Flows & Liquidity

Will credit markets be proven right again?

- **Echoing the recession scares of the previous two years, credit markets are once again more dismissive of US recession risks than equity or rate markets.**
- **The recent US equity market correction appears to be more driven by equity quant fund position adjustments and less driven by fundamental or discretionary managers reassessing US recession risks.**
- **We estimate the potential equity buying from month-end rebalancing by balanced mutual funds as well as quarter-end rebalancing by US defined benefit pension funds and Norges Bank/GPIF/SNB at around $135bn.**
- **On our momentum traders/CTA framework, the short momentum on 10y Bunds is in extreme territory both on an outright basis and in particular relative to 10y USTs, suggesting some risk of mean reversion signals being triggered.**
- **Publicly listed bitcoin miners to continue to gain share in the overall bitcoin network hashrate during 2025.**

Global Markets Strategy

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Cross Asset Fund Flow Monitor

Current level shows the latest percentile of weekly flows; Min is denoted by 0 and Max by 1. As of 5th Mar 25.

MF & ETF Flows	Min	Max	4 wk avg ($bn)	2024 avg ($bn)
All Equities			14.8	7.6
All Bonds			16.2	10.6
US Equities			8.0	5.7
US Bonds			7.8	4.3
Non-US Equities			6.8	1.9
Non-US Bonds			8.4	6.3
US HG Bonds			4.8	3.8
US HY Bonds			0.6	0.4
US Lev. Loans *			0.9	0.4
US MMFs			-0.1	16.7
EM Equities			0.7	-0.2
EM Bonds			0.39	-0.37
Japan Equities			0.7	0.2
China Equities			0.38	-0.18
Europe				
Europe Equities			2.3	-0.9
Europe Bonds			5.7	4.7
Europe HG Bonds			1.2	0.9
Europe HY Bonds			0.23	0.23
Europe MMFs			2.9	5.5
Other Equities			2.73	3.04

* US LL historical flows are monthly averages converted to weekly for comparison.
Source: Lipper, ICI, Bloomberg Finance L.P. and J.P. Morgan Flows & Liquidity.

Cross Asset Positioning Monitor

Current level shows the latest percentile, Min is denoted by 0 and Max by 1.

As of 04-Mar-25	MIN	MAX	Current percentile
Equities			0.73
Govt Bonds			0.75
Credit			0.21
Dollar			0.47
Commodities ex Gold			0.37
Gold			0.82
Bitcoin			0.68
EM Equities			0.40
EM Bonds/FX			0.09
Japan Equities			0.36
Europe Equities			0.53
US Equity Sectors:			
Energy			0.34
Materials			0.15
Industrials			0.48
Discretionary			0.88
Staples			0.30
Health Care			0.51
Financials			0.66
Technology			0.52
Communication Services			0.56
Utilities			0.65

Source: J.P. Morgan Flows & Liquidity.
Cross Asset Positioning Monitor aggregates across the various position indicators of Appendix ranging from positioning proxies across various futures contracts, momentum signals as proxies of how trend following funds/ CTAs are positioned, mutual fund betas as proxies of how mutual fund managers are positioned, risk parity fund positioning and leverage proxies, hedge fund betas as proxies of how hedge fund managers are positioned, client surveys, asset allocation estimates of private non-bank investors at global level, short interest indicators, etc.

See page 28 for analyst certification and important disclosures.

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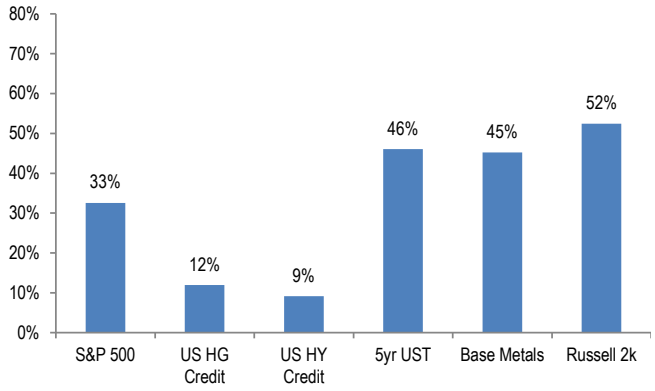
- US growth concerns due to tariff uncertainty is often mentioned in our client conversations as a major reason for the recent US equity market correction. Indeed on our estimates, the implied probability of US recession embedded across asset classes continued to creep up over the past week as risk markets suffered losses and as US Treasury yields decline . These implied recession probabilities are depicted in Figure 1 for major asset classes. Our approach has been to compare the current cycle peak to trough moves in asset prices to those seen during previous recessions.

Figure 1: Implied probability of US recession across asset classes as of March 11th

See text for details.



Source: Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

- The peak to trough declines in US equity indices across previous 12 US recessions are shown in Figure 2. The average peak to trough decline for US small caps has been around 33%, only modestly worse than the 29% seen for the S&P500. Since its November 2024 peak, the Russell 2000 small cap index has declined by 17% to March 11th , mechanically implying 17%/33%=52% probability of a US recession. The S&P500 index has declined by 9.5% from its recent peak, mechanically implying 9.5%/29%=33% probability of a US recession. In other words, our simple framework implies that small caps price in a rather high probability of US recession currently. Given the higher cyclicality and interest rate sensitivity of small caps (due to their greater sensitivity to domestic US economic growth and greater reliance on floating rate debt), that makes them a more suitable place to gauge US cyclical risks. And Figure 1 suggests that the current pricing of US small caps embeds around 50% probability of US recession, in line with rate and commodity markets.
- At the same time, what is striking in Figure 1 is how low is the probability of US recession implied by credit markets compared to the 50% implied by either rate or equity markets. In fact, this divergence has been a phenomenon for most of the previous two years with multiple occasions when rate markets or equity markets priced in a high probability of US recession, while credit markets were much less concerned. At the end it was credit markets that were proven right as no recession took place. And in the current juncture, while there is clearly elevated uncertainty in the near term as the Trump Administration has at least initially prioritized more disruptive polices, the risk is that credit markets are proven right once again.

Figure 2: US small and large cap peak to trough declines during previous US recessions

S&P500 peak	S&P500 trough	S&P500 price decline peak-to-trough	S&P500 EPS decline peak-to-trough	US small-cap decline peak -to-trough	Relative performance of small-cap vs large-cap	Earnings decline
Jun-48	Jun-49	-21%	-3%	-25%	-4%	Mild
Jan-53	Sep-53	-15%	-12%	-16%	-1%	Mild
Jul-56	Dec-57	-22%	-22%	-21%	1%	Deep
Jan-60	Oct-60	-13%	-12%	-12%	2%	Mild
Dec-68	Jul-70	-36%	-13%	-53%	-17%	Mild
Jan-73	Dec-74	-48%	-15%	-55%	-7%	Deep
Feb-80	Apr-80	-17%	-5%	-25%	-8%	Mild
Nov-80	Aug-82	-27%	-19%	-23%	4%	Deep
Dec-89	Oct-90	-20%	-26%	-29%	-9%	Deep
Mar-00	Sep-01	-37%	-23%	-35%	2%	Deep
Oct-07	Mar-09	-57%	-45%	-58%	-2%	Deep
Feb-20	Mar-20	-34%	-21%	-42%	-8%	Deep
Average		-29%	-18%	-33%	-4%	
Median		-24%	-17%	-27%	-3%	
Average in Deep		-35%	-24%	-38%	-3%	
Average in Mild		-20%	-9%	-26%	-6%	

Source: Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

- If one puts more weight on credit markets and dismisses US recession risk, what then explains the correction in US equities and in particular Nasdaq? Looking across investor types, retail investors are unlikely to be the culprits. As we highlighted in our recent publications, retail investors continued their “buying the dip behavior” over the past three weeks. Since the peak in US equities on February 19th, there has been only one day of outflows from US equity ETFs on February 28th. In all the other days there were inflows with even stronger inflows on days when Nasdaq was down a lot, like last Monday March 10th when $10bn entered US equity ETFs on that day. US domiciled investors have been the dip in important ETFs such as NVDL, the biggest Nvidia ETF (Figure 3), and MTUM, the biggest equity momentum factor ETF (Figure 4). Admittedly, the latter saw a big outflow on March 11th, but until March 10th there was buying. It remains to be seen whether the outflow from MTUM on March 11th propagates over the coming days. We doubt the outflows from MTUM propagate from here given the already large 15% drawdown in MTUM.

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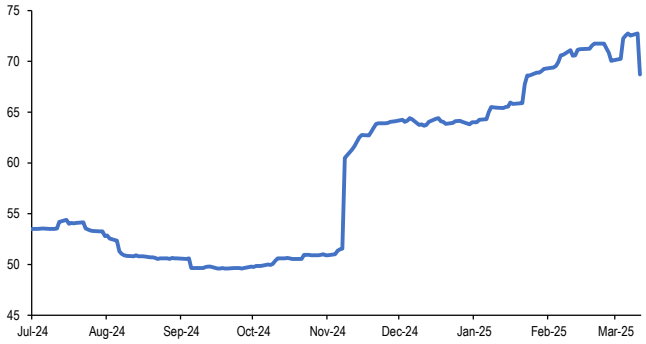
Figure 3: Outstanding shares of the NVDL ETF (the biggest Nvidia ETF)

In mn shares.

Source: Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

Figure 4: Outstanding shares of the MTUM ETF (the biggest Equity Momentum Factor ETF)

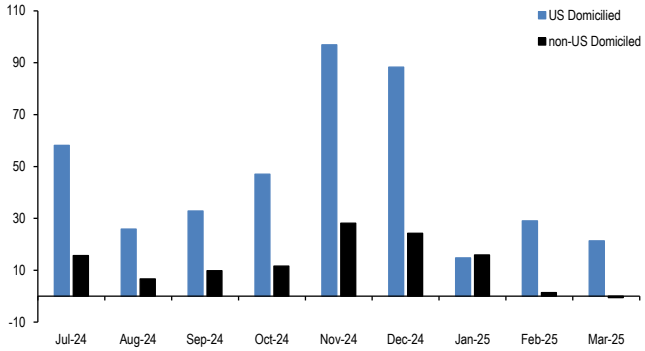
In mn shares.



Source: Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

- What about non-US domiciled retail investors? Non-US domiciled retail investors have refrained from buying US equity ETFs in both February and March (MTD), perhaps because they saw more opportunities in Europe or China tech, but they have not sold either (Figure 5). This lack of selling has been positive thus far, but at the same time one could argue that this is the risk for US equities going forward, that retail investors and non-US domiciled investors in particular start selling US equity ETFs propagating the correction in US equities further. Again, we doubt that retail investors will change their behavior turning the flows of Figure 5 materially negative in the near term, given the already large drawdowns of 13% in Nasdaq, 9.5% in S&P500 and 17% in Russell 2000 up to March 11th. Of course that does not mean that this risk is insignificant and it is important in our mind to monitor the US Equity ETF impulse on a daily basis to detect potential shifts in behavior.

Figure 5: Monthly flows into equity ETFs that invest into US equities



Source: Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

- If retail investors are not culprits, who are the culprits then? In our mind the most likely culprits are equity hedge funds and in particular two categories: Equity Quant hedge funds and Equity TMT Sector hedge funds. Provisional data of monthly reporting hedge funds from Pivotal Path shown in Figure 6 and Figure 7 imply a big drop in the equity beta of these two types of hedge funds in February vs January pointing to position reduction. In contrast, more traditional discretionary Equity Diversified Long/Short hedge funds saw an increase in their equity beta in February, making them less likely culprits (Figure 8). In addition, more traditional discretionary Equity Diversified Long/Short hedge funds tend to be heavier users of either futures or major ETFs such as SPY/QQQ ETFs in order to regulate their equity beta, and the fact neither futures (Figure 9) nor SPY/QQQ ETFs (Figure 10) saw a meaningful increase in short interest in recent weeks, reinforces the thesis that more traditional discretionary Equity Diversified Long/Short hedge funds played less of the role in the recent US equity market correction than Equity Quant hedge funds and Equity TMT Sector hedge funds. Admittedly, the abrupt decline in our futures position proxy on March 10th might be indicative of more significant de-risking by Equity Diversified Long/Short hedge funds, so it is important in our mind to monitor these futures position proxies on a daily basis also to detect potentially more significant shifts going forward.

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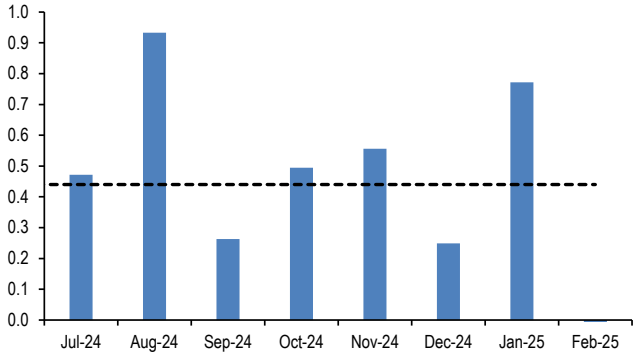
Figure 6: Equity beta of monthly reporting Equity Quant hedge funds

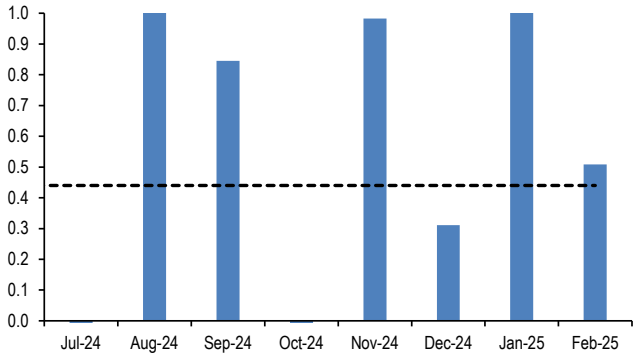
Proxied by the ratio of the monthly performance of Pivotal Equity Quant hedge fund index divided by the monthly performance of MSCI AC World Index. Feb 25 obs. is based on provisional data from Pivotal Path.



Source: Bloomberg Finance L.P., Pivotal Path, J.P. Morgan Flows & Liquidity.

Figure 7: Equity beta of monthly reporting Equity TMT Sector hedge funds

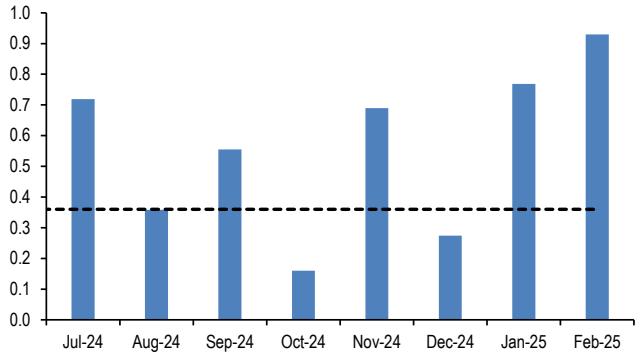
Proxied by the ratio of the monthly performance of Pivotal Path equally-weighted Equity Sector Technology/Media/Telecomm hedge fund index divided by the monthly performance of Nasdaq Composite Index. Feb 25 obs. is based on provisional data from Pivotal Path.



Source: Bloomberg Finance L.P., Pivotal Path, J.P. Morgan Flows & Liquidity.

Figure 8: Equity beta of monthly reporting Equity Diversified Long/ Short hedge funds

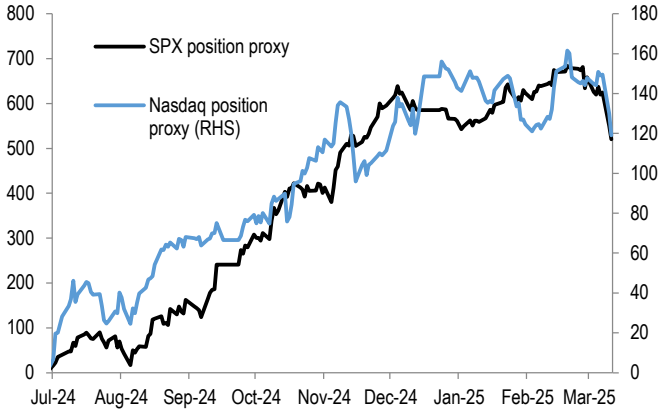
Proxied by the ratio of the monthly performance of Pivotal Path Asset-Weighted Equity Diversified hedge fund index divided by the monthly performance of MSCI AC World Index. Feb 25 obs. is based on provisional data from Pivotal Path.



Source: Bloomberg Finance L.P., Pivotal Path, J.P. Morgan Flows & Liquidity.

Figure 9: Our futures position proxies on S&P 500 and Nasdaq equity futures

'000 contracts.



Source: Bloomberg Finance L.P. , J.P. Morgan Flows & Liquidity.

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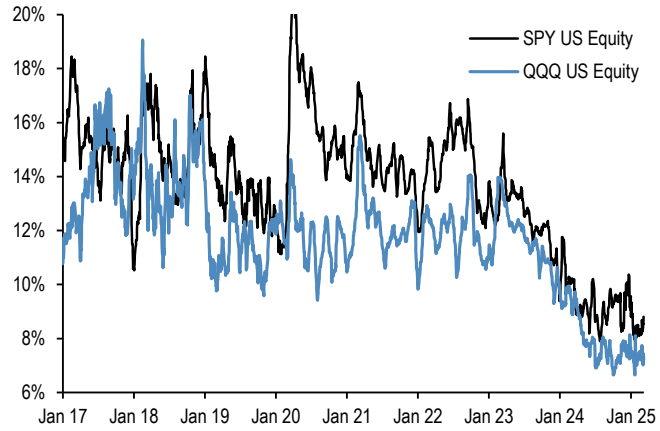
Figure 10: Short interest on the SPY and QQQ US ETFs

Short Interest as a % share of share outstanding. Last obs. is for 7th Mar 2025.



Source: S3, J.P. Morgan Flows & Liquidity.

- If the above assessment is correct and equity quant hedge funds played more of a role than their discretionary counterparts, then the recent US equity market correction would appear to be more driven by equity quant fund position adjustments and less driven by fundamental or discretionary managers reassessing US recession risks. And if US equity ETFs continue to see mostly inflows as they have thus far, there is a good chance that most of the current US equity market correction is behind us.

How much rebalancing into quarter-end?

- Given the sell-off in equities and positive bond returns thus far in 1Q25, the question of rebalancing from multi-asset investors has again resurfaced in our conversations. We update below our analysis of rebalancing flow from multi-asset investors such as balanced mutual funds, US defined benefit pension funds, the Norwegian oil fund, the SNB and the Japanese GPIF.
- Starting with mutual funds with strict rebalancing such as 60:40 funds, we estimate the size of this universe at around $3.8tr. This is much narrower than the AUM of the broader hybrid fund category, which at the global level stood at $7.7tr in 3Q24 according to ICI. However, the total universe is larger than this estimate and perhaps closer to $11.5tr if one includes target date and lifestyle funds. Because target date and lifestyle funds are fund of funds, their flows or AUM are excluded from ICI to avoid double counting. But they do matter for rebalancing. Lifestyle funds offer a mix of asset classes with the mix determined by their level of risk. Some of them have fixed weights and are thus stricter in terms of rebalancing, while others use descriptions like "conservative," "moderate," or "aggressive" and have more flexibility. Target date funds have instead a glide path in terms of asset mix and are identified by their specified target date ("2030 fund," "2035 fund," etc.) as they adjust their asset allocation over time to become more conservative. We reckon that target date and lifestyle funds together have an AUM of close to $3.8tr in mid-2024, but not all of them apply strict monthly rebalancing, the same way not all of the $7.7tr of hybrid funds apply strict rebalancing. The majority of target date, lifestyle funds and hybrid funds are likely flexible and our guess is that only a third or $3.8tr of the total $11tr universe applies strict rebalancing. Assuming around $3.8tr of mutual funds with strict rebalancing, based month-to-date equity and bond returns, we estimate around $50bn of equity buying globally (and equal amount of bond selling).
- Turning to quarter-end rebalancing by pension funds and sovereign wealth funds, US defined benefit pension plans are a large universe with AUM of around $9.4tr. They tend to rebalance more slowly over a few quarters. If we assume for simplicity that they were fully rebalanced at the end of December and taking into account the QTD performance of US equities and bonds, we estimate that the pending equity rebalancing flow by US defined benefit pension fund plans into year-end could see net buying of around $150bn of equities and a similar net selling of bonds. The caveat with this calculation is that pension funds overall are less strict in rebalancing than either balanced mutual funds or other pension fund related entities such as the Norges Bank or GPIF. Therefore, the above $150bn of estimated equity buying is unlikely to take place by this quarter-end, but rather something closer to around a third of that or around $50bn.
- To do the same calculation for the Norges Bank, a $1.7tr AUM entity as at Dec24, we take quarter-to-date equity and bond returns and assume it rebalances back to end-2024 weights given that deviations from its 70% equity weights have tended to be sticky. In addition, we incorporate the government's projected oil revenues less the expected non-oil budget deficit (Norway 2024 budget, Oct 6th) and assume net revenues are invested roughly equally across quarters and by their 4Q24 asset weight. Based on these assumptions, we estimate net buying of equities of around $18bn.
- In addition to the Norges Bank, the SNB also invests a considerable portion of the foreign currency reserves it has accumulated over the course of its FX interventions from 2008 onward in equities. Its equity allocation had remained relatively stable at 20% from 2016 to end-2020, its equity allocation then increased to 23% during 2021 and to 25% in 1Q22, after which it has stabilised at that level. To estimate its pending rebalancing flow, we estimate returns on its equity portfolio using the SNB's Form 13F filings with the SEC to estimate the split between US

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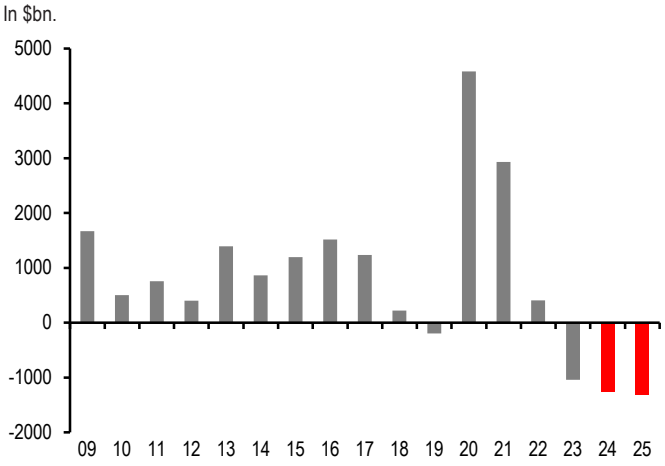
and non-US equities, and approximate portfolio returns using the MSCI US and MSCI World ex-US non-financial equities, since, in order to avoid conflicts of interest, the SNB does not buy bank equities. We then estimate the pending rebalancing flow based on its reported reserves and assume its target equity allocation remains unchanged. Assuming that its balance sheet remains little changed, this proxy would suggest the SNB would need to buy around $10bn of equities. Tracking overall liquidity is somewhat less straightforward after the SNB added SNB bills and CHF repos as tools to complement sight deposits in managing liquidity but with more lagged reporting, though since Sep24 a gradual decline in sight deposits has been offset by a rise in CHF repos keeping the overall liquidity provision little changed.

- For the GPIF, the Japanese government pension plan with around $1.7tr of AUM as at end-Dec 2024, to estimate the pending rebalancing flow we assume that it would rebalance to its end-Sep allocations. Based on quarter-to-date returns on the GPIF's benchmark indices for domestic and foreign bonds and equities in domestic currency terms, we estimate that it would need to buy around $7bn of equities, with $13bn of purchases of foreign equities and $6bn of sales of domestic equities, and sell an equivalent amount of bonds to rebalance its portfolio allocations. Newspaper reports have suggested that that the GPIF's target weights will remain unchanged for the new five year plan starting from April 1st. We had previously seen a risk that it would increase its allocation target to domestic bonds, which could have weighed against any rebalancing into equities this quarter, but these reports could suggest this risk is now unlikely to materialise.
- In all, we estimate that the potential equity buying from month-end rebalancing by balanced mutual funds as well as quarter-end rebalancing by US defined benefit pension funds and Norges Bank/GPIF/SNB, of around $135bn.

On our momentum traders/CTA framework, the short momentum on 10y Bunds is in extreme territory both on an outright basis and in particular relative to 10y USTs suggesting some risk of mean reversion signals being triggered.

- Given the sharp movements in bond yields since the start of the month following the announcement by CDU leader Merz of a sizeable German fiscal package for defence and infrastructure spending, this has raised questions in our conversations over the global bond supply-demand balance, as well as the role played by market liquidity and positioning in the moves. We turn first to the global bond supply-demand balance, updating on our previous work (F&L, Nov 27th).
- Starting on the demand side, as we have noted previously the around $200bn deterioration in G4 central bank net bond demand in 2024 vs. 2023 was rather modest after the significant swings in previous years (Figure 11). For 2025, our colleagues in US rates research expect the Fed to end its QT in 3Q25, vs. 1Q previously, meaning the negative Treasury demand impulse will last somewhat longer. And once it ends QT overall, we expect it to reinvest maturing MBS into T-bills, which we exclude from our bond supply-demand analysis given the negligible duration impact, meaning that there will be a continued modest negative net bond demand via reductions in MBS holdings even after QT ends. For the ECB, the ECB has shifted into full run-off mode for maturing APP and PEPP holdings. The BoE looks set to continue its QT via both scheduled maturities and active sales. And we continue to see the BoJ reducing its JGB holdings by just over JPY30tr. We now see a modest deterioration in net bond demand by G4 central banks of around $50bn in 2025 vs. 2024, compared to an improvement of around $100bn previously.

Figure 11: Net QE by G4 central banks



Source: Federal Reserve, ECB, BoE, BoJ, J.P. Morgan Flows & Liquidity.

- What about G4 commercial banks? 2024 saw a rather sharp shift higher in net bond demand after a relatively modest increase in the previous year with net demand of around $970bn, or an improvement of around $790bn vs. 2023. For 2025, we continue to see scope for ongoing bond demand by commercial banks, with deposit growth having picked up notably for both US and Euro area banks (Figure 12). For the US, as we have noted previously, there is scope for higher loan growth in the event the deregulatory agenda supports credit demand, e.g. from SMEs, though in the near term there could also be some downside risk from tariff uncertainty. In the euro area, the

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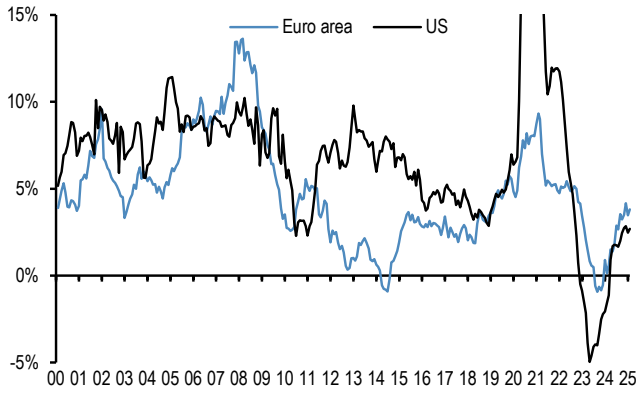
share of bonds on bank balance sheets remains well below its levels prior to ECB QE, and as QT continues this share has space to increase further as banks may need to replace one form of high-quality liquid assets (reserves) with another. That said, given that the starting point is the already rather strong net demand backdrop from commercial banks in 2024, we see some moderation in the pace and continue to project a modest $200bn deterioration in bond demand of around $200bn.

Figure 12: Y/y deposit growth for US and Euro area banks

In %. Commercial bank deposits from the Fed's H.8 release for the US, ECB data on loans to non-financial corporations ex. general government for the Euro area.



Source: Fed, ECB, J.P. Morgan Flows & Liquidity.

- What about retail investors? We used a forecasting model that forecasts current year annual bond flows as a % of AUM as a function of the previous year's bond flow and bond returns. For this year, given the bond flow and returns in 2024, the model forecasted around $700bn of inflows into bond funds, or a deterioration of around $600bn. While this would mark a rather sharp deceleration in inflows from last year's 1.3tr (our current racking estimate is $1.2tr, but this does not yet include quarterly reporting funds for 4Q24), though as Chart A1 in the Appendix shows this tends to be the norm after years of previous record years in 2012, 2017, 2019 and 2021. This historical pattern if anything points to downside risks to this forecast, though the annualized pace of inflows YTD points to some upside risk.
- What about foreign official demand? We noted after the release of the 3Q24 IMF COFER data (F&L, Jan 10th) that, after adjusting the reported quarterly changes in reserves for bond and currency returns, FX reserve managers saw a net decrease in reserves of just under $80bn in the year to 3Q24. When we complement these COFER data with more timely data on EM FX reserve holdings for 4Q24, again adjusting changes in reserves by currency and bond returns, we estimate an overall net reduction in bond holdings by FX reserve managers of around $60bn for 2024. For 2025, the backdrop for FX reserves remains uncertain given the prospects of broader tariffs as well as risks over capital outflows which in turn could prompt some intervention to smooth exchange rate volatility. In our 2025 global bond supply-demand analysis, we had projected a modest deterioration in net bond demand by foreign official institutions of around $100bn for this year vs. 2024, though acknowledging that there is clearly significant downside risk.
- What about G4 pension funds and insurance companies? Based on flow of funds data for the G4 economics up to 3Q24, net bond demand by G4 pension funds and insurance companies were tracking a pace of around $1tr. This is well above its average over the past decade and a half of around $500bn, though as we outlined in our 2025 supply-demand balance we continue to see the backdrop for as supportive for pension fund bond demand overall, and project only a modest deterioration in bond demand of around $100bn for this year vs. 2024.
- Finally, what about bond supply? Taking the net issuance projections from our strategists' 2025 outlooks, adjusted for some updates since then, we estimate overall net issuance for 2024 of around $4.3tr and around $4.1tr for 2025, implying a modest decline in net issuance of around $0.2tr. Our European economists and strategists estimate that the impact of the German infrastructure and defence package would increase federal net issuance by around €45-€65bn in 2025 (Germany: An attempt at some fiscal calculations, Mar 7th), which on its own would not significantly alter the picture, and there is some uncertainty over whether the proposals have the necessary majority support in the Bundestag to make the needed constitutional changes. Proposals at the EU level could be rather larger, though many practical questions over implementation remain open (EU: von der Leyen's big proposal leaves open questions, Mar 4th).
- Putting it all together, the above analysis implies a deterioration in global bond demand of around $1tr in 2025 vs. 2024, and with a $0.2tr decline in global bond supply continues to imply a deterioration in the global bond supply/demand balance of around $0.8tr. Based on the relationship between annual changes in excess supply and the Global Agg bond index yield over since 2008, this would imply an increase in Global Agg yields of around 40bp, suggesting some upside risk to yields from a supply/demand perspective, though since our initial analysis Global Agg yields have risen around 10bp.

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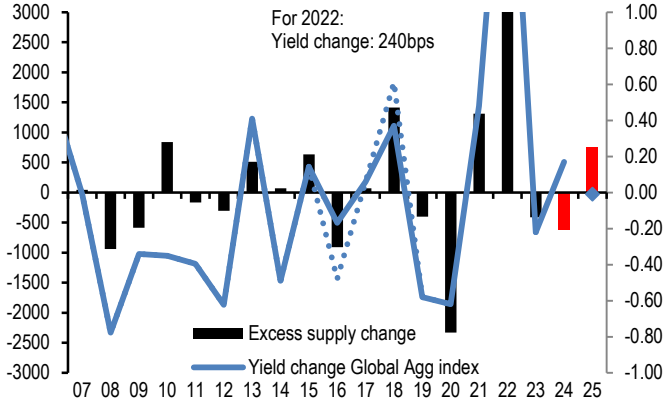
Figure 13: Annual change in the balance between global bond supply and demand

Change in excess bond supply in $bn per annum in the left axis calculated as the difference between changes in global bond supply and changes in global bond demand as explained in the text. It includes our 2024 and 2025 estimates. Right axis shows the annual change of the yield on the Bloomberg Global Agg index in % (Jan-Oct in dotted lines for 2016 and 2018), and the blue diamond shows the YTD change in 2025.

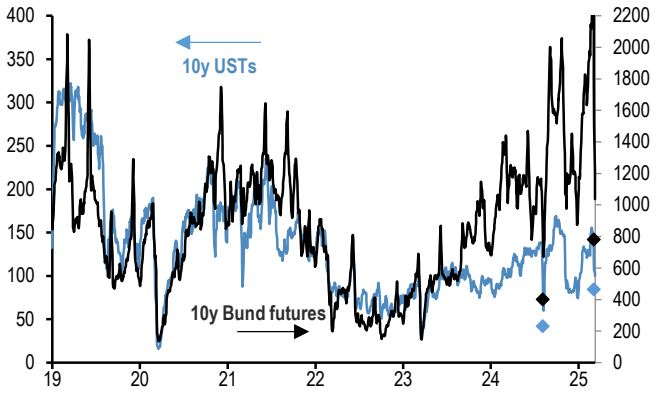


Source: J.P. Morgan Flows & Liquidity.

- Given the magnitude of the sell-off in European markets last week, with 10y Bund yields rising by nearly 30bp on Mar 5th, this has also raised questions in our conversations over bond market liquidity and positioning. Turning first to liquidity, Figure 14 shows the 1-week moving average of market depth of 10y USTs and 10y Bund futures, with the diamonds for the respective series showing their daily local troughs on August 5th 2024 and their local lows last week. It suggests that, while liquidity conditions for Bund futures had largely normalised and if anything reached higher levels than pre-pandemic, there was a sharp deterioration in liquidity conditions that likely amplified the magnitude of the sell-off.

Figure 14: Market depth on 10y USTs and 10y Bund futures

5-day moving average of the daily average size of tightest three bids and asks eachday, in $mn (lhs) for USTs and no.of contracts (rhs) for Bund futures.



Source: Brokertec, Eurex, J.P. Morgan Flows & Liquidity.

- What about positioning? Are bonds trading long or short? Figure 15 shows an alternative indicator that tries to gauge broader bond market positioning by examining the response of bond markets to economic news, where we think of 'news' as surprises relative to expectations. To construct this position indicator, we take as our starting point the economic releases incorporated in our USD and EUR EASI indices, complement them with inflation releases, and calculate for each release the z-score of surprises (actual – survey median) / (std. dev. of past surprises) and the z-score of changes in UST and Bund yields for that day. We calculate separately the average beta (or the ratio of the z-score of UST and Bund yield changes over the z-score of economic surprises) for positive and negative news over rolling two-month windows, and take the difference between the two. An exponential-weighted scheme is used in order to attach a higher weight to more recent observations.
- This indicator, shown in Figure 15, represents an indirect positioning metric, where positive (negative) values suggest investors have found themselves longer (shorter) duration than they would like to be given the surprises in the economic data flow, rather than necessarily long (short) relative to benchmark. It suggests that bond investors continue to find themselves shorter duration than they would like to be given the overall tone in the economic data flow. While Figure 15 shows the average of UST and Bund reactions to both US and Euro area data releases, we can also separate them to show reactions of USTs to US economic releases and the reactions of Bunds to Euro area releases. This is shown in Figure 16, which suggests that since the beginning of March there has been a divergence where UST investors continue to find themselves shorter duration than they would like to be given the economic surprises, the opposite is now true for Bund inves-

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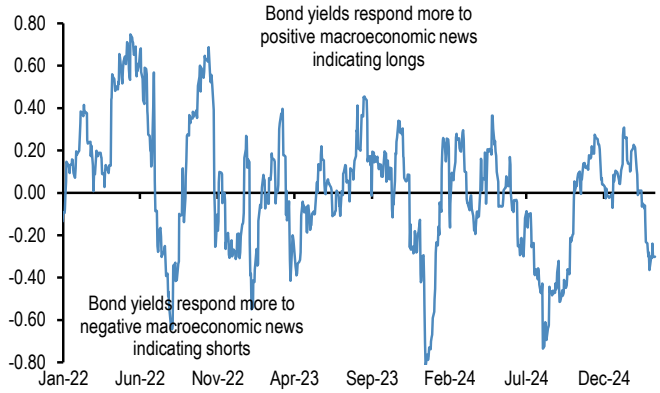
tors who are finding themselves longer than they would like to be given surprises in the euro area data flow.

Figure 15: Difference in the beta of the average of 10y UST and 10y Bund yields to positive US and Euro area economic news minus beta to negative news (including inflation news)

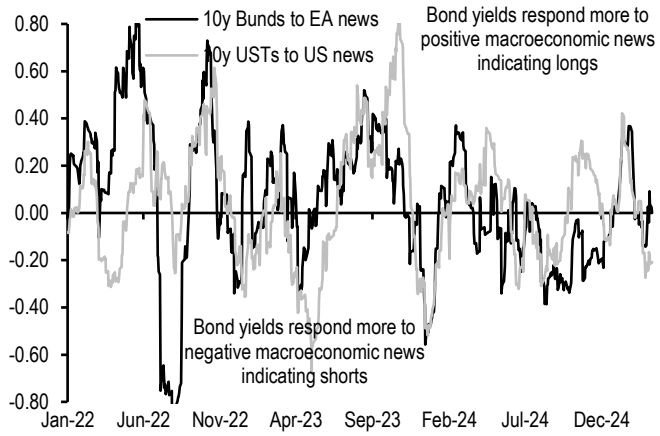
42 day exponential weighted moving average (lambda = 0.98).



Source: Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

Figure 16: Difference in the betas of 10y US and Bund yields to positive US and Euro area economic news respectively minus beta to negative news (including inflation news)

42 day exponential weighted moving average (lambda = 0.98).

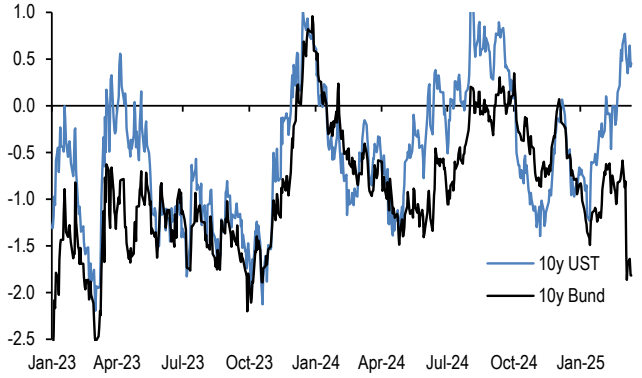


Source: Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

- What about momentum-based investors such as CTAs? Figure 17 shows the average of the z-scores of the shorter- and longer-term signals for 10y USTs and Bunds. While the signals had diverged already since the start of the year, with the z-score for USTs at +0.7 in end-February while for Bunds it was around -0.6, they have diverged sharply in March. At the time of writing, the signal for 10y USTs was at +0.5, while the signal for 10y Bunds was at -1.8, suggesting that the z-score is in more extreme territory indicating a higher risk of triggering mean reversion or profit taking signals. Moreover, when we look at the difference between the UST and Bund signals to gauge the magnitude of the divergence (Figure 18), or an implicit net long USTs vs. Bunds trade, this gap between the two reached its most extreme level since 2008 on Mar 6th and remains close to that level.

Figure 17: Momentum signals for 10Y USTs and Bunds

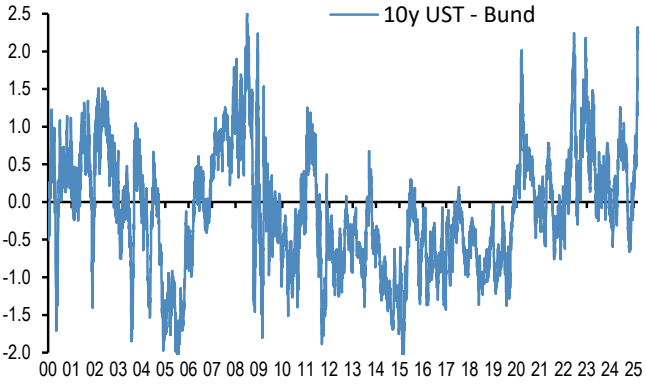
Average z-score of Short- and Long-term momentum signal in our Trend Following Strategy framework shown in Tables A3 and A4 below in the Appendix.



Source: Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

Figure 18: 10y UST minus 10y Bund momentum signal

Average z-score of Short- and Long-term momentum signal in our Trend Following Strategy framework shown in Tables A3 and A4 below in the Appendix.



Source: Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

- In all, the global supply-demand balance for 2025 suggests some further room for upside in yields over the course of the year. The sell-off in Bunds last week appears to have been amplified by a deterioration in liquidity conditions, while our momentum signals suggest short momentum on 10y Bunds is in extreme territory both on an outright basis and in particular relative to 10y USTs suggesting some risk of mean reversion signals being triggered.

Publicly listed bitcoin miners to continue to gain share in the overall bitcoin network hashrate

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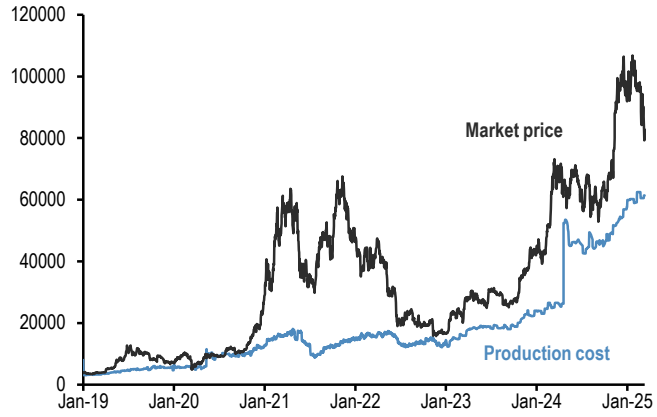
- Following the 2024 Bitcoin halving event, the reduction in issuance rewards has increased production costs, pressuring miners' profitability amid a rising hashrate environment and more recently with the bitcoin price re-converging towards its production as shown in Figure 19. In response, bitcoin miners have pursued horizontal integration, diversifying into AI and high-performance computing (HPC) due to operational synergies. While horizontal integration has been beneficial, some bitcoin mining firms are now turning to vertical integration to reduce overall mining costs even further. The major components of bitcoin production costs are electricity and hardware. By expanding into these areas, miners aim to lower costs and boost profitability.

Figure 19: Our central estimate of the bitcoin production cost

In $

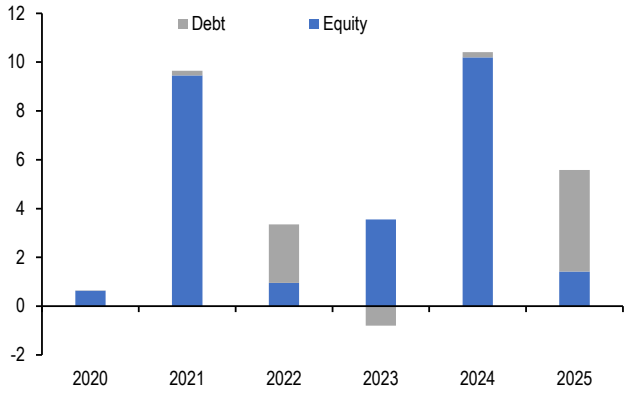


Source: Coin Metrics, Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

- A key aspect of vertical integration is securing power sources. Instead of relying on the power grid, miners are investing into energy solutions like renewable and other cheaper alternatives. For example, Mara Holdings acquired a wind farm in Texas, and Bitdeer acquired a gas-fired power plant project in Canada. These strategic moves not only meet energy requirements but also drive costs lower.
- Another dimension of vertical integration is chip manufacturing and in-house chip development. Bitdeer, for instance, has collaborated with TSMC to develop a bitcoin mining chip, achieving notable efficiency with the SEAL03 model. This has led the miner to sell their bitcoin mining rigs in the secondary market as they have been implementing proprietary and more efficient mining rigs for their bitcoin mining operation.
- Publicly listed bitcoin miners in particular benefit from access to equity funding, which has supported their operations and enabled significant capital expenditures for expansion and diversification, as evidenced by record equity financing volumes in 2024. However, the recent decline in bitcoin prices has made equity financing more challenging, prompting a shift towards debt financing as seen in Figure 20, to maintain operations without selling bitcoin holdings. This flexible funding approach has supported both operational needs as well as horizontal and vertical expansions.

Figure 20: Equity and Debt raised by listed bitcoin miners

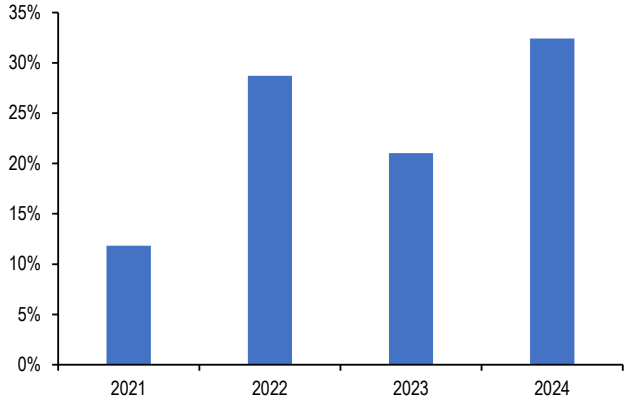
In $bn



Source: Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

- All these have allowed publicly listed bitcoin miners to expand their share in the overall bitcoin network hashrate in 2024 (Figure 21), a trend that is likely to continue this year.

Figure 21: Publicly listed bitcoin miners share in the overall bitcoin network hashrate



Source: Company reports., J.P. Morgan Flows & Liquidity.

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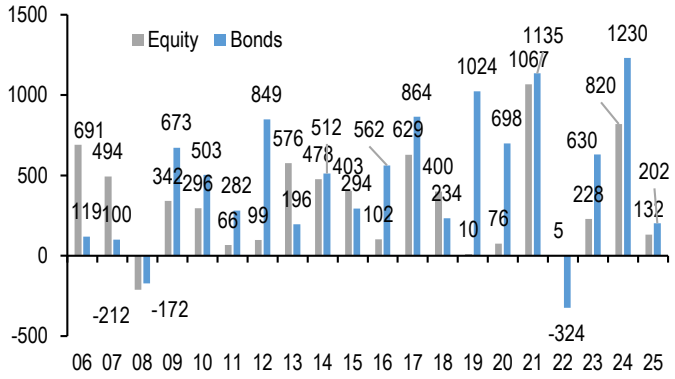
Appendix

Chart A1a: Global equity & bond fund flows

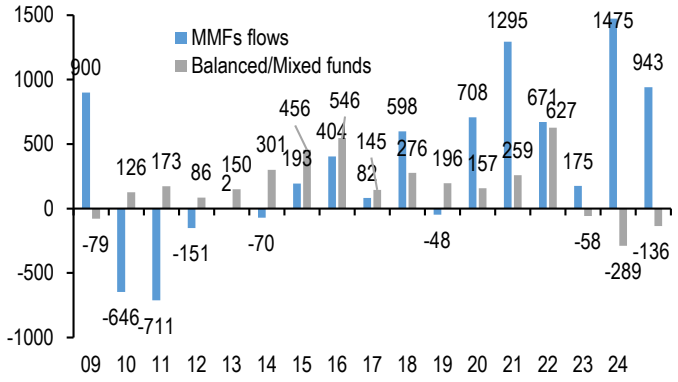
$bn per year of Net Sales, i.e. includes net new sales + reinvested dividends for Mutual Funds and ETFs globally, i.e. for funds domiciled both inside and outside the US. Flows come from ICI (worldwide data up to Q3'24). Data since then are a combination of monthly and weekly data from Lipper and Bloomberg.



Source: ICI, Lipper, Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

Chart A1b: Quarterly Balanced/Mixed funds & MMFs flows worldwide

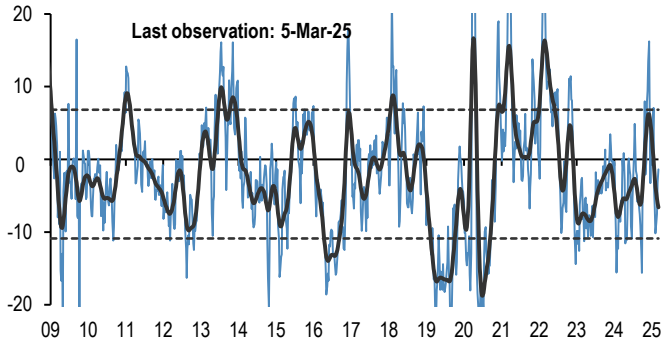
$bn per quarter of Net Sales, i.e. includes net new sales + reinvested dividends for Mutual Funds and ETFs globally, i.e. for funds domiciled both inside and outside the US. Data come from ICI (worldwide data) and are till Q3'24.



Source: ICI, J.P. Morgan Flows & Liquidity.

Chart A2: Fund flow indicator

Difference between flows into Equity and Bond funds: $bn per week. Difference between flows into Equity vs. Bond funds in $bn per week. Flows include Mutual Fund and ETF flows globally, i.e. funds domiciled both inside and outside the US (source: Lipper). The thin blue line shows the 4-week average of difference between Equity and Bond fund flows. Dotted lines depict ±1 StDev of the blue line since 2009. The thick black line shows a smoothed version of the same series. The smoothing is done using a Hodrick-Prescott filter with a Lambda parameter of 100.



Source: Lipper, J.P. Morgan Flows & Liquidity.

Table A2: Trading turnover monitor

Volumes are monthly and Turnover ratio is annualised (monthly trading volume annualised divided by the amount outstanding). UST Cash is primary dealer transactions in all US government securities. UST futures are from Bloomberg Finance L.P. JGBs are OTC volumes in all Japanese government securities. Bunds, Gold, Oil and Copper are futures. Gold includes Gold ETFs. Min-Max chart is based on Turnover ratio. For Bunds and Commodities, futures trading volumes are used while the outstanding amount is proxied by open interest. The diamond reflects the latest turnover observation. The thin blue line marks the distance between the min and max for the complete time series since Jan-2005 onwards. Y/Y change is change in YTD notional volumes over the same period last year.

As of Feb-25	MIN	MAX	Turnover ratio	Vol (tr)	y/y chng
Equities					
EM Equity*			0.6	$0.6	-29%
DM Equity*			1.1	$8.1	7%
Govt Bonds					
UST cash			12.1	$16.7	3%
UST futures			0.7	$26.6	6%
JGBs*			42.3	¥4,282	14%
Bund futures			1.4	€7.4	5%
Credit					
US HG			1.0	$0.7	2%
US HY			0.7	$0.2	-3%
US Convertibles			3.0	$0.04	10%
Commodities					
Gold			41.8	$1.2	39%
Oil			86.9	$2.1	-34%
Copper			1.9	$0.5	41%
Digital Assets					
CME Bitcoin			93.5	$0.150	26%
CME Ethereum			112.0	$0.028	-12%

* Data with one month lag

Source: Bloomberg Finance L.P., Federal Reserve, Trace, Japan Securities Dealer Association, WFE, J.P. Morgan Flows & Liquidity.

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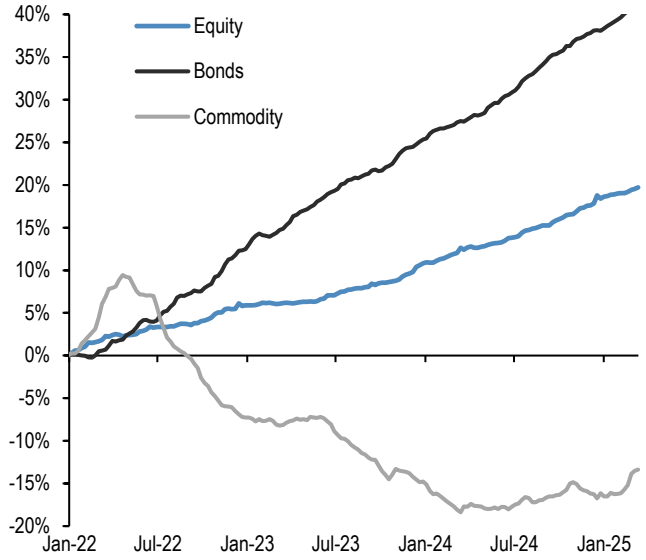
ETF Flow Monitor (as of 12th Mar)

Chart A3: Global Cross Asset ETF Flows

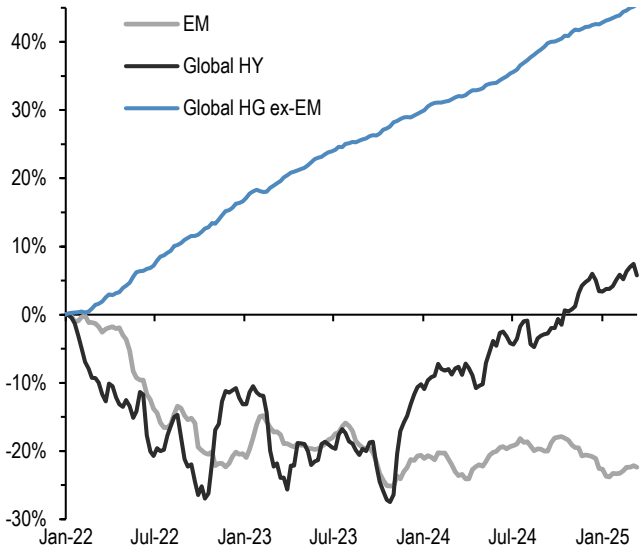
Cumulative flow into ETFs as a % of AUM



Source: Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

Chart A4: Bond ETF Flows

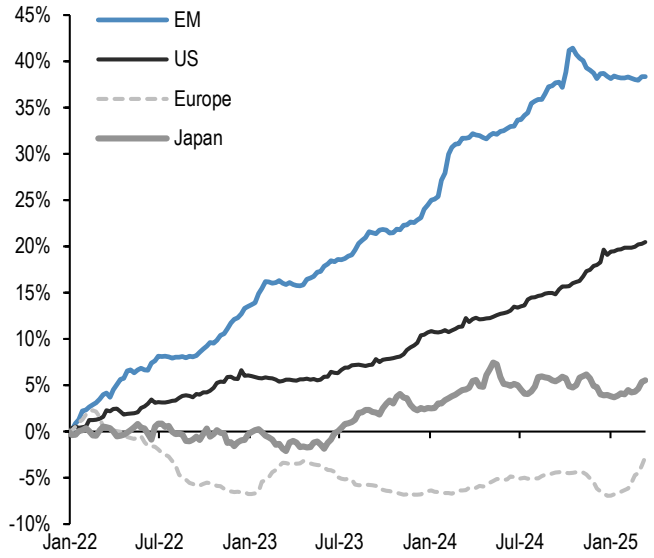
Cumulative flow into bond ETFs as a % of AUM



Source: Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

Chart A5: Global Equity ETF Flows

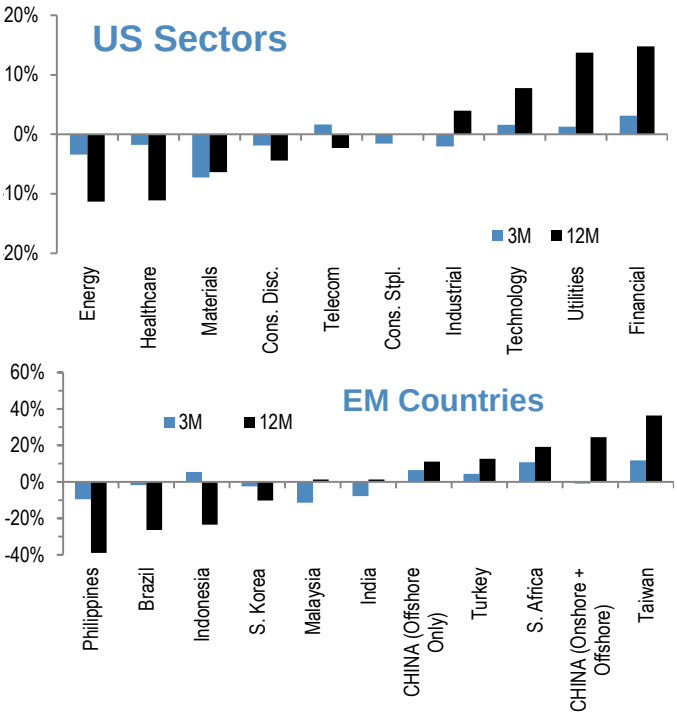
Cumulative flow into global equity ETFs as a % of AUM



Source: Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.
Note: We include ETFs with AUM > $200mn in all the flow monitor charts. Chart A5 exclude China On-shore (A-share) ETFs from EM and in Japan. We subtract the BoJ buying of ETFs.

Chart A6: Equity Sectoral and Regional ETF Flows

Rolling 3-month and 12-month change in cumulative flows as a % of AUM. Both sorted by 12-month change



Source: Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

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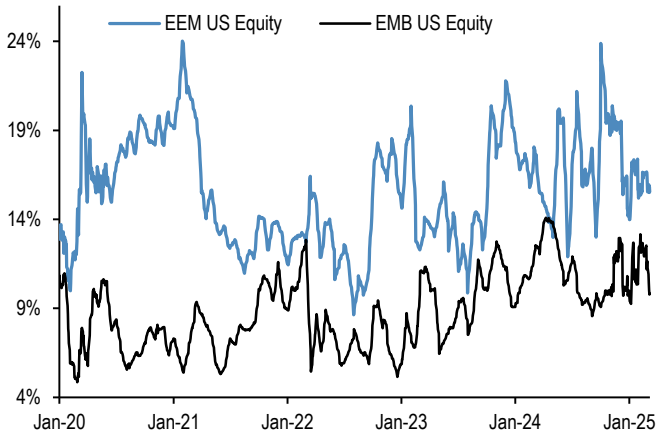
Short Interest Monitor

Chart A7: Short interest on the EEM and EMB US ETF

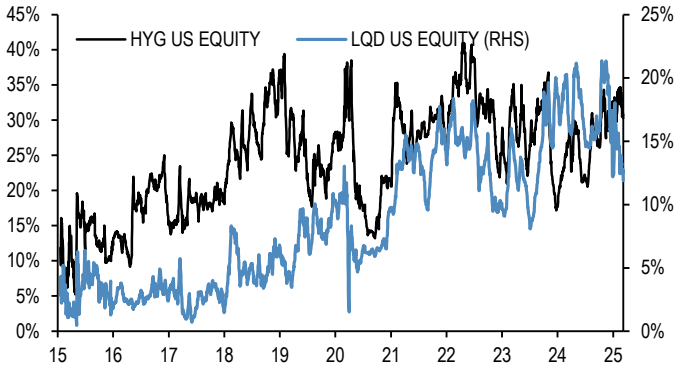
Short Interest as a % share of share outstanding.



Source: S3, J.P. Morgan Flows & Liquidity.

Chart A8: Short interest on the LQD and HYG US ETF

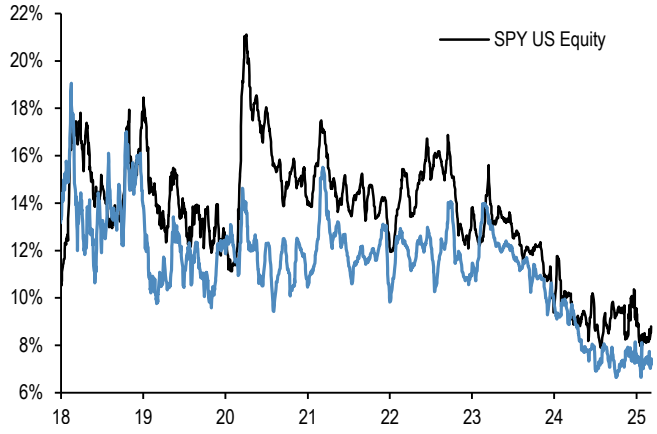
Short Interest as a % share of share outstanding.



Source: S3, J.P. Morgan Flows & Liquidity.

Chart A9: Short interest on the SPY and QQQ US ETF

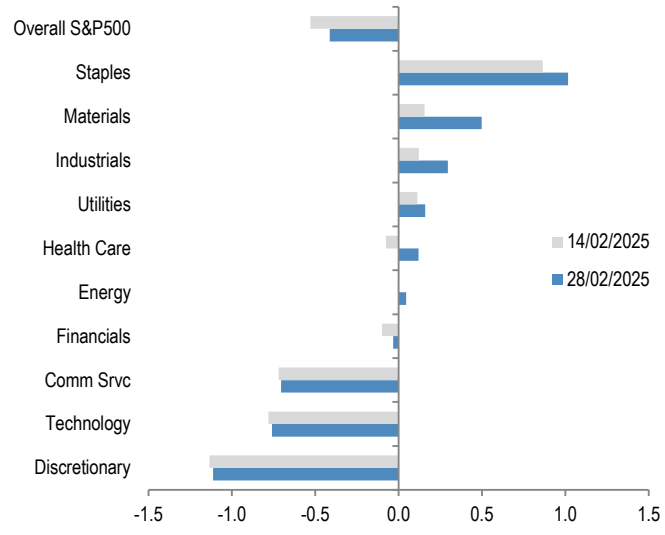
Short Interest as a % share of share outstanding. Last obs is for 7th Mar 2025.



Source: S3, J.P. Morgan Flows & Liquidity.

Chart A10: S&P500 sector short interest

Short interest as a % of shares outstanding based on z-scores. A strategy which overweights the S&P500 sectors with the highest short interest z-score (as % of shares o/s) vs. those with the lowest, produced an information ratio of 0.7 with a success rate of 56% (see F&L, Jun 28,2013 for more details).



Source: NYSE, Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

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Chart A11a: Cross Asset Volatility Monitor 3m ATM Implied Volatility (1y history), as of 11th Mar-2025

This table shows the richness/cheapness of current three-month implied volatility levels (red dot) against their one-year historical range (thin blue bar) and the ratio to current realised volatility. Assets with implied volatility outside their 25th/75th percentile range (thick blue bar) are highlighted. The implied-to-realised volatility ratio uses 3-month implied volatilities and 1-month (around 21 trading days) realised volatilities for each asset.

Asset	Current	Low	Low date	High	High date		Upside	Downside	Implied/realized volatility
S&P 500	20%	11%	21-May-24	25%	05-Aug-24		4%	9%	1.09x
EuroSTOXX	18%	12%	20-May-24	20%	05-Aug-24		2%	6%	0.95x
Nikkei 225	21%	16%	02-Jul-24	37%	05-Aug-24		16%	5%	1.14x
Hang Seng	25%	18%	05-Sep-24	33%	07-Oct-24		8%	6%	0.73x
MSCI EM	20%	11%	28-Mar-24	27%	21-Mar-24		7%	8%	0.98x
Gold	15%	11%	25-Mar-24	17%	12-Aug-24		2%	4%	1.00x
Oil (brent)	28%	20%	15-Jul-24	39%	14-Oct-24		11%	7%	1.20x
Copper	18%	16%	18-Dec-24	31%	20-May-24		13%	2%	0.59x
BB commodity index	15%	12%	12-Jul-24	15%	17-Jan-25		1%	3%	1.30x
EUR/USD	12%	8%	19-Mar-24	14%	05-Aug-24		2%	4%	1.21x
USD/NOK	11%	9%	23-May-24	13%	05-Aug-24		3%	1%	0.99x
USD/JPY	7%	6%	12-Jul-24	9%	05-Aug-24		1%	2%	0.74x
GBP/USD	8%	6%	13-Mar-24	11%	13-Jan-25		3%	2%	1.14x
USD/CHF	6%	6%	22-May-24	7%	16-Apr-24		1%	1%	0.83x
10y US swaps	8%	6%	20-May-24	10%	05-Aug-24		1%	2%	0.93x
10y Eur swaps	83%	64%	19-Sep-24	87%	06-Mar-25		3%	20%	0.88x
CDX IG	43%	35%	13-Feb-25	54%	05-Aug-24		11%	9%	1.46x
CDX HY	46%	30%	12-Jun-24	46%	10-Mar-25		0%	16%	1.64x
iTraxx	46%	37%	13-Feb-25	61%	05-Aug-24		15%	9%	1.71x
iTraxx X/O	27%	20%	16-Sep-24	37%	07-Oct-24		9%	7%	1.10x

Source: J.P. Morgan, Bloomberg Finance L.P.

Note: Swaps volatility is 3m 10y payer ATMF implied annualized BP vol and credit volatility is 3m 5y on-the-run ATM spread volatility. MSCI EM, Gold, Oil, Copper, BB Commodity Index and Treasury futures are 3m implied vol from Bloomberg.

Definitions:

Current:	Latest available closing level (10-Mar-25)
Low:	Lowest closing level in the last 1y
Low date:	Date the lowest closing level was reached (or the first time it was reached in the case of several identical low closing levels)
High:	Highest closing level in the last 1y
High date:	Date the highest closing level was reached (or the first time it was reached in the case of several identical high closing levels)
Graph:	Shows the current level and the 25th/75th percentile relative to the 1y high/low
Upside:	Implied return/volatility percentage points from current level up to the High (note: return is calculated as simple difference for spread products)
Upside (σ):	Upside in terms of standard deviations (Upside / Current 1y realized volatility)
Downside:	Implied return/volatility percentage points from current level down to the Low (note: return calculated as simple difference for spread products)
Downside (σ):	Downside in terms of standard deviations (Downside / Current 1y realized volatility)
Implied/realized volatility:	Current 3m implied volatility / current realized 3m volatility

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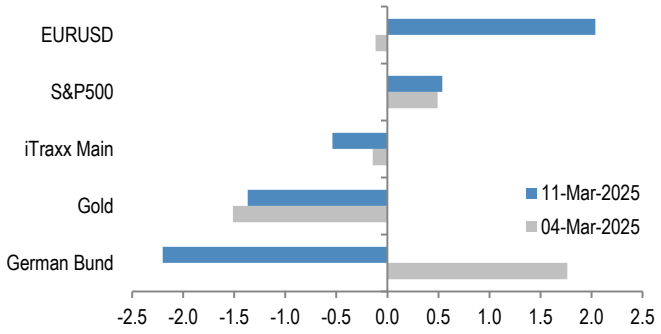
Chart A11b: Option skew monitor

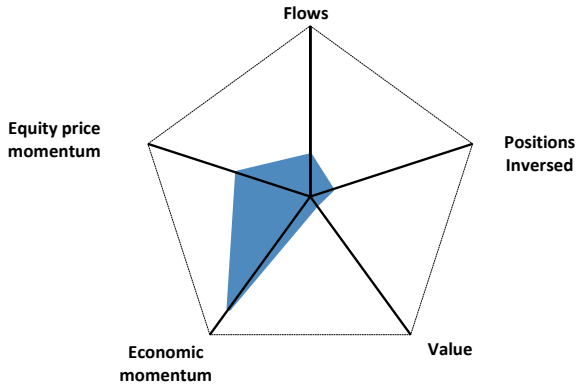
Skew is the difference between the implied volatility of out-of-the-money (OTM) call options and put options. A positive skew implies more demand for calls than puts and a negative skew, higher demand for puts than calls. It can therefore be seen as an indicator of risk perception in that a highly negative skew inequities is indicative of a bearish view. The chart shows z-score of the skew, i.e. the skew minus a rolling 2-year avg skew divided by a rolling two-year standard deviation of the skew. A negative skew on iTraxx Main means investors favour buying protection, i.e. a short risk position. A positive skew for the Bund reflects a long duration view, also a short risk position



Source: J.P. Morgan Flows & Liquidity.

Chart A11c: Equity-Bond metric map

Explanation of Equity - Bond metric map: Each of the five axes corresponds to a key indicator for markets. The position of the blue line on each axis shows how far the current observation is from the extremes at either end of the scale. For example, a reading at the centre for value would mean that risky assets are the most expensive they have ever been while a reading at the other end of the axis would mean they are the cheapest they have ever been. Overall, the larger the blue area within the pentagon, the better for the risky markets. All variables are expressed as the percentile of the distribution that the observation falls into. I.e. a reading in the middle of the axis means that the observation falls exactly at the median of all historical observations. **Value**: The slope of the risk-return trade-off line calculated across USTs, US HG and HY corporate bonds and US equities(see GMOS p. 6, Loeys et al, Jul 6 2011 for more details). **Positions**: Difference between net spec positions on US equities and intermediate sector UST. See Chart A13. **Flow momentum**: The difference between flows into equity funds (incl. ETFs) and flows into bond funds. Chart A1. We then smooth this using a Hodrick-Prescott filter with a lambda parameter of 100. We then take the weekly change in this smoothed series as shown in Chart A1. **Economic momentum**:The 2-month change in the global manufacturing PMI. (See REVISITING: Using the Global PMI as trading signal, Nikolaos Panigirtzoglou, Jan 2012). **Equity price momentum**: The 6-month change in the S&P500 equity index. As of 7th Mar 25.



Source: Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

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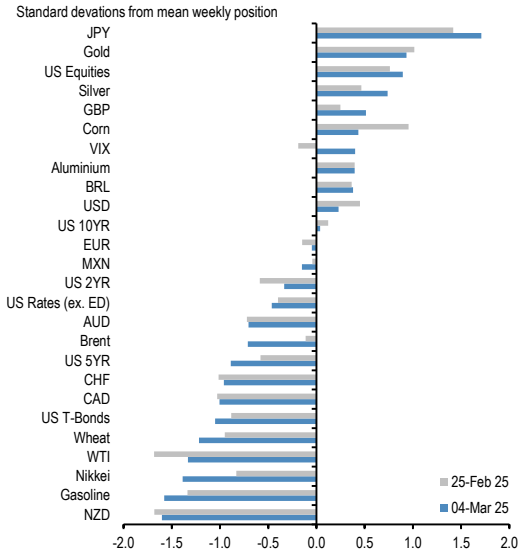
Spec position monitor

Chart A12: Weekly Spec Position Monitor

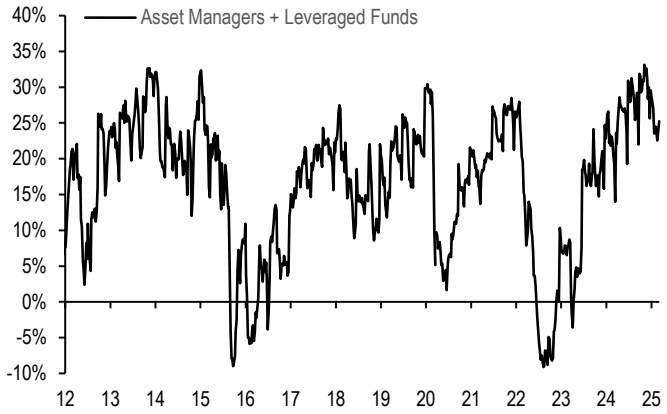
Net spec positions are proxied by the number of long contracts minus the number of short contracts using the speculative category of the Commitments of Traders reports (as reported by CFTC). To proxy for speculative investors for equity and US Treasury bond futures positions we use Asset managers and leveraged funds (see Chart A13), whereas for other assets we use the legacy Non-Commercial category. This net position is then converted to a dollar amount by multiplying by the contract size and then the corresponding futures price. We then scale the net positions by open interest. The chart shows the z-score of these net positions. US rates is a duration-weighted composite of the individual UST futures contracts excluding the Eurodollar contract.



Source: Bloomberg Finance L.P., CFTC, J.P. Morgan Flows & Liquidity.

Chart A13: Positions in US equity futures by Asset managers and Leveraged funds

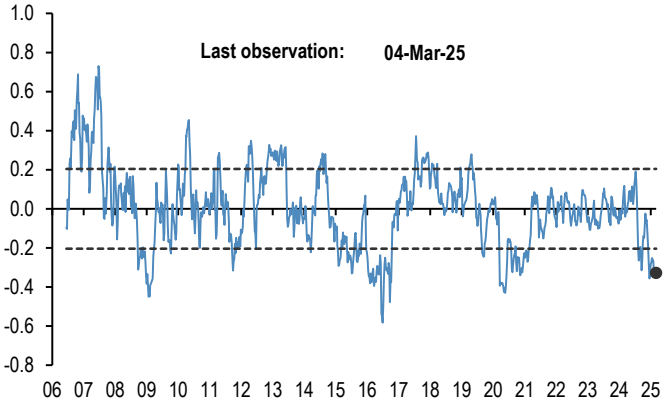
CFTC positions in US equity futures by Leveraged funds and Asset managers (as a % of open interest). It is an aggregate of the S&P500, DowJones, NASDAQ and their Mini futures contracts.



Source: CFTC, Bloomberg Finance L.P. and J.P. Morgan Flows & Liquidity.

Chart A14: Spec position indicator on Risky vs. Safe currencies

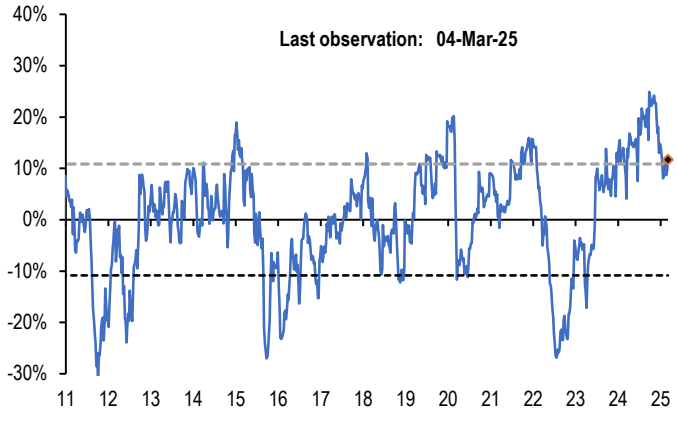
Difference between net spec positions on risky & safe currencies. Net spec position is calculated in USD across 5 'risky' and 3 'safe' currencies (safe currencies also include Gold). These positions are then scaled by open interest and we take an average of 'risky' and 'safe' assets to create two series. The chart is then simply the difference between the"risky" and "safe" series. The final series shown in the chart below is demeaned using data since 2006. The risky currencies are: AUD, NZD,CAD, MXN and BRL. The safe currencies are: JPY, CHF and Gold.



Source: Bloomberg Finance L.P., CFTC, J.P. Morgan Flows & Liquidity.

Chart A15: Spec position indicator on US equity futures vs. intermediate sector UST futures

Difference between net spec positions on US equity futures vs.intermediate sector UST futures. This indicator is derived by the difference between total CFTC positions in US equity futures by Asset managers + Leveraged Funds scaled by open interest minus the Asset managers + Leveraged Funds spec position on intermediate sector UST futures (i.e. all UST futures duration weighted ex ED and ex 2Y UST futures) also scaled by open interest.



Source: CFTC, Bloomberg Finance L.P. and J.P. Morgan Flows & Liquidity.

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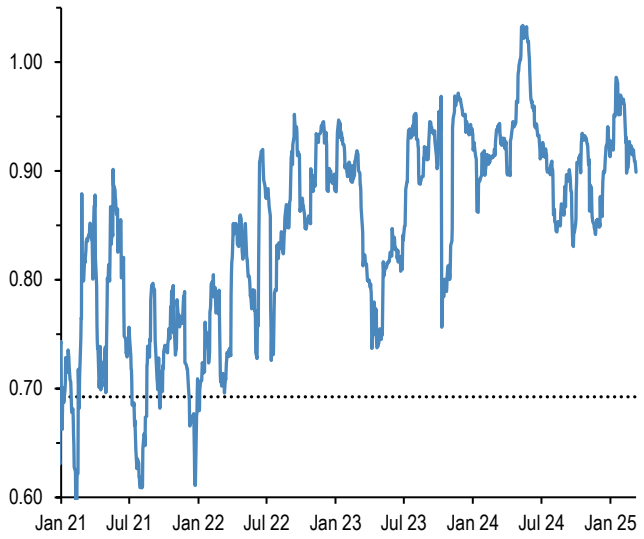
Mutual fund and hedge fund betas

Chart A16: 21-day rolling beta of 20 biggest active US bond mutual fund managers with respect to the US Agg Bond Index

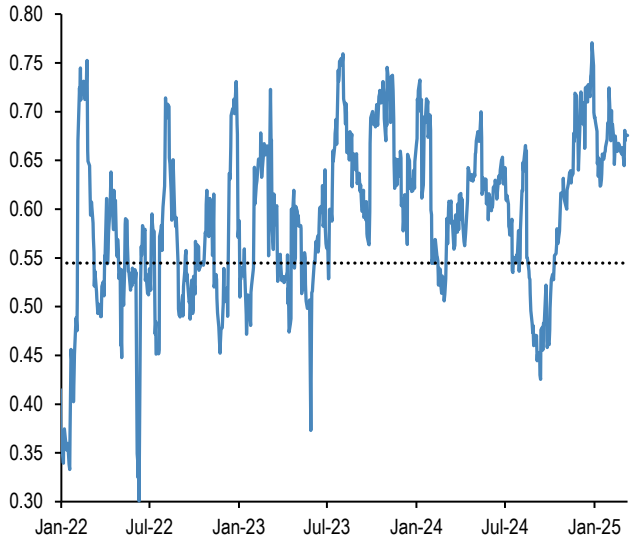
The dotted line shows the average beta since 2013.



Source: Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

Chart A17: 21-day rolling beta of 20 biggest active Euro bond mutual fund managers with respect to the Euro Agg Bond Index

The dotted line shows the average beta since 2013.



Source: Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

Chart A18: Performance of various type of investors

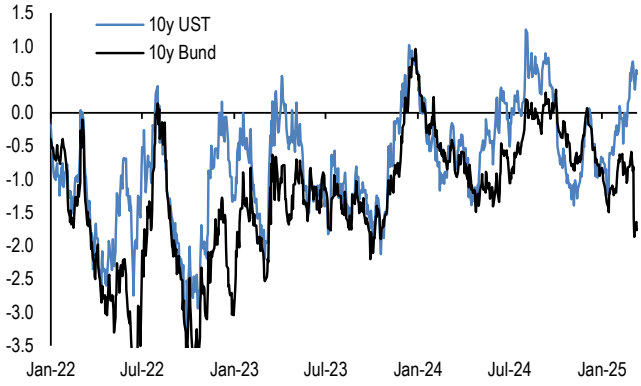
The table depicts the performance of various types of investors in % as of 10th Mar 2025.

Date	2019	2020	2021	2022	2023	2024	2025
Investors							
Equity L/S	12.6%	13.4%	9.3%	-7.0%	11.3%	13.0%	2.0%
Macro ex-CTAs	5.6%	4.9%	4.3%	11.5%	1.3%	6.0%	2.3%
CTAs	7.1%	1.2%	8.8%	14.7%	-2.5%	2.9%	-2.5%
Risk Parity Funds	18.4%	3.5%	4.7%	-18.6%	6.0%	5.0%	2.1%
US Balanced MFs	20.1%	13.2%	14.4%	-13.0%	13.8%	11.4%	0.1%
Benchmark							
MSCI AC World	26.6%	16.3%	16.4%	-18.4%	22.2%	17.5%	-0.8%
Barclays Global Agg	8.2%	5.6%	-2.5%	-11.2%	7.1%	3.4%	0.8%
S&P Riskparity Vol 10	22.8%	11.5%	12.8%	-16.2%	15.0%	5.4%	1.2%
60 US Equity : 40 US Bonds	22.2%	13.3%	14.8%	-15.4%	18.6%	16.4%	-2.2%

Source: Bloomberg Finance L.P., HFR, Pivotal Path, J.P. Morgan Flows & Liquidity.

Chart A19: Momentum signals for 10Y UST and 10Y Bunds

Average z-score of Short- and Long-term momentum signal in our Trend Following Strategy framework shown in Tables A3 and A4 below in the Appendix



Source: Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

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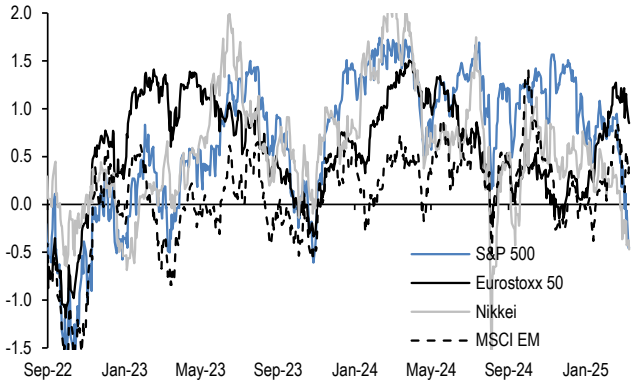
Chart A20: Momentum signals for S&P500

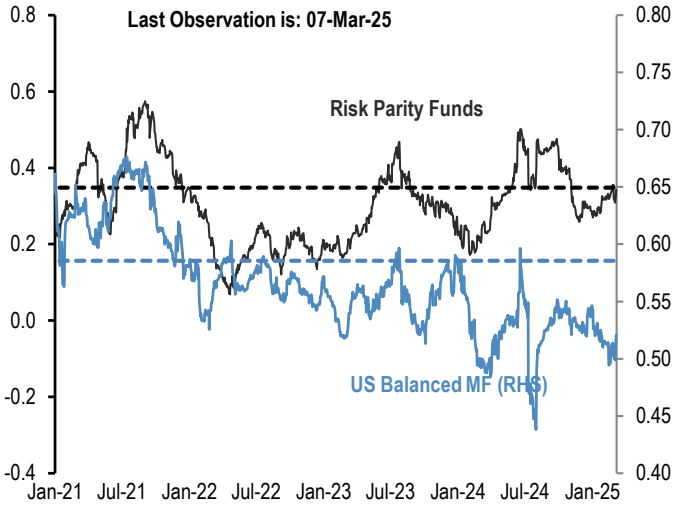
Average z-score of Short- and Long-term momentum signal in our Trend Following Strategy framework shown in Tables A3 and A4 below in the Appendix.



Source: Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

Chart A21: Equity beta of US Balanced Mutual funds and Risk Parity funds

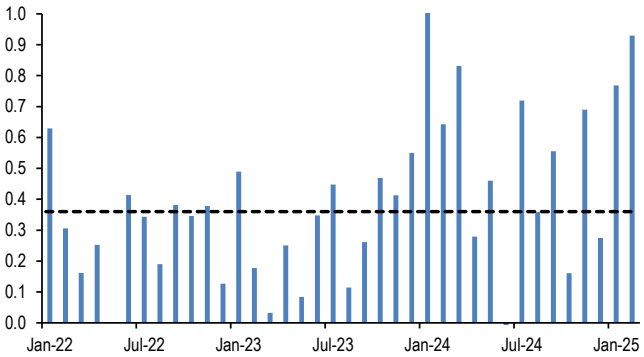
Rolling 42-day equity beta based on a bivariate regression of the daily returns of our Balanced Mutual fund and Risk Parity fund return indices to the daily returns of the S&P 500 and BarCap US Agg indices. Given that these funds invest in both equities and bonds we believe that the bivariate regression will be more suitable for these funds. Our risk parity index consists of 25 daily reporting Risk Parity funds. Our Balanced Mutual fund index includes the top 20 US-based active funds by assets and that have existed since 2006. Our Balanced Mutual fund index has a total AUM of $700bn, which is around half of the total AUM of $1.5tr of US based Balanced funds which we believe to be a good proxy of the overall industry It excludes tracker funds and funds with a low tracking error. Dotted lines are average since 2015.



Source: Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

Chart A22: Equity beta of monthly reporting Equity Long/Short hedge funds

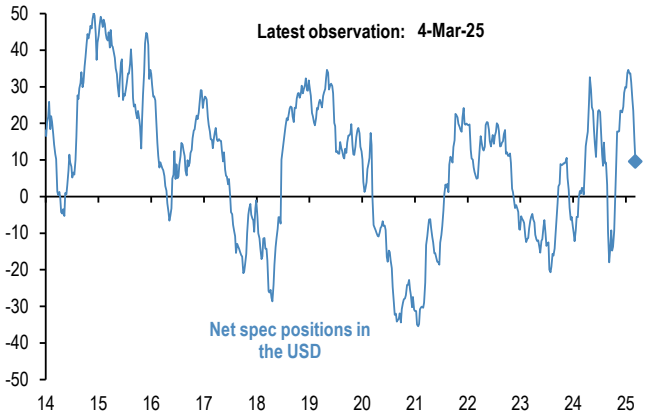
Proxied by the ratio of the monthly performance of Pivotal Path Asset-Weighted Equity Diversified hedge fund index divided by the monthly performance of MSCI AC World Index. Jan 25 obs. is based on provisional data from Pivotal path.



Source: Bloomberg Finance L.P., Pivotal Path, J.P. Morgan Flows & Liquidity.

Chart A23: USD exposure of currency hedge funds

The net spec position in the USD as reported by the CFTC. Spec is the non-commercial category from the CFTC.



Source: CFTC, Barclay, Datastream, Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

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CTAs – Trend following investors' momentum indicators

Table A3: Simple return momentum trading rules across various commodities

Optimal look-back period of each momentum strategy combined with a mean reversion indicator that turns signal neutral when momentum z-score more than 1.5 standard deviations above or below mean, and a filter that turns neutral when the z-score is low (below 0.05 and above -0.05) to avoid excessive trading. Look-backs, current signals and z-scores are shown for shorter-term and longer-term momentum separately, along with performance of a combined signal. Annualised return, volatility and information ratio of the signal; current signal; and z-score of the current return over the relevant look-back period; data from 1999 onward.

		Lookback (moving avg, days)	Annualized return (%)	Vol (%)	IR	Current signal	Time since last change (days)	Z-score	% Change of return index from its moving average
WTI	short	21	5.7	22.6	0.25	-1	12	-0.8	-4.9%
	long	462				-1	7	-0.2	-6.5%
Brent	short	84	4.4	21.4	0.20	-1	7	-0.5	-5.4%
	long	504				-1	7	-0.2	-6.4%
Unleaded gas	short	105	3.7	23.3	0.16	-1	7	-0.4	-6.1%
	long	483				-1	19	-0.4	-11.4%
Heat Oil	short	63	4.8	21.7	0.22	-1	6	-0.5	-5.1%
	long	483				-1	12	-0.3	-9.5%
Gasoil	short	63	8.0	20.5	0.39	-1	10	-0.5	-5.1%
	long	378				-1	12	-0.3	-9.1%
Nat gas	short	105	17.1	35.5	0.48	0	17	2.4	43.3%
	long	315				1	26	1.4	43.0%
EU emission allowances	short	42	11.4	29.8	0.38	-1	15	-1.1	-11.2%
	long	483				-1	15	-0.3	-11.0%
1m fwd TTF Nat gas	short	21	41.9	30.8	1.36	-1	1	-0.9	-9.0%
	long	294				1	1	0.2	7.9%
Gold	short	21	3.2	10.5	0.31	0	0	0.0	-0.1%
	long	483				0	30	1.9	21.6%
Silver	short	10	5.2	19.0	0.27	1	0	0.6	1.9%
	long	462				1	203	0.7	15.8%
Palladium	short	42	11.6	22.9	0.51	-1	11	-0.5	-4.2%
	long	273				-1	12	-0.3	-6.4%
Platinum	short	105	3.2	18.3	0.18	0	0	0.0	-0.3%
	long	273				-1	11	-0.1	-1.4%
Aluminium	short	105	4.9	15.2	0.32	1	4	0.4	3.4%
	long	357				1	43	0.5	7.4%
Copper	short	147	7.0	17.2	0.40	1	4	0.2	3.0%
	long	399				1	4	0.1	3.2%
Lead	short	126	1.5	19.6	0.08	1	0	0.1	0.9%
	long	357				-1	168	-0.3	-5.8%
Nickel	short	42	12.7	23.2	0.55	1	6	0.5	4.5%
	long	336				-1	203	-0.2	-5.7%
Zinc	short	126	8.5	19.8	0.43	-1	48	-0.3	-3.2%
	long	399				1	0	0.1	1.8%
Wheat	short	168	3.8	23.5	0.16	-1	9	-0.4	-4.6%
	long	294				-1	199	-0.7	-10.7%
Kansas wheat	short	147	8.6	21.0	0.41	-1	7	-0.2	-2.5%
	long	483				-1	263	-0.8	-17.4%
Corn	short	63	7.9	16.8	0.47	-1	7	-0.3	-2.7%
	long	399				-1	11	-0.3	-5.8%
Soybeans	short	42	6.0	14.7	0.41	-1	9	-0.7	-3.9%
	long	231				-1	146	-0.5	-6.5%
Cotton	short	168	5.7	18.8	0.31	-1	242	-0.6	-7.7%
	long	483				-1	243	-0.8	-20.9%
Sugar	short	63	6.6	21.7	0.30	1	2	0.3	2.6%
	long	252				0	1	0.0	-0.3%
Coffee	short	63	7.9	23.7	0.33	1	3	1.3	11.5%
	long	273				0	84	2.8	53.2%
Cocoa*		10	6.1	29.7	0.21	-1	3	-0.9	-3.1%

* For cocoa, uses only short-term momentum and a z-score threshold of 3 rather than 1.5 as for other contracts.

Source: Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

Table A4: Simple return momentum trading rules across international equity indices, bond futures and FX

Optimal look-back period of each momentum strategy combined with a mean reversion indicator that turns signal neutral when momentum z-score more than 1.5 standard deviations above or below mean, and a filter that turns neutral when the z-score is low (below 0.05 and above -0.05) to avoid excessive trading. Look-backs, current signals and z-scores are shown for shorter-term and longer-term momentum separately, along with performance of a combined signal. Annualised return, volatility and information ratio of the signal; current signal; and z-score of the current return over the relevant look-back period; data from 1999 onward.

		Lookback (moving avg, days)	Annualized return (%)	Vol (%)	IR	Current signal	Time since last change (days)	Z-score	% Change of return index from its moving average
S&P 500	short	84	7.3	12.4	0.59	-1	10	-1.3	-6.6%
	long	315				1	52	0.2	2.0%
Nasdaq 100	short	84	9.4	16.3	0.58	-1	10	-1.1	-8.7%
	long	462				1	60	0.4	7.7%
Nikkei	short	63	2.6	13.2	0.19	-1	13	-1.0	-5.5%
	long	420				1	155	0.1	1.0%
FTSE 100	short	168	4.8	12.3	0.39	1	48	0.5	3.1%
	long	504				1	626	1.0	10.9%
Eurostoxx 50	short	168	5.0	16.7	0.30	1	46	0.8	6.8%
	long	294				1	354	0.7	8.0%
MSCI EM	short	42	12.4	11.6	1.07	1	4	0.2	0.9%
	long	357				1	297	0.4	5.8%
HYG credit	short	168	0.8	3.3	0.23	-1	9	-0.3	-0.8%
	long	273				-1	3	-0.1	-0.3%
LQD credit	short	10	2.9	6.7	0.44	-1	0	-0.8	-1.1%
	long	189				-1	0	-0.4	-2.0%
2Y USTs	short	252	1.0	1.1	0.90	1	1	0.1	0.1%
	long	462				-1	0	-0.1	-0.2%
5Y USTs	short	252	1.9	2.8	0.65	0	0	0.0	0.0%
	long	420				-1	0	-0.1	-0.2%
10Y USTs	short	42	2.4	3.5	0.68	1	5	1.0	1.3%
	long	441				-1	0	-0.1	-0.6%
2Y Schatz	short	189	0.6	0.8	0.74	0	4	-1.8	-1.5%
	long	504				0	653	-2.3	-3.8%
5y Bobl	short	63	1.4	1.9	0.74	0	4	-1.8	-1.7%
	long	483				0	0	-1.5	-5.1%
10y Bund	short	105	2.4	3.4	0.70	0	4	-2.2	-4.6%
	long	462				-1	345	-1.5	-7.4%
10Y JGB	short	126	0.9	2.3	0.37	0	27	-2.3	-2.2%
	long	273				0	19	-2.0	-2.6%
10Y Gilts	short	42	2.1	3.9	0.54	-1	4	-0.5	-0.8%
	long	399				0	4	-1.6	-8.4%
10y OAT vs Bund	short	189	0.5	1.5	0.34	1	34	1.1	1.0%
	long	294				1	18	0.5	0.5%
10y BTP vs. Bund	short	84	2.4	6.5	0.36	1	128	0.3	0.9%
	long	273				1	363	0.6	2.7%
Euro	short	42	3.6	6.5	0.56	0	0	1.9	4.0%
	long	273				-1	40	-0.3	-1.7%
Yen	short	21	3.5	6.2	0.55	1	18	0.8	1.3%
	long	462				-1	25	-0.9	-7.8%
Sterling	short	168	1.7	7.1	0.24	-1	35	-0.1	-0.2%
	long	294				-1	101	-0.2	-1.1%
AUD	short	42	4.2	7.9	0.53	0	0	0.0	0.1%
	long	420				-1	115	-0.8	0.0%
CAD	short	168	1.4	6.0	0.24	-1	5	-1.3	-4.9%
	long	504				0	10	-1.6	0.0%

Source: Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

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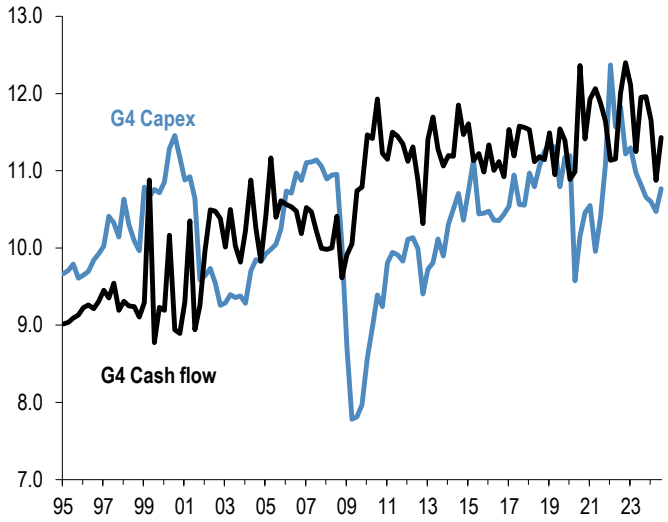
Corporate Activity

Chart A24: G4 non-financial corporate capex and cash flow as % of GDP

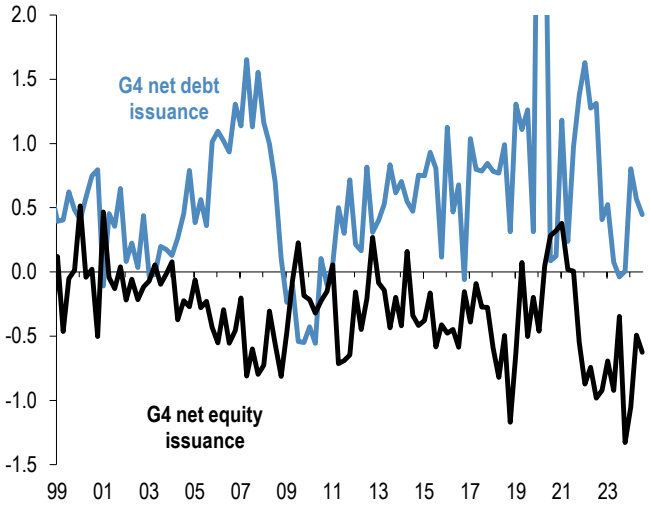
% of GDP, G4 includes the US, the UK, the Euro area and Japan. Last observation as of Q3 2024.



Source: ECB, BOJ, BOE, Federal Reserve flow of funds, J.P. Morgan Flows & Liquidity.

Chart A25: G4 non-financial corporate sector net debt and equity issuance

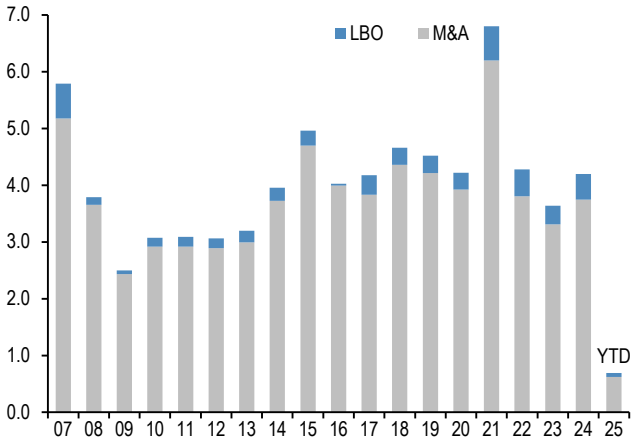
$tr per quarter, G4 includes the US, the UK, the Euro area and Japan. Last observation as of Q3 2024.



Source: ECB, BOJ, BOE, Federal Reserve flow of funds, J.P. Morgan Flows & Liquidity.

Chart A26: Global M&A and LBO

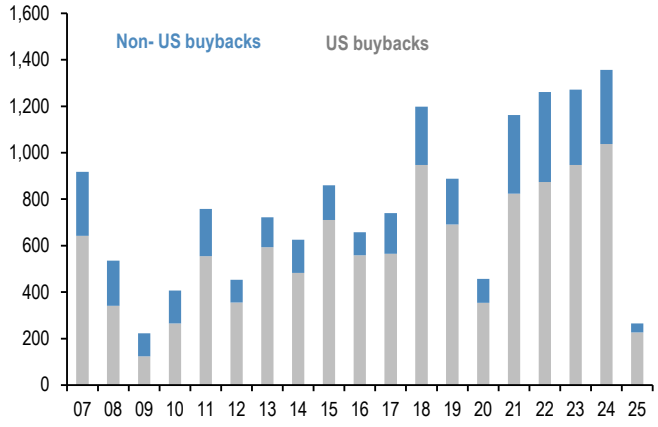
$tr. M&A and LBOs are announced.



Source: Dealogic, J.P. Morgan Flows & Liquidity.

Chart A27: US and non-US share buyback

$bn, are as of March.



Source: Bloomberg Finance L.P., Thomson Reuters, J.P. Morgan Flows & Liquidity.

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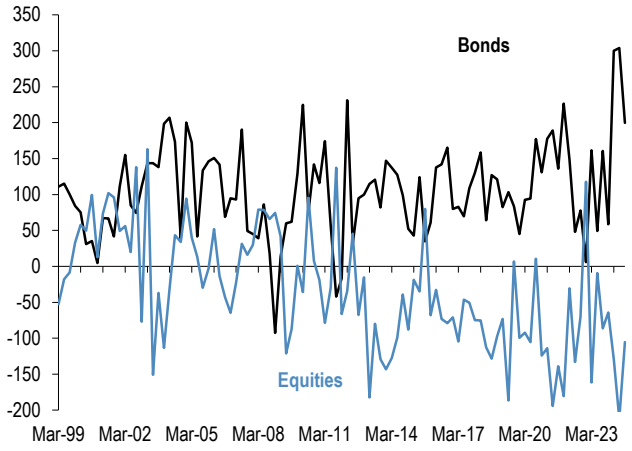
Pension fund and insurance company flows

Chart A28: G4 pension funds and insurance companies equity and bond flows

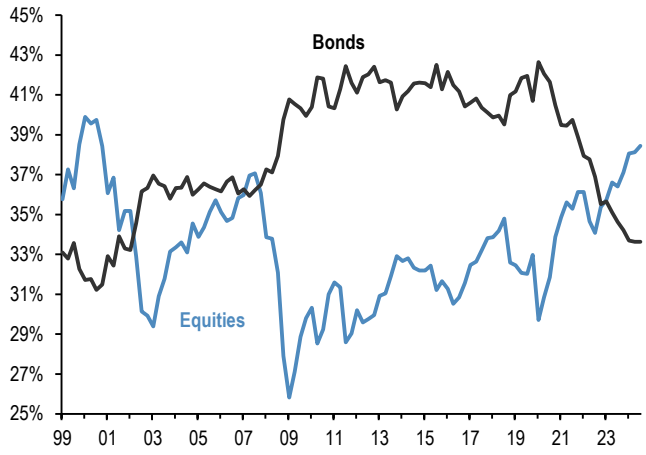
Equity and bond buying in $bn per quarter. G4 includes the US, the UK, Euro area and Japan. Last observation is Q3 2024.



Source: ECB, BOJ, BOE, Federal Reserve flow of funds, J.P. Morgan Flows & Liquidity.

Chart A29: G4 pension funds and insurance companies equity and bond levels

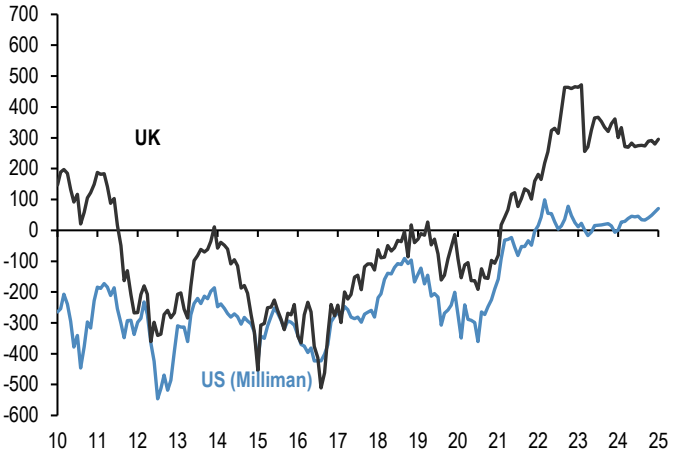
Equity and bond as % of total assets per quarter. G4 includes the US, the UK, Euro area and Japan. Last observation is Q3 2024.



Source: ECB, BOJ, BOE, Federal Reserve flow of funds., J.P. Morgan Flows & Liquidity.

Chart A30: Pension fund deficits

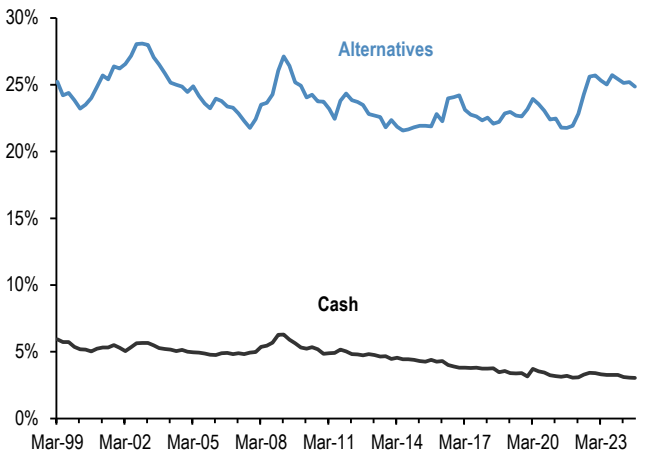
US$bn. For US, funded status of the 100 largest corporate defined benefit pension plans, from Milliman. For UK, funded status of the defined benefit schemes eligible for entry to the Pension Protection Fund, converted to US$ at today's exchange rates. Last obs. is Jan'25 for US & UK.



Source: Milliman, UK Pension Protection Fund, J.P. Morgan Flows & Liquidity.

Chart A31: G4 pension funds and insurance companies cash and alternatives levels

Cash and alternative investments as % of total assets per quarter. G4 includes the US, the UK, Euro area and Japan. Last observation is Q3 2024.



Source: ECB, BOJ, BOE, Federal Reserve flow of funds, J.P. Morgan Flows & Liquidity.

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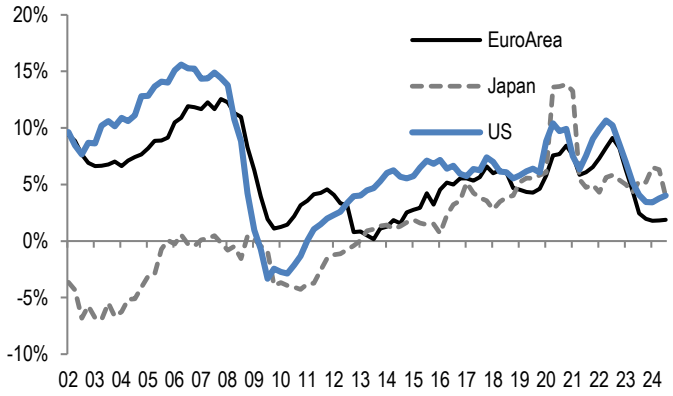
Credit Creation

Chart A32: Credit creation in the US, Japan and Euro area

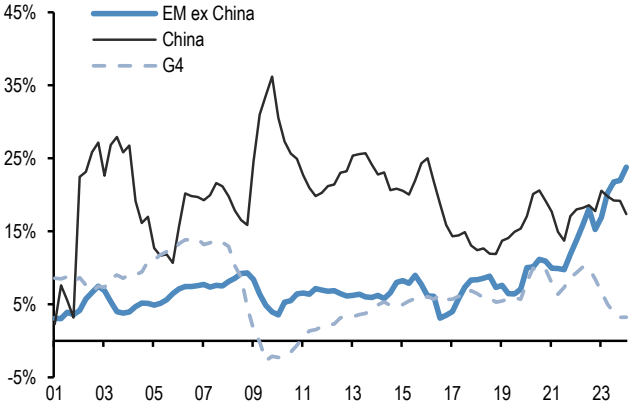
Rolling sum of 4-quarter credit creation as % of GDP. Credit creation includes both bank loans as well as net debt issuance by non-financial corporations and households. Last obs. is Q3'24 for Japan, Euro Area and US.



Source: Fed, ECB, BoJ, Bloomberg Finance L.P., and J.P. Morgan Flows & Liquidity.

Chart A33: Credit creation in EM

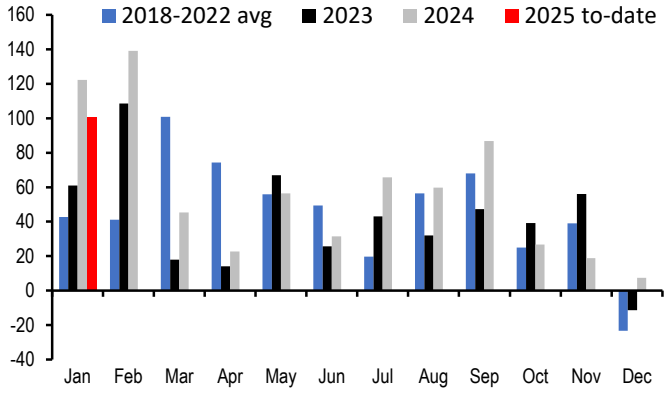
Rolling sum of 4-quarter credit creation as % of GDP. Credit creation includes both bank loans as well as net debt issuance by non-financial corporations and households. Last obs. is for Q2'24.



Source: G4 Central banks FoF, BIS, ICI, Barcap, Bloomberg Finance L.P., IMF, and J.P. Morgan Flows & Liquidity.

Chart A34: Monthly net issuance of US HG bonds

$bn. 2025 till Jan 31st.



Source: Dealogic, J.P. Morgan Flows & Liquidity.

Table A5: Equity and Bond issuance

$bn, Equity supply and corporate announcements are based on announced deals, not completed. M&A is announced deal value and buybacks are announced transactions. Y/Y change is change in YTD announcements over the same period last year.

Equity Supply	7-Mar	4 wk avg	13 wk avg	y/y chng
Global IPOs	0.9	2.6	2.3	822%
Secondary Offerings	11.1	12.8	7.3	736%
Corporate announcements				
M&A - Global	91.9	72.3	66.0	515%
- US Target	17.4	24.1	27.1	398%
- Non-US Target	74.5	48.3	38.9	656%
Net bond issuance	**Jan-25**	**3 mth avg**	**YTD avg**	**y/y chng**
USD	325	232	325	-3%
Non-USD	252	19	252	-31%

Source: Bloomberg Finance L.P., Dealogic, Thomson Reuters, J.P. Morgan Flows & Liquidity.

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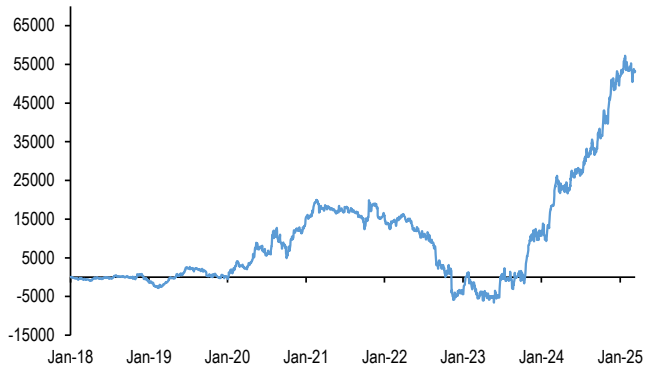
Bitcoin monitor

Chart A35: Our Bitcoin position proxy based on open interest in CME Bitcoin futures contracts

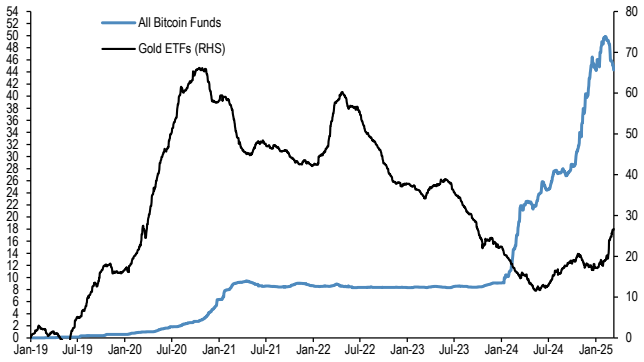
In number of contracts. Last obs. for 11th Mar 2025.



Source: Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

Chart A36: Cumulative Flows in all Bitcoin funds and Gold ETF holdings

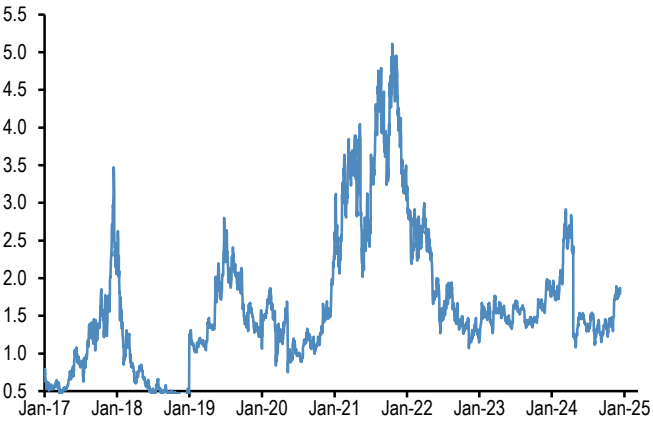
Both the y-axis in $bn.



Source: Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

Chart A37: Ratio of bitcoin market price to production cost

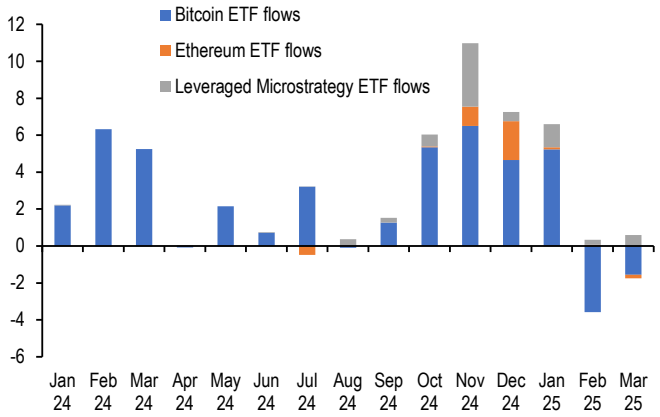
Based on the cost of production approach following Hayes (2018).



Source: Coin Metrics, J.P. Morgan Flows & Liquidity.

Chart A38: Monthly flows into spot bitcoin ETFs , spot ethereum ETFs and leveraged MicroStrategy ETF

$bn.



Source: Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

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Japanese flows and positions

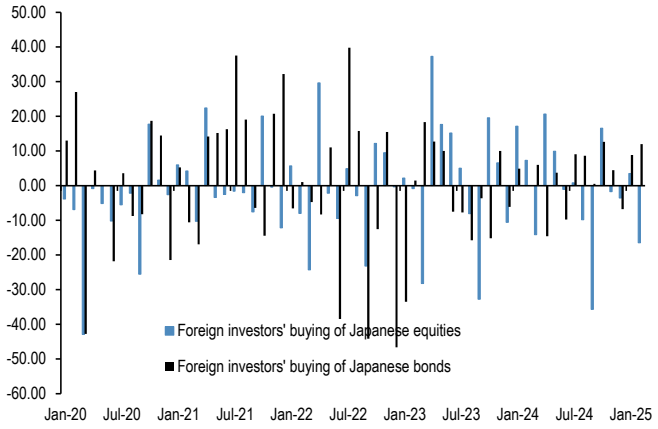
Chart A39: Tokyo Stock Exchange margin trading: total buys minus total sells

In bn of shares. Topix on right axis.

Source: Tokyo Stock Exchange, Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

Chart A40: Monthly net purchases of Japanese bonds and Japanese equities by foreign residents

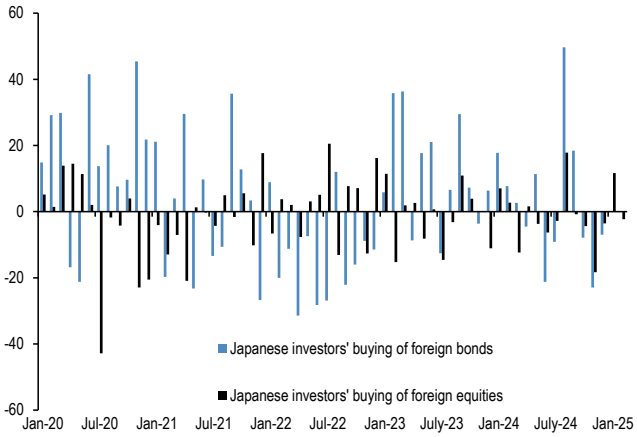
$bn, Last weekly obs. is for 28th Feb' 25.



Source: Japan MoF, Bloomberg Finance L.P., and J.P. Morgan Flows & Liquidity.

Chart A41: Monthly net purchases of foreign bonds and foreign equities by Japanese residents

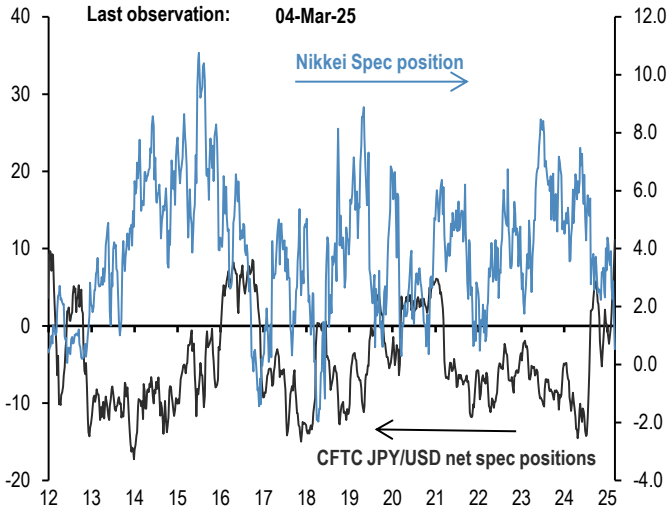
$bn, Last weekly obs. is for 28th Feb' 25.



Source: Japan MoF, Bloomberg Finance L.P., and J.P. Morgan Flows & Liquidity.

Chart A42: Overseas CFTC spec positions

CFTC spec positions are in $bn. For Nikkei we use CFTC positions in Nikkei futures (USD & JPY) by Leveraged funds and Asset managers.



Source: Bloomberg Finance L.P., CFTC, J.P. Morgan Flows & Liquidity.

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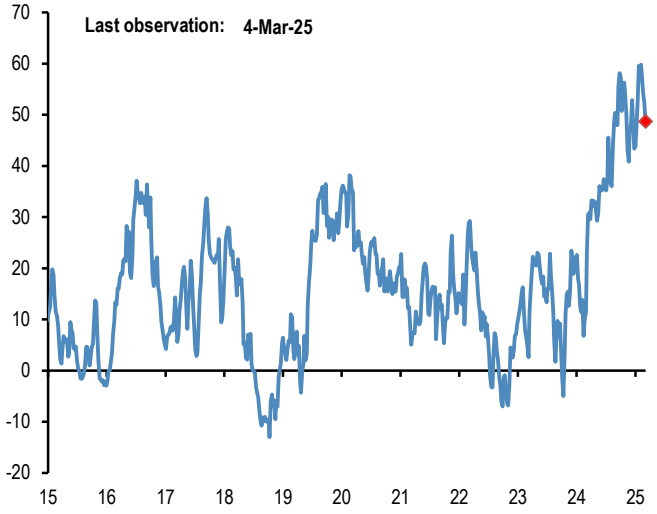
Commodity flows and positions

Chart A43: Gold spec positions

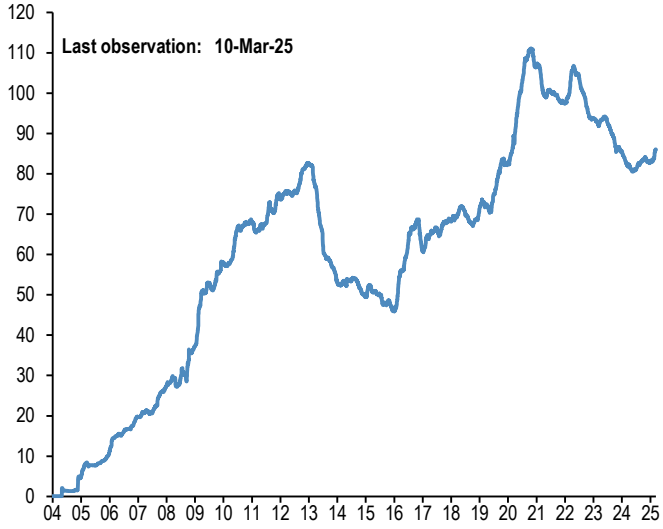
$bn. CFTC net long minus short position in futures for the Managed Money category.



Source: CFTC, Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

Chart A44: Gold ETFs

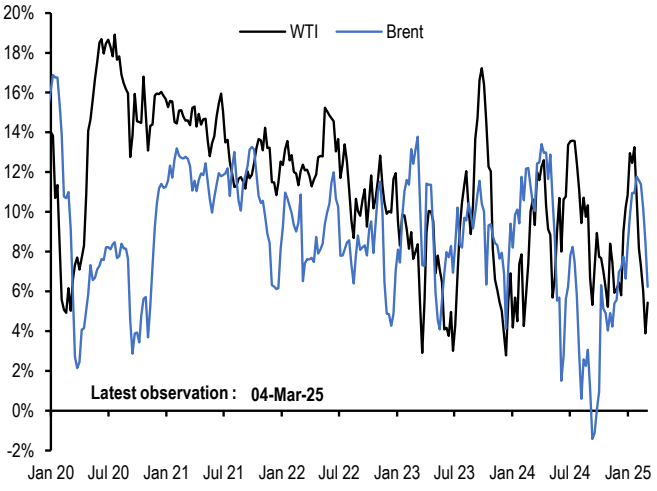
Mn troy oz. Physical gold held by all gold ETFs globally.



Source: Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

Chart A45: Oil spec positions

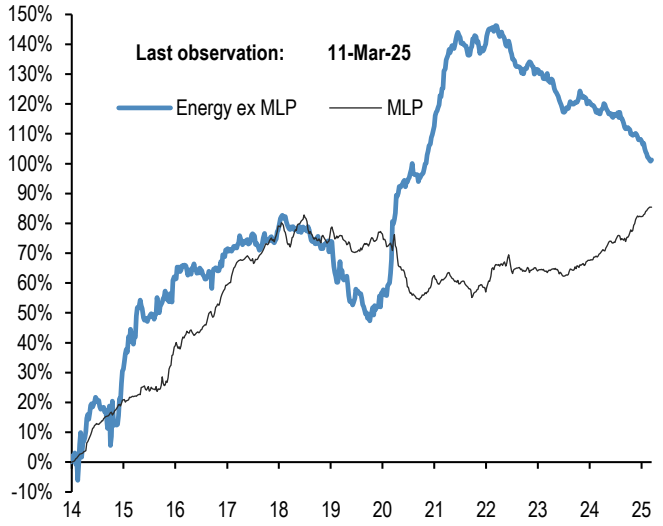
Net spec positions divided by open interest. CFTC futures positions for WTI and Brent are net long minus short for the Managed Money category.



Source: CFTC, Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

Chart A46: Energy ETF flows

Cumulative energy ETFs flow as a % of AUM. MLP refers to the Alerian MLP ETF.



Source: CFTC, Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

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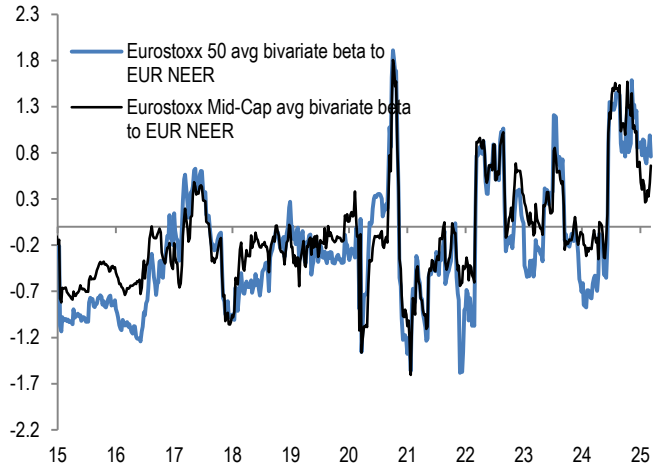
Corporate FX hedging proxies

Chart A47: Average beta of Eurostoxx 50 companies and Eurostoxx Mid-Cap to trade-weighted EUR

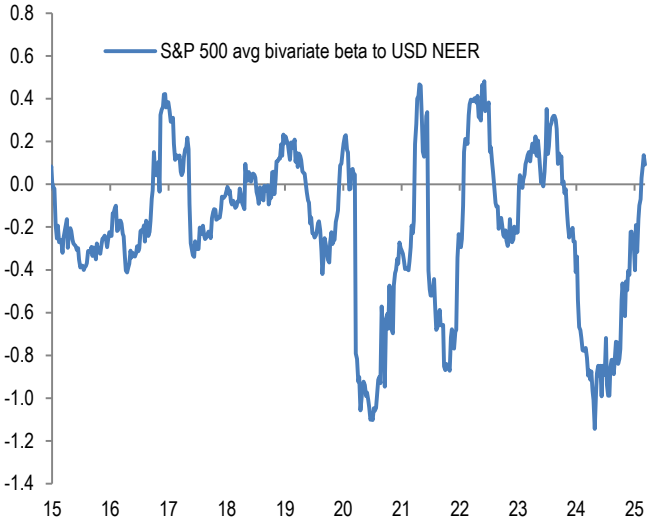
Rolling 26 weeks average betas based on a bivariate regression of the weekly returns of individual stocks in the Eurostoxx 50 index to the weekly returns of the MSCI AC World and JPM EUR Nominal broad effective exchange rate (NEER).



Source: Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

Chart A48: Average beta of S&P500 companies to trade-weighted US dollar

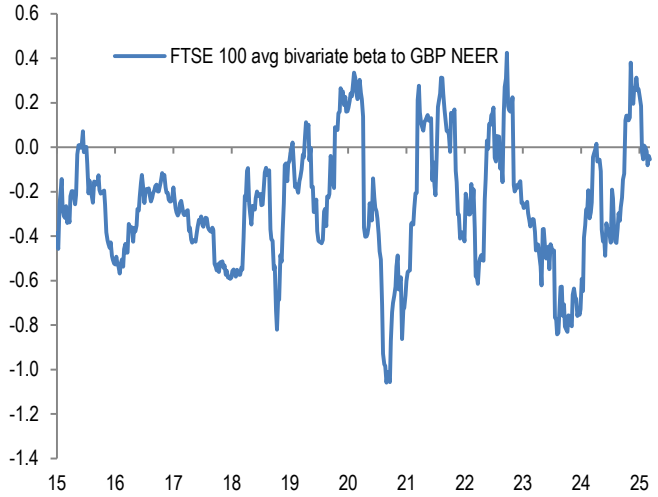
Rolling 26 weeks average betas based on a bivariate regression of the weekly returns of stocks in the S&P500 index to the weekly returns of the MSCI AC World and JPM USD Nominal broad effective exchange rate(NEER).



Source: Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

Chart A49: Average beta of FTSE 100 companies to trade-weighted GBP

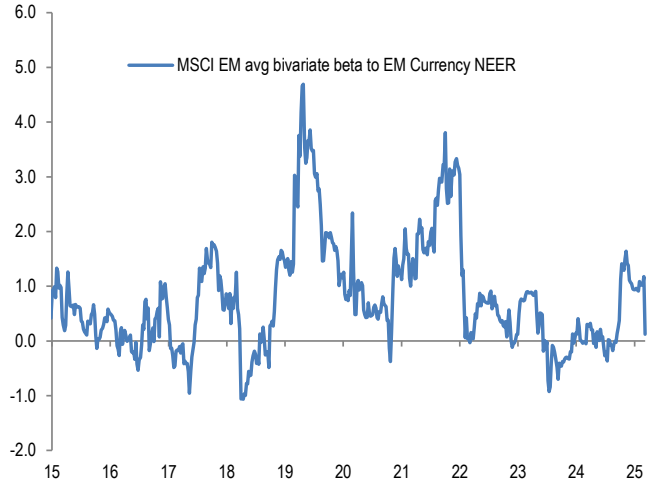
Rolling 26 weeks average betas based on a bivariate regression of the weekly returns of individual stocks in the FTSE 100 index to the weekly returns of the MSCI AC World and JPM GBP Nominal broad effective exchange rate (NEER).



Source: Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

Chart A50: Average beta of MSCI EM companies to trade-weighted EM Currency Index

Rolling 26 weeks average betas based on a bivariate regression of the weekly returns of individual stocks in the MSCI EM index to the weekly returns of the MSCI AC World and JPM EM Nominal broad effective exchange rate (NEER).



Source: Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

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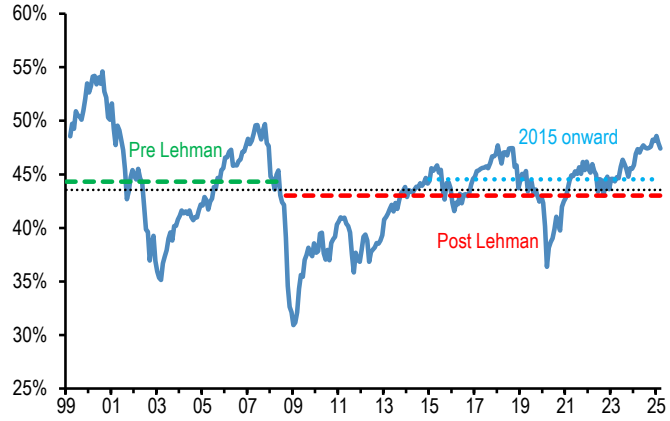
Non-Bank investors' implied allocations

Chart A51: Implied equity allocation by non-bank investors globally

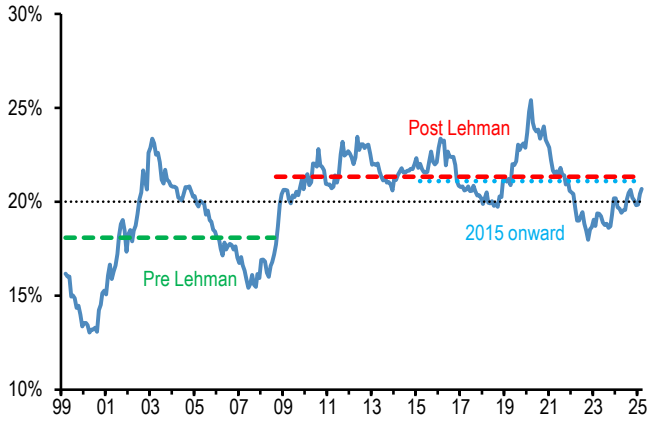
Global equities as % total holdings of equities/bonds/M2 by non-bank investors. Dotted lines are averages.



Source: Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

Chart A52: Implied bond allocation by non-bank investors globally

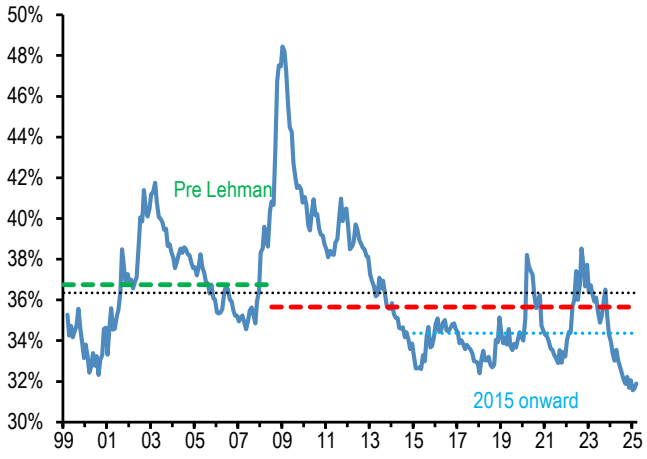
Global bonds as % total holdings of equities/bonds/M2 by non-bank investors. Dotted lines are averages.



Source: Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

Chart A53: Implied cash allocation by non-bank investors globally

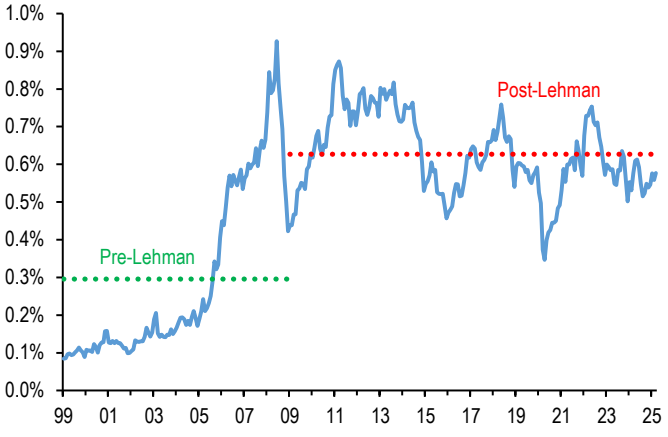
Global cash held by non-bank investors as % total holdings of equities/bonds/M2 by non-bank investors. Dotted lines are averages.



Source: Bloomberg Finance L.P., J.P. Morgan Flows & Liquidity.

Chart A54: Implied commodity allocation by non-bank investors globally

Proxied by the open interest of commodity futures ex gold as % of the stock of equities, bonds and cash held by non-bank investors globally.



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Completed 12 Mar 2025 10:53 PM GMT

Disseminated 12 Mar 2025 10:53 PM GMT