Flows & Liquidity

The return of retail investors

- **Both the older and the younger cohorts of retail investors added risk YTD.**
- **The younger cohorts' impulse into equities rose in recent weeks to the highest level since last August.**
- **The older cohorts have been buying both equity and bond funds at a strong pace YTD, reviving memories of the asset reflation flows of 2017.**
- **2H22 saw some evidence of FX reserve managers shifting into gold.**
- **How will ethereum staking change following the Shanghai upgrade?**

- The older cohorts of retail investors, i.e. the ones that tend to invest via funds including ETFs, injected \$81bn into bond funds and \$44bn into equity funds YTD. This represents an abrupt change from last year when these older cohorts had sold an unprecedented -\$340bn of bond funds and bought no equity funds. The YTD fund buying also revives memories of the asset reflation flows of 2017 when retail investors had bought both equity and bond funds simultaneously at a strong pace as shown in Figure 1
- This abrupt change in behaviour at the beginning of 2023 is perhaps driven by increased confidence among retail investors that inflation has entered a downward trajectory and that the Fed policy rate is approaching its peak. Therefore, unless inflation reaccelerates inducing a significantly higher peak in the Fed funds rate than currently expected, it is likely that the YTD flow patterns by the older cohorts of retail investors will be sustained supporting both equities and bonds during 2023

Global Markets Strategy
Global Quantitative & Derivatives Strategy

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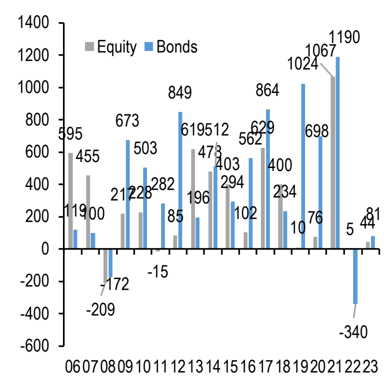
Figure 1: Global equity & bond fund flows

\$bn per year of Net Sales, i.e. includes net new sales + reinvested dividends for MF and ETFs. Flows are from ICI (worldwide data up to Q3'22). Data since then are a combination of monthly and weekly data from ICI, EPFR and ETF flows from Bloomberg Finance L.P



Source: ICI, Lipper, EPFR, , Bloomberg Finance L.P. J.P. Morgan

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See page 22 for analyst certification and important disclosures.

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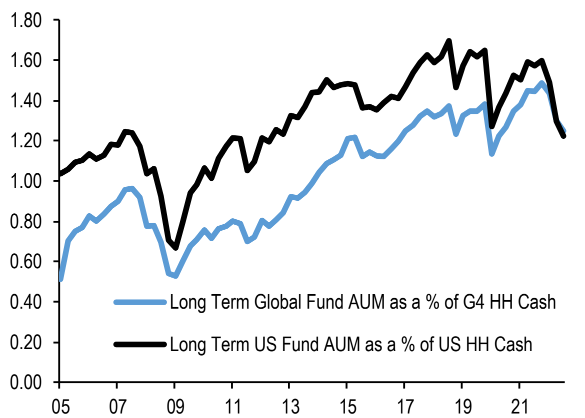
- This is also because retail investors had become rather underinvested in longer-term funds relative to their cash balances during the second half of 2022. This is shown by Figure 2 which compares the AUM of longer-term funds (i.e. bond, equity and hybrid funds excluding Money Market Funds) relative to the cash balances of the Household sector across the US, Euro area, UK and Japan. The data come from Flow of Funds and Q3 2022 is the last available observation. As can be seen in Figure 2, the ratio of longer-term funds to household cash holdings had declined by Q3 2022 to levels last seen during the pandemic crisis in March 2020 and well below the norms of the past decade. As households had become underinvested in longer-term funds and overweight cash, they have been deploying these excess cash balances into both equity and bond funds now that the inflation and policy backdrop looks more benign.

Figure 2: Ratio of the AUM of longer-term funds (i.e. bond, equity and hybrid funds excluding Money Market Funds) worldwide relative to the cash balances of the Household sector across the G4 (US, Euro area, UK and Japan)
last obs is for Q3 2022.



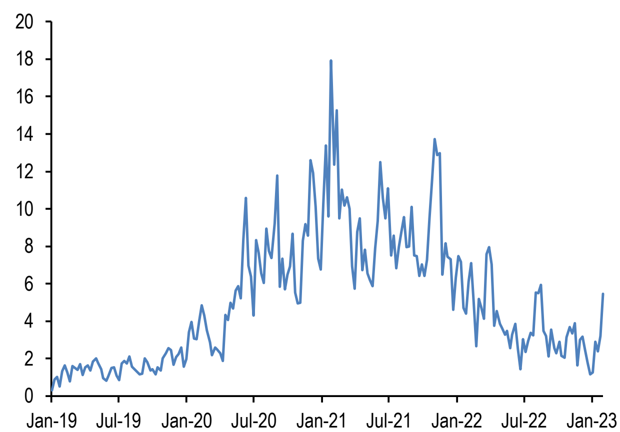
Source: J.P. Morgan

- What about the younger cohorts of retail investors that tend to use leverage via margin accounts and tend to invest in the equity market via individual stocks or options on individual stocks? We do not have yet the monthly data from NYSE margin accounts for the month of January. However our higher frequency (i.e. weekly) proxy based on small traders' equity call option flows, i.e. option customers with less than 10 contracts, show a sharp rebound YTD. These data come from OCC, the world's largest equity derivatives clearing organization. They are weekly, with the week ending February 3rd as the last available observation. Figure 3 depicts these small traders' call option flows for exchange-traded individual equity options in the US. This call option flow has increased markedly in recent weeks to its highest level since last August.

- Proxies of the US retail impulse into tech-related individual stocks are sending a similar message of re-emergence of buying by the younger cohorts of retail investors. These younger cohorts of retail investors tended to favour large tech stocks as well as small caps and as a result their stock preference can be thought of as a barbell trade. From a performance perspective, this barbell trade can be proxied by the performance of Russell 2000 and Nasdaq indices vs. that of the S&P500. This relative performance proxy shown in Figure 4 rebounded in recent weeks pointing to re-risking by the younger cohorts. Equity baskets containing stocks popular with US retail trading platforms shown in Figure 5 are conveying a similar message.

- In all, both the older and the younger cohorts of retail investors added risk YTD. The younger cohorts' impulse into equities rose in recent weeks to the highest level since last August. The older cohorts have been buying both equity and bond funds at a strong pace YTD, reviving memories of the asset reflation flows of 2017.

Figure 3: Exchange-traded Call Option Buys at Open minus Sells at Open for Costumers with less than 10 contracts for options on individual equities
In mn contracts. Last obs is for the week ending 3 Feb 2023.



Source: J.P. Morgan

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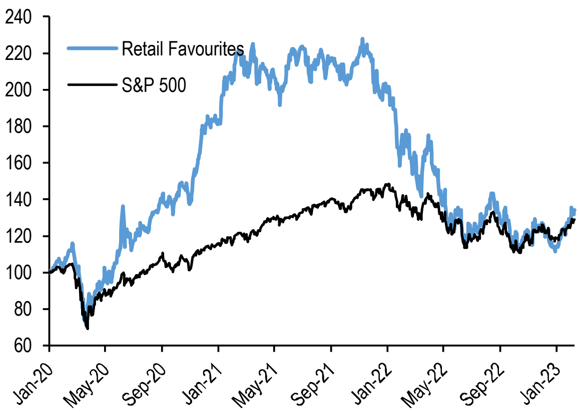
Figure 4: Retail Investors' Favorites US equity basket

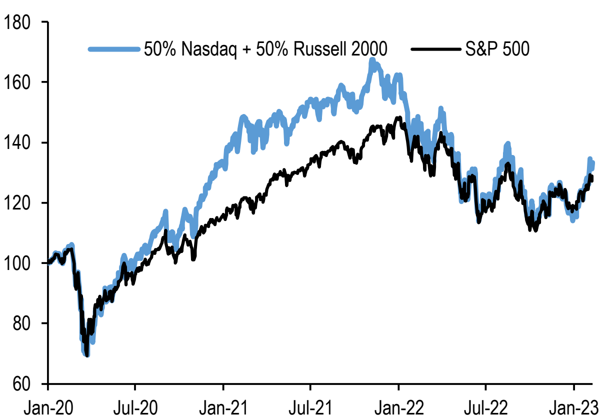
Return Index.



Source: J.P. Morgan

Figure 5: Performance of 50% Nasdaq + 50% Russell 2000 vs S&P500 index

Return Index.



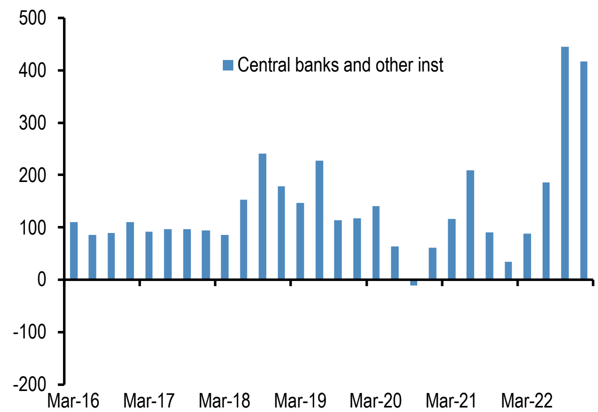
Source: J.P. Morgan

2H22 saw some evidence of FX reserve managers shifting into gold

- Following recent reports of increased gold purchases by central banks, question in our conversations about whether the Ukraine crisis and the sanctions that followed have resulted in changes in behaviour by FX reserve managers have resurfaced. In particular, it has raised the question whether some central banks will prefer to diversify their reserves to include higher shares of gold and currencies like the Renminbi.
- There has undoubtedly been a sharp pickup in demand for gold from central banks. Figure 6 shows the quarterly gold demand by central banks, which suggests a significant pickup in the pace of central bank gold purchases in 2H22 to over 400 tonnes per quarter compared to the average quarterly pace of around 100-150 tonnes. In dollar terms, using the average LBMA daily price over the past year of around $1800 per troy ounce, this implies an increase from $6bn-$8bn per quarter to close to $25bn per quarter in 2H22. Moreover, these flows took place at a time when gold prices were rising, which is not consistent with gold purchases increasing simply for rebalancing purposes.

Figure 6: Central bank gold demand

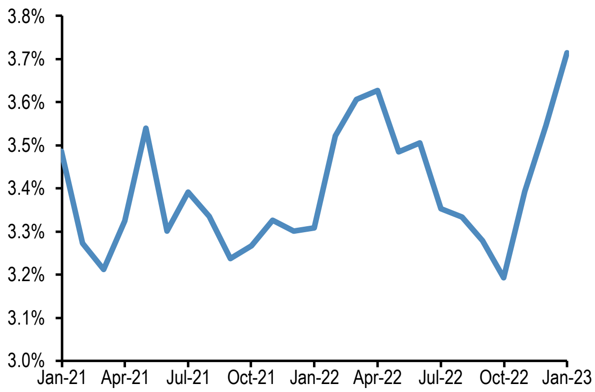
In Tonnes per quarter.



Source: World Gold Council, J.P. Morgan

- Part of this increase in gold demand has come from the PBOC, which has increased its gold holdings as part of its official reserves by nearly 80 tonnes from end-Oct22 to end-Jan23, or around $5bn at average prices over the three-month period. The previous episode of marked increases in China's gold holdings were in from Dec 2018 to Sep 2019 as US-China trade relations grew more strained, when the PBOC's gold holdings increasing by around 105 tonnes over 10 months. The gold purchases from end-Oct22 to end-Jan23 has seen the gold share of total official reserves rise from 3.2% in Oct22 to 3.7% in Jan23, though a significant part of this rise stems from the rise in gold prices over the same period. Moreover, since just over 60 tonnes of PBOC purchases took place in 4Q22, this means that the 420 tonnes of purchases in 3Q22 and the remaining 340 tonnes were by other central banks. In other words, while China's gold purchases since October attracted publicity, they account for less than a tenth of central bank gold purchases during the second half of 2022.

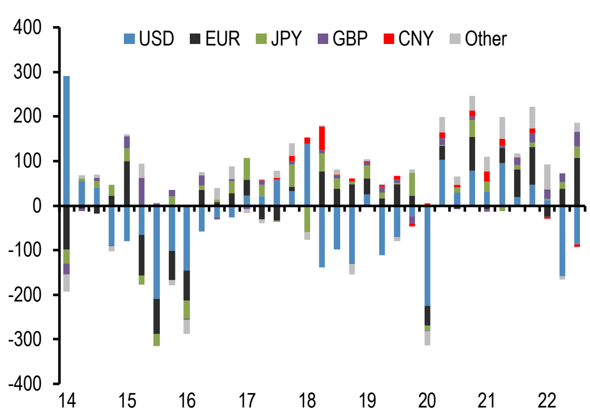
Figure 7: PBOC gold holdings as a % of official reserves
In %.



Source: PBOC, J.P. Morgan

- What about broader FX reserve manager flows? As we noted last week, the COFER data on reported reserves suggest that, after controlling for FX and bond returns, USD reserves saw combined net sales of nearly $250bn in 2Q22 and 3Q22. However, we also argued that given the large dollar appreciation over the period, those net sales of USD reserves were at least in part due to the typical contrarian behaviour by reserve managers as they sought to rebalance their reserves. Indeed, when we look at the dollar share of total reserves in the COFER data, if anything it increased modestly in 2022. This suggests that the outflows from dollars were insufficient to completely rebalance portfolios after the dollar appreciation, and not consistent with diversification flows out of dollars at least at an aggregate level.

Figure 8: Quarterly flows by FX Reserve Managers
In $bn per quarter. Based on COFER data adjusted for both bond and FX returns. Last obs. is for Q3 2022.



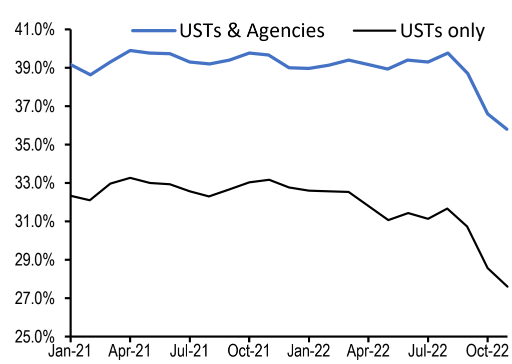
Source: IMF COFER, J.P. Morgan

Figure 9: Share of USD in aggregate FX Reserves
Last obs. is for Q3 2022.

Source: IMF COFER, J.P. Morgan

- There is however some evidence reserve diversification out of dollar reserves by the PBOC. As our China economists have noted (China: FX reserves rose $56.8bn, Feb 7th), the holdings of USTs by Chinese residents, a proxy for holdings by the central banks, has declined not just in dollar terms as the Fed has continued its hiking cycle, but also as a share of total official reserves. If we add Agency bonds from the US TIC holdings data, a similar picture emerges of a sharp drop after August 2022 (Figure 10). The figure likely understates total holdings, however, as the country attribution in the foreign holdings of US securities in the US TIC data do not capture bond holdings of a country held in custody at a third country.
- In all, there appears to be some evidence of reserve diversification flows in terms of increased gold purchases by FX reserve managers in 2H22. Outside the PBOC, there is little evidence of diversification flows out of dollar reserves at an aggregate level in 2022. There is also little evidence of CNY being a beneficiary of reserve diversification flows in 2022.

Figure 10: Holdings of USTs and Agencies by Chinese residents as % of official reserves
In %.



Source: US Treasury, SAFE, J.P. Morgan

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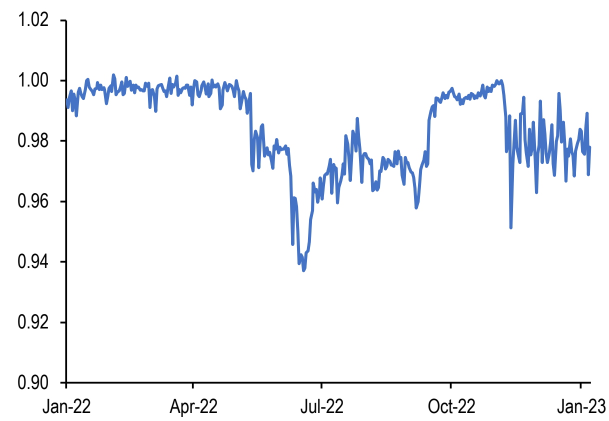
Ethereum staking following the Shanghai upgrade?

- The Ethereum ecosystem is set to launch its next major upgrade called "Shanghai" by March. This upgrade will allow stakers to withdraw ETH which have been locked since December 2020 in the beacon chain. The upgrade has undergone a set of trials already. Once successfully implemented in March the validators would be able to withdraw their staked ETH either partially or wholly. If they chose to withdraw partially, they will only be able to withdraw accrued rewards and not the initial ether staked and the validator would continue to validate transactions on the Ethereum network. In the case of full withdrawal, the validators will completely exit and stop being part of the ethereum network. For both options, validators would need to update their withdrawal credentials before the upgrade. At present, roughly 60% of the roughly half million validators are yet to update their credentials before the Shanghai upgrade. For validators who have updated their credentials, the accrued rewards would be sent automatically to the validators' withdrawal address. If the validator wants to fully exit the network, they will need to manually request for a complete exit. A maximum of seven validator exits can be processed over the beacon chain per epoch that happens in every 6.4 minutes, implying a maximum of 1600 validators could fully exit per day. The delay would depend on how many validators attempt to exit and could be as long as several months if many validators decide to exit at the same time. In other words, the difficulty and the potential delay that validators are facing in fully exiting the network, should confine liquidations over the near term to the accrued rewards of about one million ether, thus limiting the near-term downside.

- Over the medium term, we believe that the Shanghai upgrade will increase ethereum's staking ratio which is likely to converge over time to that of other proof-of-stake (PoS) networks. A significant portion of the future increase in staking will likely move to liquid staking protocols. Liquid staking protocols like Lido let ether holders stake without running a validator node. Since ether is pooled, a single user can stake fractions of ether without the need to post a minimum threshold of 32 ETH. More importantly, liquid staking protocols enable liquidity for staked assets, which would otherwise be locked in the staking contracts, by provide an equal amount of derivative token (for instance, Lido's stETH) in exchange for staked ether which can be traded.

- These liquid staking protocol derivative tokens have typically traded at below their underlying asset in the past but as we approach the upgrade these tokens are converging to parity vs. ether as any deviation from this parity would create arbitrage opportunities (Figure 11). One could argue that the utility of these liquid staking protocols would get reduced as we approach the Shanghai upgrade. The counterargument is that the utility of these protocols is not limited to providing liquidity but also acting as an intermediary for retail investors, which otherwise would face a barrier of 32 ETHs for staking. These liquid staking protocols have as a result become major Defi players. At the beginning of this year, the Lido had surpassed MarkerDAO in terms of total value locked (TVL) and had become the biggest protocol in terms of TVL within the Defi space (Figure 12).

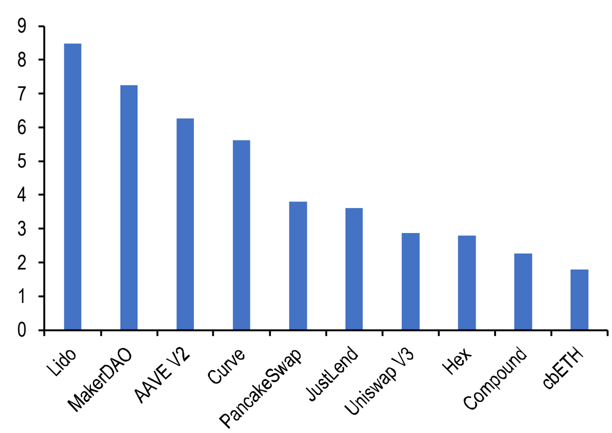
Figure 11: stETH to ETH ratio



Source: J.P. Morgan

Figure 12: Total Value Locked in Defi

$bn.



Source: J.P. Morgan

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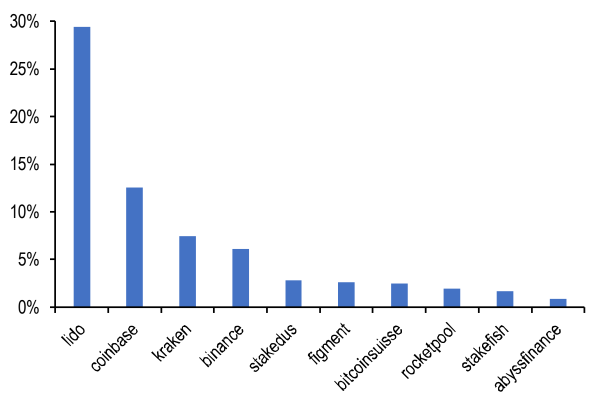
- Admittedly the rise of Lido and other liquid staking protocols following the Merge has been raising concerns about network centralization. Last September's Merge brought various benefits to the Ethereum network such as a huge reduction in power consumption by more than 99% and a reduction in ether's inflation rate by more than four percentage points. Along with those benefits, it also brought more centralization as fewer entities such as liquidity staking protocols control the majority of the staked ether, ultimately controlling validation and network security. For example, Lido, being the largest liquidity provider not just for staked ether but for other tokens of proof of stake blockchains, currently enjoys more than 30% of market share in staked ether and even higher in the overall liquid staking space (Figure 13).

Figure 13: ETH staking share of various providers



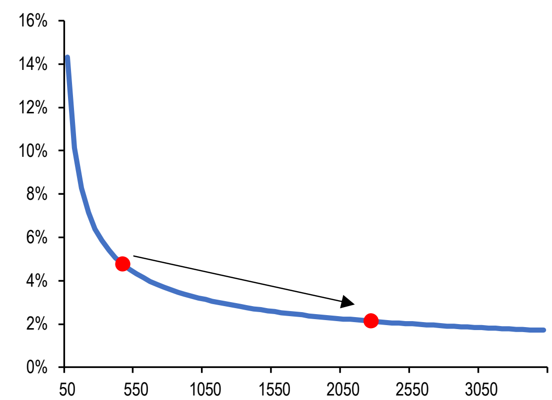
Source: J.P. Morgan

- What impact will the Shanghai upgrade have over Ethereum staking yield? We noted in our previous publication, how the staking yield excluding fees and other rewards get impacted by the number of validators in Figure 14. The current total staking yield (which apart from standard block rewards it includes variable rewards from transaction fees, tips and MEV) stands at 7.4% for each validator with 32 ETH. As a reminder to our readers, there are additional rewards beyond the standard block rewards issued by the ethereum network. These additional rewards are variable and depend on transaction fees paid by the users when transacting on the network, tips paid to the validators to prioritize user transactions or MEV (Maximum Extractable Value) rewards when the orders are rearranged before placing/validating the transactions into the block.

- Compared to other major proof-of-stake networks such as Avalanche, BNB, Cardano, Polkadot and Solana, Ethereum has a quite relatively low staking ratio of about 14% at the moment vs. 60% on average for the other networks (Figure 15). This points therefore to plenty of room for the ethereum staking ratio to increase after the Shanghai upgrade. Assuming the staking ratio converges over time to the 60% average of other major PoS networks, the validator number would increase from 0.5 million to 2.2 million and the yield would fall from 7.4% current to around 5%.

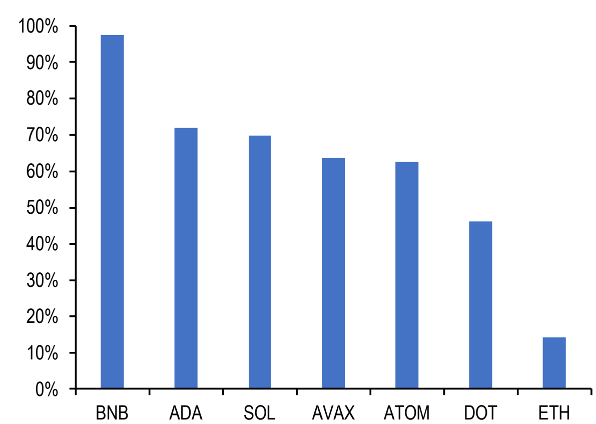
Figure 14: ETH standard staking yield excluding fees as a function of the number of validators

The horizontal axis represents number of validators in thousands, the vertical axis represents the staking yield excluding variable rewards. The staking yield in the graph is the standard block reward that is issued by ethereum network and can be treated as fixed rewards given to the validator set irrespective the activity over ethereum. Other rewards such as transaction fees, tips given by users to prioritize certain transactions and MEV (maximum extractable value) which are rewards earned through reordering the transaction before sending them into a block on the network. These other rewards are variable rewards as these are transferred from users to validators which are dependent on the level of activity over the network ultimately benefiting validators in increasing their overall staking yield.



Source: J.P. Morgan

Figure 15: Staking ratio of major proof of stake blockchains



Source: J.P. Morgan

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Table A1: Weekly flow monitor

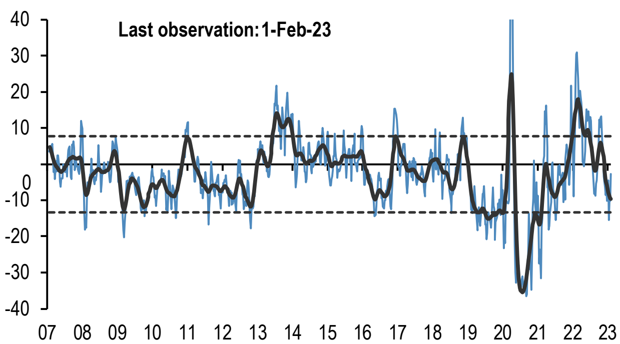
$bn, Includes Global Mutual Fund flows from EPFR and globally domiciled ETF flows from Bloomberg Finance L.P.. US Equities includes US Domiciled MFs from ICI and ETF flows from Bloomberg Finance L.P.

MF & ETF Flows	1-Feb	4 wk avg	13 wk avg	2023 avg
All Equity	16.05	11.2	0.6	6.7
All Bond	7.78	13.0	4.6	9.7
US Equity	5.84	-1.2	-10.1	-5.2
Intl. Equity	9.94	12.0	9.5	10.60
Taxable Bonds	-2.96	4.6	0.4	2.9
Municipal Bonds	-0.27	-0.2	-1.3	-0.6

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

Chart A1: Fund flow indicator

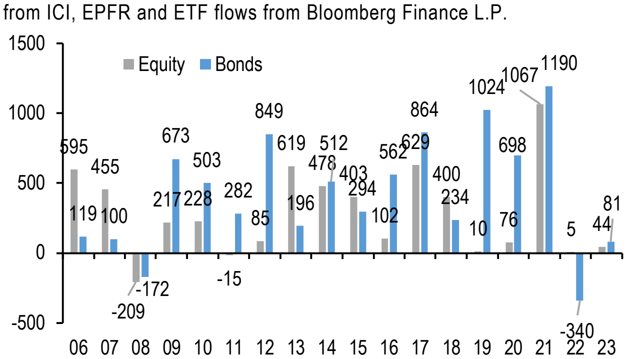
Difference between flows into Equity and Bond funds: $bn per week. Flow includes US domiciled Mutual Fund and globally domiciled ETF flows. We exclude China On-shore funds from our analysis. The thin blue line shows the 4-week average of difference between Equity and Bond fund flows. Dotted lines depict ±1 StDev of the blue line. 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: Bloomberg Finance L.P., ICI, J.P. Morgan.

Chart A2: Global equity & bond fund flows

$bn per year of Net Sales, i.e. includes net new sales + reinvested dividends for MF and ETFs. Flows are from ICI (worldwide data up to Q3'22). Data since then are a combination of monthly and weekly data from ICI, EPFR and ETF flows from Bloomberg Finance L.P.



Source: ICI, Lipper, EPFR, , Bloomberg Finance L.P. J.P. Morgan.

Table A2: 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. More details on net bond issuances in Chart A40.

Equity Supply	27-Jan	4 wk avg	13 wk avg	y/y chng
Global IPOs	0.2	0.9	2.0	-85%
Secondary Offerings	3.0	5.1	5.9	-58%
Corporate announcements				
M&A - Global	16.8	26.9	52.8	-64%
- US Target	10.7	11.7	23.2	-67%
- Non-US Target	6.1	15.2	29.7	-62%
Net bond issuance	**Jul-22**	**3 mth avg**	**YTD avg**	**y/y chng**
USD	-81	-54	61	-10%
Non-USD	-11	3	30	-4%

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

Table A3: Trading turnover monitor

Volumes are monthly and Turnover ratio is annualized (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 Dec-22	MIN	MAX	Turnover ratio	Vol (tr)	y/y chng
Equities					
EM Equity*			0.7	$0.7	-38%
DM Equity*			1.2	$6.8	-1%
Govt Bonds					
UST cash			8.4	$10.1	-2%
UST futures			0.5	$8.4	-2%
JGBs*			35.5	¥3,294	59%
Bund futures			0.3	€1.3	-12%
Credit					
US HG			0.7	$0.4	10%
US HY			0.6	$0.1	-13%
US Convertibles			2.2	$0.0	26%
Commodities					
Gold			25.6	$0.6	-7%
Oil			74.3	$1.7	-3%
Copper			3.2	$0.3	-23%
Digital Assets					
CME Bitcoin			89.7	$0.010	-38%
CME Ethereum			119.2	$0.004	42%

* Data with one month lag

Source: Bloomberg Finance L.P., Federal Reserve, Trace, Japan Securities Dealer Association, WFE, J.P. Morgan. * Data with one month lag.

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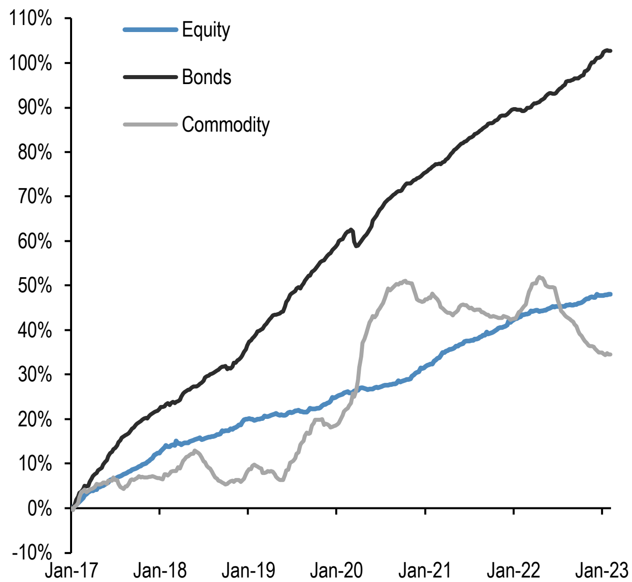
ETF Flow Monitor (as of Jan 31st)

Chart A3: Global Cross Asset ETF Flows

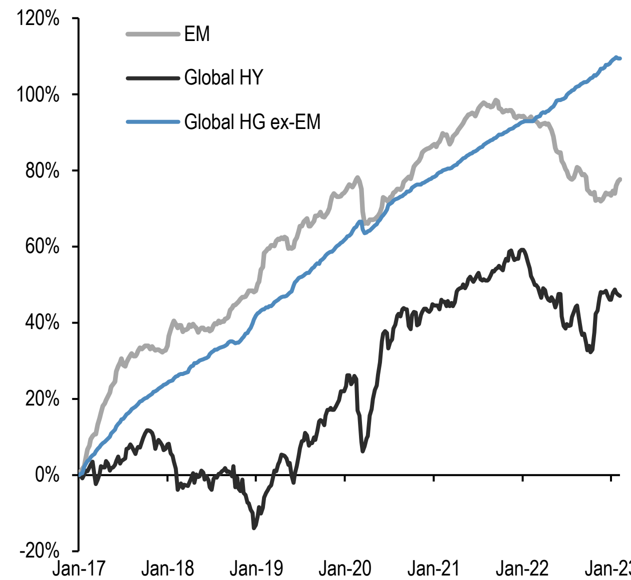
Cumulative flow into ETFs as a % of AUM



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

Chart A4: Bond ETF Flows

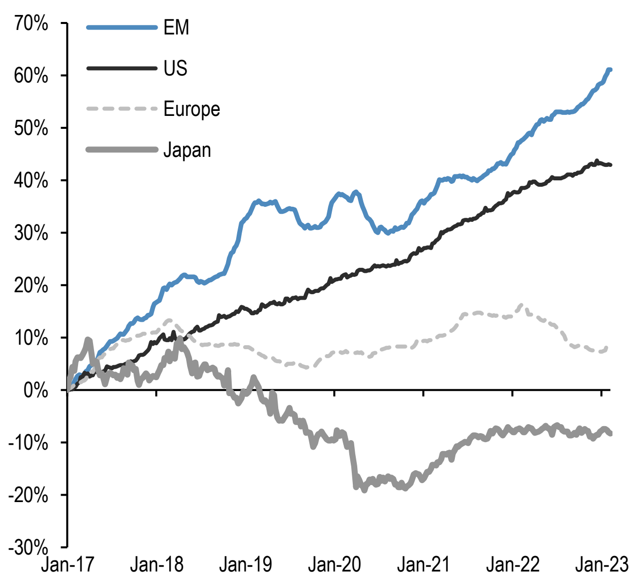
Cumulative flow into bond ETFs as a % of AUM



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

Chart A5: Global Equity ETF Flows

Cumulative flow into global equity ETFs as a % of AUM

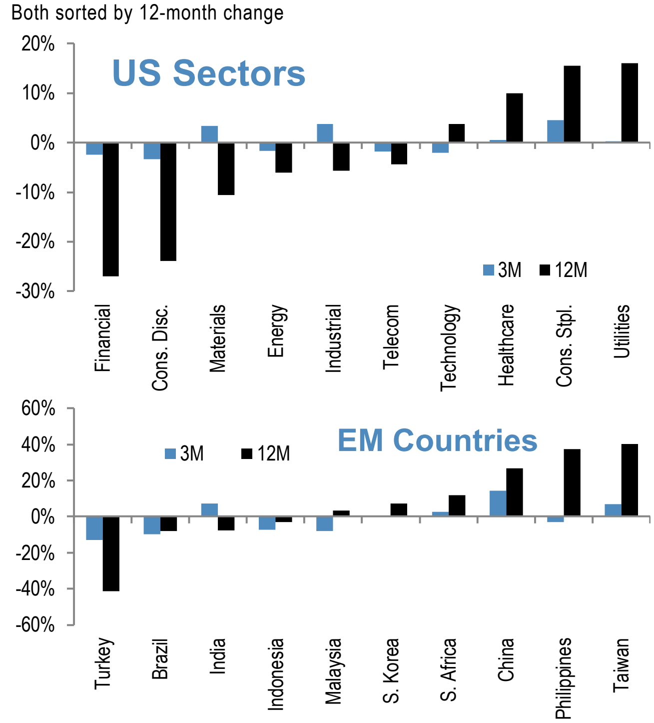


Source: J.P. Morgan. Bloomberg Finance L.P.

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

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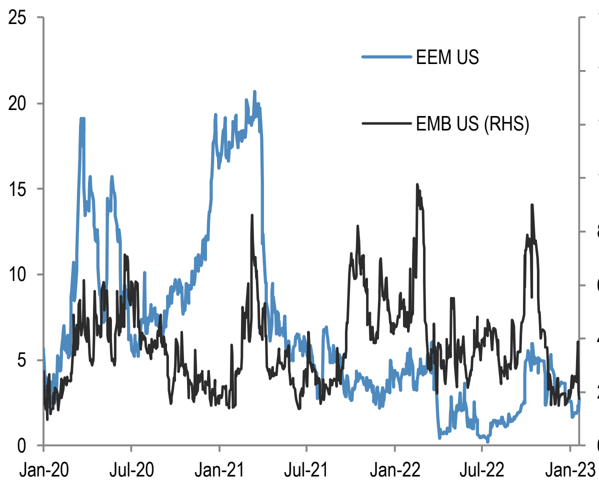
Short Interest Monitor

Chart A7: Quantity-On-Loan on the EEM and EMB US ETF

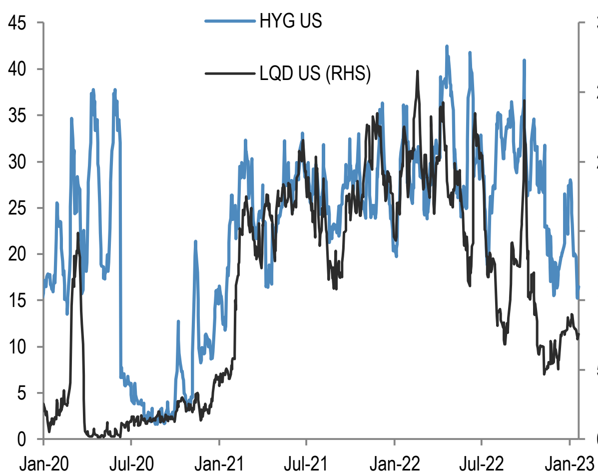
On loan quantity as a % share of share outstanding



Source: Datalend, J.P. Morgan

Chart A8: Quantity-On-Loan on the LQD and HYG US ETF

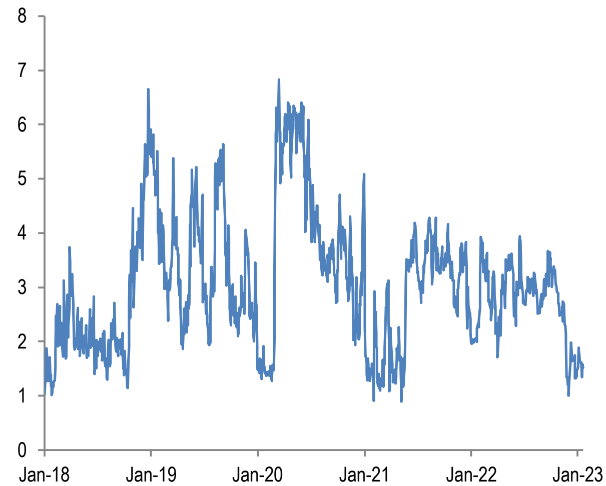
On loan quantity as a % share of share outstanding



Source: Datalend, J.P. Morgan

Chart A9: Quantity-On-Loan on the SPY US ETF

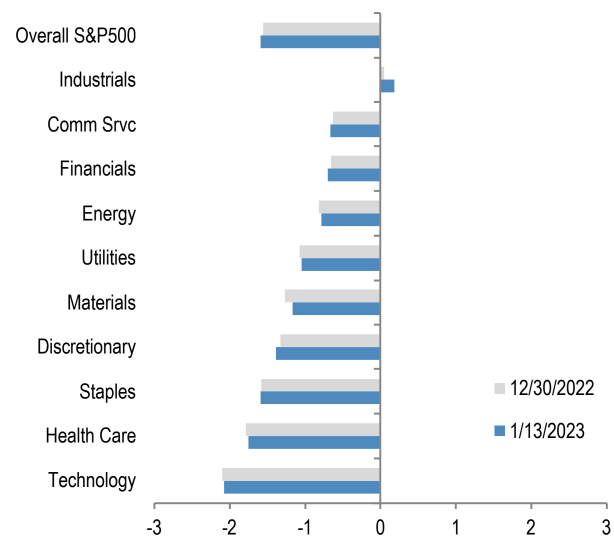
On loan quantity as a % share of share outstanding. Last obs is for 19th Jan 2023.



Source: Datalend, J.P. Morgan

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, J.P. Morgan

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Chart A11a: Cross Asset Volatility Monitor
3m ATM Implied Volatility (1y history) as of 07th Feb-2023

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

Asset	Current	Low	Low date	High	High date	Upside	Downside	Implied/realized volatility
S&P 500	17%	17%	2-Feb-23	28%	13-Jun-22	11%	0%	1.0x
EuroSTOXX	16%	14%	2-Feb-23	39%	4-Mar-22	23%	2%	1.3x
Nikkei 225	16%	16%	7-Feb-23	27%	9-Mar-22	12%	0%	1.0x
Hang Seng	22%	19%	9-Feb-22	39%	15-Mar-22	17%	3%	1.0x
MSCI EM	19%	15%	13-Apr-22	41%	11-Mar-22	22%	4%	1.2x
Gold	14%	14%	10-Feb-22	27%	8-Mar-22	13%	1%	1.0x
Oil (brent)	39%	38%	31-Jan-23	73%	23-Mar-22	34%	1%	1.4x
Copper	26%	24%	8-Jun-22	35%	15-Jul-22	10%	1%	1.6x
BB commodity index	20%	17%	10-Feb-22	30%	26-Jul-22	10%	3%	1.3x
EUR/USD	9%	7%	10-Feb-22	13%	28-Sep-22	4%	2%	1.1x
USD/NOK	15%	12%	10-Feb-22	18%	12-Oct-22	3%	3%	1.1x
USD/JPY	13%	6%	9-Feb-22	14%	16-Jan-23	1%	7%	0.9x
GBP/USD	10%	7%	9-Feb-22	19%	28-Sep-22	8%	4%	1.1x
USD/CHF	9%	6%	23-Feb-22	11%	28-Sep-22	2%	2%	0.9x
10y US swaps	107	82	9-Feb-22	156	21-Oct-22	49	24	0.9x
10y Eur swaps	106	67	9-Feb-22	170	29-Sep-22	64	39	0.9x
CDX IG	47%	45%	2-Feb-23	76%	7-Mar-22	29%	2%	1.5x
CDX HY	45%	43%	2-Feb-23	68%	7-Mar-22	23%	2%	1.6x
iTraxx	52%	49%	3-Feb-23	86%	7-Mar-22	34%	3%	1.2x
iTraxx X/O	47%	45%	3-Feb-23	85%	7-Mar-22	37%	2%	1.2x

Source: J.P. Morgan.

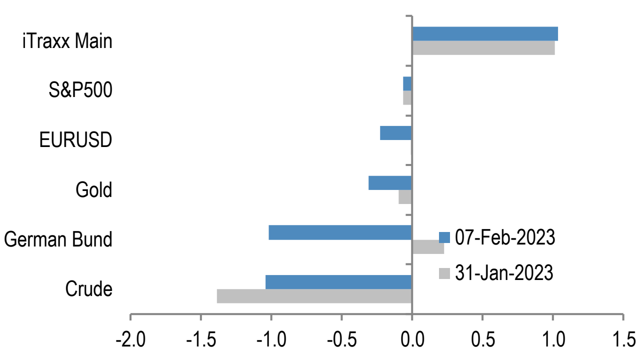
Note: Swaps volatility is 3m 10y payer ATMF implied annualized BP vol and credit volatility is 3m 5y on-the-run ATM spread volatility. MSCI EM, Gold, Oil, Copper, BB Commodity Index and Treasury futures are 3m implied vol from Bloomberg.

Definitions:

Current:	Latest available closing level (07-Feb-23)
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

Chart A11b: Option skew monitors

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 in equities 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 favor 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

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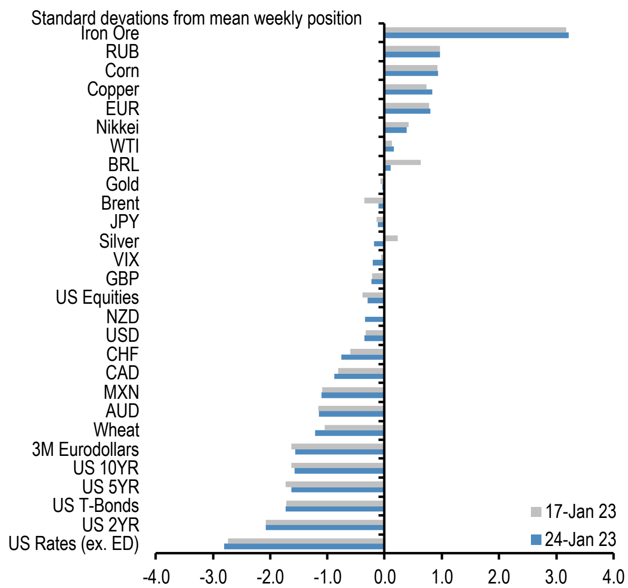
Spec position monitors

Chart A12: Weekly Spec Position Monitor

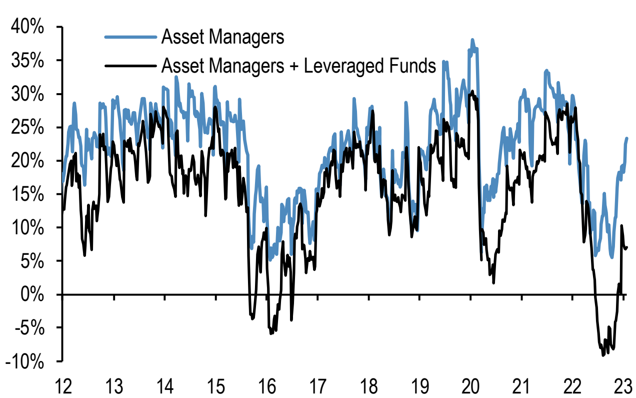
Net spec positions are proxied by the number of long contracts minus the number of short contracts using the speculative category of the Commitments of Traders reports (as reported by CFTC). To proxy for speculative investors for equity futures positions we use Asset managers (see Chart A16), whereas 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

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, Dow Jones, NASDAQ and their Mini futures contracts.

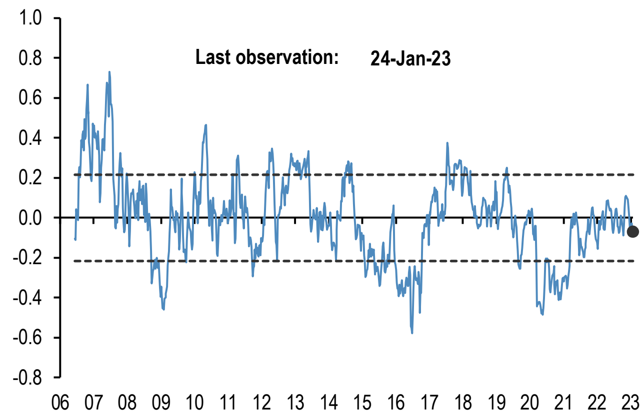


Source: CFTC, Bloomberg Finance L.P. and J.P. Morgan

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, RUB, MXN and BRL. The safe currencies are: JPY, CHF and Gold.

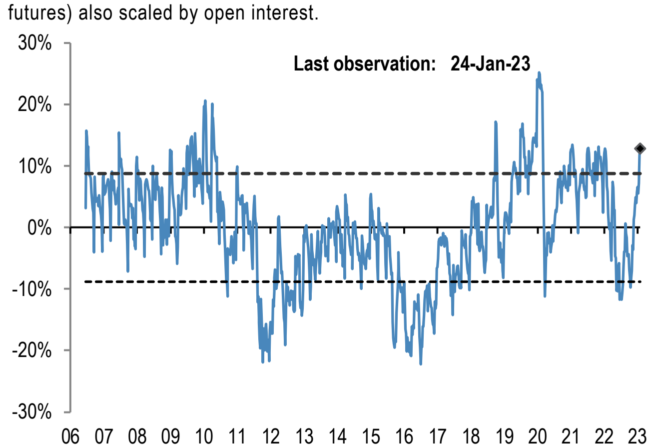


Source: CFTC, J.P. Morgan

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 (Chart A16) scaled by open interest minus the non-commercial category 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

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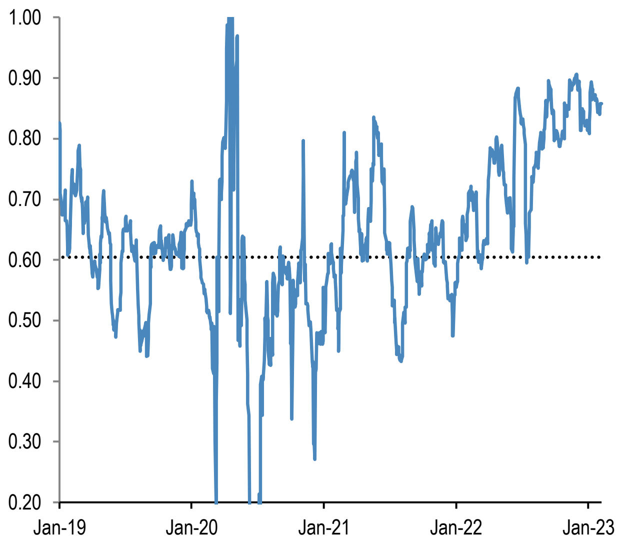
Mutual fund and hedge fund betas

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

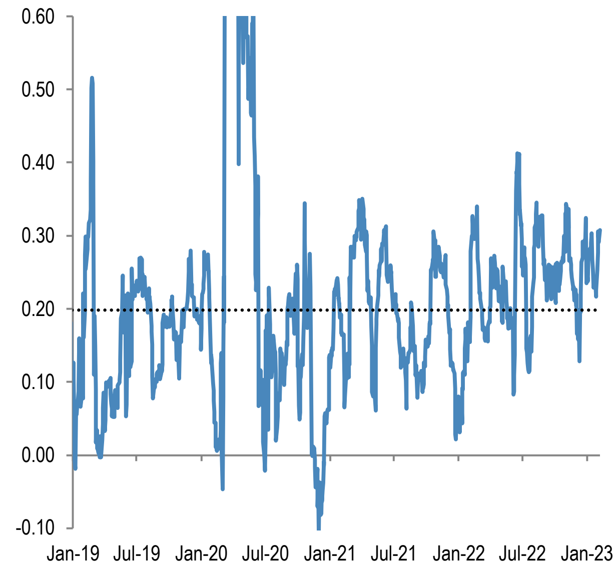
The dotted line shows the average beta since 2013.



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

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.

Chart A18: Performance of various type of investors

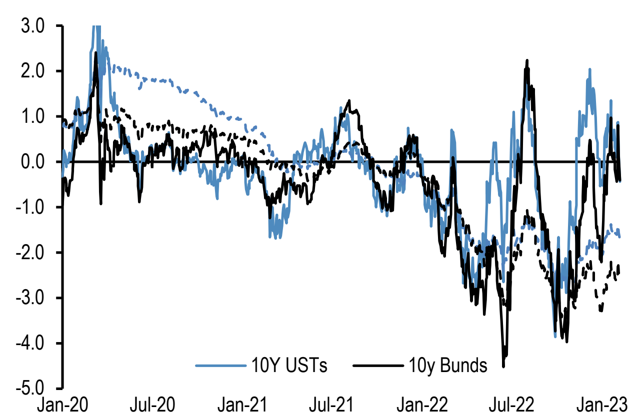
The table depicts the performance of various types of investors in % as of 27th Jan 2022.

Date	2017	2018	2019	2020	2021	2022	2023
Investors							
Equity L/S	11.8%	-5.9%	12.8%	8.7%	6.6%	-8.7%	4.1%
Macro ex-CTAs	5.6%	9.8%	2.9%	7.8%	7.2%	6.2%	1.0%
CTAs	2.2%	-8.1%	9.2%	6.3%	10.9%	27.3%	-2.2%
Risk Parity Funds	13.5%	-6.5%	18.4%	3.5%	4.7%	-18.6%	4.0%
US Balanced MFs	14.0%	-4.9%	20.1%	13.2%	14.4%	-13.0%	4.9%
Benchmark							
MSCI AC World	24.0%	-9.4%	26.6%	16.3%	16.4%	-18.4%	7.3%
Barclays Global Agg	3.0%	1.8%	8.2%	5.6%	-2.5%	-11.2%	2.2%
60 US Equity : 40 US Bonds	14.3%	-1.9%	22.2%	13.3%	14.8%	-15.4%	5.2%
S&P Riskparity Vol 10	10.4%	-4.3%	22.8%	11.5%	12.8%	-16.2%	5.0%

Source: Bloomberg Finance L.P., HFR, SG CTA Index, J.P. Morgan.

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

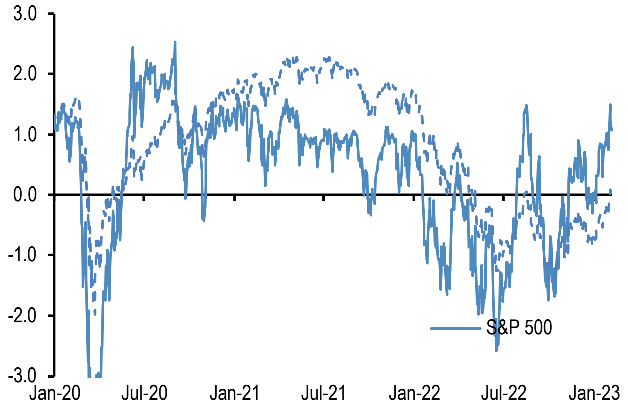
z-score of the momentum signal in our Trend Following Strategy framework shown in Tables A5 and A6 in the Appendix. Solid lines are for the shorter term and dotted lines for longer-term momentum.



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

Chart A20: Momentum signals for S&P 500

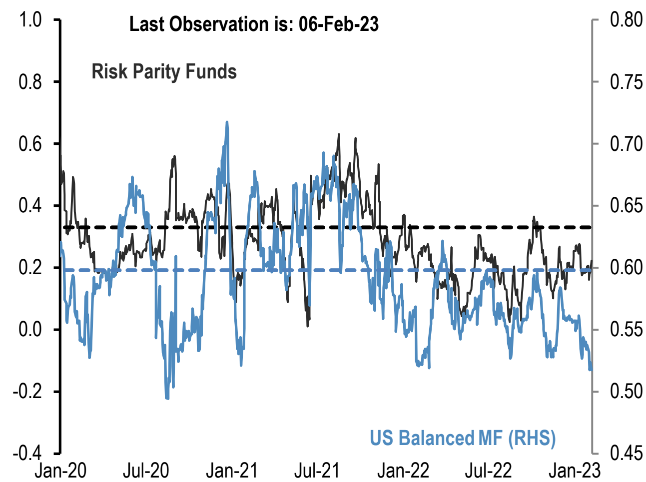
z-score of the momentum signal in our Trend Following Strategy framework shown in Tables A5 and A6 in the Appendix. Solid lines are for the shorter term and dotted lines for longer-term momentum.



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

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

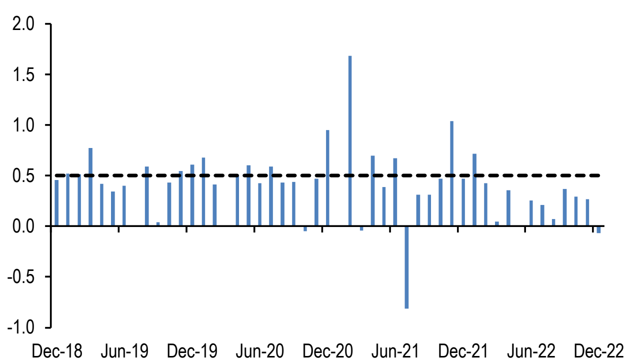
Rolling 21-day equity beta based on a bivariate regression of the daily returns of our Balanced Mutual fund and Risk Parity fund return indices to the daily returns of the S&P 500 and Barcap US Agg indices. Given that these funds invest in both equities and bonds we believe that the bivariate regression 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.

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

Proxied by the ratio of the monthly performance of HFRI Asset-Weighted Equity Hedge fund index divided by the monthly performance of MSCI AC World index



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

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.

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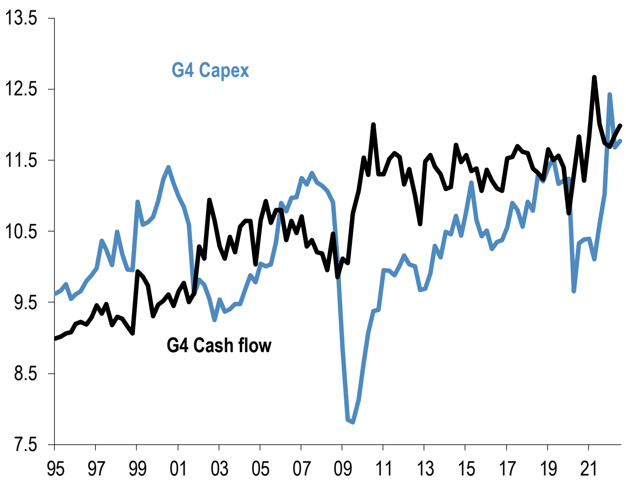
Corporate activity

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

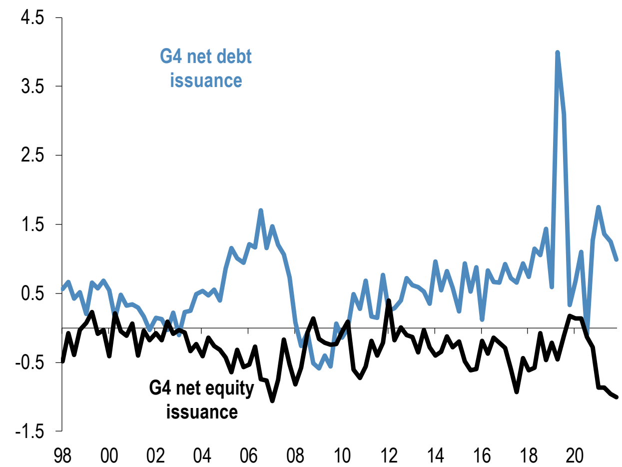
% of GDP, G4 includes the US, the UK, the Euro area and Japan. Last observation as of Q3 2022.



Source: ECB, BOJ, BOE, Federal Reserve flow of funds.

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

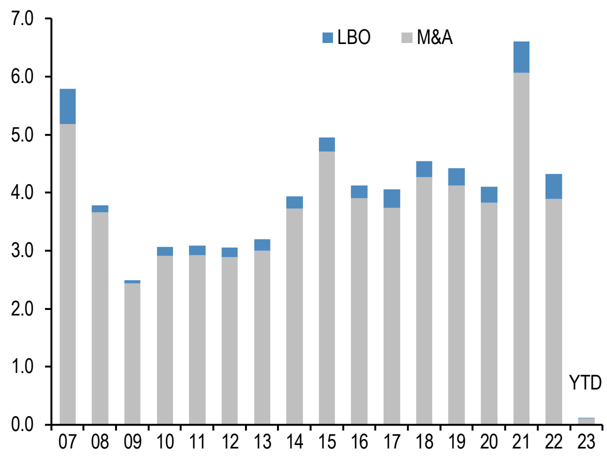
$tr per quarter, G4 includes the US, the UK, the Euro area and Japan. Last observation as of Q3 2022.



Source: ECB, BOJ, BOE, Federal Reserve flow of funds.

Chart A26: Global M&A and LBO

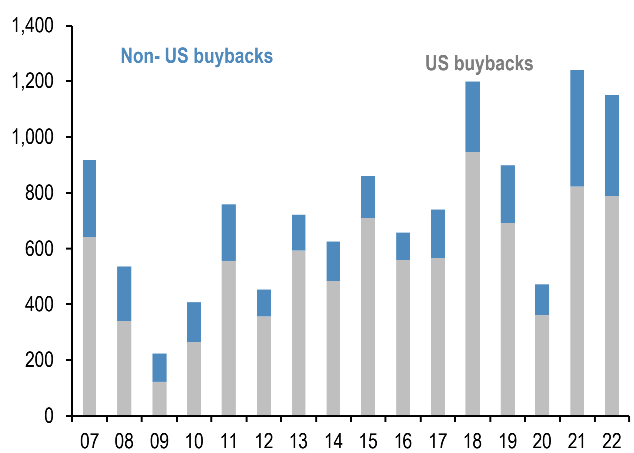
$tr. YTD 2023 as of 25th Jan 23. M&A and LBOs are announced.



Source: Dealogic, J.P. Morgan.

Chart A27: US and non-US share buyback

$bn, 2022 are as of Dec'22. Buybacks are announced.



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

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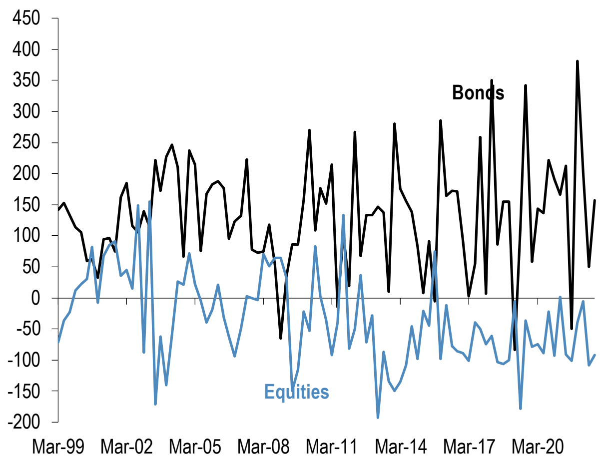
Pension fund and insurance company flows

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

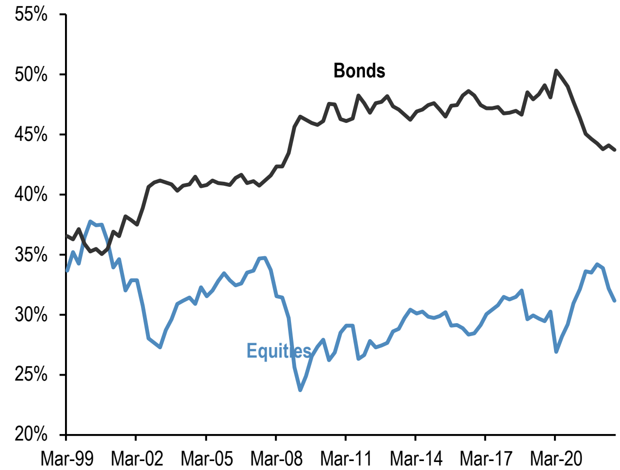
Equity and bond buying in $bn per quarter. G4 includes the US, the UK, Euro area and Japan. Last observation is Q3 2022



Source: ECB, BOJ, BOE, Federal Reserve flow of funds.

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

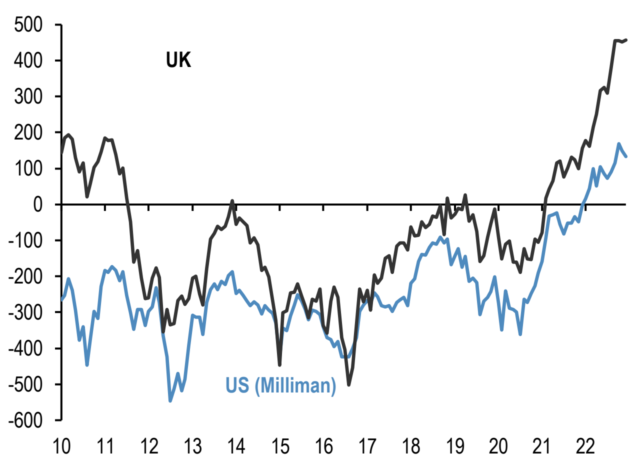
Equity and bond as % of total assets per quarter. G4 includes the US, the UK, Euro area and Japan. Last observation is Q3 2022.



Source: ECB, BOJ, BOE, Federal Reserve flow of funds

Chart A30: Pension fund deficits

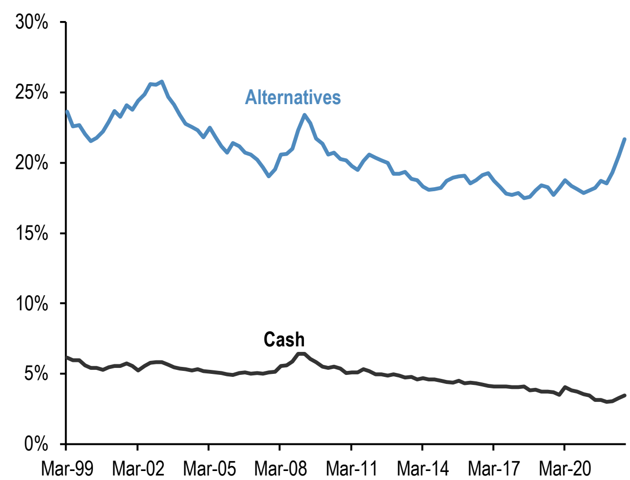
US$bn. For US, funded status of the 100 largest corporate defined benefit pension plans, from Milliman. For UK, funded status of the defined benefit schemes eligible for entry to the Pension Protection Fund, converted to US$ at today's exchange rates. Last obs. is Dec'22.



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

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 2022.

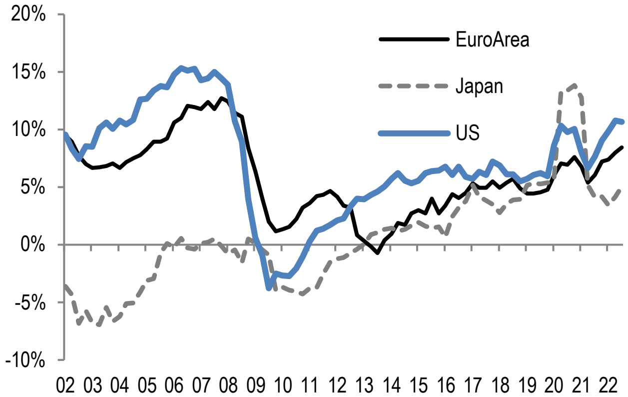


Source: ECB, BOJ, BOE, Federal Reserve flow of funds

Credit Creation

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

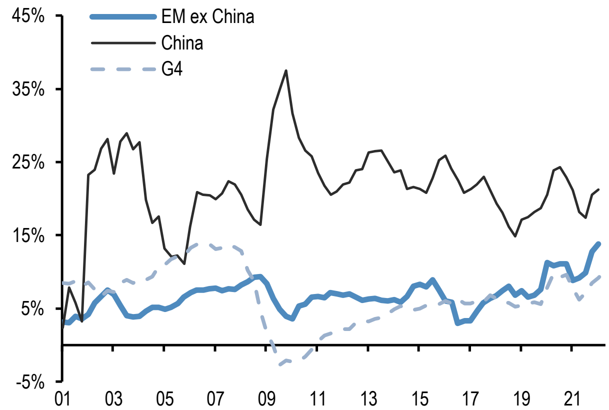
Rolling sum of 4 quarter credit creation as % of GDP. Credit creation includes both bank loans as well as net debt issuance by non-financial corporations and households. Last obs. is for Q3'22.



Source: Fed, ECB, BoJ, Bloomberg Finance L.P. and J.P. Morgan calculations.

Chart A33: Credit creation in EM

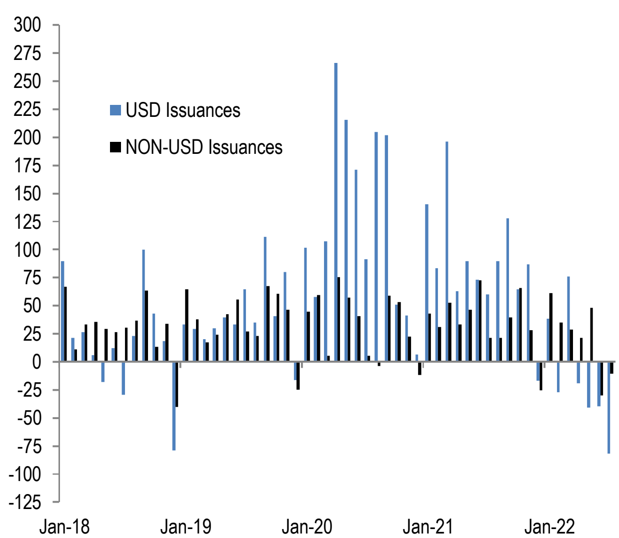
Rolling sum of 4 quarter credit creation as % of GDP. Credit creation includes both bank loans as well as net debt issuance by non-financial corporations and households. Last obs. is for Q2'22.



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

Chart A34: USD and Non-USD net bond issuances

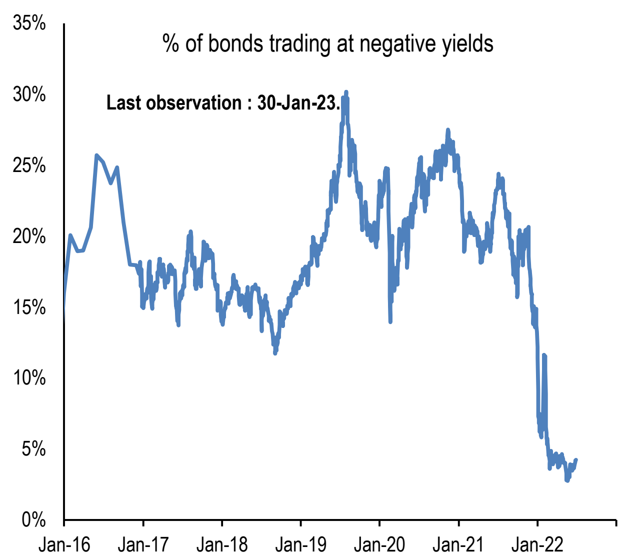
Gross issuance minus redemptions in $bn per month. Non-USD issuance includes bonds issued in EUR, GBP and JPY. Non-USD bond issuance is converted to USD at today's exchange rate through the full historical period. In this way net bond issuance fluctuations are unaffected by currency changes. Our bond issuance figures include only Non-Government bonds issued globally, excluding short-term debt (maturity less than 1-year) and self-funded issuance (where the issuing bank is the only book runner).Last observation is Jul 2022.



Source: Dealogic, J.P. Morgan

Chart A35: Market value of negative yield bonds as a % of total outstanding in Bloomberg Barclays Global Agg Index

In %



Source: J.P. Morgan

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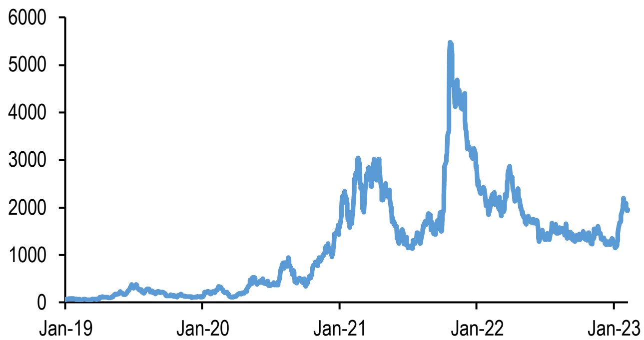
Bitcoin monitor

Chart A36: Open interest in CME Bitcoin futures contracts

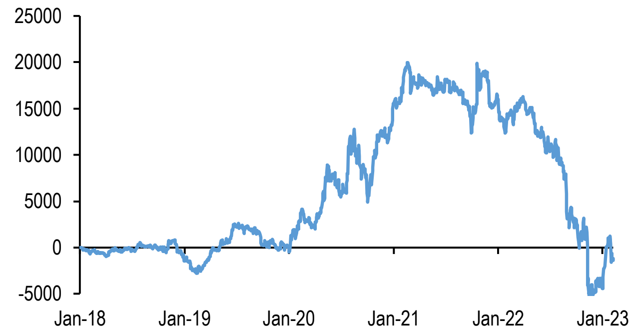
$mn. Last obs. for 7 Feb 2023.



Source: CME, J.P. Morgan.

Chart A37: Our Bitcoin position proxy based on open interest in CME Bitcoin futures contracts

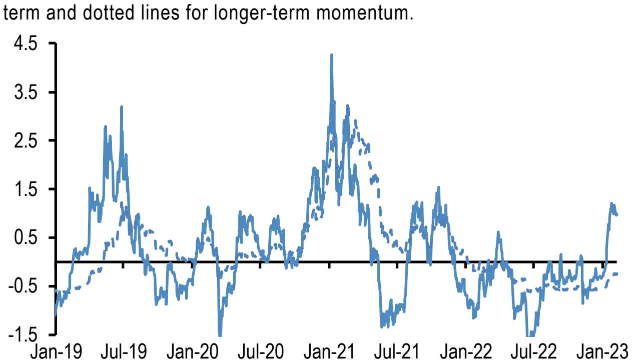
In number of contracts. Last obs. for 30 Jan 2023.



Source: J.P. Morgan

Chart A38: Momentum signals for Bitcoin

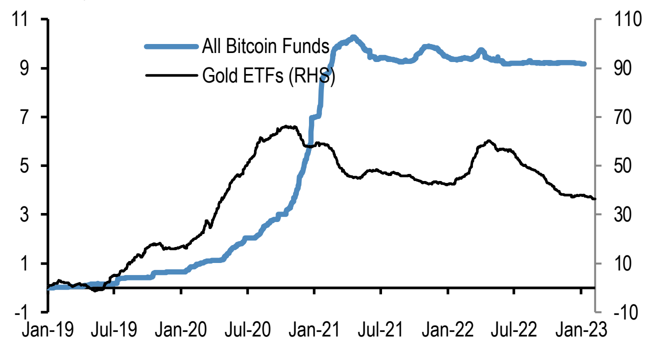
z-score of the momentum signal in our Trend Following Strategy framework shown in Tables A5 and A6 in the Appendix. Solid lines are for the shorter term and dotted lines for longer-term momentum.



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

Chart A39: Cumulative Flows in all Bitcoin funds and Gold ETF holdings

Both the y-axis in $bn



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

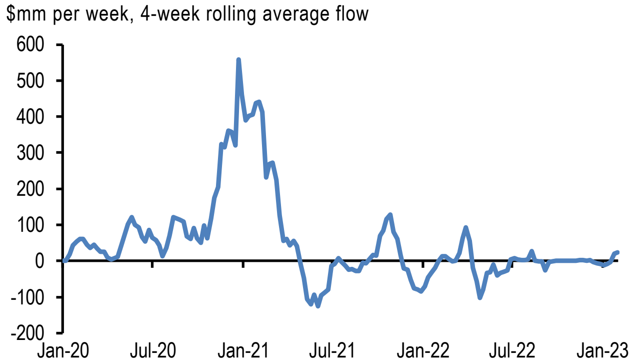
Chart A40: Ratio of Bitcoin market price to production cost

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

Source: J.P. Morgan

Chart A41: Flow pace into publicly listed Bitcoin funds including Bitcoin ETFs

$mm per week, 4-week rolling average flow



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

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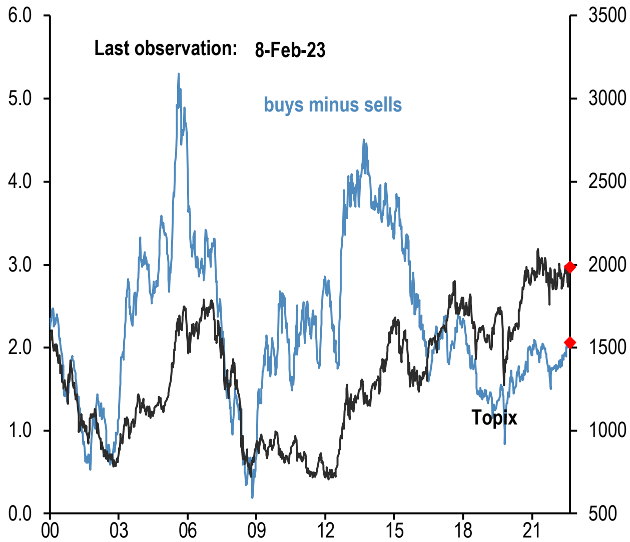
Japanese flows and positions

Chart A42: Tokyo Stock Exchange margin trading: total buys minus total sells

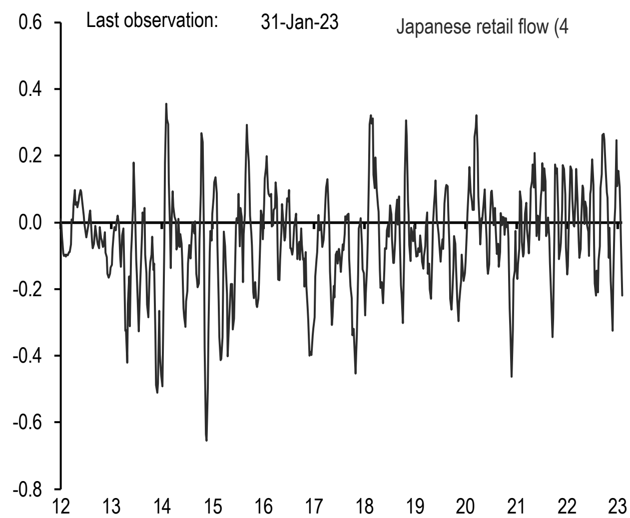
In bn of shares. Topix on right axis.



Source: Tokyo Stock Exchange, J.P. Morgan.

Chart A43: Domestic retail flows

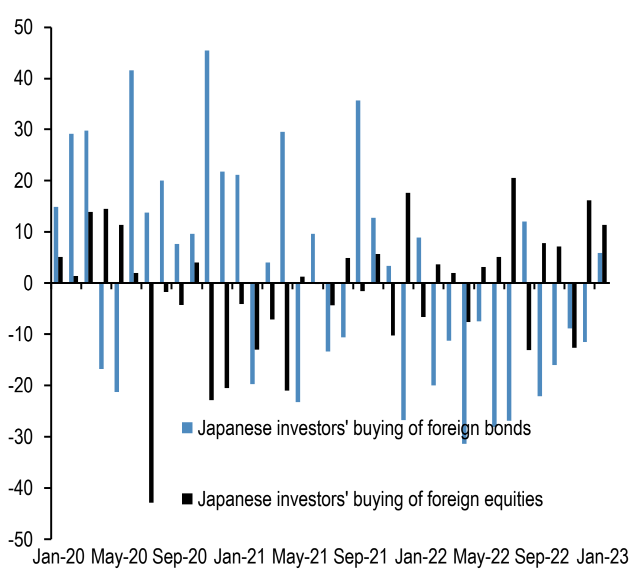
In JPY tr. Retail flows are from Tokyo stock exchange.



Source: TSE, J.P. Morgan calculations.

Chart A44: Monthly net purchases of foreign bonds and foreign equities by Japanese residents

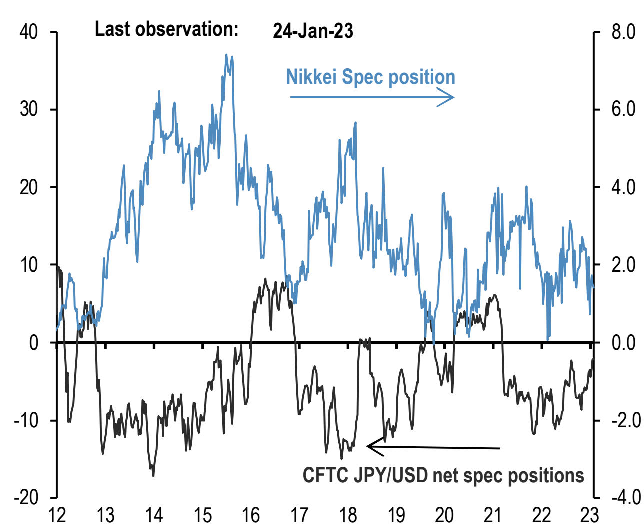
$bn, Last weekly obs. is for 27th Jan'23.



Source: Japan MoF, J.P. Morgan.

Chart A45: 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 calculations.

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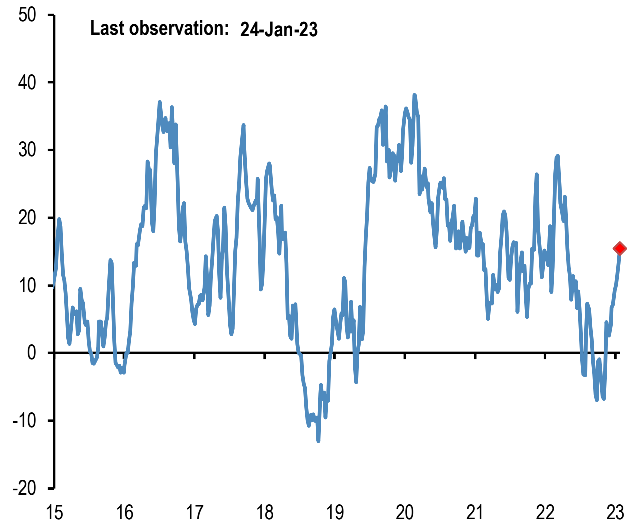
Commodity flows and positions

Chart A46: Gold spec positions

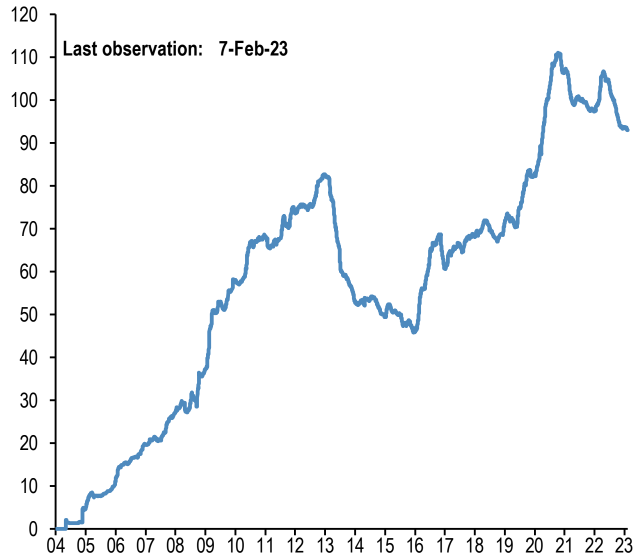
$bn. CFTC net long minus short position in futures for the Managed Money category.



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

Chart A47: Gold ETFs

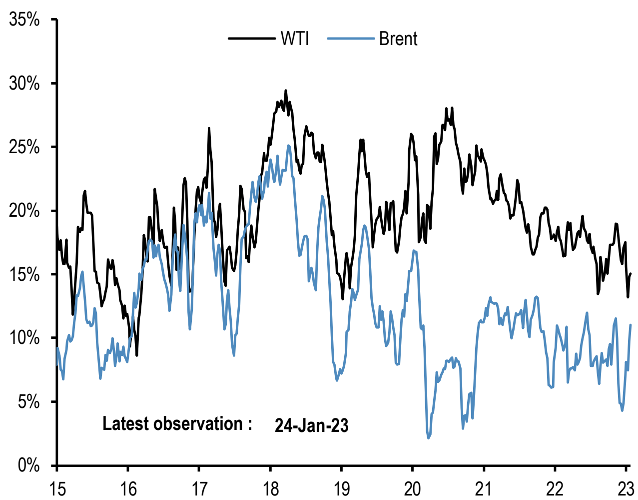
Mn troy oz. Physical gold held by all gold ETFs globally.



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

Chart A48: Oil spec positions

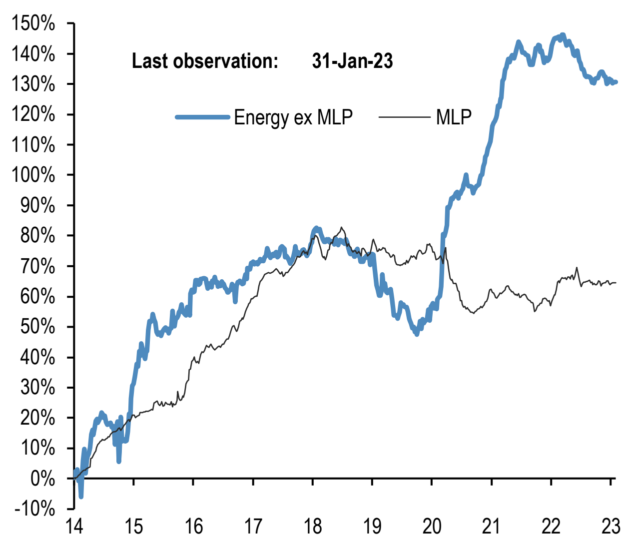
Net spec positions divided by open interest. CFTC futures positions for WTI and Brent are net long minus short for the Managed Money category.



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

Chart A49: 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

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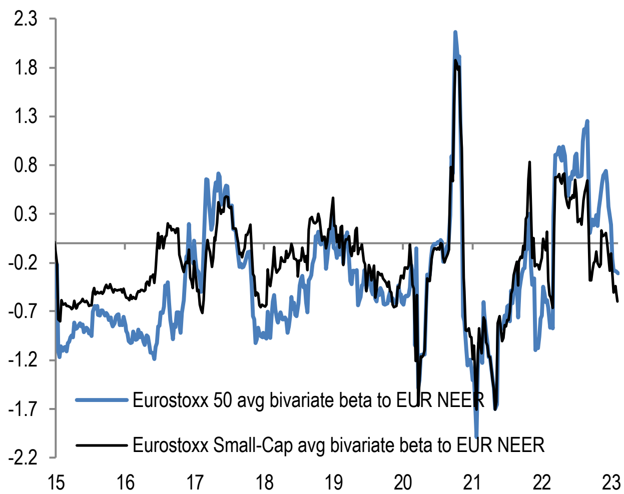
Corporate FX hedging proxies

Chart A50: Average beta of Eurostoxx 50 companies and Eurostoxx Small-Cap to trade weighted EUR

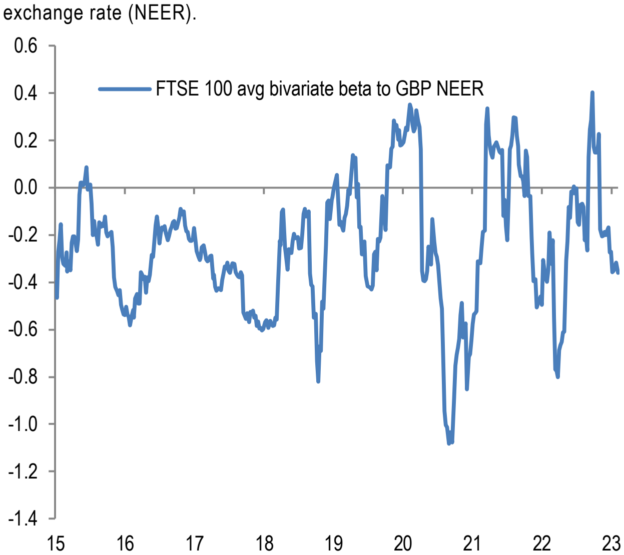
Rolling 26 weeks average betas based on a bivariate regression of the weekly returns of individual stocks in the Eurostoxx 50 index to the weekly returns of the MSCI AC World and JPM EUR Nominal broad effective exchange rate (NEER).



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

Chart A51: Average beta of FTSE 100 companies to trade weighted GBP

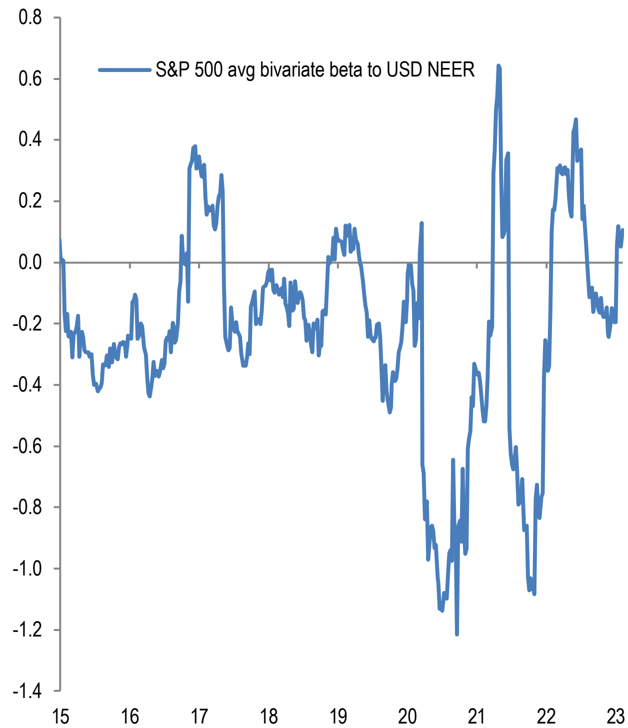
Rolling 26 weeks average betas based on a bivariate regression of the weekly returns of individual stocks in the FTSE 100 index to the weekly returns of the MSCI AC World and JPM GBP Nominal broad effective exchange rate (NEER).



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

Chart A52: 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

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CTAs – Trend following investors' momentum indicators

Table A4: Simple return momentum trading rules across various commodities

Optimal lookback 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. Lookbacks, current signals and z-scores are shown for shorter-term and longer-term momentum separately, along with performance of a combined signal. Annualized return, volatility and information ratio of the signal; current signal; and z-score of the current return over the relevant lookback 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	10.0	22.7	0.44	-1	4	-0.3	-1.7%
	long	462				0	0	0.0	0.1%
Brent	short	84	8.6	21.7	0.40	-1	7	-0.2	-3.0%
	long	504				1	114	0.3	10.1%
Unleaded gas	short	105	6.9	24.1	0.29	1	0	0.2	2.6%
	long	483				1	66	0.7	19.3%
Heat Oil	short	63	7.4	22.0	0.34	-1	4	-0.6	-5.8%
	long	483				1	7	0.9	29.1%
Gasoil	short	63	10.6	20.7	0.51	-1	4	-0.5	-5.5%
	long	378				1	64	0.4	10.3%
Nat gas	short	105	19.2	35.4	0.54	0	35	-2.9	-51.4%
	long	315				0	17	-1.9	-56.1%
Gold	short	21	3.3	10.5	0.31	-1	2	-0.8	-2.1%
	long	483				1	22	0.1	1.2%
Silver	short	10	5.8	18.9	0.31	0	2	-1.5	-5.1%
	long	462				-1	2	-0.3	-5.5%
Palladium	short	42	13.4	21.9	0.61	-1	35	-0.7	-5.8%
	long	273				-1	82	-0.9	-21.9%
Platinum	short	105	7.4	18.0	0.41	0	0	0.0	-0.1%
	long	273				1	0	0.1	1.6%
Aluminium	short	105	5.2	15.2	0.34	1	21	0.6	4.6%
	long	357				-1	78	-0.6	-9.3%
Copper	short	147	9.3	17.7	0.53	1	49	0.8	10.1%
	long	399				0	3	0.0	-0.4%
Lead	short	126	3.7	20.2	0.18	1	10	0.1	1.0%
	long	357				-1	5	-0.1	-3.3%
Nickel	short	42	13.3	23.6	0.56	-1	2	-0.6	-5.3%
	long	336				1	64	0.2	5.5%
Zinc	short	126	10.4	20.0	0.52	1	0	0.1	0.8%
	long	399				-1	2	-0.2	-4.5%
Wheat	short	168	3.0	23.5	0.13	-1	34	-0.8	-10.4%
	long	294				-1	85	-1.2	-19.1%
Kansas wheat	short	147	8.4	20.8	0.40	-1	122	-0.1	-1.0%
	long	483				1	0	0.1	2.1%
Corn	short	63	8.3	16.9	0.49	1	10	0.2	1.3%
	long	399				1	140	0.3	6.5%
Soybeans	short	42	6.4	14.8	0.44	1	9	0.2	0.9%
	long	231				1	22	0.2	3.3%
Cotton	short	168	5.9	18.9	0.31	-1	68	-0.3	-4.7%
	long	483				-1	7	-0.1	-3.7%
Sugar	short	63	7.3	21.9	0.33	1	20	0.4	4.1%
	long	252				1	67	0.6	10.6%
Coffee	short	63	6.0	23.5	0.26	1	8	0.9	7.9%
	long	273				-1	17	-0.7	-12.7%
Cocoa*		10	0.3	28.0	0.01	-1	5	-0.1	-0.5%

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

Table A5: Simple return momentum trading rules across international equity indices, bond futures and FX

Optimal lookback 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. Lookbacks, current signals and z-scores are shown for shorter-term and longer-term momentum separately, along with performance of a combined signal. Annualized return, volatility and information ratio of the signal; current signal; and z-score of the current return over the relevant lookback 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	7.1	12.2	0.59	1	22	1.3	6.7%
	long	357				1	0	0.1	0.6%
Nasdaq 100	short	84	6.9	15.1	0.46	1	2	1.4	11.2%
	long	462				-1	207	-0.3	-5.4%
Nikkei	short	84	3.2	14.6	0.22	1	10	0.3	1.9%
	long	294				1	10	0.2	2.7%
FTSE 100	short	168	4.8	12.4	0.38	1	67	1.2	7.7%
	long	462				1	76	1.0	10.8%
Eurostoxx 50	short	168	4.6	15.9	0.29	0	3	1.5	13.7%
	long	315				1	26	0.9	11.2%
MSCI EM	short	42	13.6	11.5	1.18	1	45	0.3	1.8%
	long	336				-1	1	-0.2	-2.8%
2Y USTs	short	252	1.0	1.0	0.99	0	1	-1.6	-1.9%
	long	420				0	135	-2.1	-3.5%
5Y USTs	short	252	2.1	2.9	0.71	-1	24	-1.1	-2.7%
	long	420				0	2	-1.8	-6.1%
10Y USTs	short	42	2.1	3.6	0.57	-1	1	-0.6	-0.8%
	long	504				0	2	-1.7	-8.6%
2Y Schatz	short	189	0.5	0.8	0.55	0	42	-1.8	-1.3%
	long	504				0	105	-2.3	-2.7%
5y Bobl	short	84	1.6	1.9	0.81	-1	2	-0.5	-0.6%
	long	483				0	122	-2.5	-7.0%
10y Bund	short	84	2.8	3.5	0.80	-1	1	-0.4	-0.8%
	long	483				0	124	-2.6	-11.8%
10Y JGB	short	126	1.1	2.1	0.52	-1	10	-0.4	-0.4%
	long	273				-1	10	-0.4	-0.5%
10Y Gilts	short	105	1.9	4.2	0.44	1	1	1.1	2.6%
	long	399				0	2	-2.0	-9.0%
Euro	short	42	3.5	6.3	0.56	-1	1	-0.2	-0.6%
	long	273				-1	1	-0.1	-0.3%
Yen	short	21	2.6	6.4	0.41	-1	2	-0.7	-1.2%
	long	462				-1	28	-1.2	-9.4%
Sterling	short	168	2.6	7.2	0.36	1	22	0.1	0.3%
	long	294				-1	63	-0.7	-4.1%
AUD	short	42	4.2	7.7	0.54	1	0	0.2	0.5%
	long	420				-1	81	-0.3	-3.2%
CAD	short	168	0.7	6.0	0.11	-1	67	-0.4	-1.7%
	long	504				-1	171	-0.9	-5.6%

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

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