Flows & Liquidity

Still an overhang of credit and EM overweights

- **While equities have seen an unwind of positions back to pandemic lows, our metrics suggest that previous OWs in credit, including EM have not yet been fully cleared.**
- **Echoing previous recessions, there are some signs that companies have drawn down on credit lines as access to debt capital markets has become less attractive and/or unavailable.**
- **Hedge funds led by CTAs appear to have significantly outperformed publicly-traded equities and bonds on a risk-adjusted basis, producing on our calculations a high positive alpha YTD.**
- **In contrast, active equity mutual fund managers appear to have failed to produce a positive alpha so far this year. And active bond mutual fund managers 's alpha is barely positive YTD.**
- **Bitcoin's production cost falls further to $13k.**

- Today's US CPI release revealed a re-acceleration in the run rate for core inflation, which could be proxied by the black bars in Figure 1. The so called non-reopening components in Figure 1, which are constructed by removing energy and pandemic-related reopening components from headline CPI, have been rather sticky at around 0.5% per month over the previous five months, but rose to 0.6% in June.
- This stronger than expected inflation print would also likely postpone an eventual Fed pivot , ie a dovish shift in Fed rhetoric, which in our client conversations appears to be a necessary condition for investors to start adding risk. In turn, this implies that the headwind for risk markets from the risk off mode that has characterised markets for much of the year could continue in the near term.
- But, as we have discussed in recent F&Ls, recession risks are not equally priced across markets, and in turn this also implies that risk assets are not equally vulnerable. As we have noted, we find that equities as less vulnerable from an investor positioning point of view relative to DM and EM credit. For example, our two (differently constructed) equity positioning proxies based on US equity futures stand at March 2020 levels (Figure 2 and Figure 3). The first is our futures position proxy, which has returned to its pandemic lows, and the second is the net speculative positioning from CFTC data which now stands if anything below their pandemic lows. And in the vol space the lack of demand for equity downside protection is implying low equity positioning among investors. The lack of demand for downside protection is evident in the low put-to-call open interest ratio for S&P500 options and the low (1.0x) level of implied relative to realised vols; ie. low volatility risk premium.

Global Markets Strategy
Global Quantitative & Derivatives Strategy

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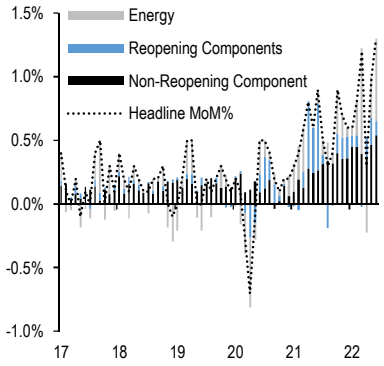
Figure 1: US CPI components
MoM % change, SA



Source: BLS, J.P. Morgan.

Click here to visit ***Flows & Liquidity Library*** on J.P. Morgan Markets.

See page 23 for analyst certification and important disclosures.

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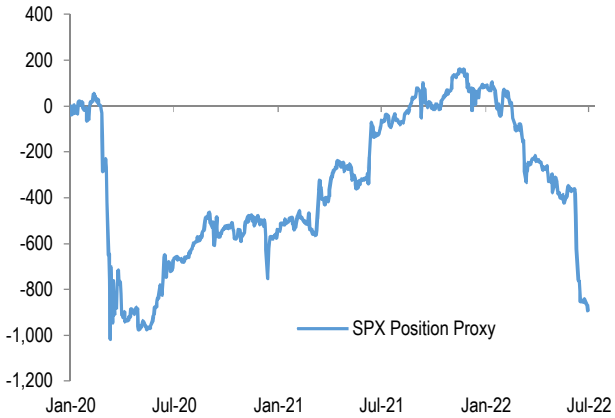
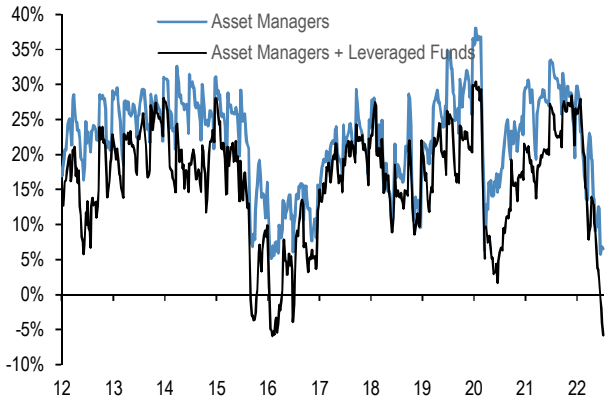
Figure 2: Position proxy for S&P 500 mini futures-longer history
Number of contracts in thousands across all expiries. Cumulative daily absolute change in open interest multiplied by the sign of the futures price change every day.



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

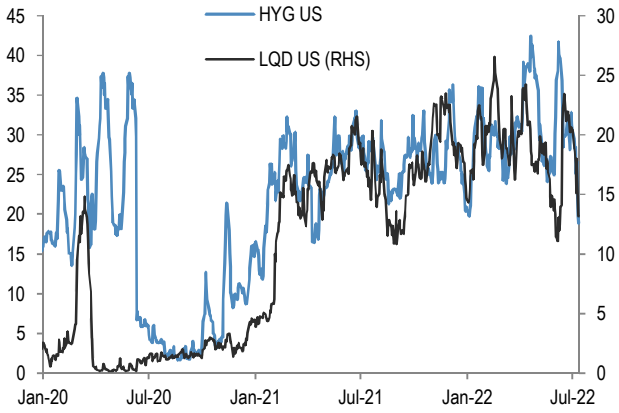
Figure 3: Positions in US equity futures by Asset managers and Leveraged funds
CFTC positions in US equity futures by Leveraged funds and Asset managers (as a % of open interest). It is an aggregate of the S&P500, Dow Jones, NASDAQ and their Mini futures contracts.



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

- By contrast, in US credit the implied to realised vol ratio is around 2.0x, indicating high demand for downside protection likely as the result of an overhang of credit overweights. This high demand for downside protection is also evident in the high short interest for the HYG ETF, which remains stubbornly high despite the YTD correction in US HY (Figure 4). Similarly, the short interest on the LQD ETF also remains high. This stubbornly high short base in the HYG and LQD ETFs in turns suggests that the previous overhang of credit overweights has not yet been fully cleared.

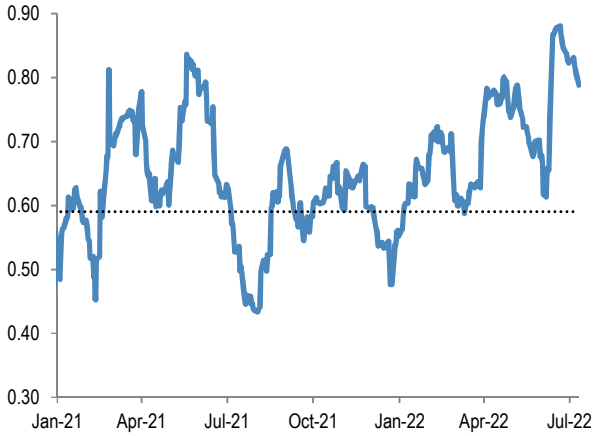
Figure 4: Quantity-On-Loan on HYG and LQD ETFs
On loan quantity as a % share of share outstanding



Source: Datalend, J.P. Morgan.

- As we have previously noted, the 21-day rolling betas of US active bond mutual funds to the US Agg index have remained elevated. While the beta had seen some moderation from late April peak, it increased sharply since early May. It appears likely that credit OWs have very likely played a role in that elevated beta. The cumulative performance of the 20 largest US bond mutual funds since early June has been around -1.6%, compared to a -0.2% return for the US Agg index. Over the same period, the Treasury component produced a modestly positive return, while the credit component saw quite negative returns. This suggests that credit OWs were a factor, and short vol positions may also have played a role.

Figure 5: 21-day rolling beta of 20 largest 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.

- What about EM? There appears to be some vulnerability in EM as well. Figure 6 depicts the beta

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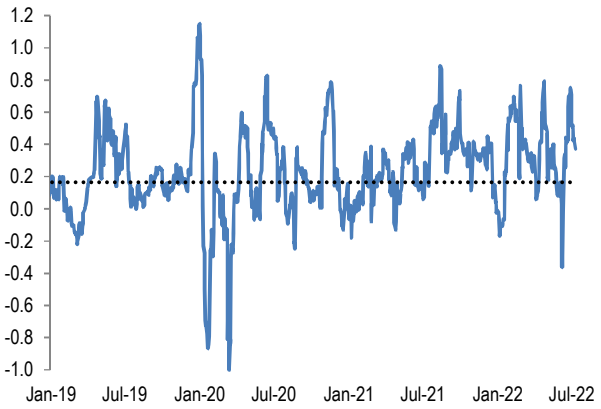
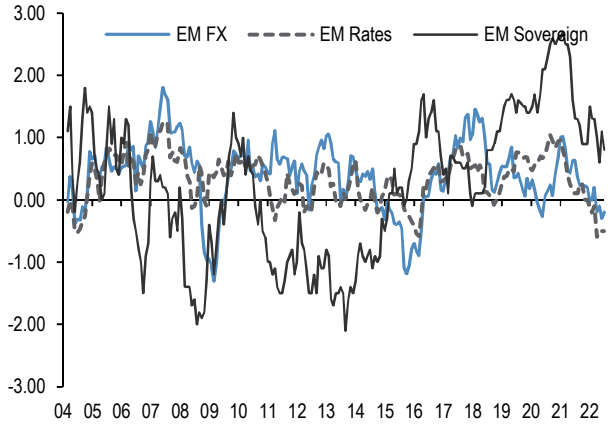
of EM-dedicated HFs to EM FX, and suggests that they remain OW EM assets. Our EM client survey also suggests that, while EM-dedicated investors more broadly have reduced their sovereign bond OWs they remain OW (Figure 7), but that positions in local currency bonds and FX have if anything shifted to somewhat UW territory. The short base in the EMB ETF, by far the largest EM sovereign bond ETF, has seen a meaningful downshift since the start of the year, but it remains above its lows in recent years, suggesting that the overhang of OWs is not yet fully cleared.

Figure 6: EM FX betas of EM hedge funds
Rolling 21-day rolling beta. The EM hedge fund beta is based on univariate regression of daily returns of HFRX EM index to returns on the JPM EM currency index.



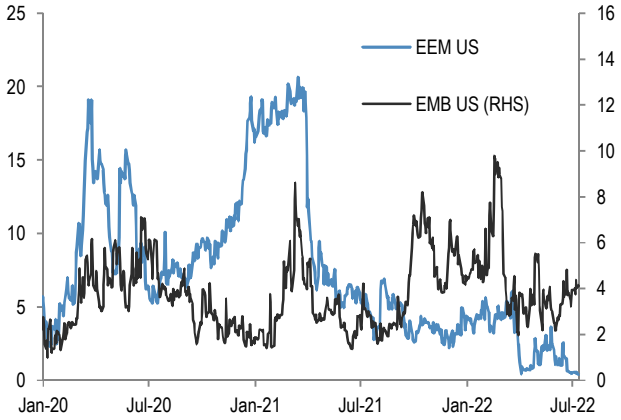
Source: Bloomberg Finance L.P., J.P. Morgan.

Figure 7: J.P. Morgan EM client Survey
Last obs. is for Jun 2022 published on Jun 16th 2022.



Source: J.P. Morgan.

Figure 8: Quantity-On-Loan on EEM and EMB ETFs
On loan quantity as a % share of share outstanding



Source: Datalend, J.P. Morgan.

- Along with the widening in credit spreads, net issuance has seen a notable downshift since the start of the year. This is evident in both US HY and HG, with average monthly issuance declining to less than $10bn per month after January in the former (Figure 9) and to just under $30bn per month in the latter in 2Q22 (Figure 10). This could be in part related to buyers being reluctant to add more credit risk at a time when an overhang of credit OWs remains. At the same time, the Fed H8 release of commercial bank balance sheets suggests loan growth picked up sharply from mid-February, with the stock of loans growing by around 6% since then, and the stock of commercial and industrial loans by nearly 9% (Figure 11). This pickup in loan growth, even as debt issuance downshifted, could be indicative of companies drawing down on credit lines, either due to the cost, or availability of debt capital became an issue, or on a precautionary basis. Indeed, during the pandemic, companies did draw down on credit lines to boost liquidity and ensure they had enough cash to meet their needs, which saw a sharp increase in Commercial and Industrial (C&I) loans that was gradually unwound over the subsequent 18 months. And more broadly, when we look at C&I loan growth around previous recessions (Figure 12), it has if anything picked up for the first few months after the recession has started, likely at least in part due companies drawing down on credit lines.

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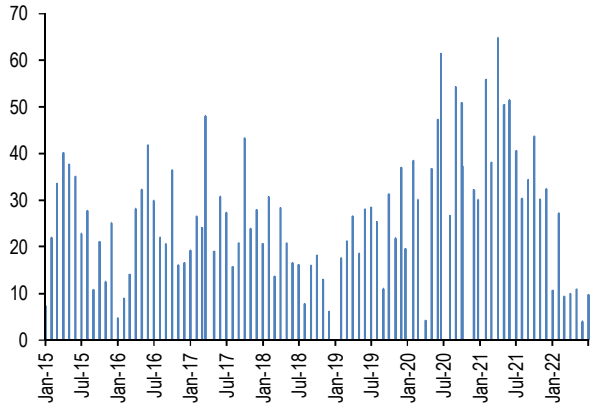
Figure 9: HY net isssuance
In $bn



Source: J.P. Morgan.

Figure 10: HG net issuance

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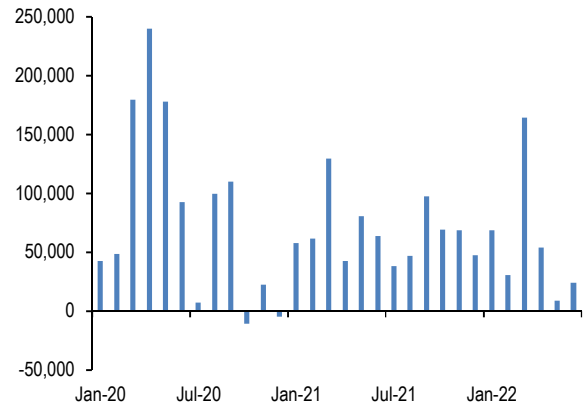
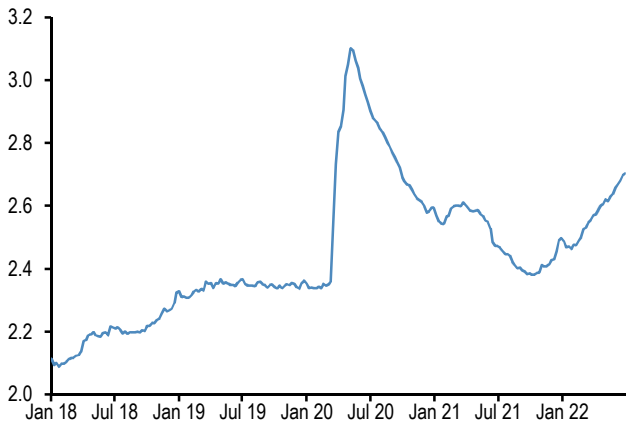


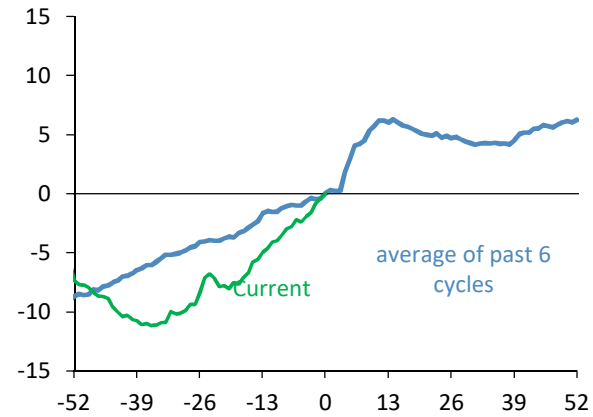
Source: J.P. Morgan.

Figure 11: US Commercial and industrial loans
$tr



Source: Federal Reserve, J.P. Morgan.

Figure 12: US Commercial and industrial loans around NBER recessions
In %.



Source: Federal Reserve, J.P. Morgan.

- In all, continued elevated inflation prints will likely keep the Fed's focus on its inflation mandate in the near term even as recession risks have been building. This implies that the headwind for risk markets from the risk off mode that has characterised markets for much of the year could continue in the near term, but not all risk assets are equally vulnerable. While equities have seen an unwind of positions back to pandemic lows, our metrics suggest OWs in credit have not yet been fully cleared. There are some signs that companies have drawn down on credit lines as access to debt capital markets has become less attractive and/or unavailable.

Strong positive alpha YTD for hedge funds but not for active mutual funds

- The reversal in commodity and bond market momentum weighed somewhat on the performance of momentum traders such as CTAs in June and July, but only modestly. After returning 21% by the end of May the HFRX index of daily reporting macro systematic diversified hedge funds lost only 3% cumulatively in June and July (Figure 13). But in the most recent week the resumption of the downtrend in equities and the uptrend in the dollar appears to be helping CTAs performance to currently rebound again.
- Outside CTAs, the performance of hedge funds has been less impressive this year, but still significantly better than that the performance of traditional publicly-traded equities and bonds. Discretionary macro hedge funds had produced a positive 3% return by the end of June, while Equity Long-Short exhibited a lower than average beta to public equities.

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- Our methodology for calculating the alpha of hedge funds is based on equally weighted HFRI index over a bond/equity benchmark portfolio. To calculate HF alpha, we subtract from the Equally-Weighted HFRI index the return of a bond/equity portfolio benchmark, with weights chosen to reflect the relative distance of bond and equity volatility from that of HFs. It is important to note that, in calculating hedge fund alpha, Figure 14 chooses different weights for the benchmark bond/equity portfolio each year, depending on how close bond and equity vol has been to the volatility of HF returns over a 3-year rolling window. In 2021, for example, the weight of our benchmark portfolio on the S&P500 was only 38% vs 62% for the US Agg index, given how close bond index vol has been to that of HFs over the past three years, and given how further equity index vol was instead. According to Figure 14, HFs delivered the highest positive alpha during YTD'22 since GFC.
- Alpha generation looks more disappointing for active mutual fund managers, however, in particular equity mutual fund managers which appear to have failed to produce a positive alpha for second year in a row. This is shown by Figure 15 and Figure 16. Bond mutual fund managers appear to have done better than equity managers this year - but even for them their alpha is barely positive YTD (Figure 17 and Figure 18).
- To demonstrate this point, we have been employing a new methodology for gauging the alpha of equity and bond mutual funds. Our previous methodology, based on the proportion or magnitude by which the biggest active funds are outperforming their benchmarks, suffers from survivorship bias and likely overstates the true alpha as it fails to adjust for the underperforming funds that got liquidated, merged or simply shrank in size due to outflows over the years. Instead, our new methodology focuses on the return earned by mutual fund investors on aggregate relative to market indices. In contrast to ETFs, mutual funds are mostly active rather than passive. The methodology's starting point is to calculate the AUM change of the aggregate universe of equity or bond mutual funds in each year minus the net flow (including reinvested dividends) and divide it by the AUM at the beginning of the year. We then compare this return produced by mutual funds to the price return of a market index. There are two advantages with this methodology. The first advantage is that it provides a measure of the effective return earned by mutual fund investors relative to the overall market. Second, mutual fund liquidations or mergers as well as manager fees are reflected in the AUM of the overall mutual fund universe.
- In all, hedge funds led by CTAs appear to have significantly outperformed publicly traded equities and bonds on a risk-adjusted basis, producing on our calculations a high positive alpha YTD. In contrast, active equity mutual fund managers appear to have failed to produce a positive alpha so far this year. And active bond mutual fund managers' alpha is barely positive YTD.

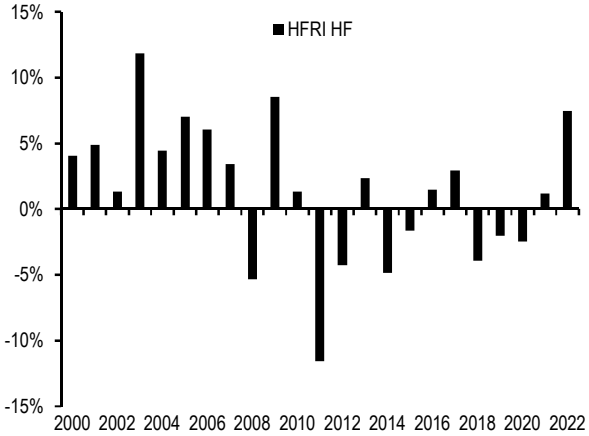
Figure 13: Performance of Various Hedge Funds

Date	2016	2017	2018	2019	2020	2021	2022
Investors							
Equity L/S	2.2%	11.8%	-5.9%	12.8%	8.7%	6.6%	-12.4%
Macro ex-CTAs	2.8%	5.6%	9.8%	2.9%	7.8%	7.2%	3.0%
CTAs	-6.1%	2.2%	-8.1%	9.2%	6.3%	10.9%	28.3%
Risk Parity Funds	10.0%	13.5%	-6.5%	18.4%	3.5%	4.7%	-15.8%
US Balanced MFs	8.4%	14.0%	-4.9%	20.1%	13.2%	14.4%	-13.4%
Benchmark							
MSCI AC World	7.9%	24.0%	-9.4%	26.6%	16.3%	16.4%	-18.6%
Barclays Global Agg	3.9%	3.0%	1.8%	8.2%	5.6%	-2.5%	-9.0%
60 US Equity : 40 US Bonds	8.8%	14.3%	-1.9%	22.2%	13.3%	14.8%	-14.0%
S&P Riskparity Vol 10	12.8%	10.4%	-4.3%	22.8%	11.5%	12.8%	-9.7%

Source: HFR, J.P. Morgan

Figure 14: Our estimate of HF alpha

Hedge fund alpha over the performance of a bond/equity portfolio weighted by rolling volatilities. 2022 is up until Jun



Source: HFR, J.P. Morgan

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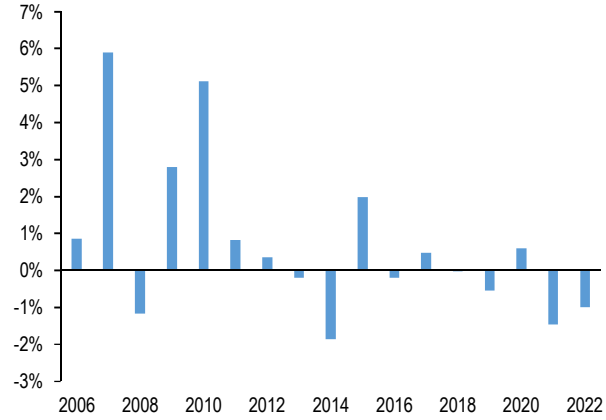
Figure 15: Excess aggregate return of Worldwide equity mutual funds vs. MSCI AC World benchmark

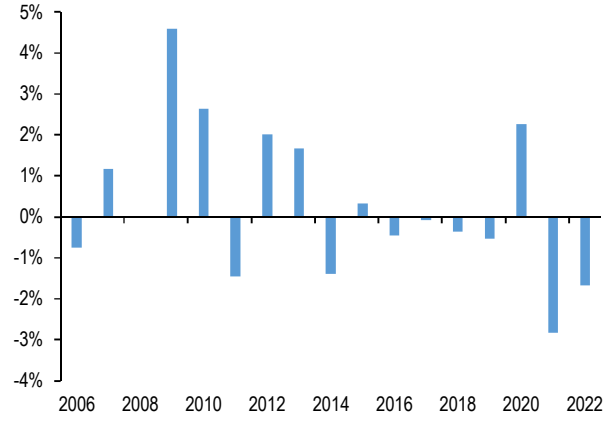
In %, see text for details about the methodology. Last obs is March'22.



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

Figure 16: Excess aggregate return of equity mutual funds domiciled in the US vs. an S&P500/MSCI AC World weighted benchmark

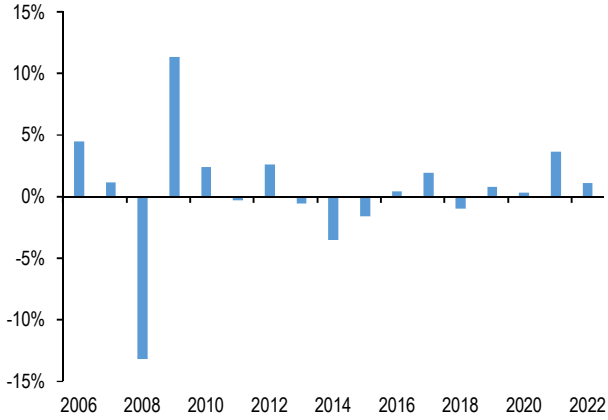
In %, see text for details about the methodology. The benchmark market index used is proxied by an S&P500/MSCI AC World combined benchmark weighted by the relative AUM weight of US focused vs. internationally focused equity mutual funds domiciled in the US. Last obs is May'22



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

Figure 17: Excess aggregate return of US Bond mutual funds vs. Barclays US Agg index benchmark

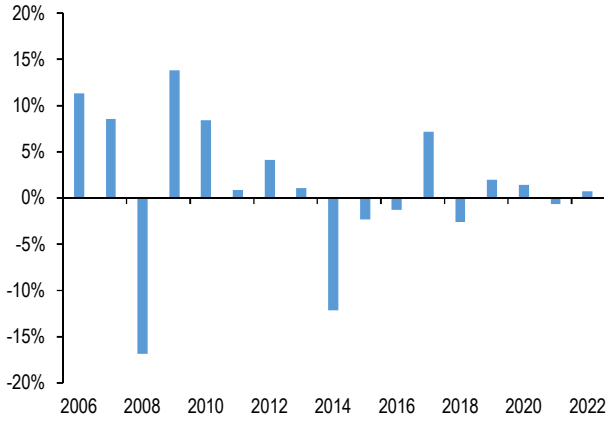
In %, see text for details about the methodology. Last obs is May'22.



Source: ICI, Eikon, J.P. Morgan

Figure 18: Excess aggregate return of Worldwide Bond mutual funds vs. Barclays Global Agg index benchmark

In %, see text for details about the methodology. Last obs is March'22.



Source: ICI, Eikon, J.P. Morgan

Bitcoin's production cost falls further to $13k

- We had recently highlighted (see F&L of June 24th) that the fight for survival among bitcoin miners has been inducing an increase in mining efficiency and as a result a reduction in bitcoin's production cost. Our estimate of bitcoin's average production cost has dropped from around $20k at the beginning of June to around $15k by the end of June and around $13k currently (Figure 19). See F&L of June 24th for more details about our methodology for estimating the average production cost for bitcoin.
- This decline of the production cost estimate been has been driven almost entirely by the decline in electricity use as proxied by the Cambridge Bitcoin

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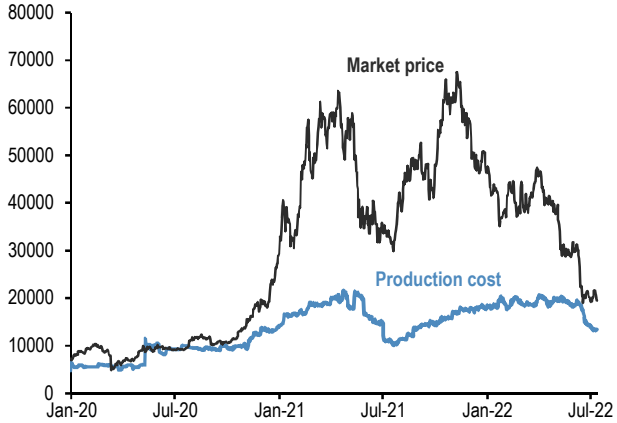
Electricity Consumption Index, while the hash rate has been fluctuating in recent months with no clear downtrend (Figure 20). The picture from Figure 20 is in our opinion consistent with a strong effort by miners to protect their profitability by deploying more efficient mining rigs rather than a mass exodus by less efficient miners.

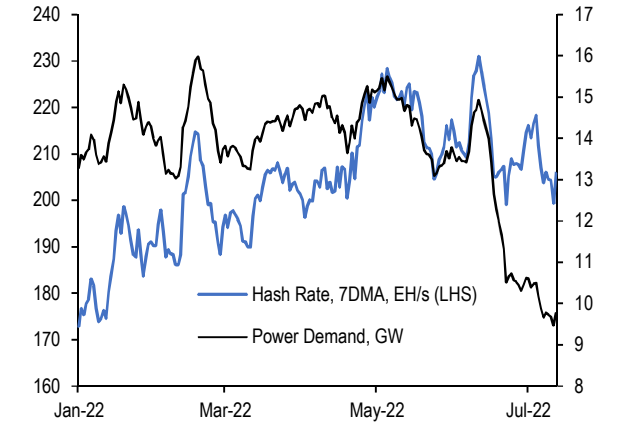
- While clearly helping miners' profitability and potentially reducing pressures on miners to sell bitcoin holdings to raise liquidity or for deleveraging, the decline in the production cost might be perceived as negative for the bitcoin price outlook going forward to the extent that the production cost is perceived by some market participants as the lower bound of the bitcoin's price range in a bear market.

Figure 19: Bitcoin market price and average cost of production
$; Based on the cost of production approach following Hayes (2018)



Source: Bitinfocharts.com, J.P. Morgan

Figure 20: Power Demand vs Hashrate 7 DMA
Power Demand, GW and Hashrate 7DMA, (EH/s)



Source: J.P. Morgan

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Table A1: Weekly flow monitor

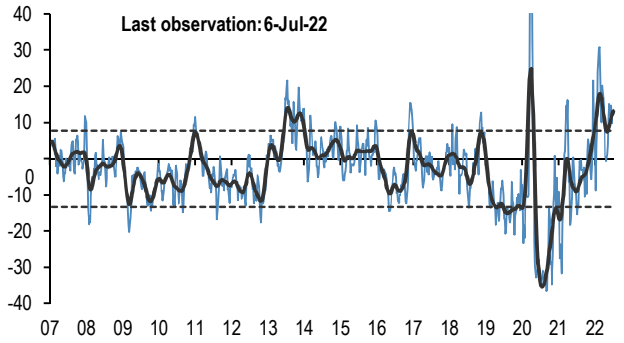
$bn, Includes Global Mutual Fund flows from EPFR and globally domiciled ETF flows from Bloomberg Finance L.P.. US Equities includes US Domiciled MFs from ICI and ETF flows from Bloomberg Finance L.P.

MF & ETF Flows	6-Jul	4 wk avg	13 wk avg	2022 avg
All Equity	-4.61	-2.7	-1.7	7.6
All Bond	2.42	-14.1	-9.5	-6.7
US Equity	-0.88	1.5	2.2	5.6
Intl. Equity	-2.79	1.9	4.1	7.90
Taxable Bonds	9.18	1.6	3.0	2.4
Municipal Bonds	0.99	0.6	0.7	0.5

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

Chart A1: Fund flow indicator

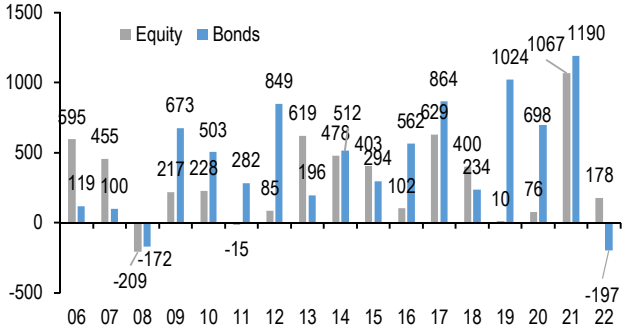
Difference between flows into Equity and Bond funds: $bn per week. Flow includes US domiciled Mutual Fund and globally domiciled ETF flows. We exclude China On-shore funds from our analysis. The thin blue line shows the 4-week average of difference between Equity and Bond fund flows. Dotted lines depict ±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 Q3'21). Data since then are a combination of monthly and weekly data from ICI, EPFR and ETF flows from Bloomberg Finance L.P.



Source: ICI, EPFR, EFAMA, 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	8-Jul	4 wk avg	13 wk avg	y/y chng
Global IPOs	1.1	2.1	2.3	-71%
Secondary Offerings	5.5	6.5	5.6	-58%
Corporate announcements				
M&A - Global	18.6	42.0	82.0	-21%
- US Target	6.9	14.1	34.5	-31%
- Non-US Target	11.7	27.9	47.5	-11%
Net bond issuance	**Feb-22**	**3 mth avg**	**YTD avg**	**y/y chng**
USD	-27	-115	29	-56%
Non-USD	-6	-38	16	-46%

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 are 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 Jun-22	MIN	MAX	Turnover ratio	Vol (tr)	y/y chng
Equities					
EM Equity*			0.7	$0.7	-31%
DM Equity*			1.5	$9.1	14%
Govt Bonds					
UST cash			12.0	$14.7	3%
UST futures			0.7	$10.3	7%
JGBs*			24.7	¥2,262	13%
Bund futures			1.5	€8.1	14%
Credit					
US HG			0.8	$0.5	1%
US HY			0.9	$0.1	-10%
US Convertibles			3.0	$0.0	38%
Commodities					
Gold			28.0	$0.7	-6%
Oil			86.4	$2.8	4%
Copper			2.5	$0.4	-27%
Digital Assets					
CME Bitcoin			188.3	$0.021	-35%
CME Ethereum			516.1	$0.009	-22%

* 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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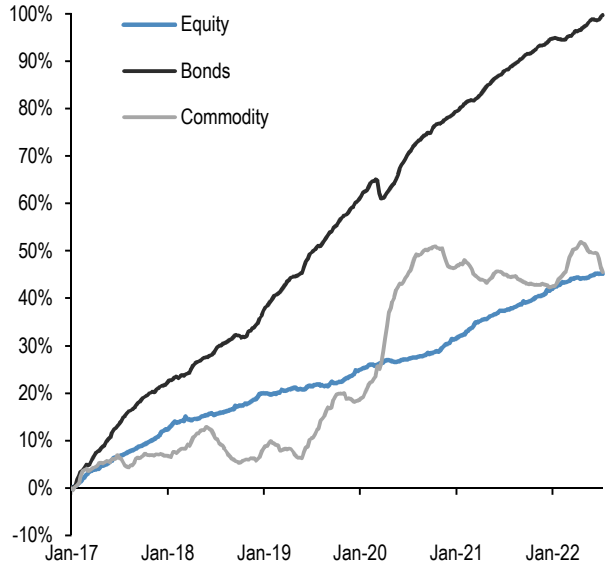
ETF Flow Monitor (as of Jul 12th)

Chart A3: Global Cross Asset ETF Flows

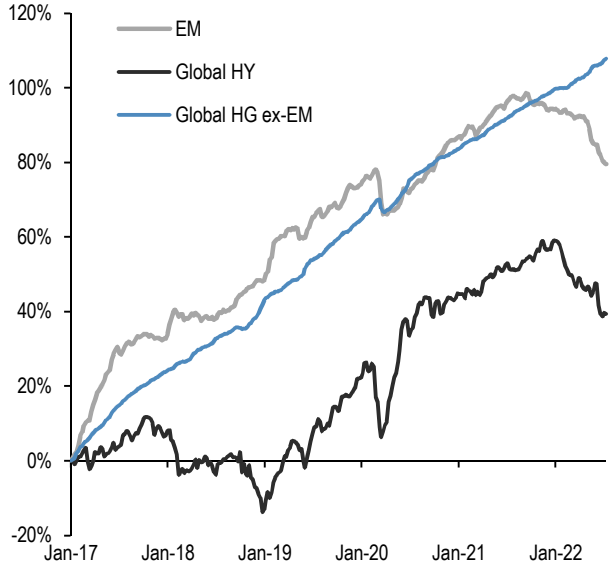
Cumulative flow into ETFs as a % of AUM



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

Chart A4: Bond ETF Flows

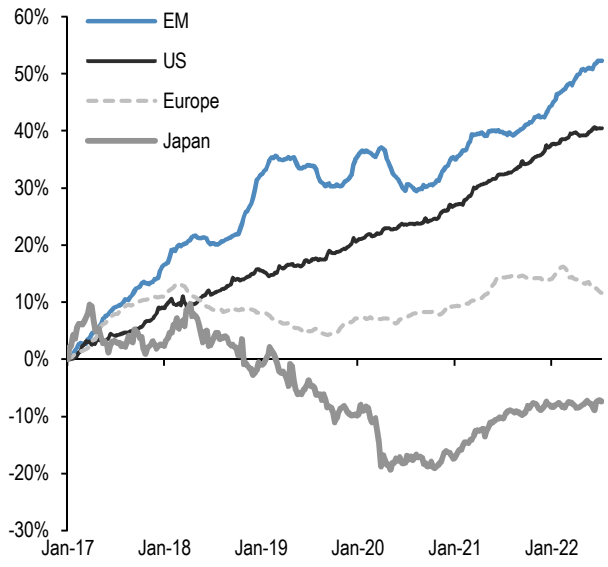
Cumulative flow into bond ETFs as a % of AUM



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

Chart A5: Global Equity ETF Flows

Cumulative flow into global equity ETFs as a % of AUM

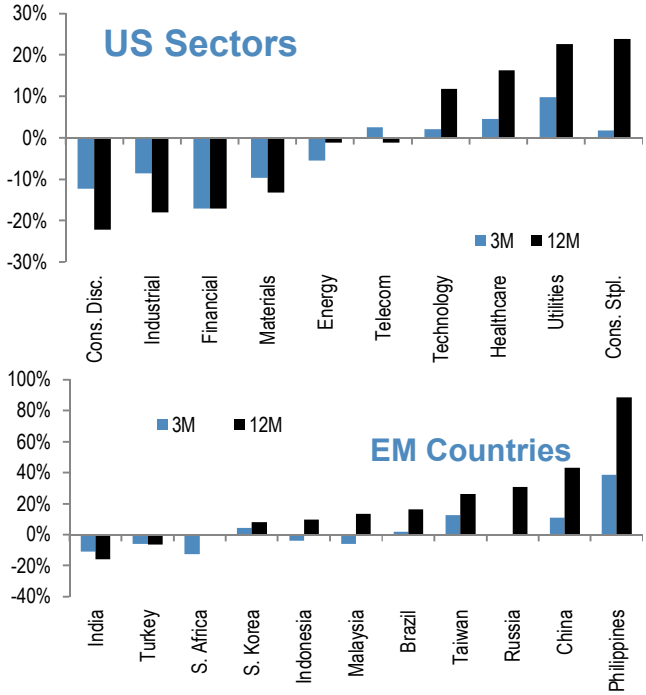


Source: J.P. Morgan. Bloomberg Finance L.P.

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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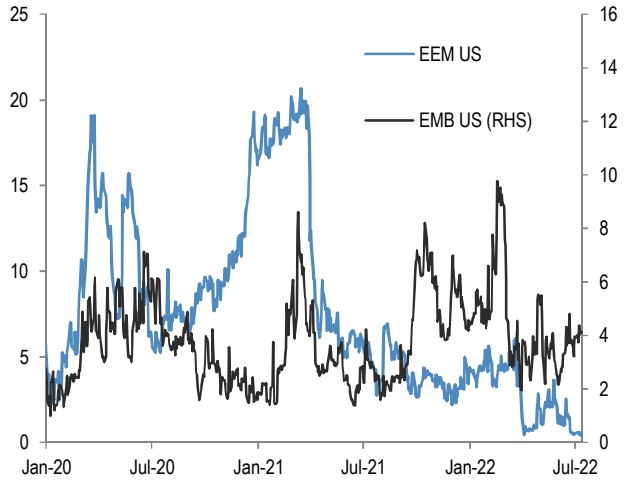
Short Interest Monitor

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

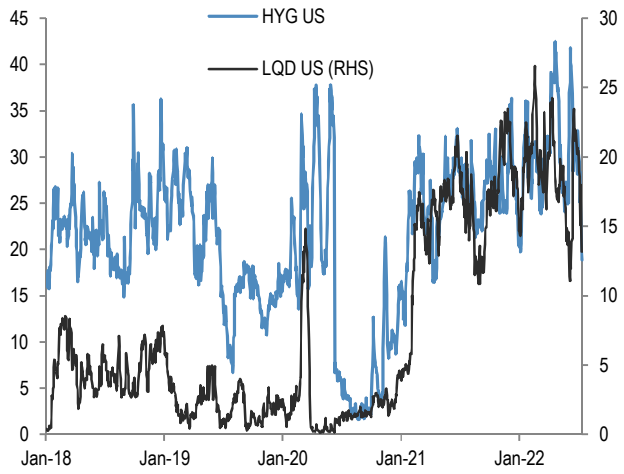
On loan quantity as a % share of share outstanding



Source: Datalend, J.P. Morgan

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

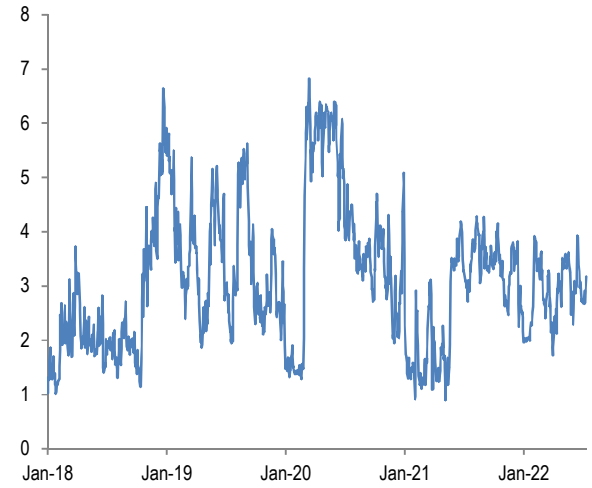
On loan quantity as a % share of share outstanding



Source: Datalend, J.P. Morgan

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

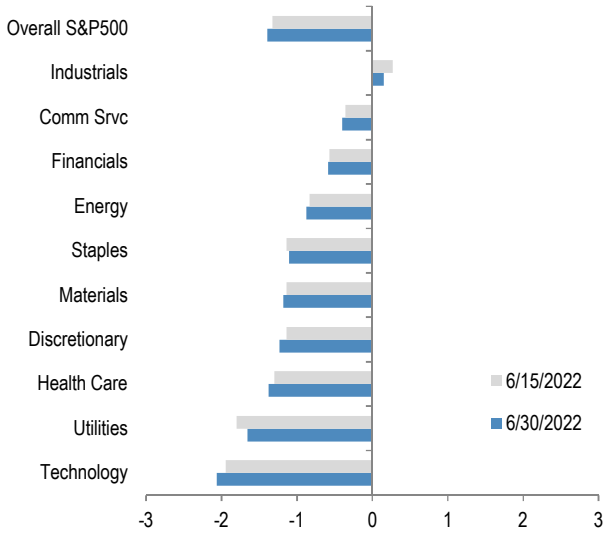
On loan quantity as a % share of share outstanding. Last obs is for 12th Jul 2022.



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 05th Jul-2022

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	24%	14%	6-Jul-21	28%	13-Jun-22	4%	10%	0.8x
EuroSTOXX	28%	14%	5-Nov-21	39%	4-Mar-22	11%	14%	1.1x
Nikkei 225	21%	16%	13-Jul-21	27%	9-Mar-22	6%	5%	1.0x
Hang Seng	26%	15%	6-Jul-21	61%	14-Oct-21	36%	10%	0.9x
MSCI EM	25%	15%	13-Apr-22	41%	11-Mar-22	16%	9%	0.9x
Gold	17%	13%	15-Sep-21	27%	8-Mar-22	10%	4%	1.2x
Oil (brent)	52%	28%	30-Jul-21	73%	23-Mar-22	21%	24%	1.1x
Copper	31%	24%	16-Aug-21	34%	15-Oct-21	3%	7%	1.1x
BB commodity index	28%	17%	10-Nov-21	28%	5-Jul-22	0%	12%	1.0x
EUR/USD	10%	5%	14-Sep-21	10%	5-Jul-22	0%	6%	1.2x
USD/NOK	15%	10%	14-Sep-21	16%	12-May-22	1%	5%	1.0x
USD/JPY	13%	5%	14-Sep-21	14%	16-Jun-22	1%	7%	1.0x
GBP/USD	12%	6%	13-Aug-21	12%	14-Jun-22	0%	5%	0.9x
USD/CHF	10%	6%	13-Aug-21	10%	17-Jun-22	0%	4%	0.7x
10y US swaps	129	67	14-Sep-21	132	14-Jun-22	3	62	0.8x
10y Eur swaps	134	36	24-Aug-21	135	4-Jul-22	2	97	0.7x
CDX IG	65%	40%	30-Aug-21	76%	7-Mar-22	10%	26%	2.1x
CDX HY	61%	37%	5-Nov-21	68%	7-Mar-22	6%	24%	2.2x
iTraxx	68%	36%	8-Nov-21	86%	7-Mar-22	18%	32%	1.3x
iTraxx X/O	66%	42%	8-Nov-21	85%	7-Mar-22	19%	24%	1.2x

Source: J.P. Morgan.

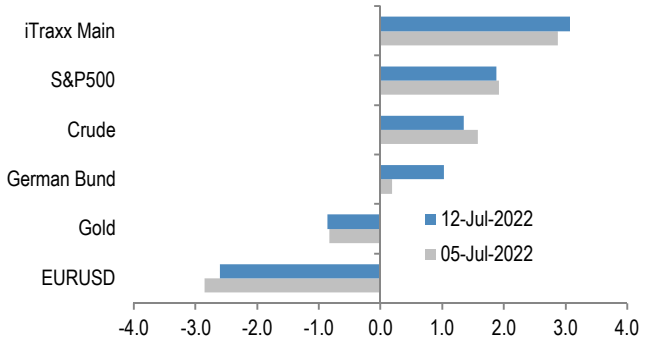
Note: Swaps volatility is 3m 10y payer ATMF implied annualized BP vol and credit volatility is 3m 5y on-the-run ATM spread volatility. MSCI EM, Gold, Oil, Copper, BB Commodity Index and Treasury futures are 3m implied vol from Bloomberg.

Definitions:

Current:	Latest available closing level (05-Jul-22)
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 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 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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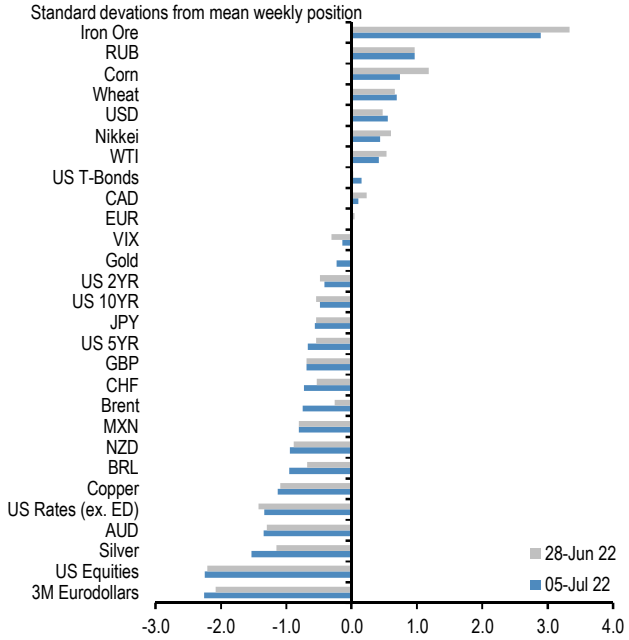
Spec position monitors

Chart A12: Weekly Spec Position Monitor

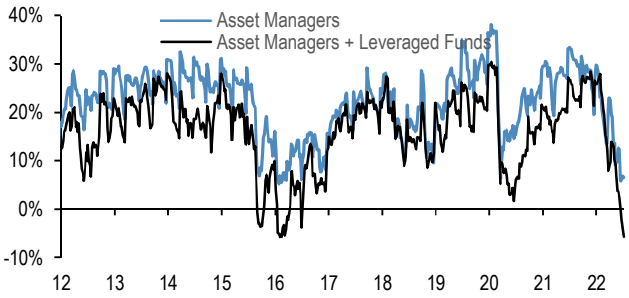
Net spec positions are proxied by the number of long contracts minus the number of short contracts using the speculative category of the Commitments of Traders reports (as reported by CFTC). To proxy for speculative investors for equity futures positions we use Asset managers (see Chart A16), whereas 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. The sample starts in Jun 2006 for all futures contracts apart from Brent which starts in Jan-2011.



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.

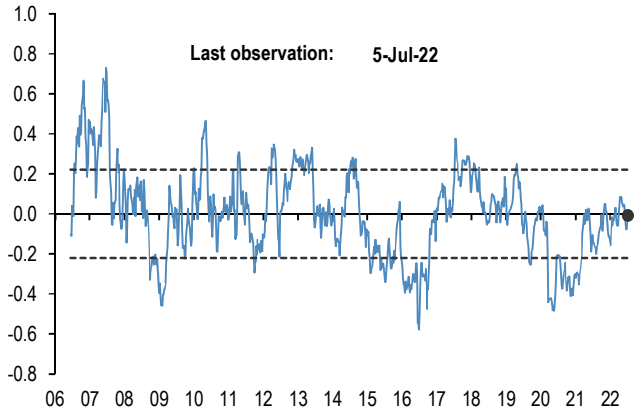


Source: CFTC, Bloomberg Finance L.P. and J.P. Morgan

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.

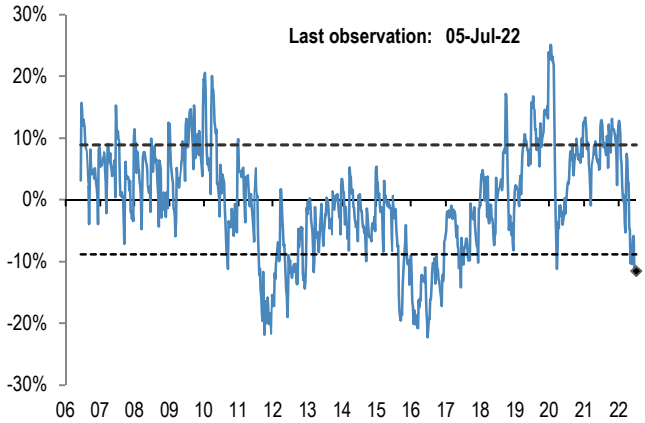


Source: CFTC, J.P. Morgan

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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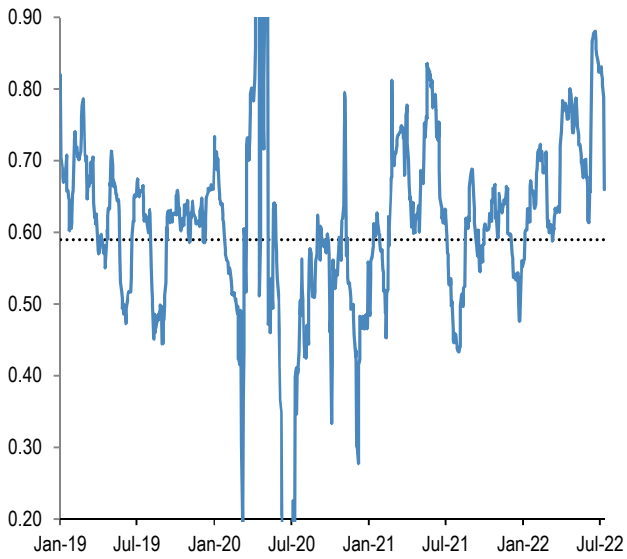
Mutual fund and hedge fund betas

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

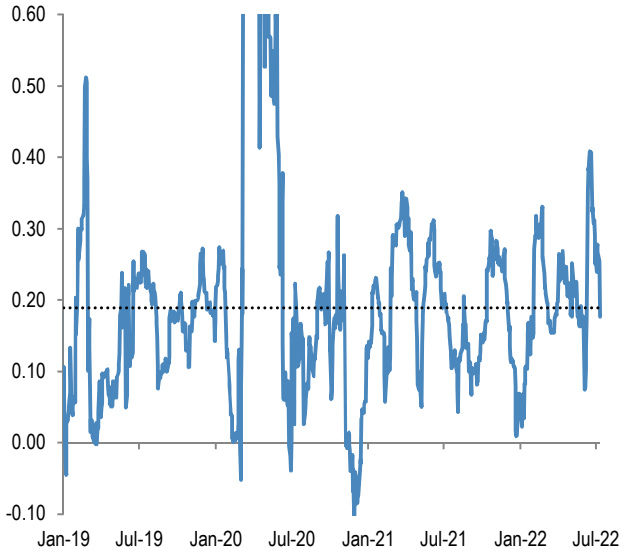
The dotted line shows the average beta since 2013.



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

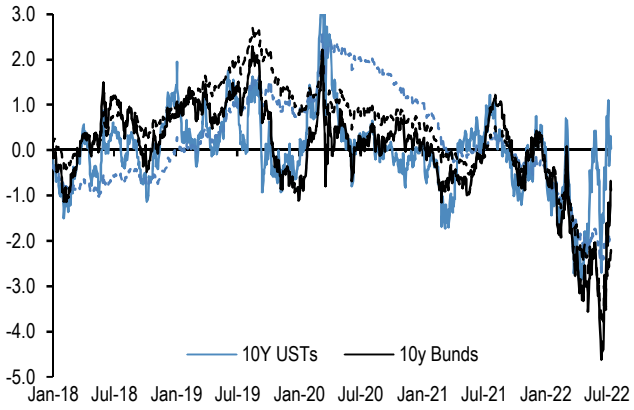
The table depicts the performance of various types of investors in % as of 11th Jul 2022.

Date	2016	2017	2018	2019	2020	2021	2022
Investors							
Equity L/S	2.2%	11.8%	-5.9%	12.8%	8.7%	6.6%	-12.6%
Macro ex-CTAs	2.8%	5.6%	9.8%	2.9%	7.8%	7.2%	3.1%
CTAs	-6.1%	2.2%	-8.1%	9.2%	6.3%	10.9%	29.2%
Risk Parity Funds	10.0%	13.5%	-6.5%	18.4%	3.5%	4.7%	-16.1%
US Balanced MFs	8.4%	14.0%	-4.9%	20.1%	13.2%	14.4%	-13.8%
Benchmark							
MSCI AC World	7.9%	24.0%	-9.4%	26.6%	16.3%	16.4%	-19.6%
Barclays Global Agg	3.9%	3.0%	1.8%	8.2%	5.6%	-2.5%	-8.7%
60 US Equity : 40 US Bonds	8.8%	14.3%	-1.9%	22.2%	13.3%	14.8%	-14.5%
S&P Riskparity Vol 10	12.8%	10.4%	-4.3%	22.8%	11.5%	12.8%	-9.2%

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.

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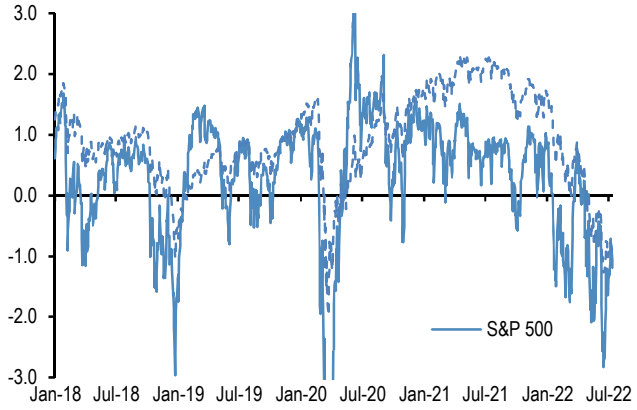
Chart A20: Momentum signals for S&P 500

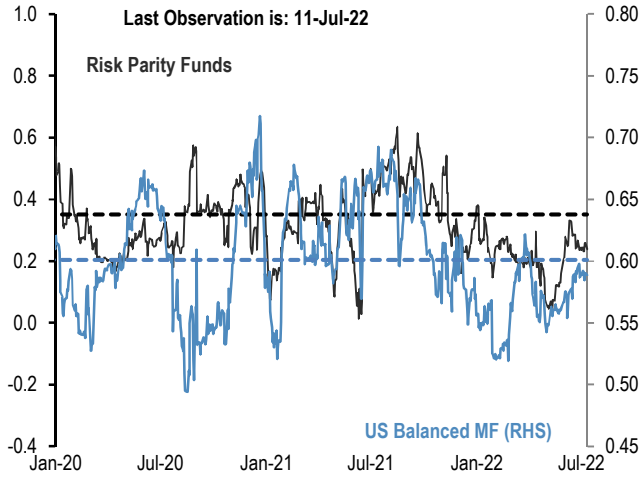
z-score of the momentum signal in our Trend Following Strategy framework shown in Tables A5 and A6 in the Appendix. Solid lines are for the shorter term and dotted lines for longer-term momentum.



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

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

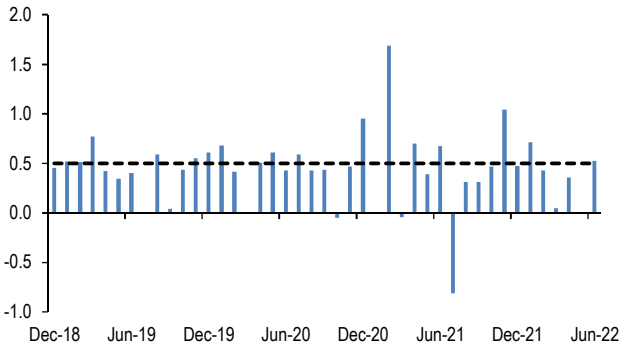
Rolling 21-day equity beta based on a bivariate regression of the daily returns of our Balanced Mutual fund and Risk Parity fund return indices to the daily returns of the S&P 500 and Barcap US Agg indices. Given that these funds invest in both equities and bonds we believe that the bivariate regression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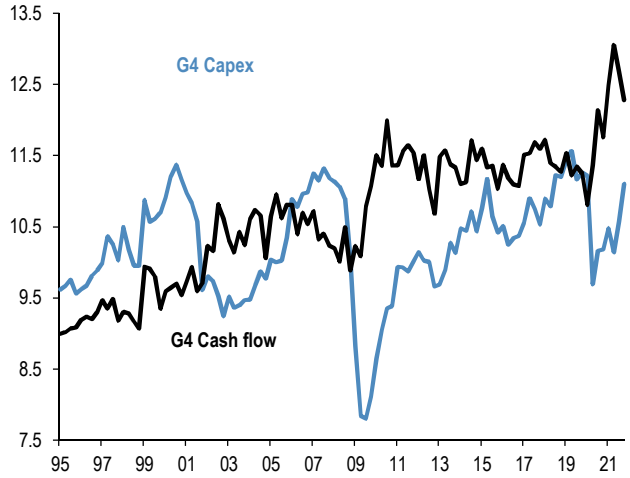
Corporate activity

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

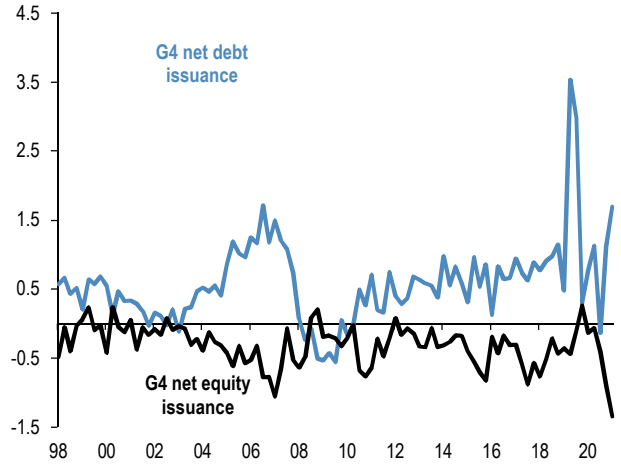
% of GDP, G4 includes the US, the UK, the Euro area and Japan. Last observation as of Q4 2021.



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

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

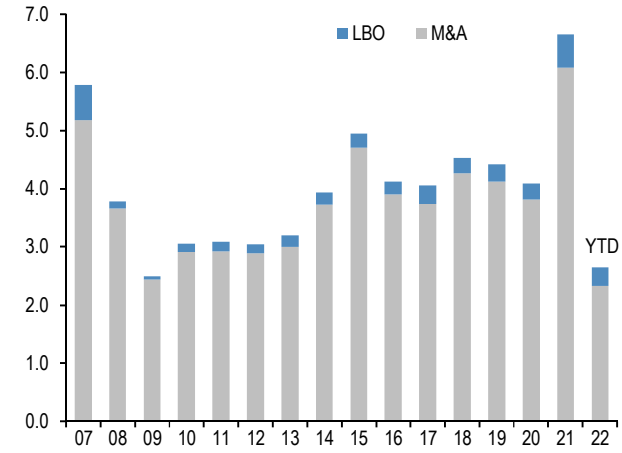
$tr per quarter, G4 includes the US, the UK, the Euro area and Japan. Last observation as of Q4 2021.



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

Chart A26: Global M&A and LBO

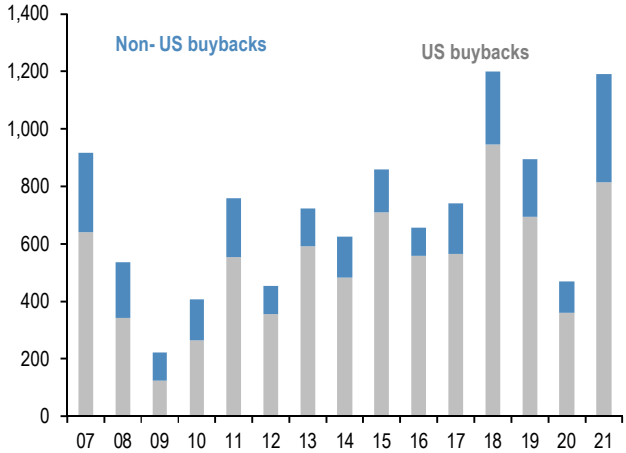
$tr. YTD 2022 as of 06th July 22. M&A and LBOs are announced.



Source: Dealogic, J.P. Morgan.

Chart A27: US and non-US share buyback

$bn, 2021 are as of Dec'21. Buybacks are announced.



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

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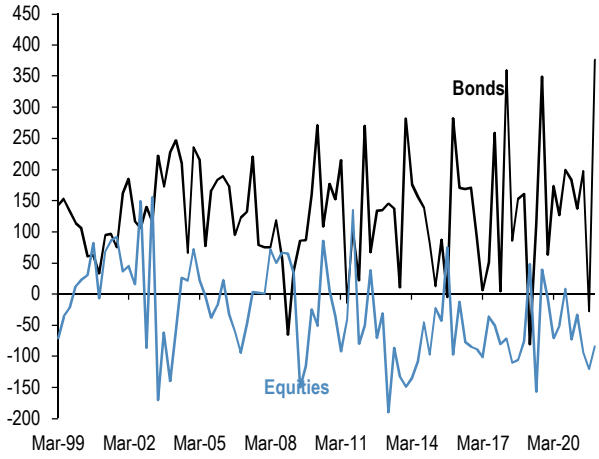
Pension fund and insurance company flows

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

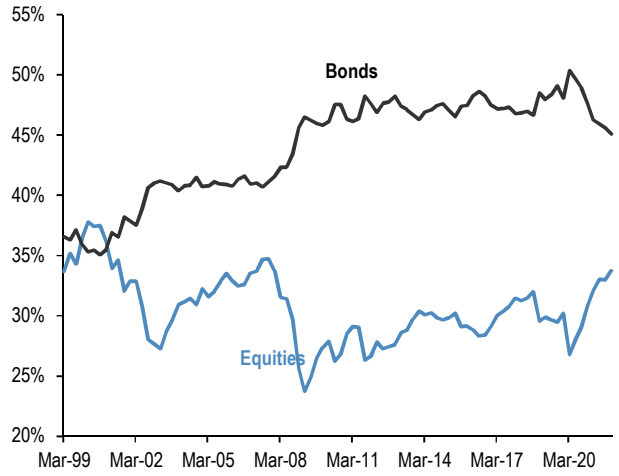
Equity and bond buying in $bn per quarter. G4 includes the US, the UK, Euro area and Japan. Last observation is Q4 2021



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

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

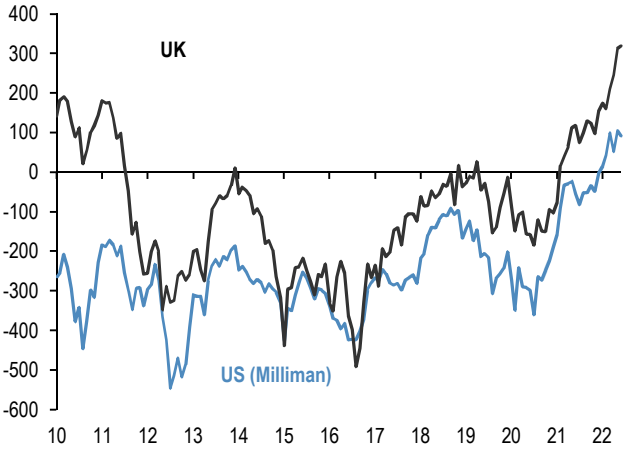
Equity and bond as % of total assets per quarter. G4 includes the US, the UK, Euro area and Japan. Last observation is Q4 2021.



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

Chart A30: Pension fund deficits

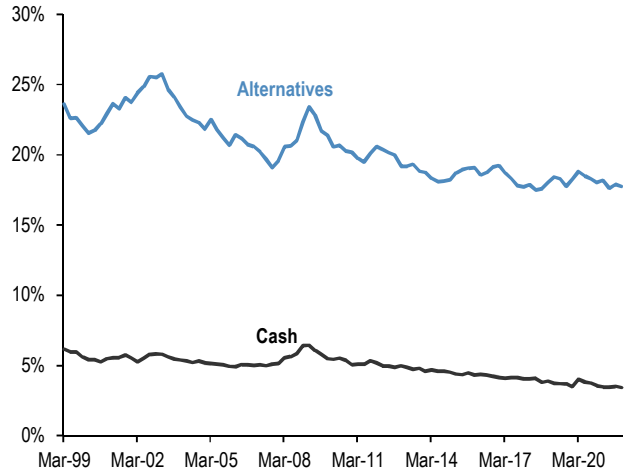
US$bn. For US, funded status of the 100 largest corporate defined benefit pension plans, from Milliman. For UK, funded status of the defined benefit schemes eligible for entry to the Pension Protection Fund, converted to US$ at today's exchange rates. Last obs. is Jun'22.



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 Q4 2021.



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

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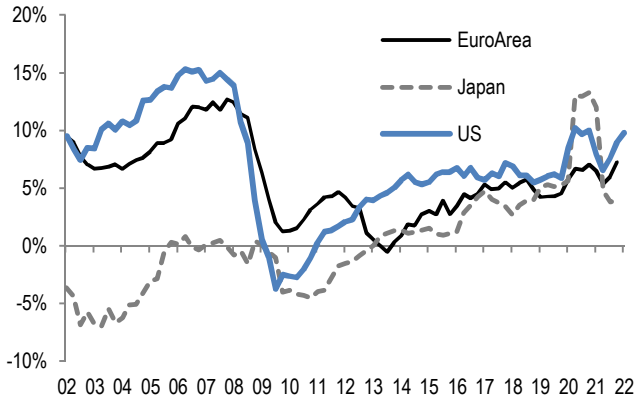
Credit Creation

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

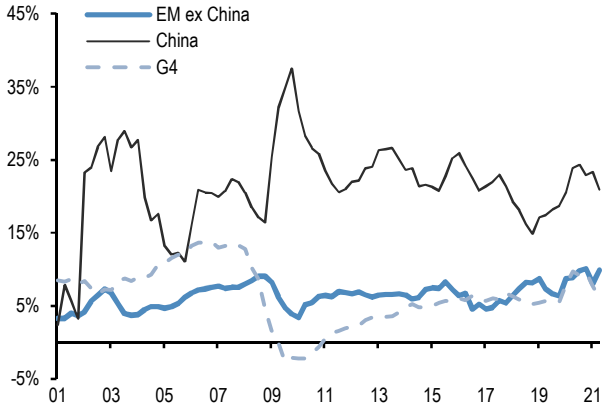
Rolling sum of 4 quarter credit creation as % of GDP. Credit creation includes both bank loans as well as net debt issuance by non-financial corporations and households. Last obs. is for Q1'22 for US and Q4'21 for japan and Euroarea.



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

Chart A33: Credit creation in EM

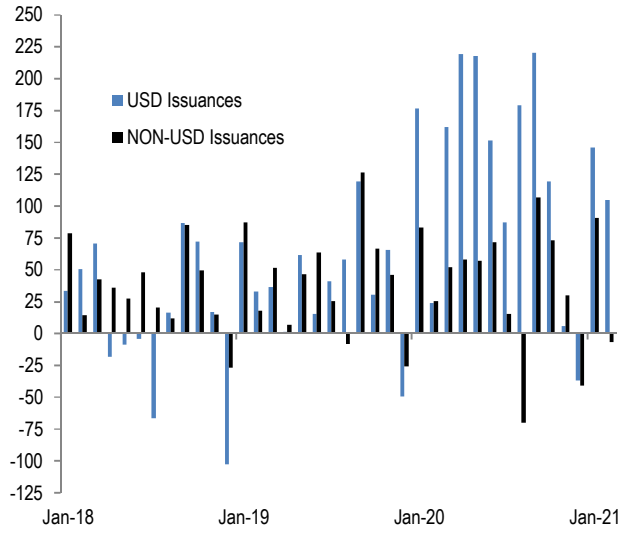
Rolling sum of 4 quarter credit creation as % of GDP. Credit creation includes both bank loans as well as net debt issuance by non-financial corporations and households. Last obs. is for Q2'21.



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

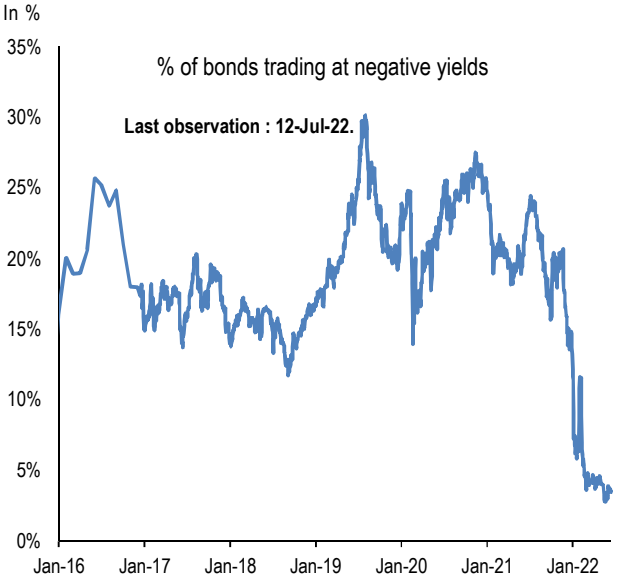
Chart A34: USD and Non-USD net bond issuances

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 Feb 2021.



Source: Dealogic, J.P. Morgan

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



Source: J.P. Morgan

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Bitcoin monitor

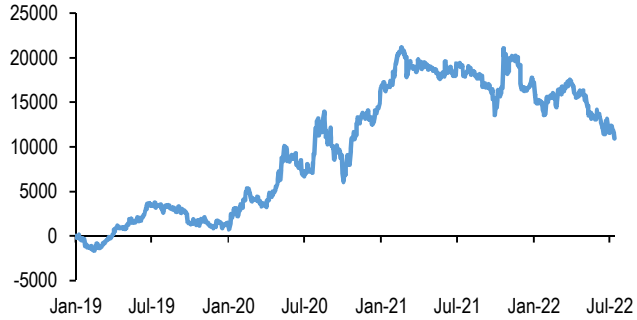
Chart A36: Open interest in CME Bitcoin futures contracts

$mn. Last obs. for 12 Jul 2022.

Source: CME, J.P. Morgan.

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

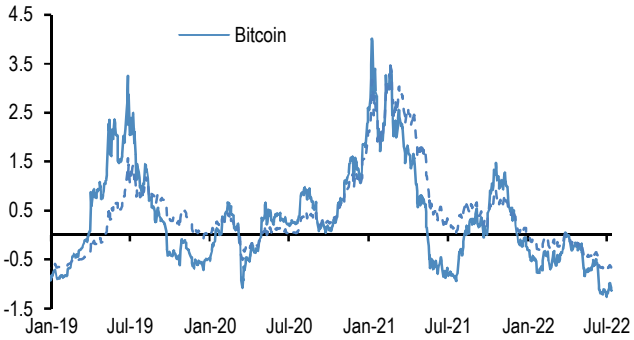
In number of contracts. Last obs. for 12 Jul 2022.



Source: J.P. Morgan

Chart A38: Momentum signals for Bitcoin

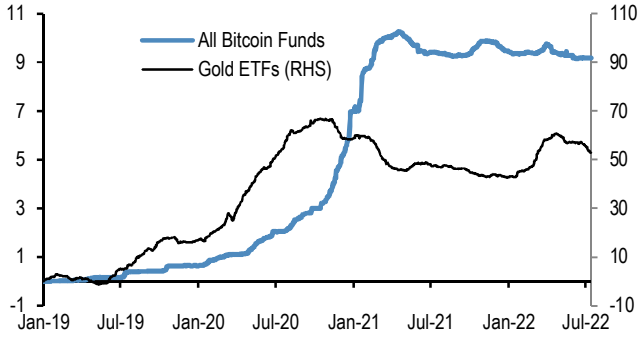
z-score of the momentum signal in our Trend Following Strategy framework shown in Tables A5 and A6 in the Appendix. Solid lines are for the shorter term and dotted lines for longer-term momentum.



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

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

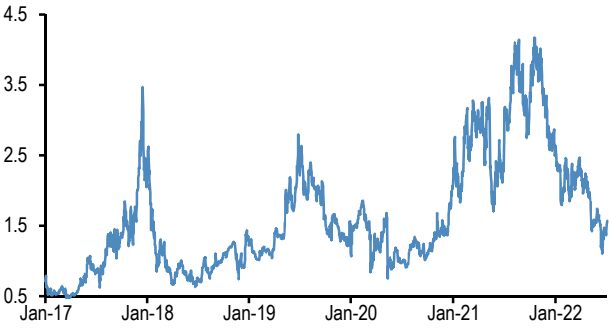
Both the y-axis in $bn



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

Chart A40: Ratio of Bitcoin market price to production cost

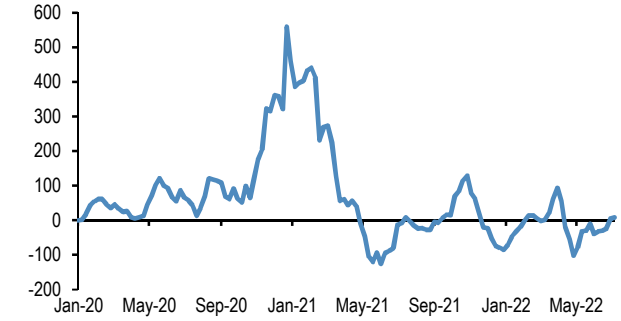
Based on the cost of production approach following Hayes (2018).



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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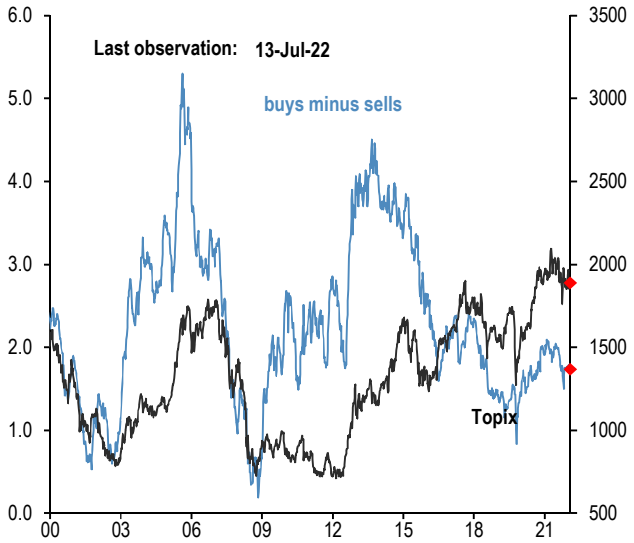
Japanese flows and positions

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

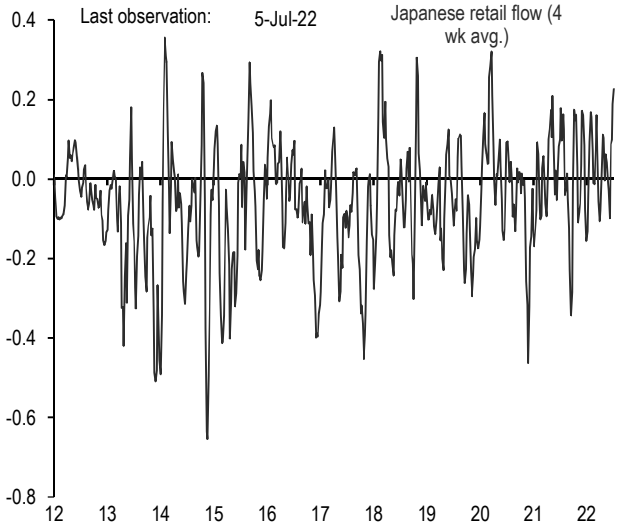
In bn of shares. Topix on right axis.



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

Chart A43: Domestic retail flows

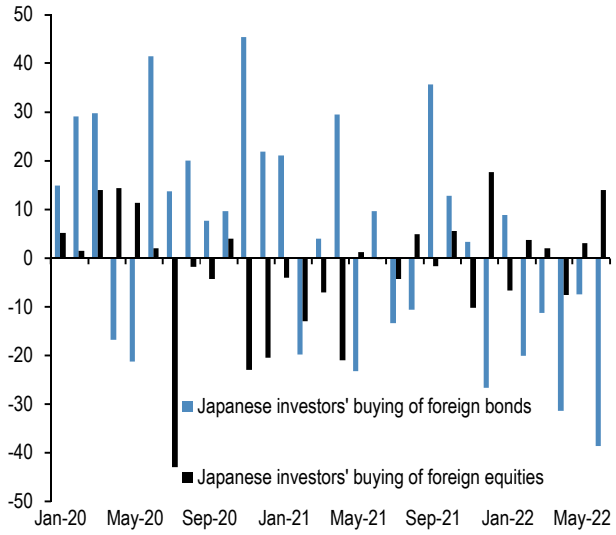
In JPY tr. Retail flows are from Tokyo stock exchange.



Source: TSE, J.P. Morgan calculations.

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

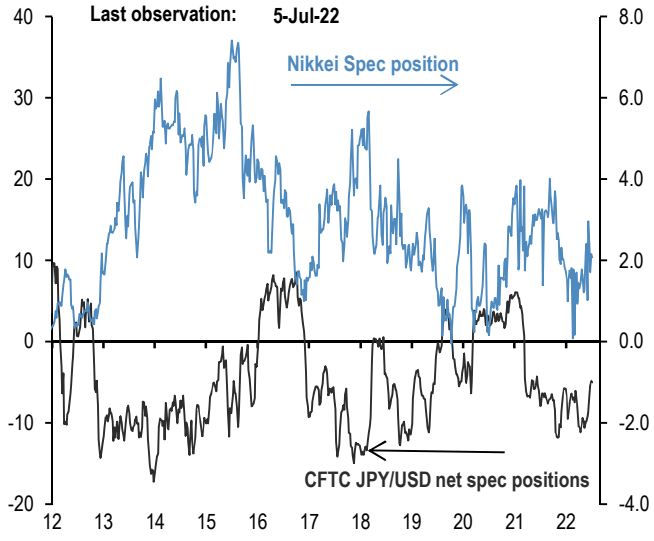
$bn, Last weekly obs. is for 30th Jun'22.



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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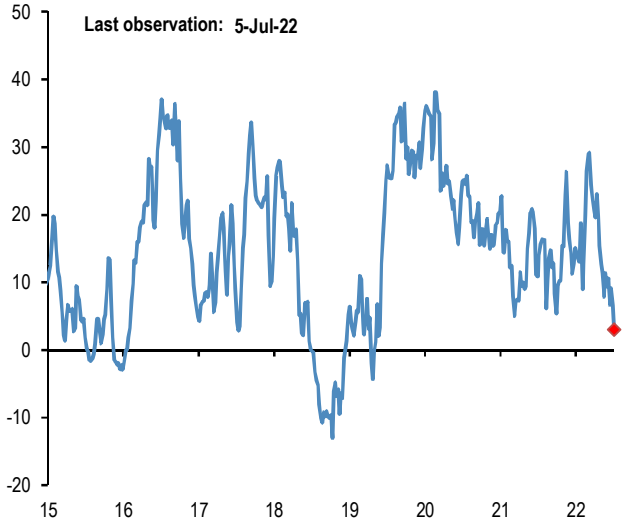
Commodity flows and positions

Chart A46: Gold spec positions

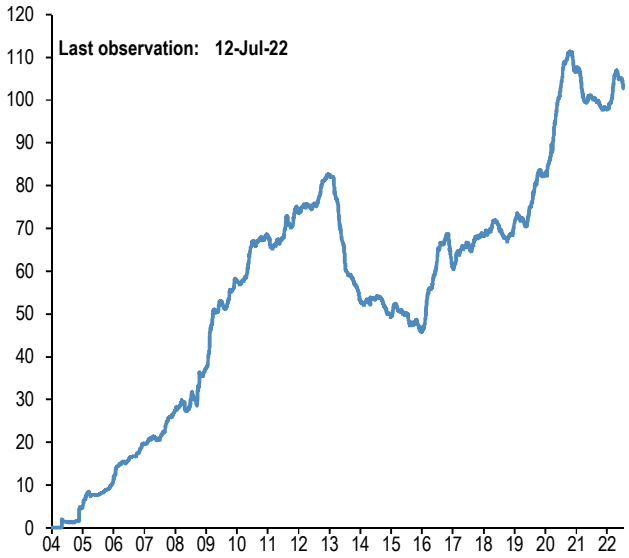
$bn. CFTC net long minus short position in futures for the Managed Money category.



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

Chart A47: Gold ETFs

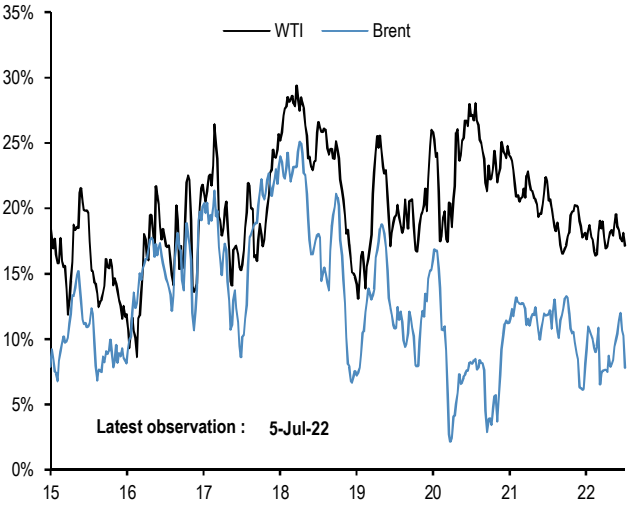
Mn troy oz. Physical gold held by all gold ETFs globally.



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

Chart A48: Oil spec positions

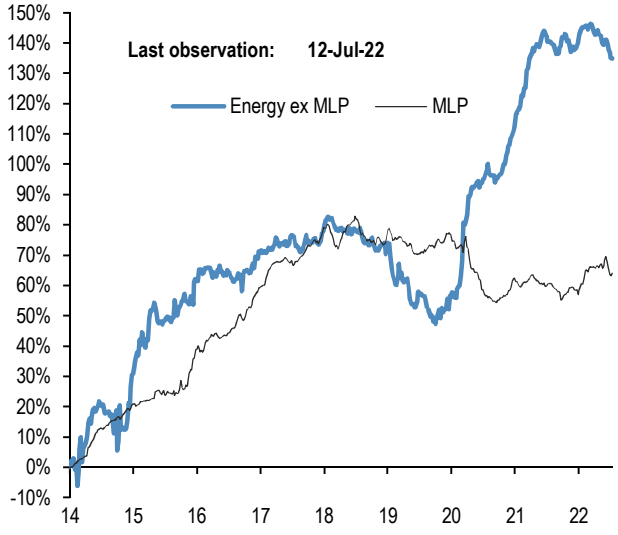
Net spec positions divided by open interest. CFTC futures positions for WTI and Brent are net long minus short for the Managed Money category.



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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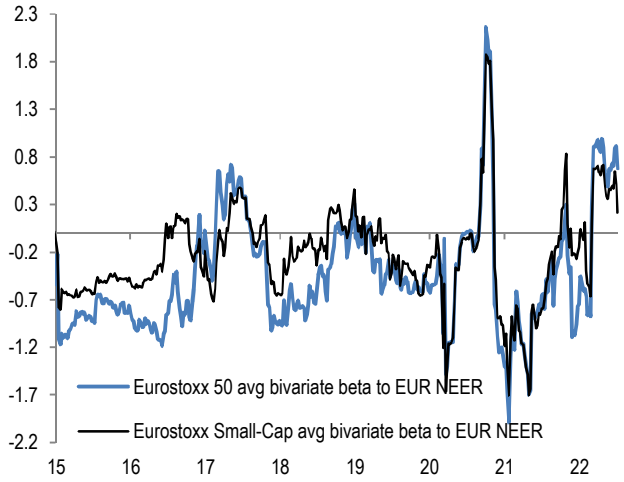
Corporate FX hedging proxies

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

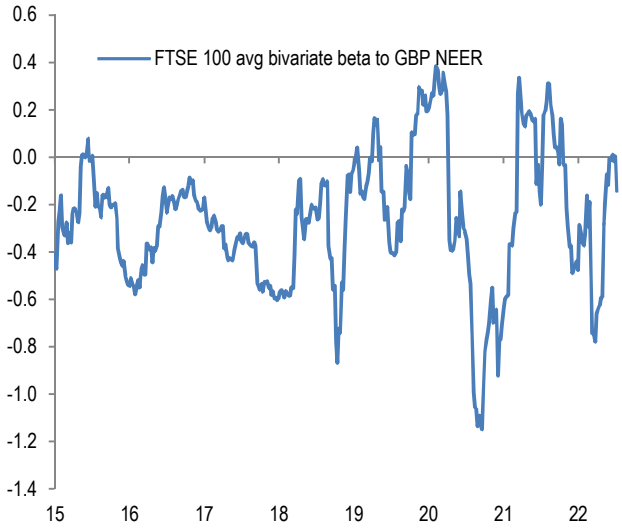
Rolling 26 weeks average betas based on a bivariate regression of the weekly returns of individual stocks in the Eurostoxx 50 index to the weekly returns of the MSCI AC World and JPM EUR Nominal broad effective exchange rate (NEER).



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

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

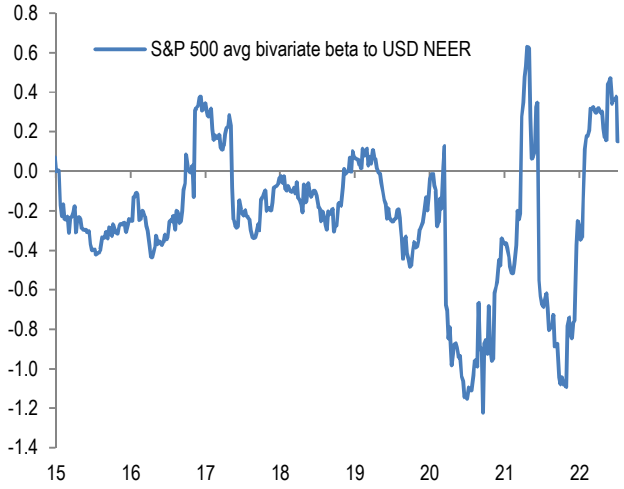
Rolling 26 weeks average betas based on a bivariate regression of the weekly returns of individual stocks in the FTSE 100 index to the weekly returns of the MSCI AC World and JPM GBP Nominal broad effective exchange rate (NEER).



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

Chart A52: Average beta of S&P500 companies to trade weighted US dollar

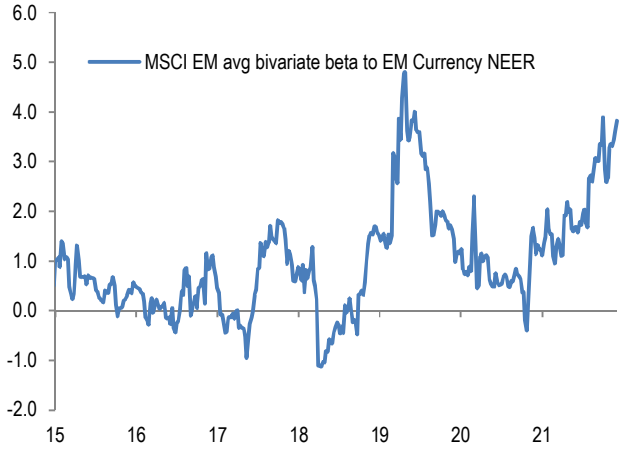
Rolling 26 weeks average betas based on a bivariate regression of the weekly returns of stocks in the S&P500 index to the weekly returns of the MSCI AC World and JPM USD Nominal broad effective exchange rate (NEER).



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

Chart A53: Average beta of MSCI EM companies to the 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.

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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	11.4	22.5	0.51	0	0	-1.7	-10.8%
	long	504				0	127	1.5	46.9%
Brent	short	105	9.2	22.2	0.41	-1	0	-0.4	-5.2%
	long	504				0	135	1.7	49.5%
Unleaded gas	short	105	7.0	24.4	0.29	0	0	0.0	-0.5%
	long	462				0	155	2.1	56.7%
Heat Oil	short	63	7.3	22.0	0.33	-1	5	-0.4	-4.3%
	long	483				0	134	2.9	86.3%
Gasoil	short	63	11.0	20.2	0.54	-1	0	-0.4	-3.9%
	long	504				0	129	2.7	88.5%
Nat gas	short	147	17.5	36.4	0.48	1	3	0.2	3.9%
	long	294				1	17	0.7	19.9%
Gold	short	21	3.1	10.6	0.30	0	1	-1.6	-4.3%
	long	504				-1	21	-0.6	-7.3%
Silver	short	10	6.7	18.8	0.36	-1	2	-1.1	-3.5%
	long	462				-1	58	-1.1	-23.6%
Palladium	short	42	15.2	21.3	0.71	1	3	0.4	3.7%
	long	273				-1	56	-0.4	-9.2%
Platinum	short	105	8.3	17.8	0.47	0	0	-1.7	-15.4%
	long	273				-1	24	-1.2	-17.2%
Aluminium	short	21	4.9	13.8	0.36	-1	3	-1.4	-4.6%
	long	378				-1	22	-0.9	-14.1%
Copper	short	147	10.4	17.6	0.59	0	1	-1.8	-23.7%
	long	399				-1	20	-0.9	-21.6%
Lead	short	126	4.2	20.1	0.21	-1	54	-1.0	-12.6%
	long	357				-1	22	-0.5	-11.5%
Nickel	short	42	15.7	23.1	0.68	0	8	-1.9	-16.6%
	long	336				-1	4	-0.2	-5.2%
Zinc	short	126	12.0	19.9	0.60	0	2	-1.6	-18.9%
	long	399				-1	8	-0.2	-5.9%
Wheat	short	168	2.1	23.2	0.09	-1	13	-1.3	-15.8%
	long	294				-1	1	-0.4	-6.9%
Kansas wheat	short	147	7.8	21.1	0.37	-1	12	-1.2	-14.8%
	long	504				1	12	0.6	13.1%
Corn	short	63	8.7	17.0	0.51	0	0	-2.1	-17.2%
	long	399				1	15	0.2	3.2%
Soybeans	short	42	7.1	14.7	0.48	0	0	-1.8	-9.6%
	long	231				1	4	0.1	2.0%
Cotton	short	168	6.5	18.6	0.35	-1	13	-1.0	-14.4%
	long	483				1	14	0.4	9.9%
Sugar	short	63	7.6	22.0	0.35	-1	22	-0.3	-2.6%
	long	252				-1	1	-0.1	-2.2%
Coffee	short	63	5.5	23.3	0.24	-1	5	-0.9	-8.0%
	long	315				-1	0	-0.1	-1.3%
Cocoa*		10	2.2	28.2	0.08	1	1	0.1	0.3%

* 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 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	63	6.9	11.9	0.58	-1	7	-1.1	-4.8%
	long	357				-1	48	-0.9	-10.6%
Nasdaq 100	short	84	7.9	14.7	0.54	-1	13	-1.1	-8.9%
	long	462				-1	57	-0.7	-14.7%
Nikkei	short	63	3.4	13.6	0.25	-1	0	-0.3	-1.5%
	long	420				-1	21	-0.3	-4.9%
FTSE 100	short	147	4.4	12.2	0.36	-1	9	-0.3	-1.7%
	long	462				1	106	0.5	6.1%
Eurostoxx 50	short	21	3.2	13.3	0.24	1	0	0.1	0.4%
	long	357				-1	57	-0.8	-10.8%
MSCI EM	short	42	13.6	11.4	1.20	-1	9	-0.9	-4.8%
	long	357				-1	122	-1.2	-19.6%
2Y USTs	short	252	0.9	1.0	0.94	0	90	-2.0	-2.2%
	long	483				0	29	-1.7	-3.0%
5Y USTs	short	252	2.0	2.8	0.70	0	86	-2.0	-4.6%
	long	378				0	86	-2.0	-5.8%
10Y USTs	short	42	2.0	3.6	0.56	1	1	0.3	0.4%
	long	504				0	81	-1.8	-8.2%
2Y Schatz	short	252	0.3	0.8	0.39	-1	7	-0.6	-0.4%
	long	441				-1	8	-0.6	-0.6%
5y Bobl	short	84	1.5	1.8	0.81	1	1	0.6	0.6%
	long	483				0	76	-1.6	-3.8%
10y Bund	short	105	2.5	3.4	0.74	-1	1	-0.7	-1.4%
	long	462				0	78	-2.1	-8.1%
10Y JGB	short	168	0.9	2.2	0.43	-1	16	-0.3	-0.4%
	long	273				-1	16	-0.6	-0.8%
10Y Gilts	short	105	1.7	4.0	0.43	-1	1	-0.9	-1.9%
	long	504				0	40	-1.8	-8.1%
Euro	short	42	3.4	6.3	0.55	0	4	-2.1	-4.6%
	long	273				0	5	-1.9	-11.3%
Yen	short	21	1.9	6.1	0.32	-1	13	-0.7	-1.0%
	long	399				0	72	-2.4	-17.0%
Sterling	short	168	2.7	7.2	0.37	0	10	-1.9	-8.5%
	long	294				0	10	-1.9	-10.7%
AUD	short	42	4.5	7.7	0.58	-1	23	-1.2	-3.3%
	long	378				-1	58	-0.9	-8.3%
CAD	short	252	0.4	6.3	0.06	-1	23	-0.5	-2.4%
	long	504				-1	21	-0.3	-2.2%

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

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