asset: CFTC positioning

Exhibit 42: Equity net long positioning
Leveraged funds and asset managers net future positions ($ bn)



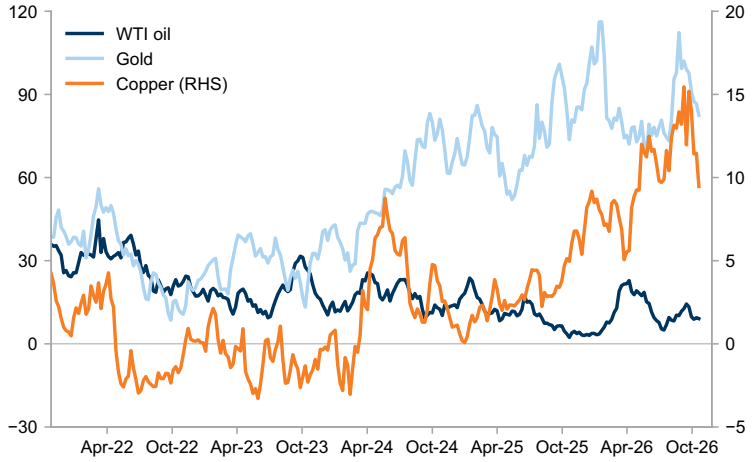
Source: Bloomberg, CFTC, Goldman Sachs Global Investment Research

Exhibit 43: Currency net long positioning
Net non-commercial positions ($ bn)



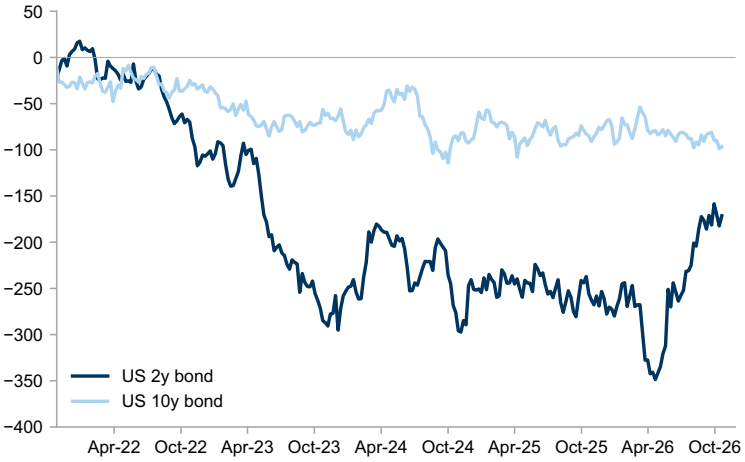
Source: Bloomberg, CFTC, Goldman Sachs Global Investment Research

Exhibit 44: Commodity net long positioning
Net non-commercial positions ($ bn)



Source: Bloomberg, CFTC, Goldman Sachs Global Investment Research

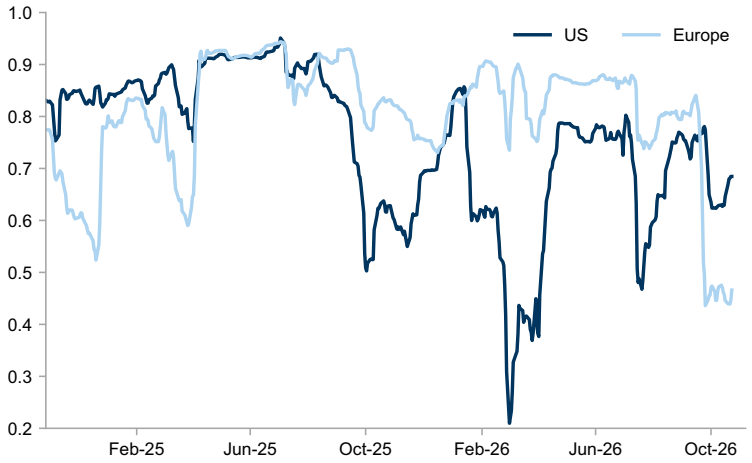
Exhibit 45: US Treasury net long positioning
Net non-commercial positions ($ bn)



Source: Bloomberg, CFTC, Goldman Sachs Global Investment Research

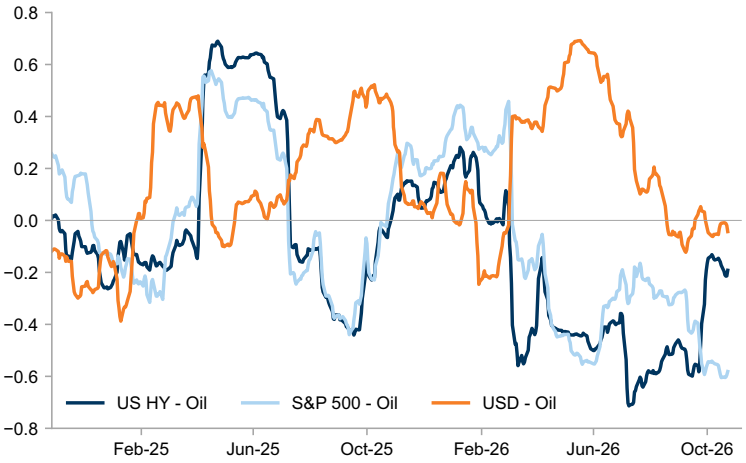
Cross-asset: Correlations: Equity vol/CDS, commodity prices/credit & FX, equity/bond, equity/FX

Exhibit 46: 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



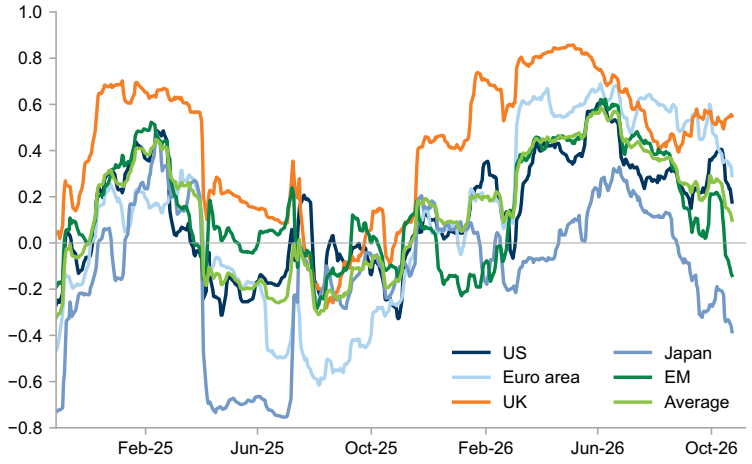
Source: Datastream, Goldman Sachs, Goldman Sachs Global Investment Research

Exhibit 47: 3m rolling commodity price correlations of weekly % changes with different assets



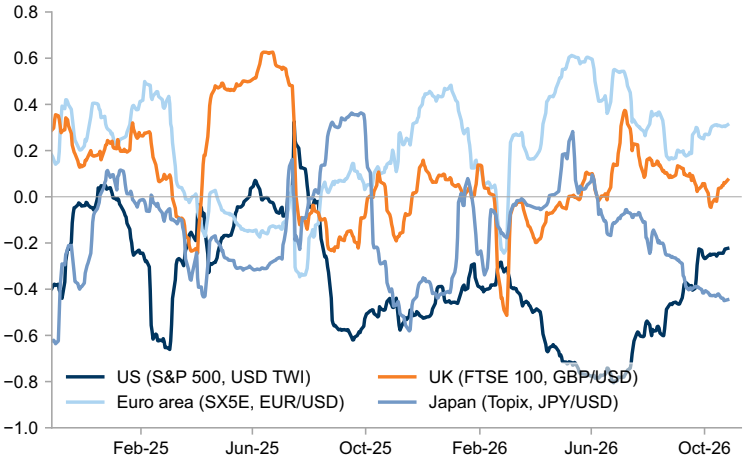
Source: Datastream, Goldman Sachs, Goldman Sachs Global Investment Research

Exhibit 48: 3m rolling equity/bond correlation of weekly returns



Source: Datastream, Goldman Sachs Global Investment Research

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



Source: Datastream, Goldman Sachs Global Investment Research

Cross-asset: Correlation matrix

Exhibit 50: 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 ($)	WTI Crude Oil	Copper	Gold	VIX
Current 1y correlation of weekly returns																					
S&P 500		0.59	0.58	0.44	0.59	0.20	0.30	0.07	0.43	0.31	-0.15	0.49	0.36	0.55	0.71	0.64	0.52	-0.38	0.59	0.45	-0.74
STOXX 600	0.03		0.38	0.47	0.40	0.44	0.48	0.05	0.68	0.30	-0.05	0.27	0.49	0.69	0.61	0.61	0.59	-0.45	0.61	0.46	-0.54
MXAPJ	0.44	0.02		0.63	0.99	0.13	0.24	0.09	0.34	0.45	-0.23	0.53	0.20	0.42	0.40	0.56	0.43	-0.50	0.51	0.38	-0.54
TOPIX	0.13	0.11	0.54		0.64	0.18	0.32	-0.10	0.41	0.12	0.10	0.17	0.21	0.42	0.30	0.48	0.38	-0.51	0.40	0.39	-0.38
MSCI EM	0.34	0.02	1.00	0.63		0.15	0.25	0.08	0.36	0.46	-0.24	0.53	0.22	0.44	0.42	0.57	0.46	-0.53	0.53	0.41	-0.55
US 10 yr	0.89	0.98	0.81	0.96	0.82		0.74	0.58	0.74	0.32	-0.15	0.24	0.92	0.72	0.58	0.40	0.74	-0.39	0.27	0.30	-0.15
Germany 10 yr	0.93	0.99	0.95	0.99	0.95	0.32		0.45	0.82	0.12	-0.11	0.12	0.70	0.86	0.42	0.29	0.51	-0.49	0.13	0.25	-0.27
Japan 10 yr	0.86	0.87	0.80	0.76	0.77	0.79	0.25		0.38	0.13	-0.12	0.21	0.51	0.32	0.22	0.04	0.42	-0.12	-0.04	-0.04	0.01
UK 10 yr	0.96	0.99	0.95	0.99	0.96	0.32	0.40	0.18		0.21	-0.12	0.18	0.72	0.82	0.56	0.49	0.63	-0.56	0.42	0.37	-0.39
EUR/USD	0.56	0.74	0.67	0.61	0.67	0.77	0.74	0.70	0.78		-0.61	0.74	0.39	0.31	0.45	0.38	0.43	-0.31	0.21	0.39	-0.38
USD/JPY	0.18	0.16	0.25	0.24	0.25	0.92	0.91	0.71	0.87	0.10		-0.46	-0.18	-0.16	-0.18	0.02	-0.18	0.09	0.06	-0.12	0.14
AUD/USD	0.53	0.34	0.25	0.26	0.31	0.84	0.82	0.88	0.82	0.90	0.23		0.30	0.30	0.53	0.37	0.49	-0.14	0.32	0.49	-0.50
iBoxx US IG	0.82	0.94	0.61	0.83	0.63	0.66	0.59	0.78	0.65	0.82	0.84	0.75		0.75	0.75	0.53	0.78	-0.38	0.33	0.34	-0.25
iBoxx EUR IG	0.93	1.00	0.84	0.99	0.85	0.77	0.62	0.47	0.84	0.85	0.59	0.76	0.68		0.66	0.65	0.73	-0.58	0.39	0.42	-0.38
BAML US HY	0.72	0.49	0.09	0.26	0.09	0.95	0.89	0.79	0.96	0.85	0.31	0.71	0.90	0.86		0.77	0.80	-0.34	0.48	0.46	-0.56
BAML EUR HY	0.87	0.41	0.51	0.39	0.63	0.93	0.84	0.62	0.95	0.88	0.38	0.58	0.85	0.78	0.49		0.73	-0.45	0.61	0.49	-0.39
EM Credit ($)	0.67	0.78	0.31	0.73	0.29	0.92	0.88	0.89	0.90	0.75	0.37	0.67	0.82	0.87	0.88	0.87		-0.49	0.47	0.45	-0.33
WTI Crude Oil	0.00	0.02	0.01	0.01	0.01	0.18	0.05	0.41	0.01	0.03	0.53	0.03	0.04	0.02	0.01	0.02	0.02		-0.31	-0.16	0.48
Copper	0.84	0.91	0.59	0.80	0.57	0.99	0.93	0.72	0.98	0.23	0.62	0.17	0.95	0.94	0.83	0.95	0.90	0.01		0.50	-0.43
Gold	0.94	0.99	0.70	0.99	0.74	0.66	0.69	0.18	0.84	0.42	0.88	0.61	0.75	0.90	0.95	0.97	0.85	0.04	0.85		-0.25
VIX	0.79	0.94	0.46	0.88	0.49	0.05	0.02	0.17	0.01	0.11	0.93	0.27	0.16	0.02	0.36	0.57	0.52	1.00	0.20	0.06	

Current correlation's percentile since 2001

Current 1y correlation of weekly returns

Current correlation's percentile since 2001

Source: Datastream, iBoxx, Goldman Sachs Global Investment Research

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

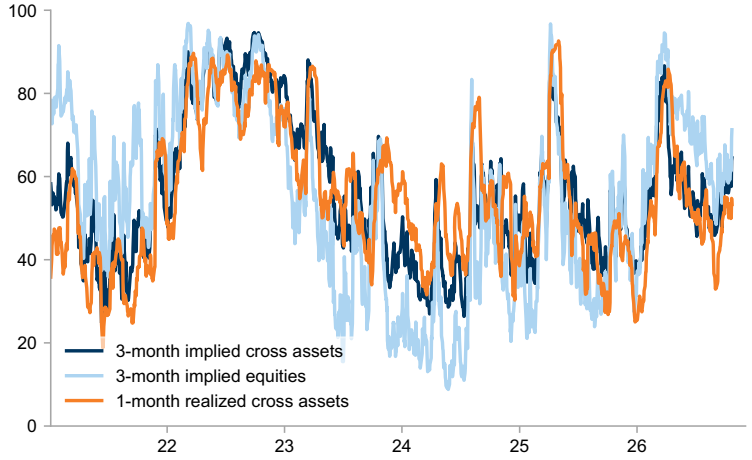
Exhibit 51: Cross-asset volatility, current and historical percentiles, implied 3m and realised 1m

	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
Implied (3-month ATM, %)																			
Current:	14.9	16.7	28.0	13.1	24.7	16.2	7.3	6.2	6.8	5.8	45.4	44.7	51.1	49.8	20.2	18.9	6.4	7.9	6.2
Percentile:	***53%***	***64%***	***95%***	***57%***	***88%***	***71%***	***77%***	***72%***	***88%***	***83%***	***54%***	***70%***	***64%***	***89%***	***88%***	***30%***	***37%***	***40%***	***5%***
1M change:	1.3	1.7	3.6	1.3	1.5	2.0	0.4	0.7	0.1	1.0	8.3	9.6	11.5	4.3	-0.9	-1.9	0.5	-0.4	-0.2
Average:	16.0	16.8	19.3	14.0	19.5	15.3	5.0	5.3	3.4	4.0	48.3	42.7	50.3	36.5	14.9	22.1	7.0	8.7	8.5
95th:	25.5	25.4	28.5	22.2	28.4	22.8	9.7	7.9	8.5	7.7	69.8	65.9	69.8	56.6	23.1	29.9	10.2	12.5	12.1
5th:	10.0	12.2	13.7	10.0	14.5	10.4	1.3	3.5	0.9	2.2	37.7	30.5	38.6	23.8	9.7	16.0	5.1	5.6	6.2
Realised (%)																			
1-month:	10.1	14.3	29.8	11.2	19.6	12.0	6.1	6.1	3.4	4.3	25.6	25.1	33.2	39.7	18.7	17.5	5.3	5.9	5.6
Percentile:	***31%***	***52%***	***90%***	***53%***	***82%***	***58%***	***73%***	***75%***	***65%***	***72%***	***23%***	***41%***	***46%***	***69%***	***83%***	***37%***	***22%***	***30%***	***11%***
Average:	15.3	15.9	19.5	13.1	15.3	13.0	4.7	5.0	2.7	3.7	38.6	32.7	38.9	39.5	14.9	20.2	7.1	8.5	8.3

Source: Goldman Sachs FICC and Equities, Goldman Sachs Global Investment Research

Exhibit 52: 10y percentile for cross-asset average volatility

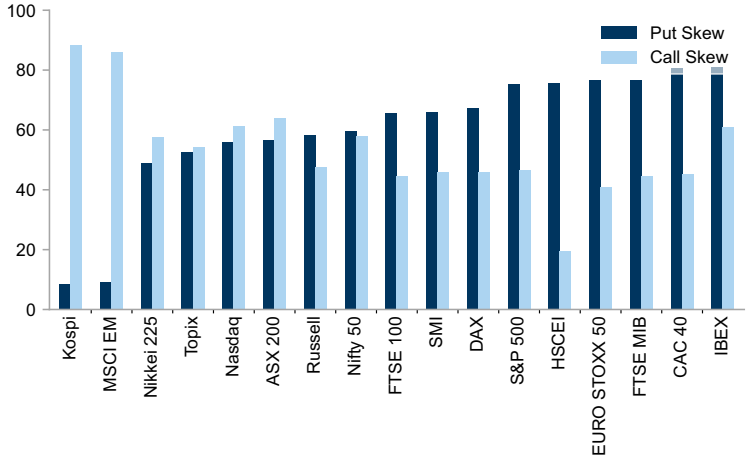
Using 16 assets across equity, government bonds, credit, commodities and FX



Source: Goldman Sachs FICC and Equities, Goldman Sachs Global Investment Research

Exhibit 53: Putwing and Callwing normalised skew 5y percentile

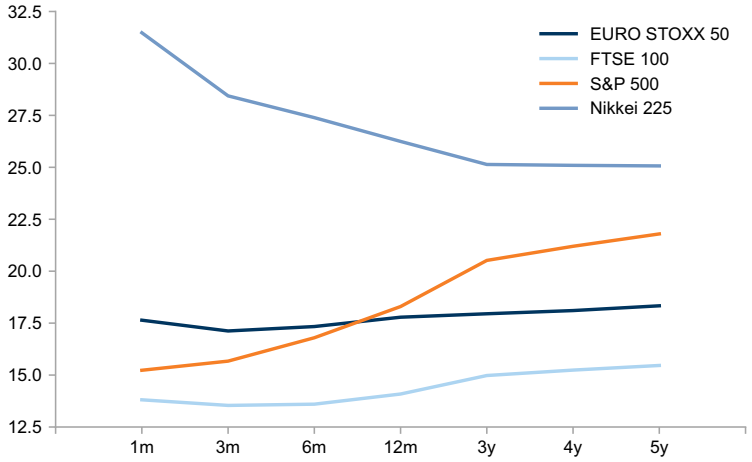
Normalised skew = (impl. vol 25 delta put/call minus implied vol 50 delta call)/50 delta call



Source: Goldman Sachs FICC and Equities, Goldman Sachs Global Investment Research

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

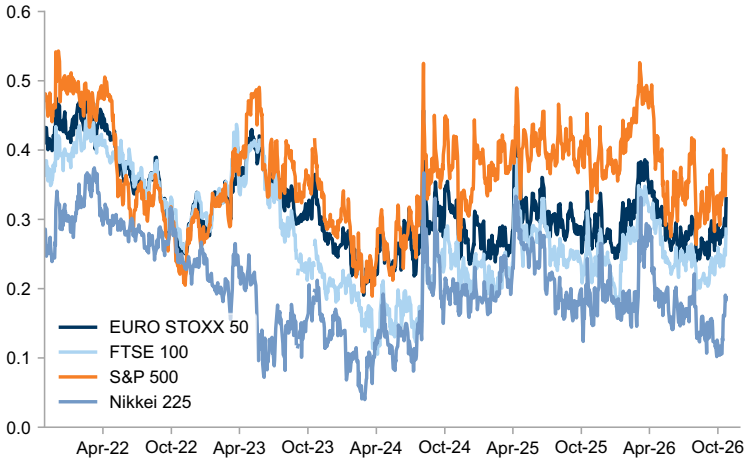
Exhibit 54: ATM implied volatility term structure for equity indices



Source: Goldman Sachs FICC and Equities, Goldman Sachs Global Investment Research

Exhibit 55: Normalised implied volatility skew across regions

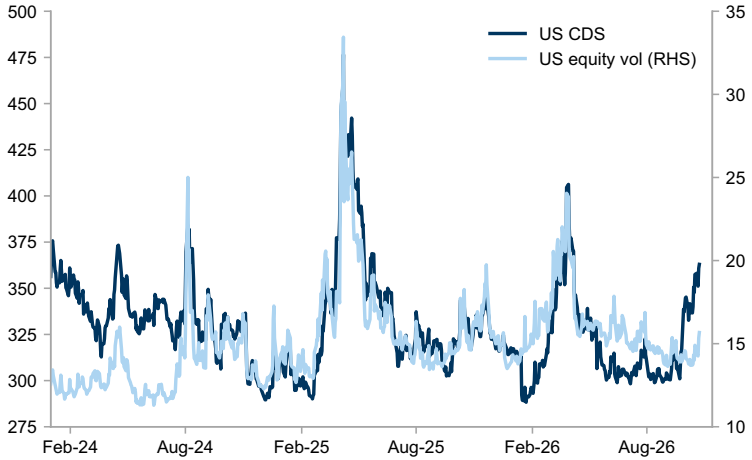
3m 25 delta put vol minus 25 delta call vol scaled by ATM implied vol



Source: Goldman Sachs FICC and Equities, Goldman Sachs Global Investment Research

Exhibit 56: CDS and equity vol levels in the US

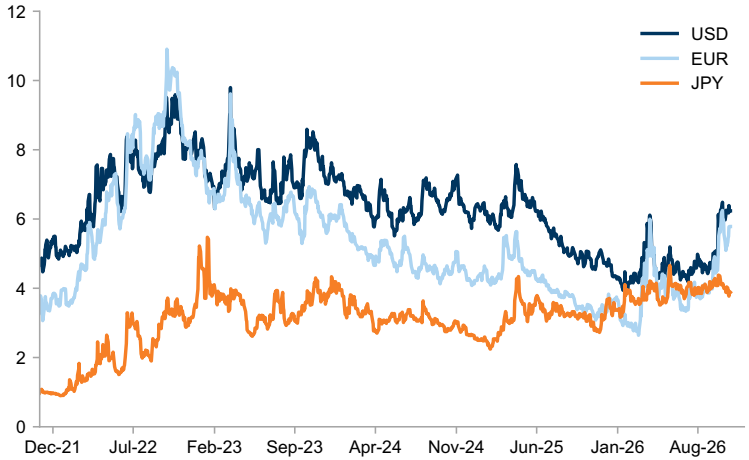
CDX HY, 3m ATM S&P 500 implied vol



Source: Goldman Sachs FICC and Equities, Goldman Sachs Global Investment Research

Exhibit 57: 3m ATM implied rate volatility across regions

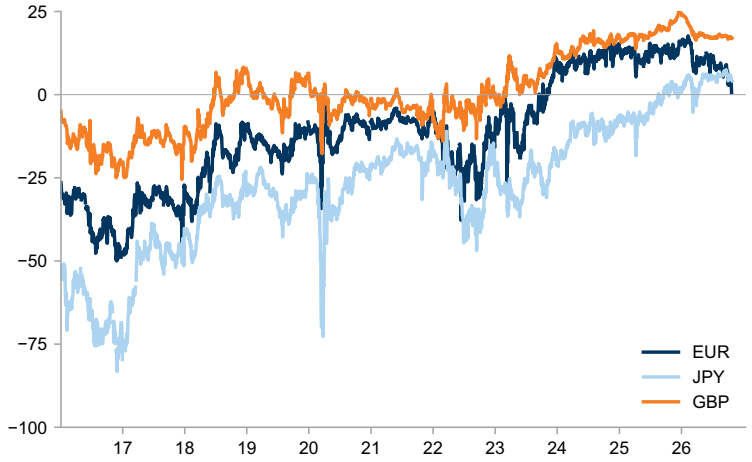
3-month implied volatility of 10-year rates (bp/day)



Source: Goldman Sachs FICC and Equities, Goldman Sachs Global Investment Research

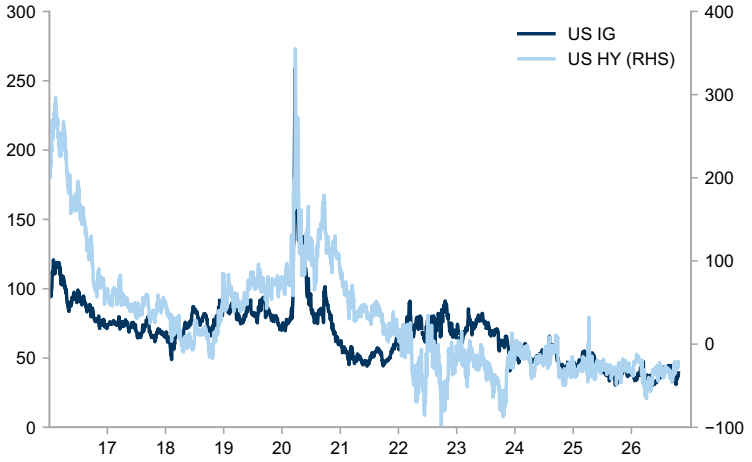
Cross-asset: Liquidity indicators

Exhibit 58: 1-year cross-currency basis
Basis points



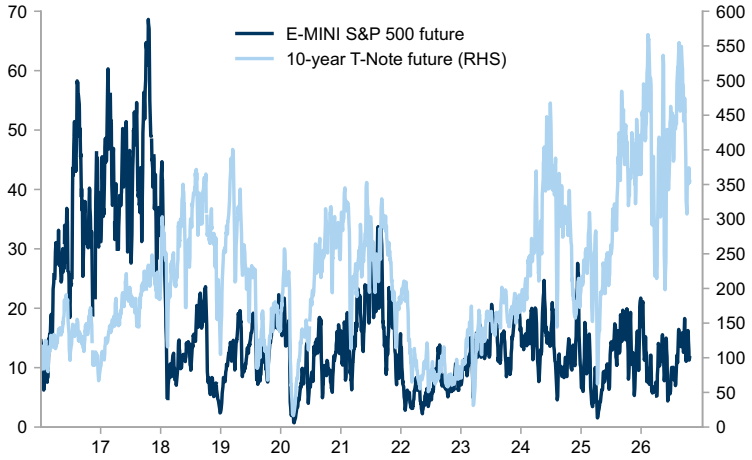
Source: Goldman Sachs FICC and Equities, Goldman Sachs Global Investment Research

Exhibit 59: Cash credit versus CDS spread
Basis points



Source: Goldman Sachs FICC and Equities, Haver Analytics, Goldman Sachs Global Investment Research

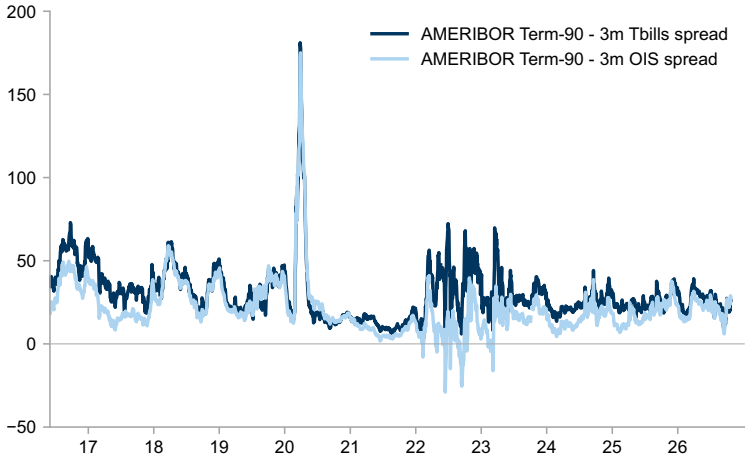
Exhibit 60: Top-of-book depth
5-day average, $ mln



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: Bloomberg, Goldman Sachs FICC and Equities, Goldman Sachs Global Investment Research

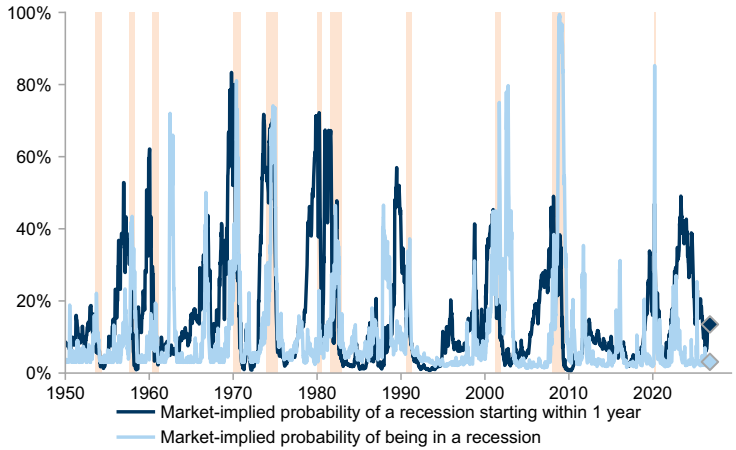
Exhibit 61: US financial institutions wholesale funding cost
Basis points



Source: Bloomberg, Goldman Sachs Global Investment Research

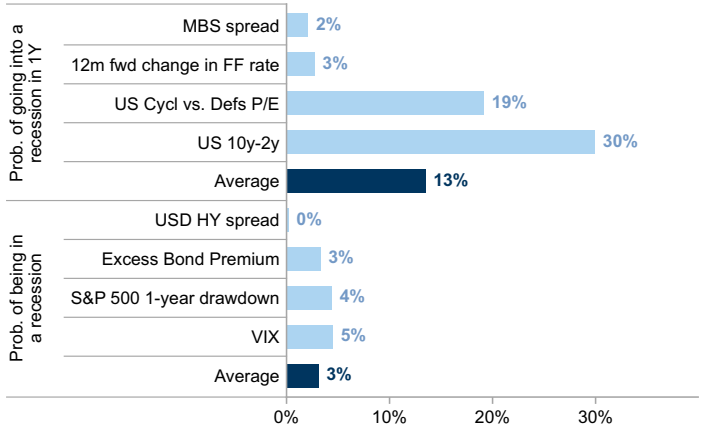
Cross-asset: Market pricing of US recession risk

Exhibit 62: Market-implied US recession probability
Average of univariate logit models on the right. Orange shade: NBER recession



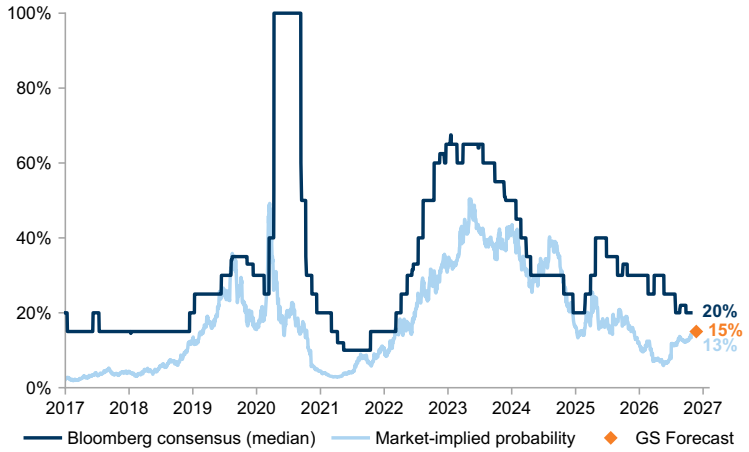
Source: Haver Analytics, Datastream, Worldscope, Goldman Sachs Global Investment Research

Exhibit 63: Market-implied US recession probability by indicator
Univariate logit models. Maximum history since 1950



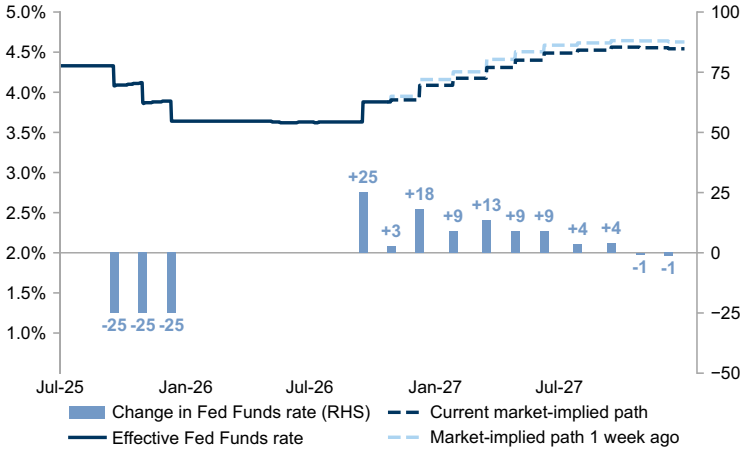
Source: Haver Analytics, Datastream, Worldscope, Goldman Sachs Global Investment Research

Exhibit 64: Probability of a US recession in the next 1 year



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

Exhibit 65: Market-implied path of the Fed Funds rate
Based on 30-day Fed Funds futures

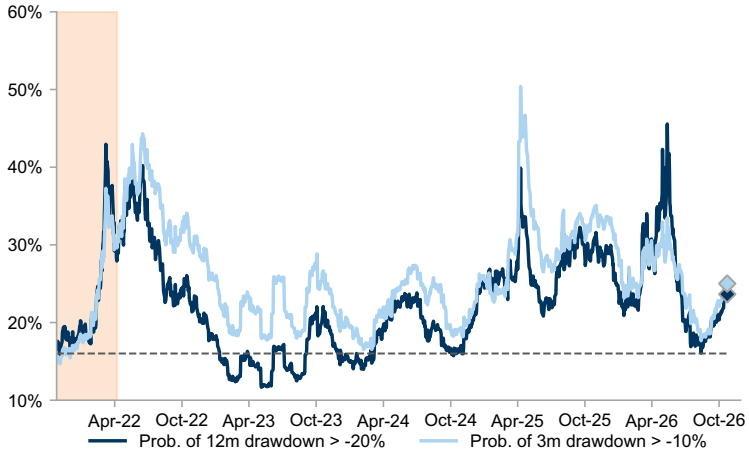


Source: Haver Analytics, Goldman Sachs Global Investment Research

Equity: Drawdown probability

Exhibit 66: Implied probability of S&P 500 drawdown based on multi-variate logit model

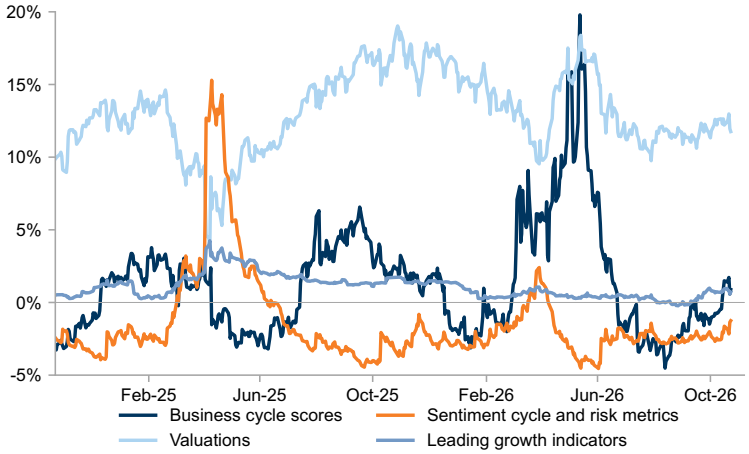
Orange shading = S&P 500 subsequent drawdown >20%. Dashed line = unconditional probability



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

Exhibit 67: Contribution to the probability of a drawdown >20% in 12m

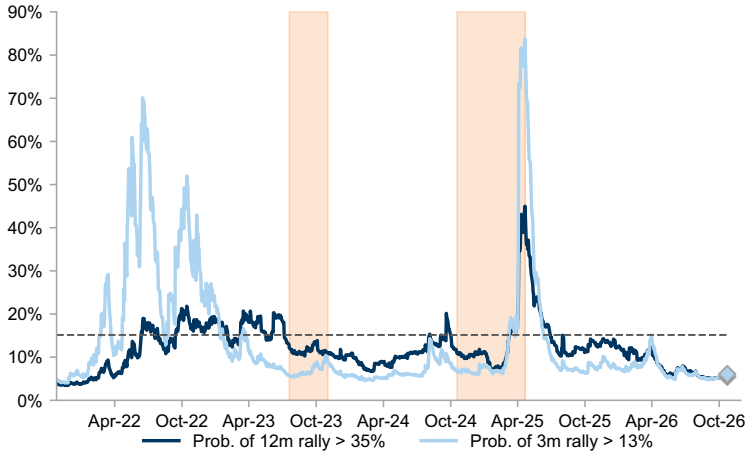
Based on Shapley values. Inputs aggregated by type



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

Exhibit 68: Implied probability of S&P 500 rally based on multi-variate logit model

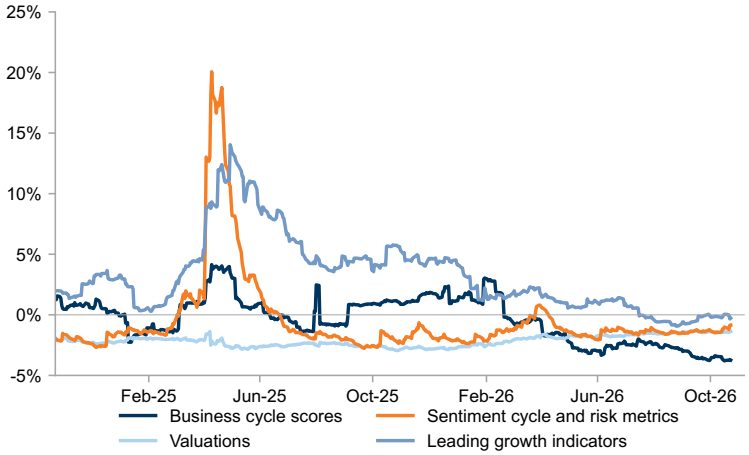
Orange shading = S&P 500 subsequent rally >35%. Dashed line = unconditional probability



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

Exhibit 69: Contribution to the probability of a rally >35% in 12m

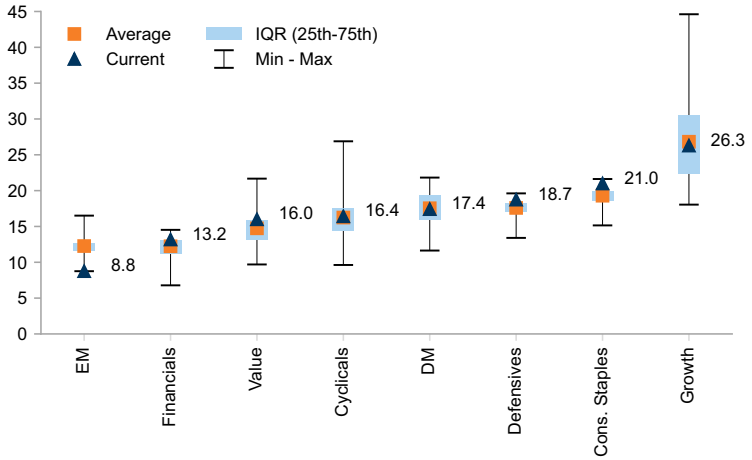
Based on Shapley values. Inputs aggregated by type



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

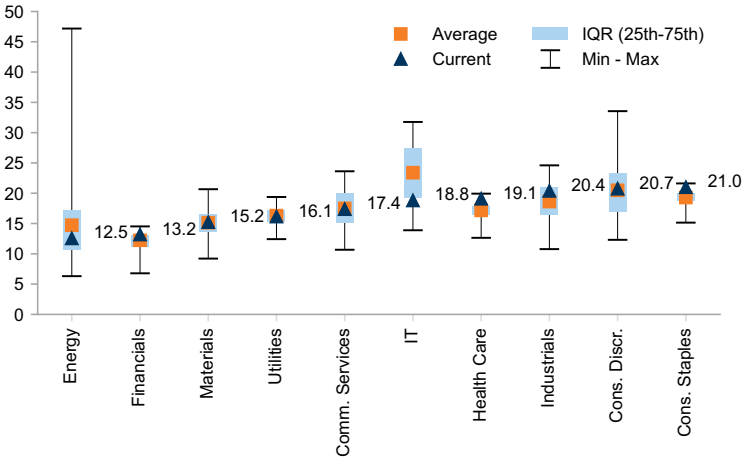
Equity: Valuation and styles

Exhibit 70: Valuation ranges of MSCI World styles indices
12-month forward P/Es relative to the last 10 years



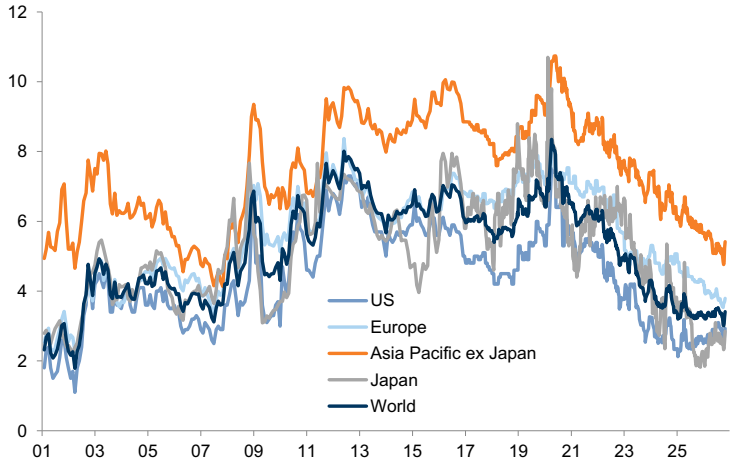
Source: Datastream, I/B/E/S, Goldman Sachs Global Investment Research

Exhibit 71: MSCI World sector valuations
12-month forward P/Es relative to the last 10 years



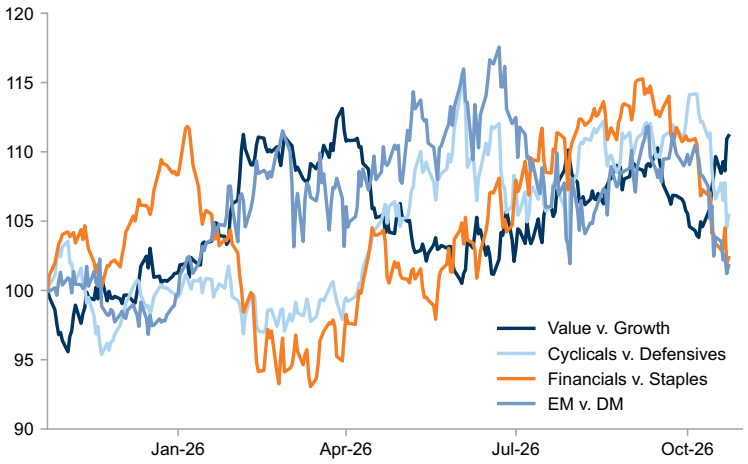
Source: Datastream, I/B/E/S, Goldman Sachs Global Investment Research

Exhibit 72: 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

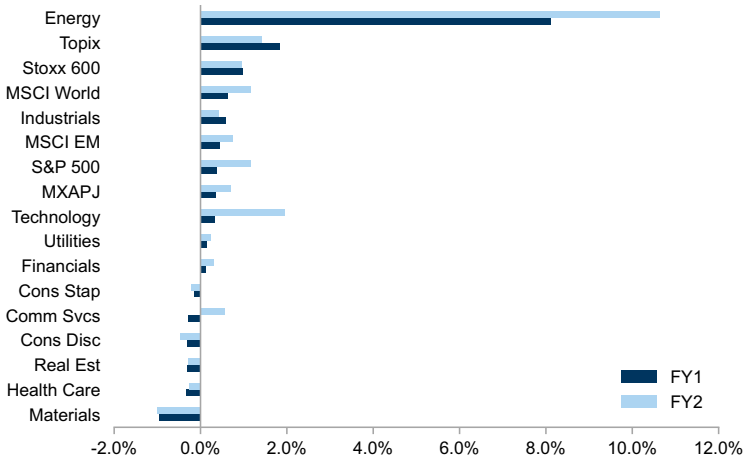
Exhibit 73: MSCI World style index performance
Performance indexed to 100 12m ago



Source: Datastream, Goldman Sachs Global Investment Research

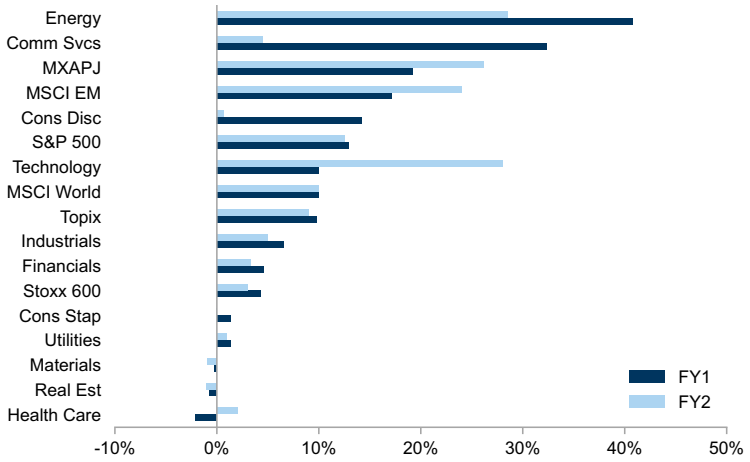
Equity: Earnings

Exhibit 74: 1-month revision to I/B/E/S consensus earnings
MSCI World sectors, other global equity index aggregates



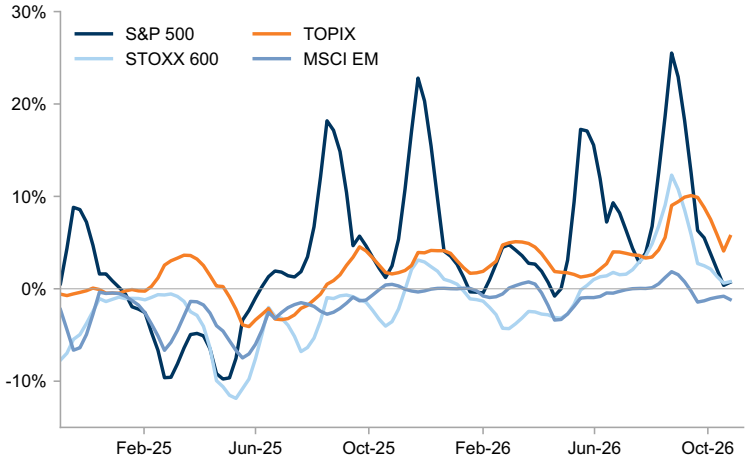
Source: Datastream, I/B/E/S, Goldman Sachs Global Investment Research

Exhibit 75: 6-month revision to I/B/E/S consensus earnings
MSCI World sectors, other global equity index aggregates



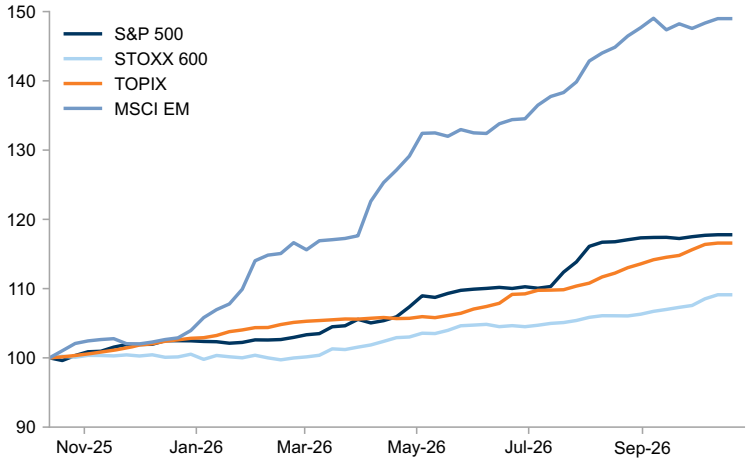
Source: Datastream, I/B/E/S, Goldman Sachs Global Investment Research

Exhibit 76: 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

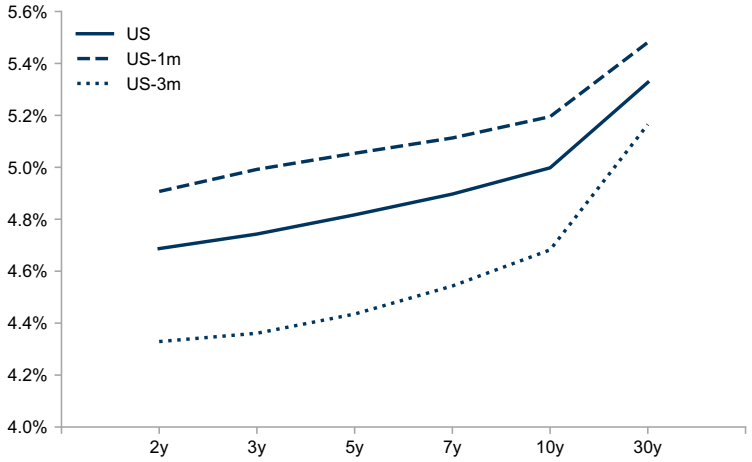
Exhibit 77: FY1 consensus earnings expectations over the past 12 months
Earnings indexed to 100 12 months ago



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

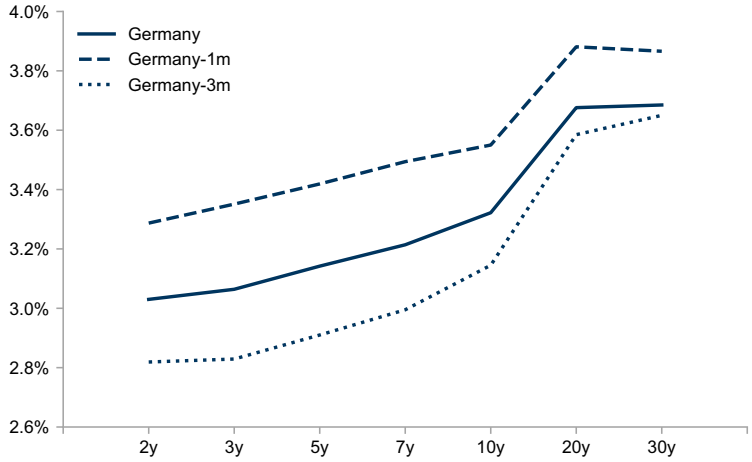
Government bonds: Yield curves

Exhibit 78: US yield curve dynamics
Current relative to 1 month and 3 months ago



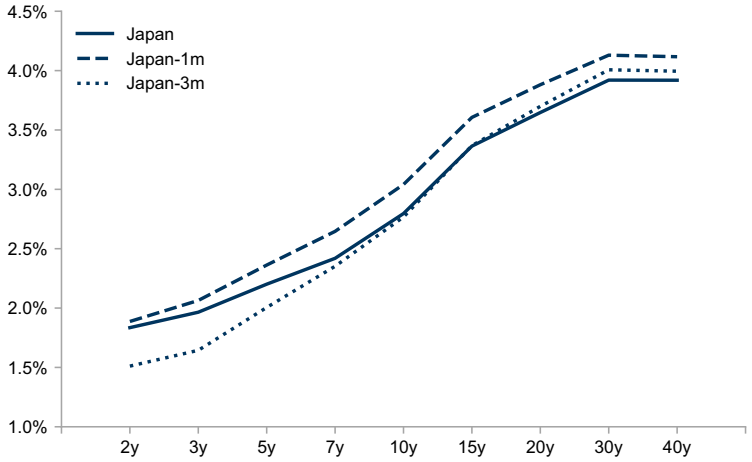
Source: Datastream, Goldman Sachs Global Investment Research

Exhibit 79: German yield curve dynamics
Current relative to 1 month and 3 months ago



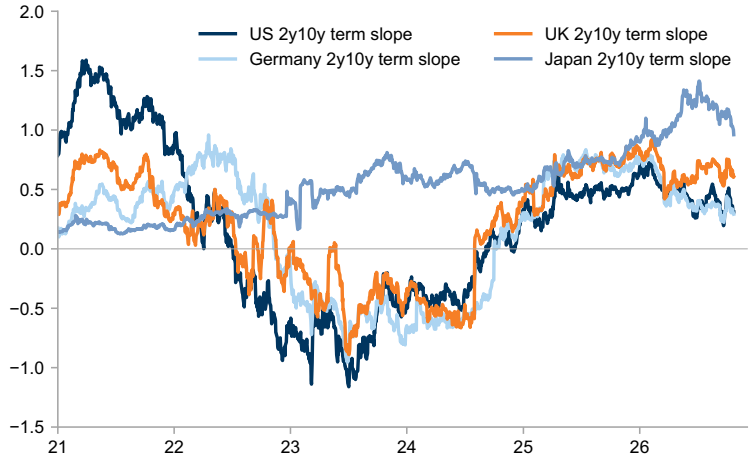
Source: Datastream, Goldman Sachs Global Investment Research

Exhibit 80: Japan yield curve dynamics
Current relative to 1 month and 3 months ago



Source: Datastream, Goldman Sachs Global Investment Research

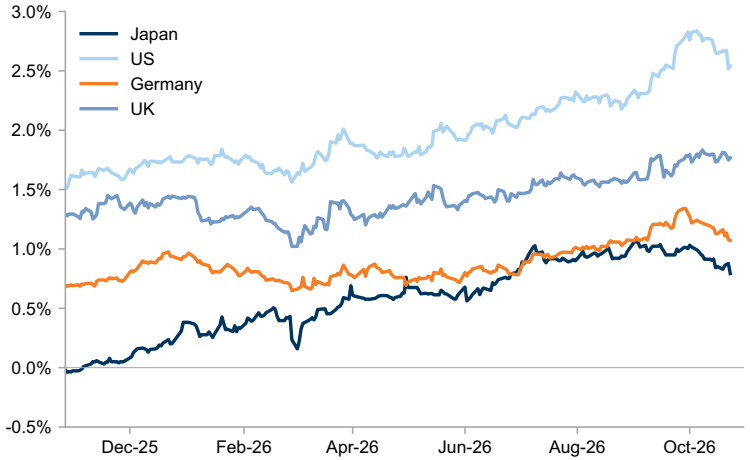
Exhibit 81: Yield curve term slope across regions



Source: Datastream, Goldman Sachs Global Investment Research

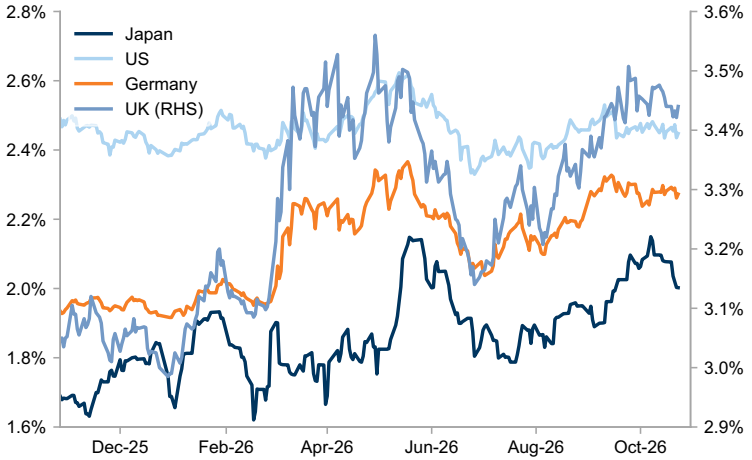
Government bonds: Real yields, inflation, breakevens, 10y IR differentials

Exhibit 82: 10y real yields across regions
Nominal bond yield minus CPI inflation swap (RPI for the UK)



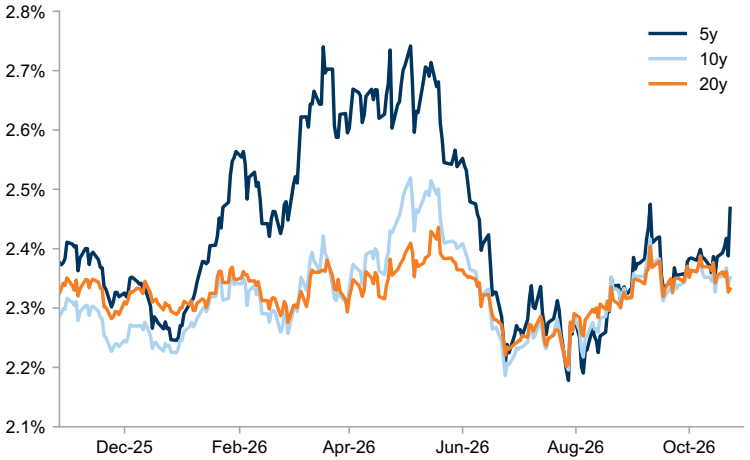
Source: Goldman Sachs, Goldman Sachs Global Investment Research

Exhibit 83: 10y inflation swaps across regions
CPI inflation swap (RPI for the UK)



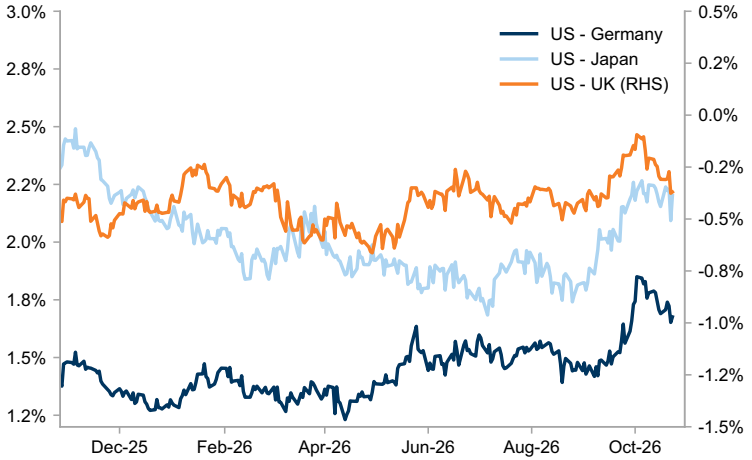
Source: Goldman Sachs, Goldman Sachs Global Investment Research

Exhibit 84: US breakeven inflation
Nominal yield minus TIPS yield



Source: Bloomberg, Goldman Sachs Global Investment Research

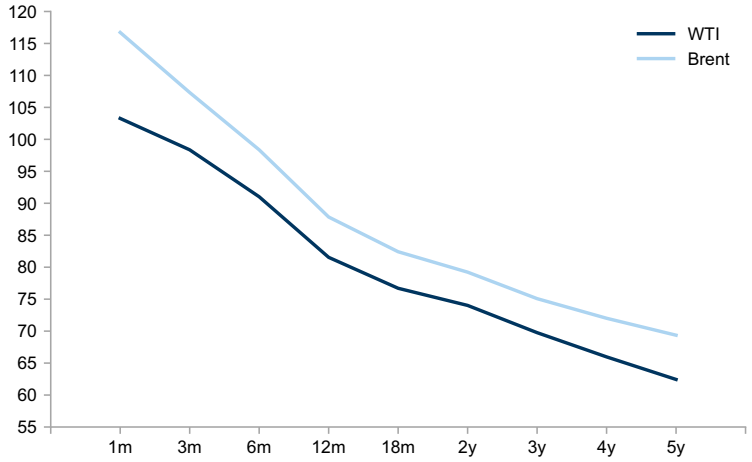
Exhibit 85: 10y nominal bond yield differentials



Source: Datastream, Goldman Sachs Global Investment Research

Commodities: Curve shapes and roll yields

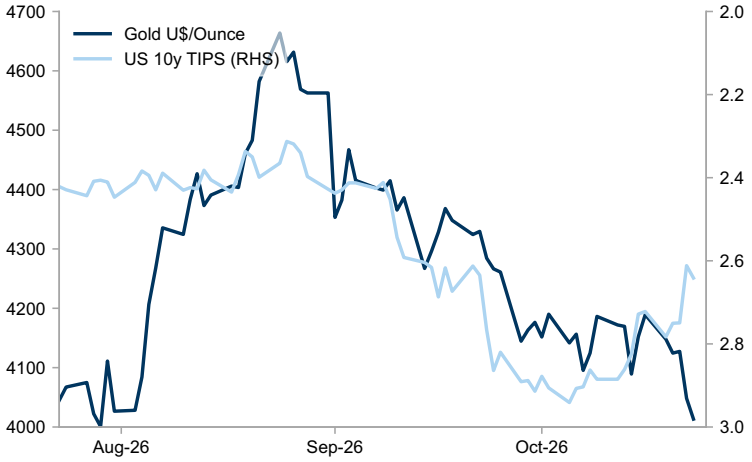
Exhibit 86: WTI and Brent oil forward curves



Source: Goldman Sachs, Goldman Sachs Global Investment Research

Exhibit 87: Gold price and US real yields

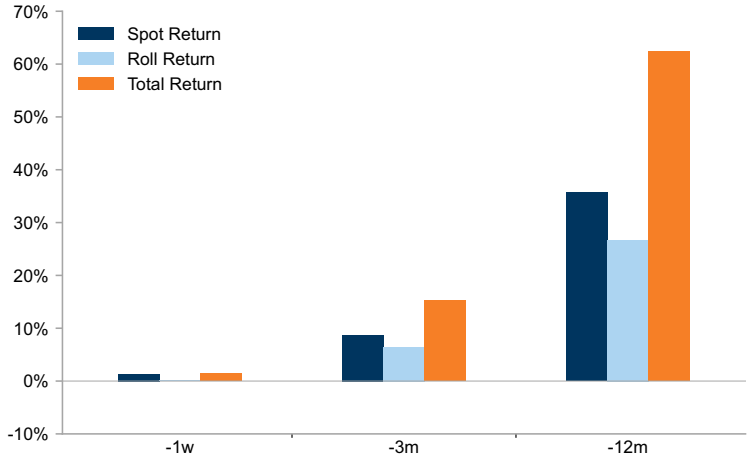
US 10-year TIPs yield, Gold U$/ounce



Source: Datastream, Goldman Sachs Global Investment Research

Exhibit 88: S&P GSCI spot, roll and total returns

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



Source: Datastream, Goldman Sachs Global Investment Research

Exhibit 89: Recent performance of S&P GSCI sectors

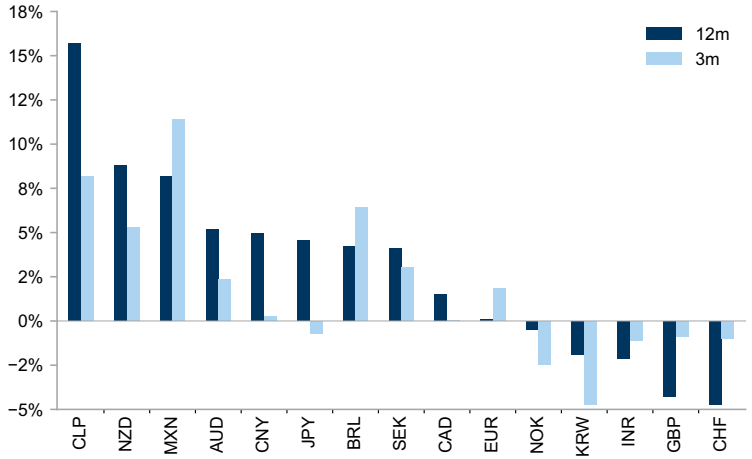
Weight signifies contribution to the S&P GSCI index

	Current Weight	Returns (%)		
	(%)	-1w	-1m	-1y
S&P GSCI	**100**	**1.4**	**4.3**	**62.4**
Energy	59.7	3.3	10.8	131.8
Industrial Metals	11.5	0.8	-3.1	23.4
Precious Metals	7.6	-4.2	-7.9	-2.9
Agriculture	13.0	-2.6	-6.4	6.2
Livestock	8.2	0.8	2.6	-0.3

Source: Goldman Sachs, Goldman Sachs Global Investment Research

FX: Forecasts and forwards, recent performance and positioning

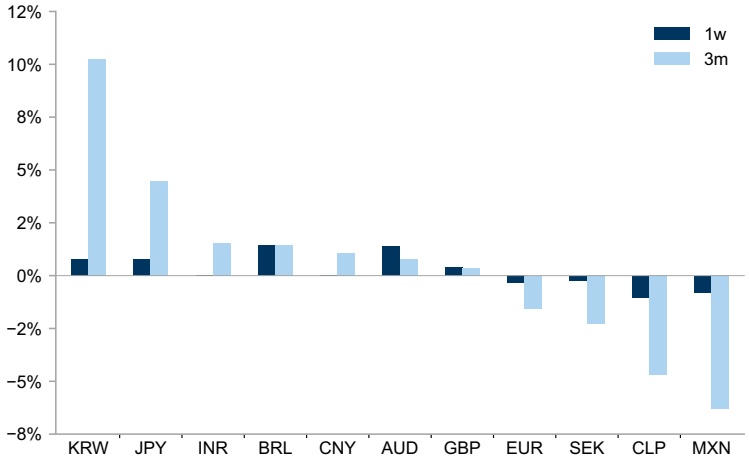
Exhibit 90: Our 3- and 12-month forecasts for dollar crosses



Source: Datastream, Goldman Sachs Global Investment Research

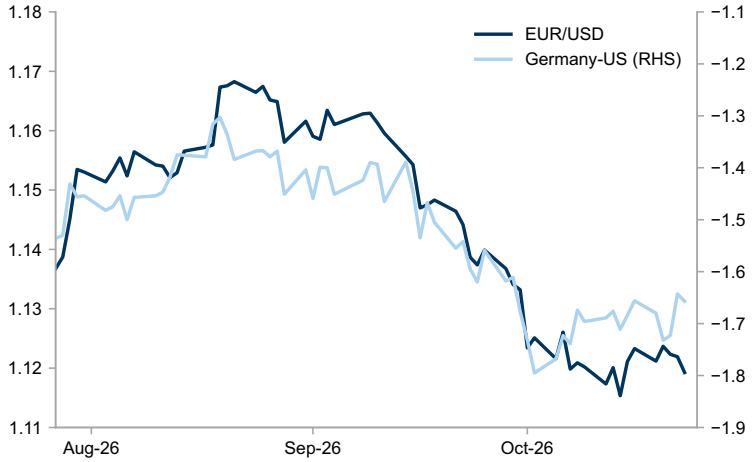
Exhibit 91: Recent performance of dollar crosses

Percentage change over past 1 week, 3 months



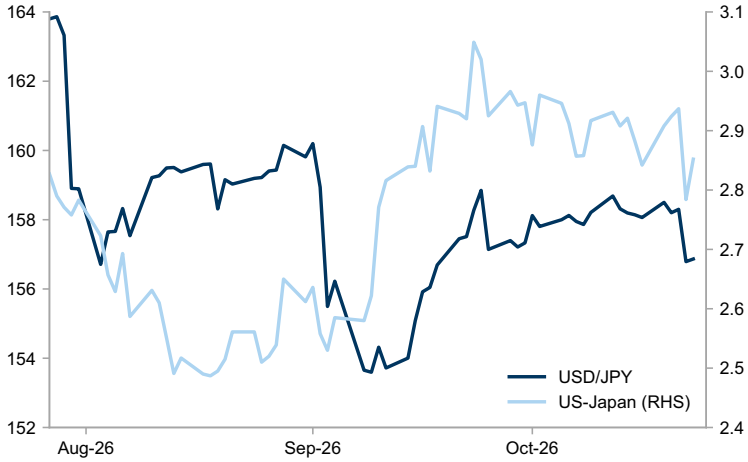
Source: Datastream, Goldman Sachs Global Investment Research

Exhibit 92: EUR/USD against German - US 2y interest rate differentials past 3m



Source: Datastream, Goldman Sachs Global Investment Research

Exhibit 93: USD/JPY against US - Japan 2y interest rate differentials past 3m



Source: Datastream, Goldman Sachs Global Investment Research

Disclosure Appendix

Reg AC

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

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