

Flows & Liquidity

US retail investors likely not the culprits

- We find little evidence to suggest that retail investors have played a big role in this month's equity correction, at least up until last week. If anything, small option traders saw last week's correction as an opportunity to add to their call option buying, especially on individual equities.
- We thus suspect that institutional investors have played a bigger role, in particular momentum traders such as CTAs, which, as we highlighted last week, had reached extremely overbought levels on Nasdaq futures on Wednesday last week, inducing triggering of mean reversion signals.
- In addition, the delta-hedging of call options sold to small traders may have served to amplify the market moves.
- The froth from the previous extreme positions of momentum traders should be largely cleared as the z-score of the momentum signal for Nasdaq fell below 1.5 standard deviations after today's move.
- Foreign and institutional investors likely contributed to last week's sell-off in onshore Chinese equities.

- The correction in equity and risky markets in September is raising questions about the role of retail investors. In our previous publication last Friday we had argued that the selling at the end of last week might have been less driven by cash equity investors and more driven by option investors, who according to press reports had boosted tech stocks in recent weeks, or quantitative investors such as momentum traders and CTAs exiting extremely long futures positions in Nasdaq. What has the role of retail investors, such as small option traders, been? Has there been continued divergence in September between the behaviour of the older cohorts of the US retail investors' universe, which have been acting as a drag on the equity market by selling equity funds in previous months, vs. millennials, which have been supporting the equity market in previous months by buying individual stocks and individual stock options?

Global Markets Strategy Global Quantitative & Derivatives Strategy

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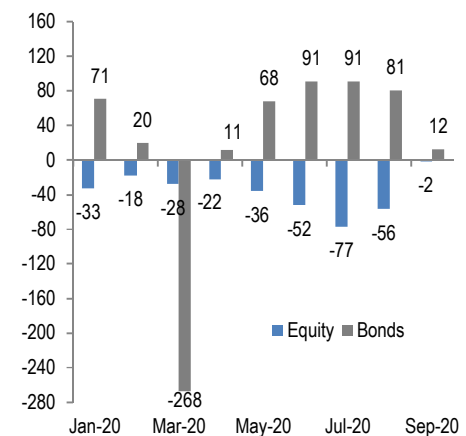
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Figure 1: Monthly flows into equity and bond funds domiciled in the US

\$bn per month, Mutual Funds and ETFs, it includes only US domiciled funds.



Source: ICI, J.P. Morgan.

2020 Institutional Investor Global Fixed-Income Research Poll

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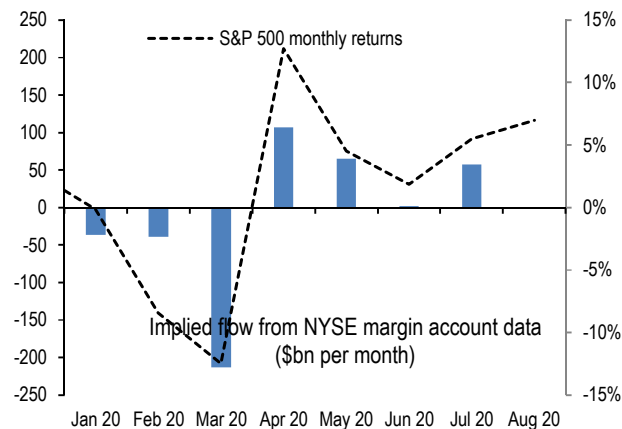
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See page 25 for analyst certification and important disclosures.

- We had argued before that younger cohorts including millennials tend to invest directly in individual equities or individual equity options, rather than via funds, while older cohorts tend to invest via mix of both equity funds and individual stocks as well as bond funds. As mentioned above these older cohorts of US retail investors' universe have been selling equity funds and buying bond funds in previous months. Preliminary fund flow data for the first week of September suggest that this previous equity fund selling slowed markedly so far in September to almost zero (Figure 1). Therefore, it appears that these older cohorts of US retail investors' universe were likely not responsible for this month's correction in equity markets.
- What about younger cohorts? To proxy the flow by the younger cohorts into individual stocks, we use NYSE margin account data. These margin accounts are predominantly used by retail investors and allow for maximum leverage of up to two times. The NYSE margin account data for the month of July showed buying of \$50bn of individual equities, up from a flattish flow in June (Figure 2). Although we do not have data for August, given the strong correlation between the implied equity flow from NYSE margin accounts and the monthly performance of the S&P500 this year, we suspect that August saw more buying than July, of around \$100bn perhaps. It is, however, too early to make any inferences about the NYSE margin account flow for September.

Figure 2: Implied equity flow from NYSE margin accounts Net Debit balances

The NYSE margin account Net Debit balance is equal to the margin debit balance minus the sum of total credit balances (cash account credit +margin account credit). The blue line is constructed by the Net Debit balance in \$bn divided by the market capitalization of the S&P500 index.

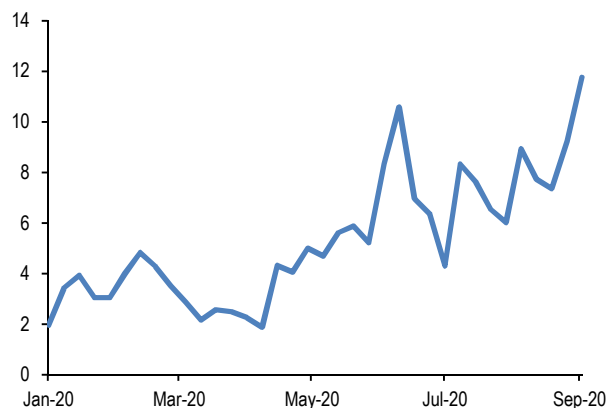


Source: FINRA, NYSE, J.P. Morgan.

- One way of gauging the behaviour of younger cohorts during September is by looking at small traders equity option flows i.e. option customers with less than 10 contracts. These data come from OCC, the world's largest equity derivatives clearing organization. They are weekly with the week ending Sep 4th as the last available observation. Figure 3 to Figure 5 depict these small traders' option flows for exchange-traded individual equity options, options on ETFs as well as option on equity indices. All three have risen for the week ending Sep 4th, suggesting that, if anything, small option traders saw last week's correction as an opportunity to add to their call option buying especially on individual equities.

Figure 3: Exchange-traded Call Option Buys at Open minus Sells at Open for Customers with less than 10 contracts for options on individual equities

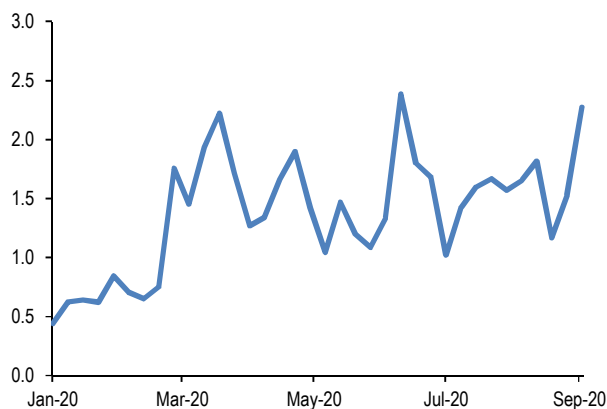
In mn contracts. Last obs is for the week ending 4th Sep 2020



Source: OCC, J.P. Morgan.

Figure 4: Exchange-traded Call Option Buys at Open minus Sells at Open for Customers with less than 10 contracts for options on ETFs

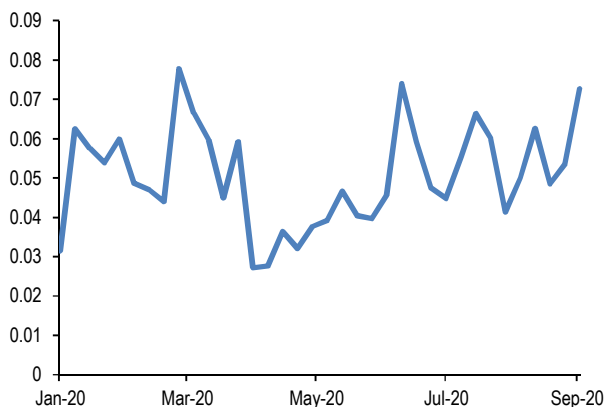
In mn contracts. Last obs is for the week ending 4th Sep 2020



Source: OCC, J.P. Morgan.

Figure 5: Exchange-traded Call Option Buys at Open minus Sells at Open for Customers with less than 10 contracts for options on Index

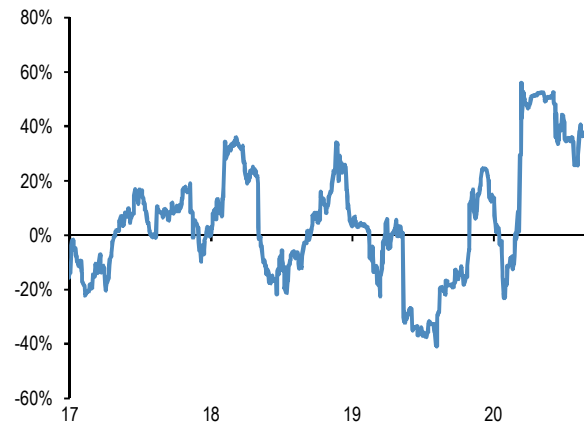
In mn contracts. Last obs is for the week ending 4th Sep 2020



Source: OCC, J.P. Morgan.

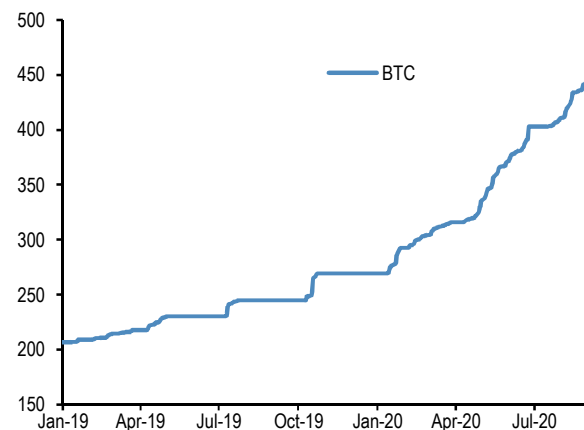
- It is also important to bear in mind that the impact on underlying equity markets from options trading is dependent on which side of the trade does the hedging. It hasn't been unusual in recent years for dealers to end up holding the long side on call options as a result of call overwriting activity as investors holding the underlying stock have sought to earn additional return by earning the premium on selling calls – essentially selling volatility. In this case, the delta-hedging activity of dealers holding long calls results in selling the underlying as it rises in price and buying it as it falls, thereby leaning against market moves. However, in the current conjuncture small traders appear to have increased significantly exposure to individual tech stocks via buying call options. As a result, dealers would be short the call options, and the delta hedging of these short calls would tend to amplify market moves, i.e. buying the underlying as the price rises and selling it as it falls.
- A second way to gauge the behaviour of the younger cohorts of US retail investors' universe during September is by looking at Bitcoin ETF flows. The correlation between the S&P500 index and Bitcoin prices has been firmly positive since March (Figure 6) as the appetite for risk by younger cohorts favoured both equities and Bitcoin. The fact that the flows into Bitcoin ETFs held up in September (Figure 7) suggests that the risk appetite by those younger cohorts has remained healthy so far in September.

Figure 6: Correlation between Bitcoin and S&P 500 Index
 3-month rolling correlation of daily returns



Source: Bloomberg, J.P. Morgan.

Figure 7: Outstanding shares for Grayscale Bitcoin Trust
 Sh. outstanding (mn) for Grayscale Bitcoin Trust.

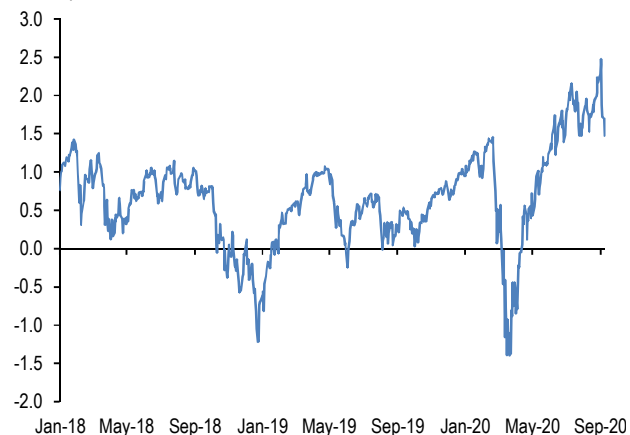


Source: Bloomberg, J.P. Morgan.

- In all, we find little evidence to suggest that retail investors have played a big role in this month's equity correction, at least up until last week. We thus suspect that institutional investors have played a bigger role, in particular momentum traders such as CTAs, which, as we highlighted last week, had reached extremely overbought levels on Nasdaq futures on Wednesday last week, inducing triggering of mean reversion signals. As Figure 8 shows, the froth from the previous extreme positions of momentum traders should be largely cleared as the z-score of the momentum signal for Nasdaq fell below 1.5 standard deviations after today's move.

Figure 8: Average of the z scores of our short and long lookback period Momentum Signals for Nasdaq

z-score of the momentum signal in our Trend Following Strategy framework shown in Tables A5 and A6 in the Appendix. The lines show the average z-score of the short and long lookback period momentum for Nasdaq.

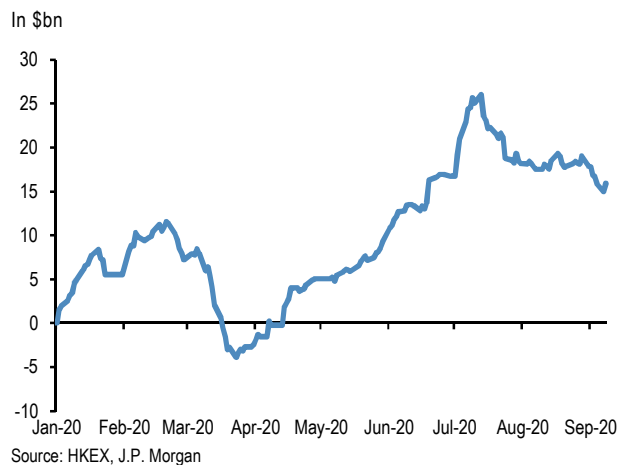


Source: Bloomberg, J.P. Morgan.

Foreign and institutional investors likely contributed to last week's sell-off in onshore Chinese equities

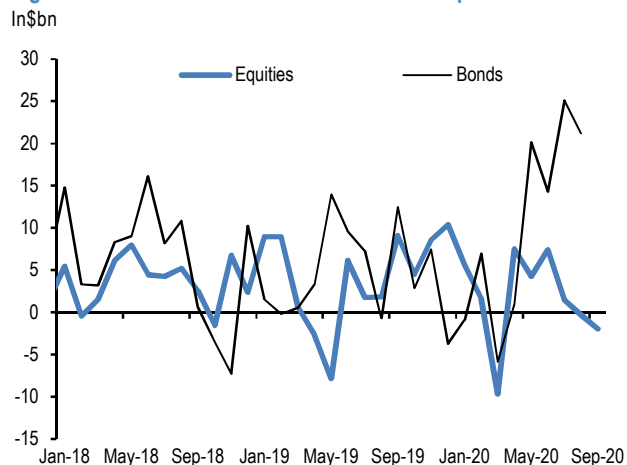
- In recent months we had noted that the rapid rise in Chinese equities until early July and subsequent swings had likely been exacerbated by foreign and momentum-driven investors with a partial offset from domestic margin investors. How have flows and positions developed since then?
- As we had argued previously, foreign investors likely exacerbated market moves earlier in the summer, though after end-July their activity overall appears to have been relatively muted. Figure 9 shows the net Northbound Connect flows, our higher frequency and more timely proxy for net flows. Indeed, following inflows of \$7.5bn in June and \$9bn in the first half of July, which were largely reversed in the second half of July, the net flow for August was effectively flat. However, foreign investors do appear to have contributed to last week's sell-off, with September to-date having seen net outflows of around \$2bn. By contrast, net inflows into Chinese onshore bonds based on BondConnect data remained strong in August with an inflow of \$20bn following July's \$25bn (Figure 10), bringing YTD net inflows to just over \$80bn.

Figure 9: Cumulative inflows into onshore Chinese equities via Northbound Stock Connect



Source: HKEX, J.P. Morgan

Figure 10: Net inflow into Chinese bonds and equities



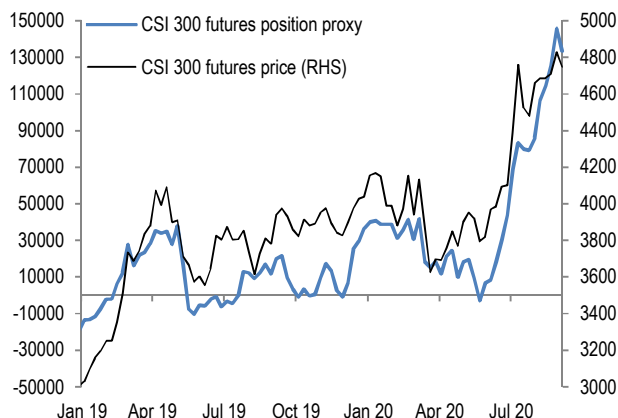
Source: HKEX, CCDC, SHCH, J.P. Morgan

- What about institutional investors? We turn first to our positioning proxy for institutional investors based on the weekly sign of price changes multiplied by the absolute change in futures contracts, which includes domestic as well as foreign hedge funds who also use these futures contracts. The idea behind this proxy is that any big change in the open interest reflects a significant position adjustment by investors, but whether it represents an increase or decrease in net positions depends on the price change. For example, if there is a price decrease and a decline in the open interest we assume that this reflects a reduction in long positions by investors. But if there is a price decrease and an increase in the open interest we assume this reflects an increase in short positions. And vice versa, if there is price increase and a decline in the open interest we assume that this reflects a reduction in short positions by investors. But if there

is a price increase and an increase in the open interest we assume this reflects an increase in long positions. This positioning proxy suggests that institutional investors have increased their net longs markedly since end-July, and they also likely contributed to last week's declines (Figure 11).

Figure 11: Position proxy for CSI 300 Futures (IFB1 Index)

Number of contracts in thousands across all expiries. Cumulative weekly absolute change in open interest multiplied by the sign of the CSI 300 futures price change every week.

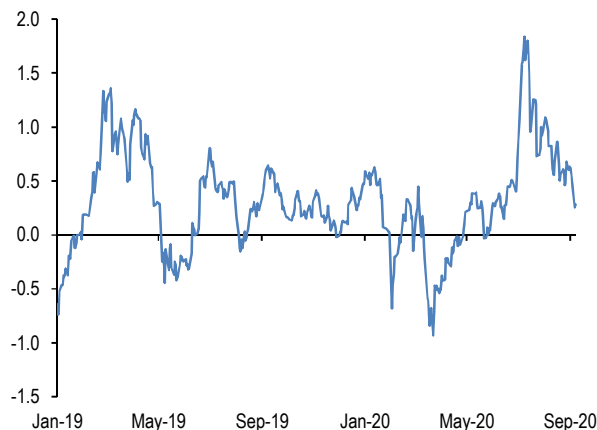


Source: Bloomberg, J.P. Morgan.

- Unlike the moves in June and July, it appears momentum-based investors such as CTAs likely diverged somewhat from other institutional investors using futures contracts in August. Figure 12 shows the average z-score of the shorter-term and longer-term momentum signals for CSI 300 futures based on a similar methodology as our regular framework for momentum-based investors shown in Tables A4 and A5 in the Appendix. After reaching extreme levels by mid-July and seeing a sharp unwind in end-July, the momentum loss in the CSI300 amid a range-bound market in August suggests if anything that CTAs likely trimmed exposure even as the broader futures positioning proxy increased. As a result, positions were likely light ahead of last week's sell-off, though last week may have seen some further moderation in remaining exposures.

Figure 12: Momentum signals for CSI 300

z-score of the momentum signal in our Trend Following Strategy framework shown in Tables A5 and A6 in the Appendix. The lines show the average z-score of the short and long lookback period momentum for the CSI 300.

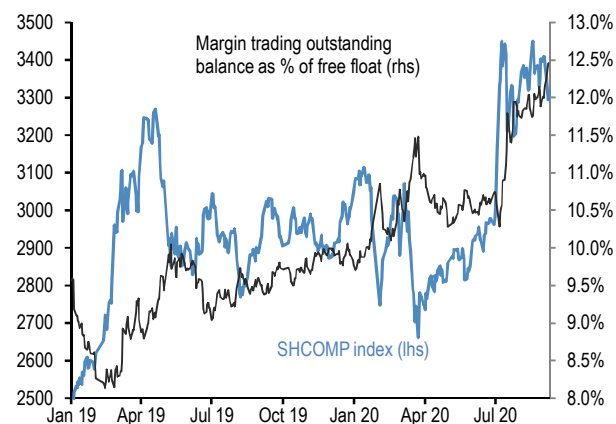


Source: Bloomberg, J.P. Morgan.

- What about domestic retail investors? We have typically proxied retail investor positioning, at least in leveraged form, using margin debt balances as a share of the free float of the Shanghai Stock exchange. This indicator, depicted in Figure 13, shows that after increasing sharply in the second half of July, largely after the July peak in the CSI300, margin trading ground gradually higher before jumping higher again last week, suggesting again that margin traders have provided some offset amid the market decline. While this leaves margin outstanding at around 12.5% of the free float, its highest level since early 2016, it still remains some way below its previous peak of 18% in mid-2015.

Figure 13: Chinese equity market margin debt

Black line (rhs) is outstanding balance of margin transactions as % of the free float of Shanghai Stock Exchange. Blue line is SHCOMP Index. Last obs. for Margin debt and SHCOMP is for Sep 07, 20.



Source: Bloomberg, J.P. Morgan.

- In all, it appears that foreign portfolio outflows and some unwind of elevated longs by institutional investors contributed to last week's sell-off in onshore Chinese equities. In August, foreign portfolio flows in equities were muted while inflows into onshore bonds remained strong, while institutional investors and domestic margin traders supported onshore equities.
- Looking beyond portfolio flows, Chinese FX reserves increased by around \$10bn in August. But this largely reflects a currency valuation gain of \$17bn given the 1.3% depreciation in the DXY that was partially offset by a negative bond return, which we proxy by returns on 1-5Y maturity buckets in JPM GBI country indices and assume a 60:40 split into dollar:non-dollar reserves and apply DXY weights to the non-dollar part. Given the sell-off in bond markets, the net effect of FX translation gains and losses on bonds was a negative reserve flow of around \$3bn. Based on their estimates for the current account surplus, our China economists estimate a net capital outflow of \$57bn in August despite portfolio inflows, which they think could be driven by a combination of seasonal dividend pay-outs, a near-term increase in dollar holdings by exporters or a possible write-off of loans to low income economies amid debt stress ([*FX reserves rose to \\$3.165tr in August*](#), Ng et al, Sep 7th).

Table A1: Weekly flow monitor

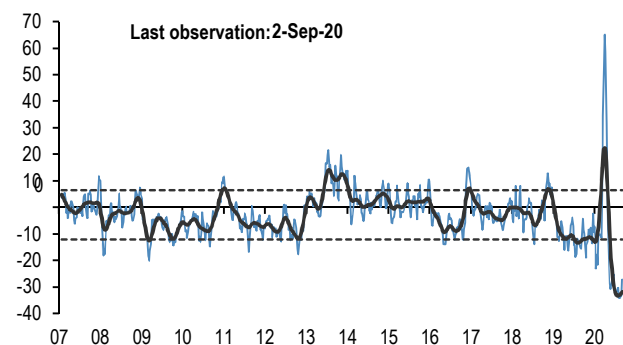
\$bn, Includes Global Mutual Fund flows from EPFR and globally domiciled ETF flows from Bloomberg. US Equities includes US Domiciled MFs from ICI and ETF flows from Bloomberg.

MF & ETF Flows	2-Sep	4 wk avg	13 wk avg	2018 avg
All Equity	-1.51	0.8	-0.5	-3.4
All Bond	22.04	16.7	17.5	9.2
US Equity	-4.98	-12.5	-13.5	-4.7
Intl. Equity	3.47	11.9	9.1	-1.15
Taxable Bonds	13.97	15.5	17.2	6.8
Municipal Bonds	0.00	2.1	2.6	2.0

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

Chart A1: Fund flow indicator

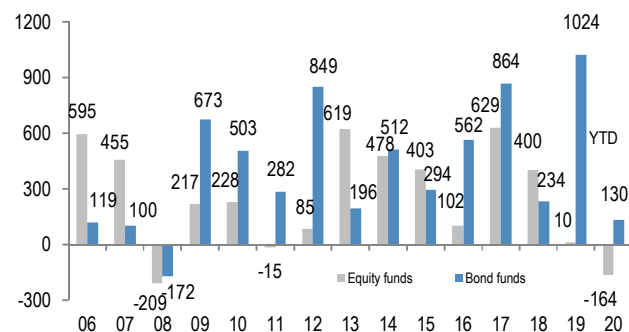
Difference between flows into Equity and Bond funds: \$bn per week. Flow includes US domiciled Mutual Fund and globally domiciled ETF flows. We exclude China On-shore funds from our analysis. The thin blue line shows the 4-week average of difference between Equity and Bond fund flows. Dotted lines depict ± 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, 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 Q4'19). Data since then are a combination of monthly and weekly data from ICI, EPFR and ETF flows from Bloomberg.



Source: ICI, EPFR, EFAMA, Bloomberg 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	4-Sep	4 wk avg	13 wk avg	y/y chng
Global IPOs	2.3	5.3	6.4	29%
Secondary Offerings	10.6	11.8	15.0	75%
Corporate announcements				
M&A - Global	46.0	52.4	78.9	-29%
- US Target	28.8	25.5	30.7	-50%
- Non-US Target	17.1	26.8	48.2	-10%
Net bond issuance				
USD	84	51	52	-4%
Non-USD	47	23	30	7%

Source: Bloomberg, 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. 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 Aug-20	MIN	MAX	Turnover ratio	Vol (tr)	y/y chng
Equities					
EM Equity*			1.2	\$1.0	67%
DM Equity*			1.4	\$6.9	42%
Govt Bonds					
UST cash			7.5	\$7.6	4%
UST futures			0.7	\$11.7	-25%
JGBs*			21.4	¥1,754	16%
Bund futures			0.2	€0.8	-21%
Credit					
US HG			0.6	\$0.4	13%
US HY			0.9	\$0.1	24%
US Convertibles			1.8	\$0.0	31%
Commodities					
Gold			58.5	\$1.6	30%
Oil			59.9	\$1.0	-47%
Copper			2.2	\$0.4	-32%

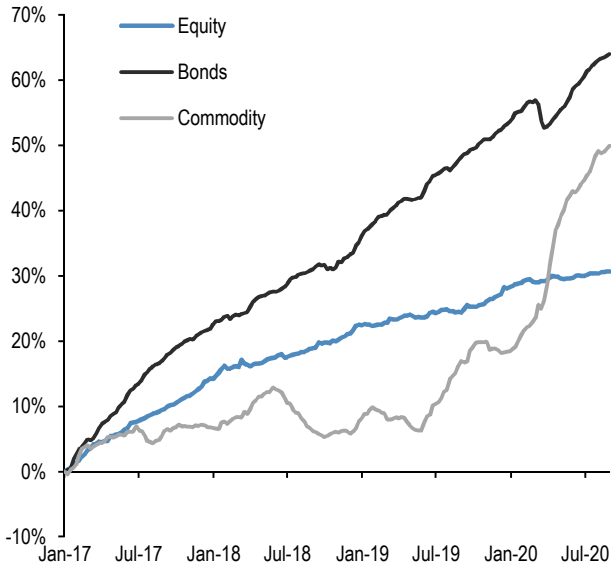
* Data with one month lag

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

ETF Flow Monitor (as of Sep 02nd)

Chart A3: Global Cross Asset ETF Flows

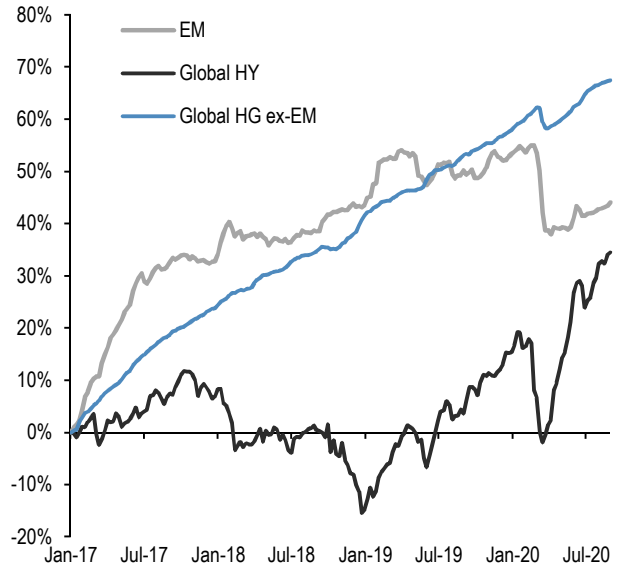
Cumulative flow into ETFs as a % of AUM



Source: J.P. Morgan. Bloomberg

Chart A4: Bond ETF Flows

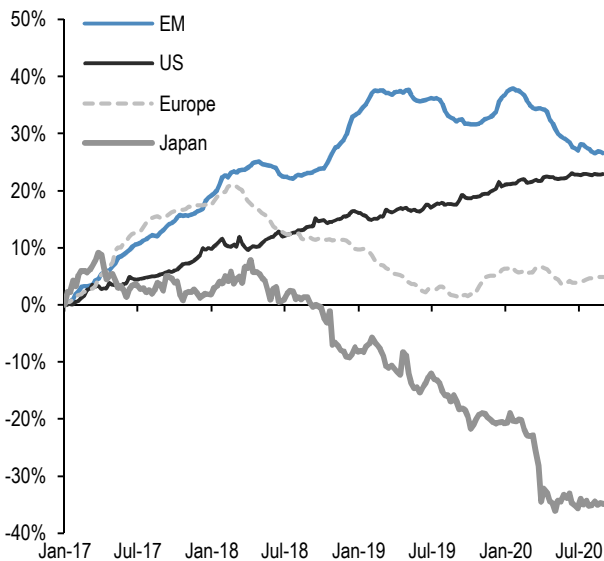
Cumulative flow into bond ETFs as a % of AUM



Source: J.P. Morgan. Bloomberg

Chart A5: Global Equity ETF Flows

Cumulative flow into global equity ETFs as a % of AUM

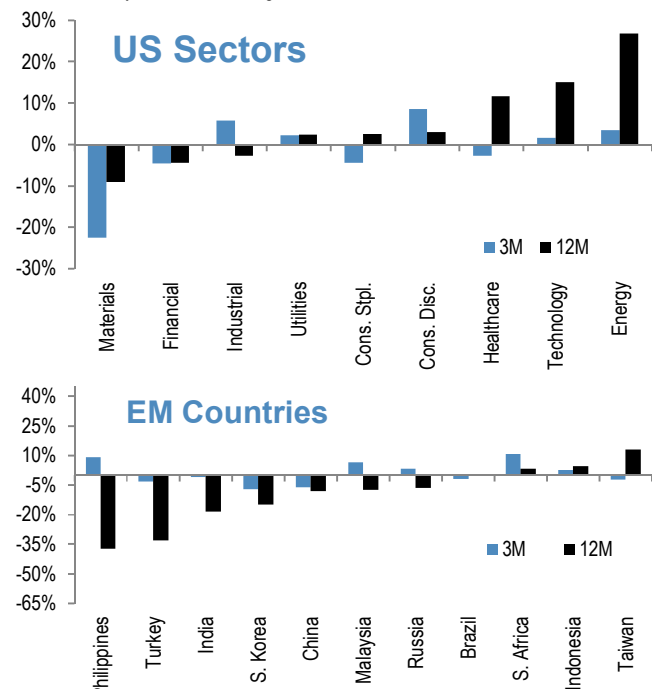


Source: J.P. Morgan. Bloomberg

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

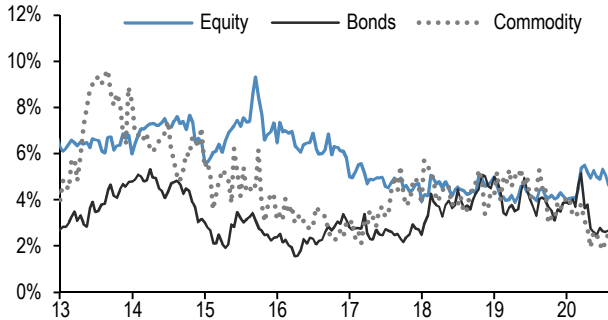


Source: J.P. Morgan. Bloomberg.

ETF Short Interest Monitor (as of Aug 14)

Chart A7: Cross Asset ETF Short Interest

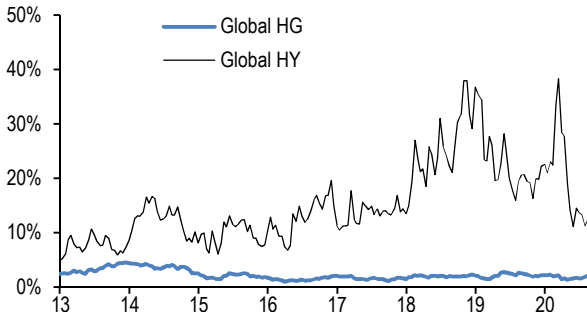
Short interest as a % of outstanding shares. Short interest is for US Domiciled ETFs and is available bi-monthly from Bloomberg. Short interest is weighted by AUM



Source: J.P. Morgan. Bloomberg.

Chart A8: Bond ETF Short Interest

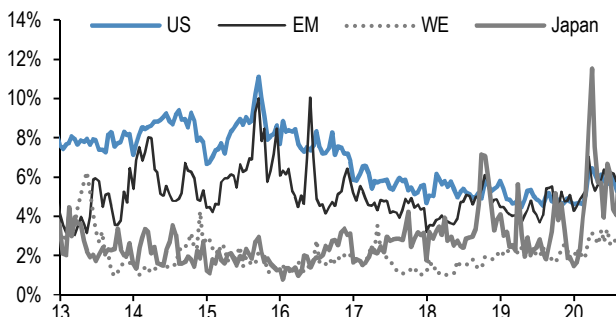
Short interest as a % of outstanding shares. Short interest is for US Domiciled ETFs and is available bi-monthly from Bloomberg. Short interest is weighted by AUM



Source: J.P. Morgan. Bloomberg.

Chart A9: Equity ETF Short Interest

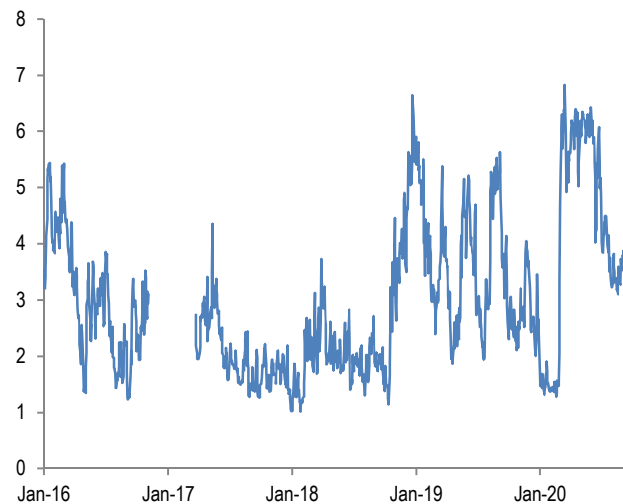
Short interest as a % of outstanding shares. Short interest is for US Domiciled ETFs and is available bi-monthly from Bloomberg. Short interest is weighted by AUM



Source: J.P. Morgan, Bloomberg.

Chart A10a: Quantity-On-Loan on the SPY US ETF

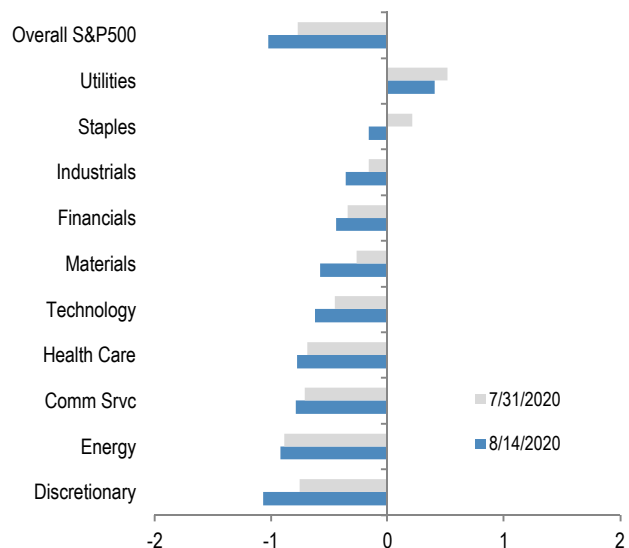
On loan quantity as a % share of share outstanding. Last obs is for 4th Sep 2020.



Source: Datalend, J.P. Morgan

Chart A10b: S&P500 sector short interest

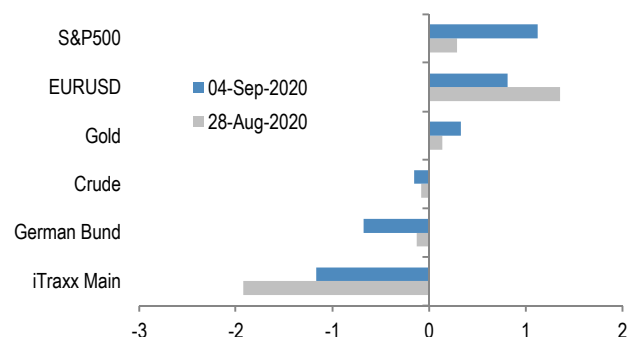
Short interest as a % of shares outstanding based on z-scores. A strategy which overweight's the S&P500 sectors with the highest short interest z-score (as % of shares o/s) vs. those with the lowest, produced an information ratio of 0.7 with a success rate of 56% (see F&L, Jun 28, 2013 for more details)



Source: NYSE, J.P. Morgan.

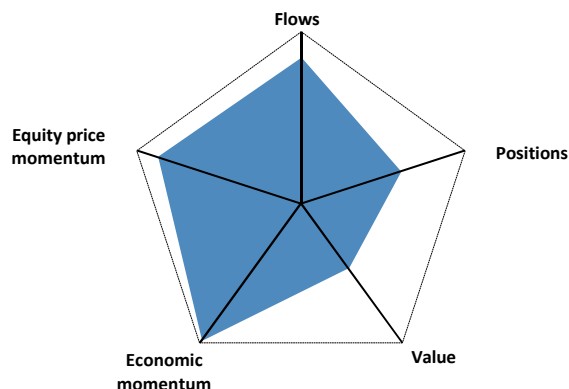
Chart A11: Option skew monitor

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: Bloomberg, J.P. Morgan

Chart A12: Market health map



Trading signal for S&P500 and 10Y UST using Artificial Intelligence

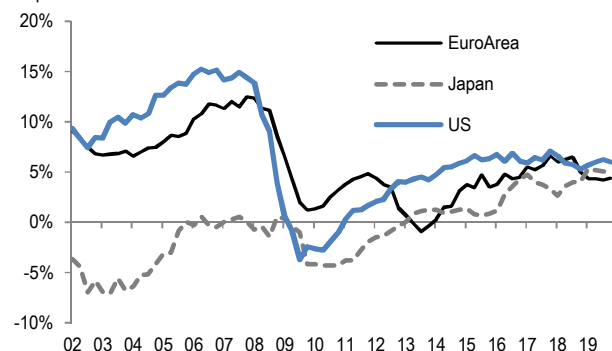
	1 Month	2 Month	3 Month	6 Month
S&P 500 Index	Down	Down	Up	Up
10Y UST Yield	Up	Up	Up	Up

Explanation of Market health map: Each of the five axes corresponds to a key indicator for markets. The position of the blue line on each axis shows how far the current observation is from the extremes at either end of the scale. The dotted line shows the same but at the beginning of 2012 for comparison. For example, a reading at the centre for value would mean that risky assets are the most expensive they have ever been while a reading at the other end of the axis would mean they are the cheapest they have ever been. Overall, the larger the blue area within the pentagon, the better for the risky markets. All variables are expressed as the percentile of the distribution that the observation falls into. I.e. a reading in the middle of the axis means that the observation falls exactly at the median of all historical observations. **Value:** The slope of the risk-return tradeoff line calculated across USTs, US HG and HY corporate bonds and US equities (see GMOS p. 6, Loeyes et al, Jul 6 2011 for more details). **Positions:** Difference between net spec positions on US equities and intermediate sector UST. See Chart A18. **Flow momentum:** The difference between flows into equity funds (incl. ETFs) and flows into bond funds. Chart A1. We then smooth this using a Hodrick-Prescott filter with a lambda parameter of 100. We then take the weekly change in this smoothed series as shown in Chart A1. **Economic momentum:** The 2-month change in the global manufacturing PMI. (See [REVISITING: Using the Global PMI as trading signal](#), Nikolaos Panigirtzoglou, Jan 2012). **Equity price momentum:** The 6-month change in the S&P500 equity index.

Credit growth

Chart A13: Credit creation in the US, Japan and Euro area

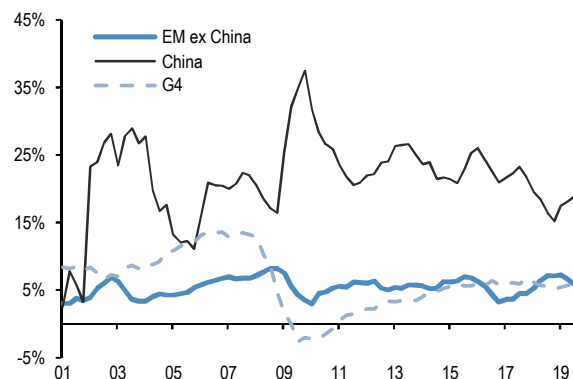
Rolling sum of 4 quarter credit creation as % of GDP. Credit creation includes both bank loans as well as net debt issuance by non-financial corporations and households. Last obs. is for Q4'19.



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

Chart A14: 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 Q4'19.

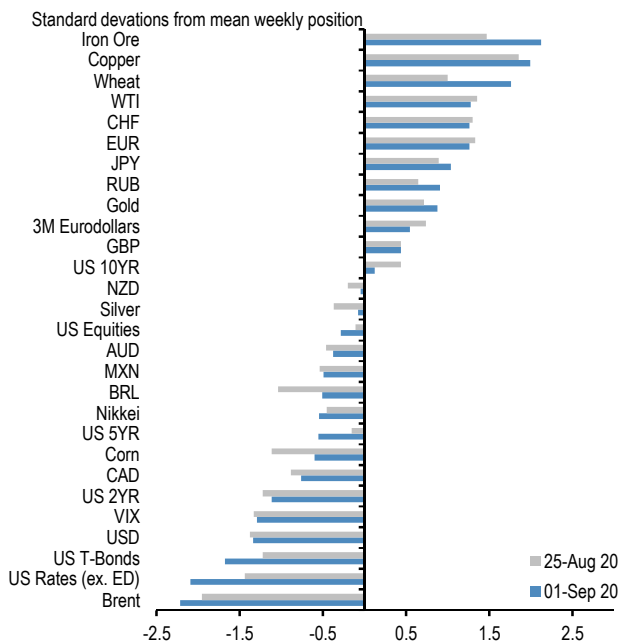


Source: G4 Central banks FoF, BIS, ICI, Barcap, Bloomberg, IMF and J.P. Morgan calculations.

Spec position monitors

Chart A15: Weekly Spec Position Monitor

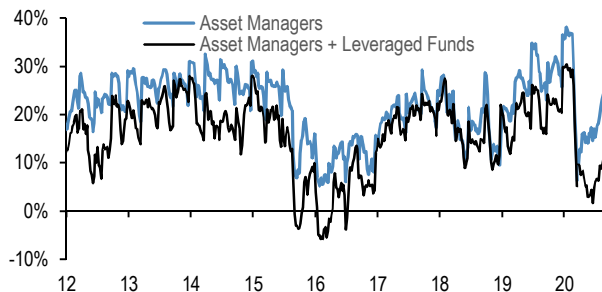
Net spec positions are proxied by the number of long contracts minus the number of short contracts using the speculative category of the Commitments of Traders reports (as reported by CFTC). To proxy for speculative investors for equity futures positions we use Asset managers (see Chart A16), whereas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

Chart A16: 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.

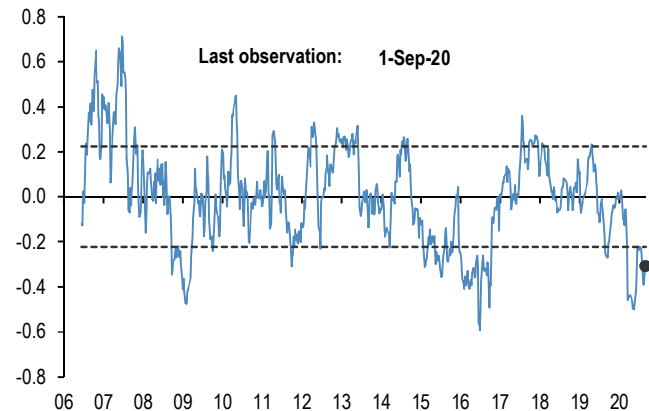


Source: CFTC, Bloomberg and J.P. Morgan

Chart A17: 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.

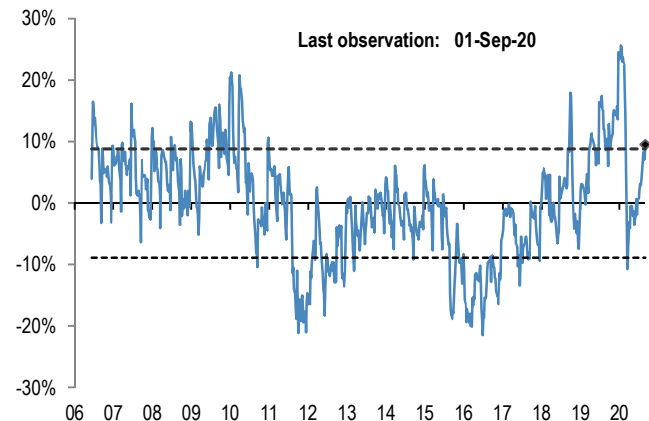


Source: CFTC, J.P. Morgan

Chart A18: 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.

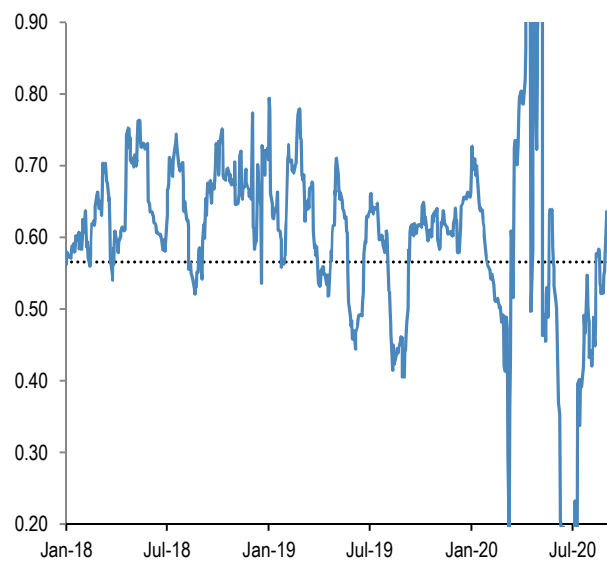


Source: CFTC, Bloomberg and J.P. Morgan

Mutual fund and hedge fund betas

Chart A19: 21-day rolling beta of 20 biggest active US bond mutual fund managers with respect to the US Agg bond index

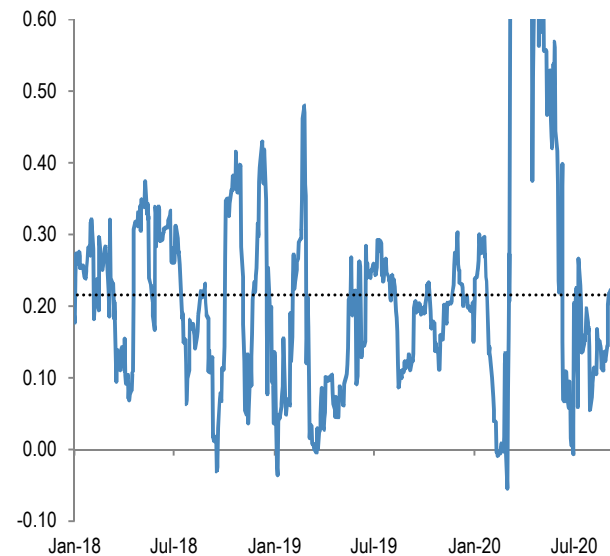
The dotted line shows the average beta since 2013.



Source: Bloomberg, J.P. Morgan

Chart A20: 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, J.P. Morgan.

Chart A21: Performance of various type of investors

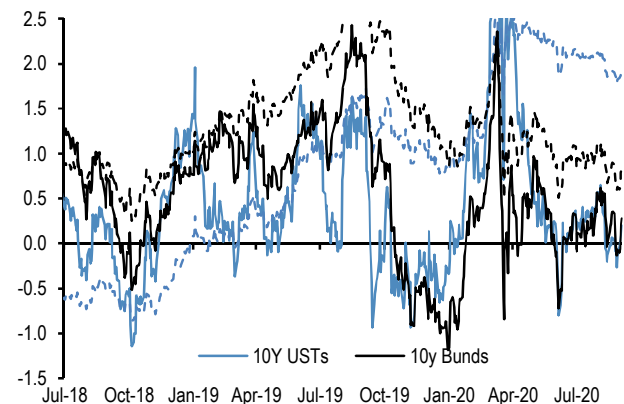
The table depicts the performance of various types of investors in % as of 04th Sep 2020.

Date	2015	2016	2017	2018	2019	2020
Investors						
Equity L/S	1.4%	2.2%	11.8%	-5.9%	12.8%	-0.5%
Macro ex-CTAs	-0.1%	3.4%	2.3%	-1.3%	5.2%	5.4%
CTAs	0.0%	-2.9%	2.5%	-5.8%	9.2%	0.5%
Risk Parity Funds	-5.1%	10.0%	13.5%	-6.5%	18.6%	-1.3%
Balanced MFs	-0.5%	8.4%	14.0%	-4.9%	20.1%	3.5%
Benchmark						
MSCI AC World	-2.4%	7.9%	24.0%	-9.4%	26.6%	2.7%
Barclays Global Agg	1.0%	3.9%	3.0%	1.8%	8.2%	4.4%
60 Equity : 40 Bonds	-0.4%	8.0%	16.1%	-1.9%	22.2%	6.3%
S&P Riskparity Vol 10	-4.1%	8.1%	8.0%	-4.0%	19.0%	1.5%

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

Chart A22: 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, J.P. Morgan.

Chart A23: 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.

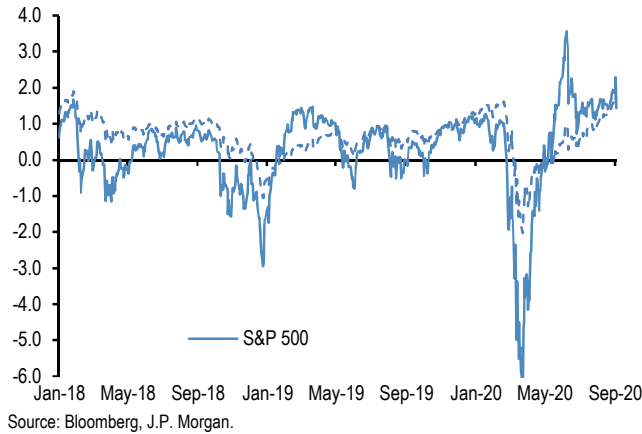


Chart A24: Equity beta of US Balanced Mutual funds and Risk Parity funds

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.

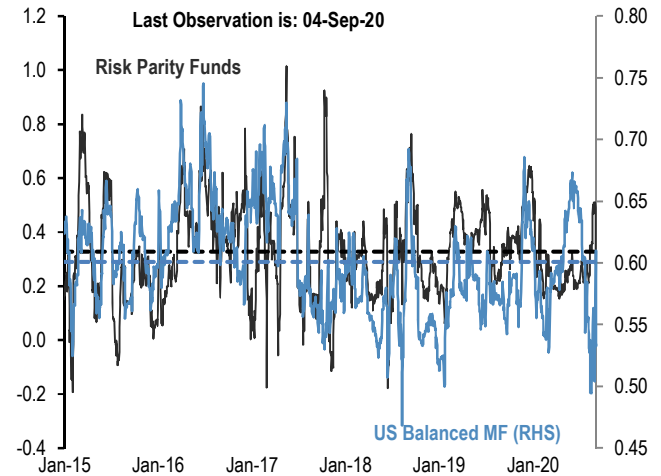


Chart A25: Equity beta of monthly reporting Equity Long/Short hedge funds

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

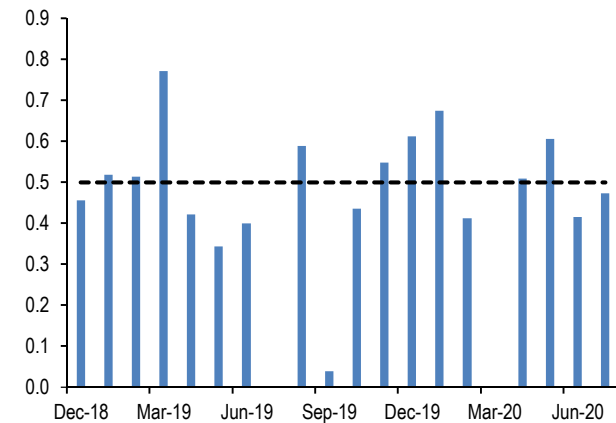
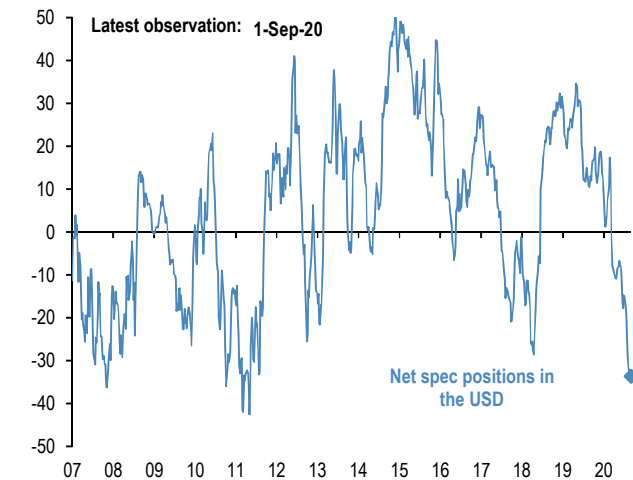


Chart A26: USD exposure of currency hedge funds

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



J.P. Morgan Prime Finance client positioning

This page highlights the trends in equity regional / sector / style positioning within the J.P. Morgan Prime Finance portfolio. This equity positioning proxy is based on the Long/Short (L/S) ratio which is measured by the aggregated amount of long positions divided by the aggregated amount of short positions within the J.P. Morgan Prime Finance portfolio. For symmetry the z scores shown below are those of the logarithm of the L/S ratio. An above zero z-score implies relative overweight position vs. the history of these data since 2018. A below zero z-score ratio implies relative underweight position vs. the history of these data since 2018. Positioning data has been aggregated by the Prime Finance business to ensure client anonymity and confidentiality. No raw data has been made available to research. Last observation is as of Sep 02, 2020.

Chart A27: Equity L/S ratio by region

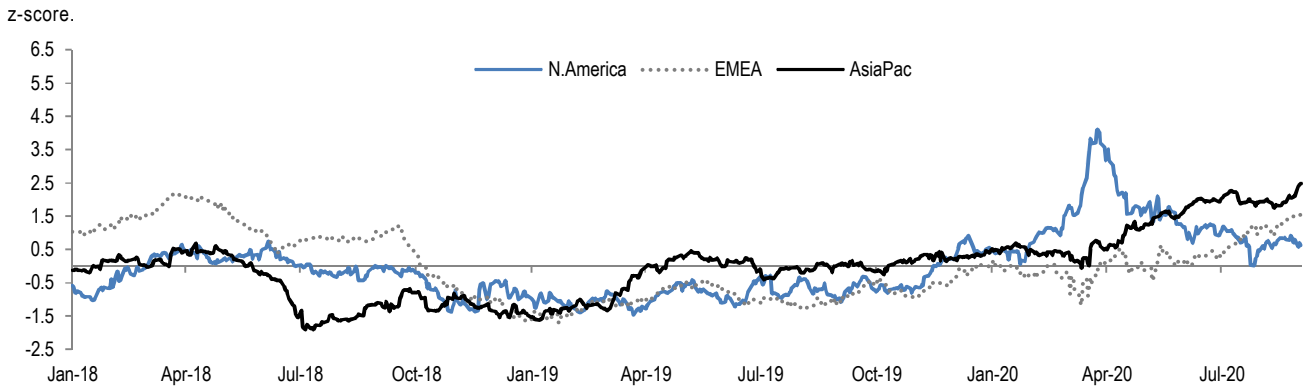


Chart A28: L/S ratio by sector in NA

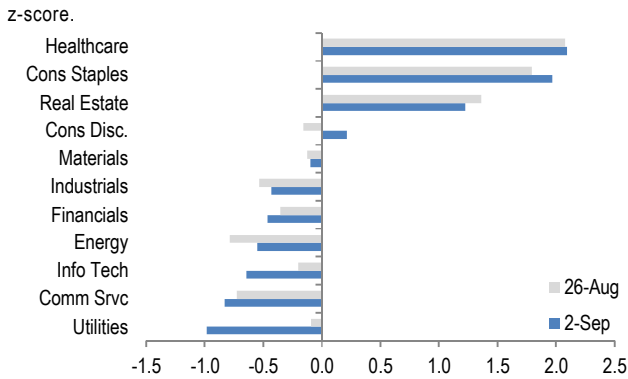


Chart A29: L/S ratio by style in NA

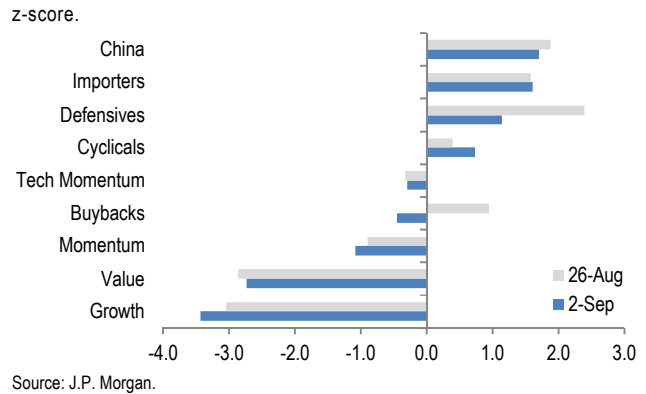


Chart A30: L/S ratio by style in EMEA

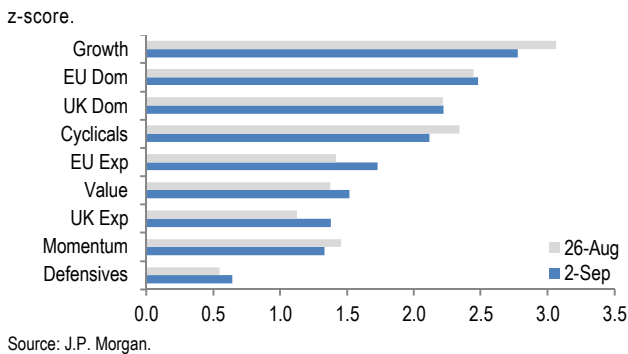
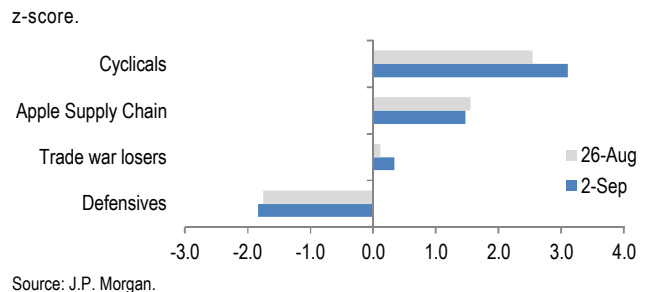


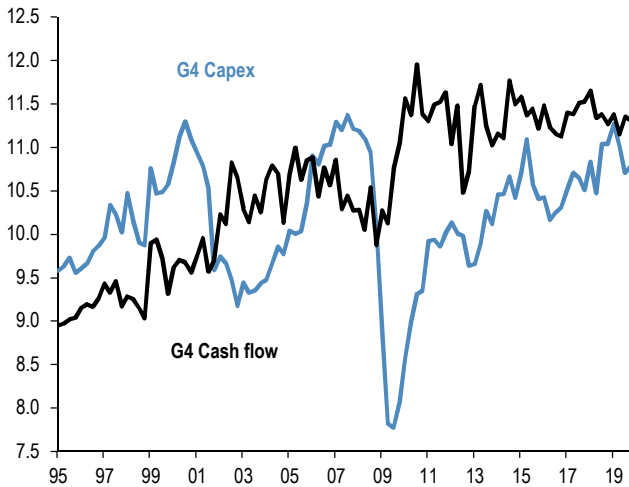
Chart A31: L/S ratio by style in APAC



Corporate activity

Chart A32: G4 non-financial corporate capex and cash flow as % of GDP

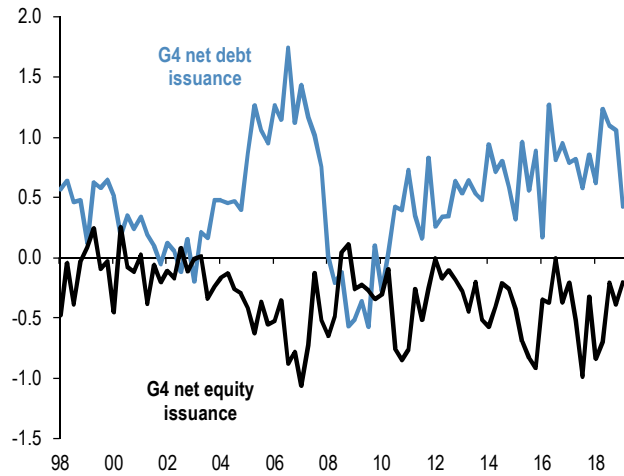
% of GDP, G4 includes the US, the UK, the Euro area and Japan. Last observation as of Q4 2019.



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

Chart A33: G4 non-financial corporate sector net debt and equity issuance

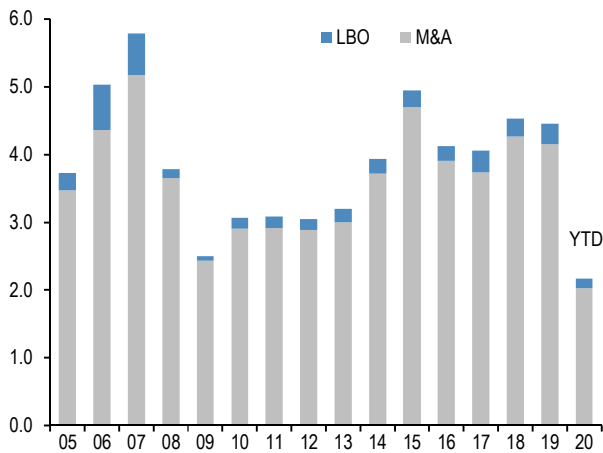
\$tr per quarter, G4 includes the US, the UK, the Euro area and Japan. Last observation as of Q4 2019.



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

Chart A34: Global M&A and LBO

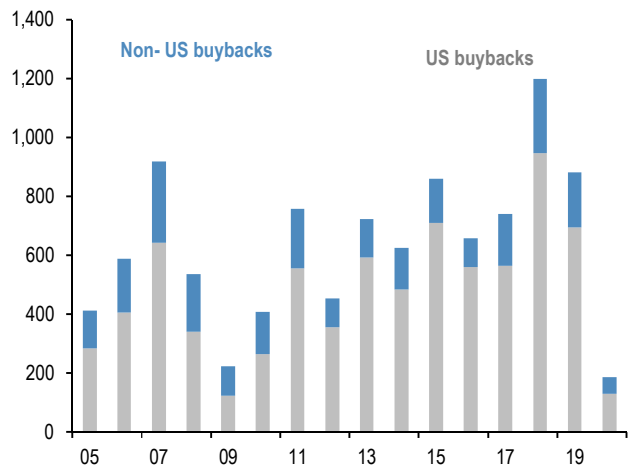
\$tr. YTD 2020 as of Sep 02. M&A and LBOs are announced.



Source: Dealogic, J.P. Morgan.

Chart A35: US and non-US share buyback

\$bn, 2020 are as of May '20. Buybacks are announced.

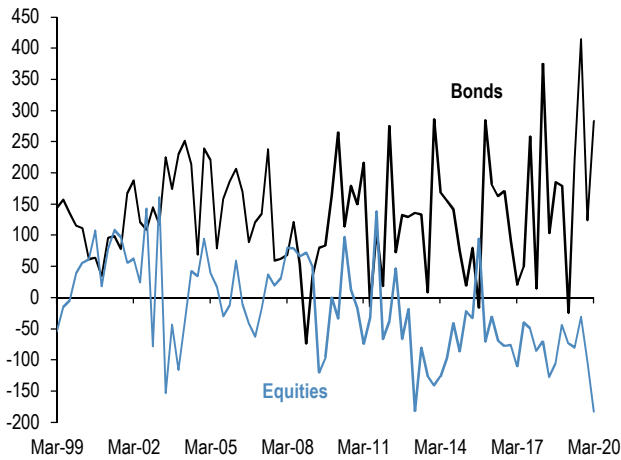


Source: Bloomberg, Thomson Reuters, J.P. Morgan

Pension fund and insurance company flows

Chart A36: G4 pension funds and insurance companies equity and bond flows

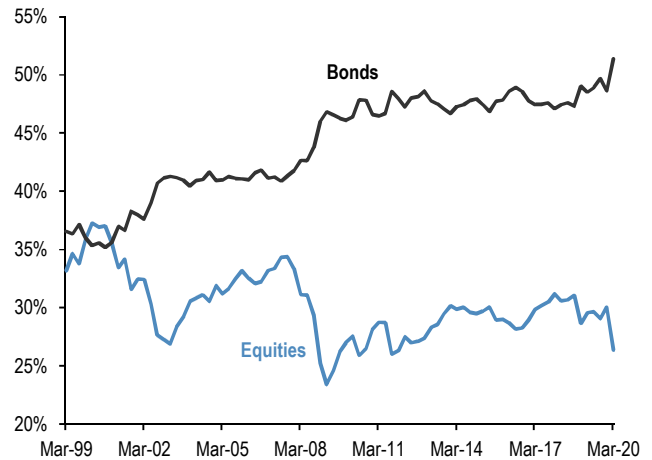
Equity and bond buying in \$bn per quarter. G4 includes the US, the UK, Euro area and Japan. Last observation is Q1 2020



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

Chart A37: G4 pension funds and insurance companies equity and bond levels

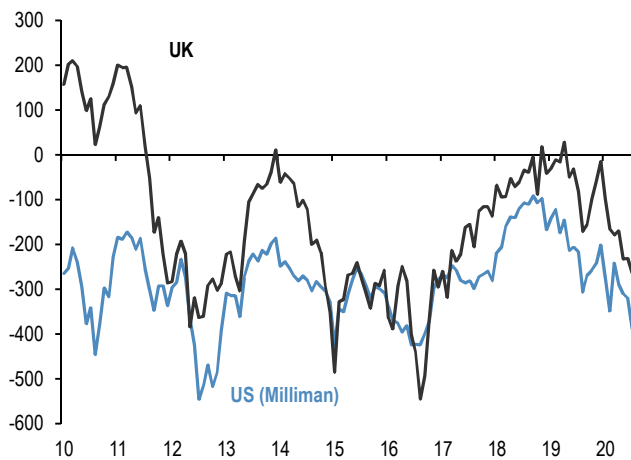
Equity and bond as % of total assets per quarter. G4 includes the US, the UK, Euro area and Japan. Last observation is Q1 2020.



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

Chart A38: Pension fund deficits

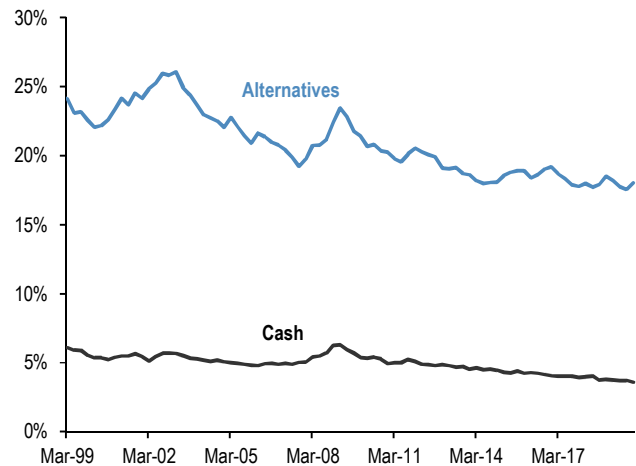
US\$bn. For US, funded status of the 100 largest corporate defined benefit pension plans, from Milliman. For UK, funded status of the defined benefit schemes eligible for entry to the Pension Protection Fund, converted to US\$ at today's exchange rates. Last obs. is Jul'20.



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

Chart A39: 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 2019.



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

Funding market monitor

Table A4: Bank deposits and ECB reliance

Deposits are non-seasonally adjusted Euro area non-bank, non-government deposits as of July 2020. We take total deposits (item 2.2.3. in MFI balance sheets minus "deposits from other financial institutions", which includes deposits from securitized vehicles and financial holding corporations among others. We also subtract repos (item 2.2.3.4) from the total figures to give a cleaner picture of deposits outside interbank borrowing. ECB borrowing and Target 2 balances are latest available. ECB borrowing is gross borrowing from regular MROs and LTROs. The Chart shows the evolution of Target 2 balance for Spain and Italy along with government bond spreads. The shaded area denotes the period between May 2011 and Aug 2012 when convertibility risk premia were elevated due to Greece exit fears.

€bn	Target 2 bal.	Target 6m chng	ECB borrowing	Depo 3m chng	Depo 12m chng
Austria	-33	9	61	3.2%	6.0%
Belgium	-51	-23	75	4.4%	5.5%
Cyprus	7	-1	2	-0.6%	-1.8%
Finland	70	7	20	8.9%	12.6%
France	48	20	195	9.4%	14.4%
Germany	995	100	284	2.2%	4.2%
Greece	-70	-44	37	3.2%	8.0%
Ireland	21	-20	3	7.4%	13.6%
Italy	-522	-139	345	3.8%	8.7%
Luxembourg	235	42	8	6.0%	11.2%
Netherlands	70	23	115	6.0%	7.0%
Portugal	-83	-8	32	3.5%	5.5%
Spain	-446	-55	257	5.7%	7.3%

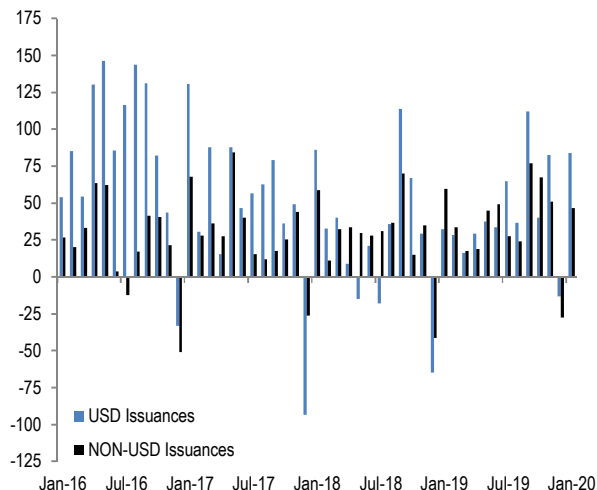


Source: Bloomberg, ECB, National Central Banks, J.P. Morgan

Source: Bloomberg, National Central Banks, J.P. Morgan

Chart A40: 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 Jan 2020.



Source: Dealogic, J.P. Morgan

Chart A41: Market value of negative yield bonds as a % of total outstanding in Bloomberg Barclays Global Agg Index



Source: J.P. Morgan

Italian stress market monitor

Chart A42: Open Interest for 10Y Italian Government Bond Futures

In thousands.



Source: J.P. Morgan.

Chart A43: Position proxy for 10Y Italian Government Bond Futures (IKA Comdty)

Number of contracts in thousands across all expiries. Cumulative weekly absolute change in open interest multiplied by the sign of the BTP futures price change every week.



Source: Bloomberg, J.P. Morgan calculations

Chart A44: Position proxy for 10Y French Government Bond Futures (OATA Comdty)

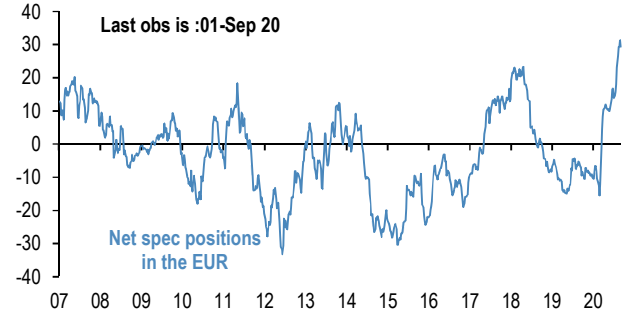
Number of contracts in thousands across all expiries. Cumulative weekly absolute change in open interest multiplied by the sign of the OAT futures price change every week.



Source: Bloomberg, J.P. Morgan calculations.

Chart A45: Currency hedge fund EUR exposure

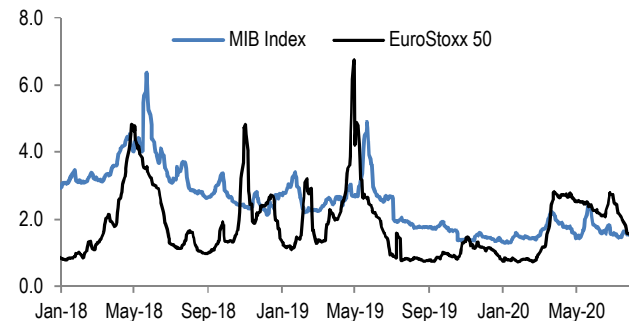
Net spec position in the EUR as reported by the CFTC. Spec is the non-commercial category from the CFTC.



Source: Bloomberg, CFTC, J.P. Morgan calculations.

Chart A46: Quantity on loan for MIB and EuroStoxx 50 index stocks

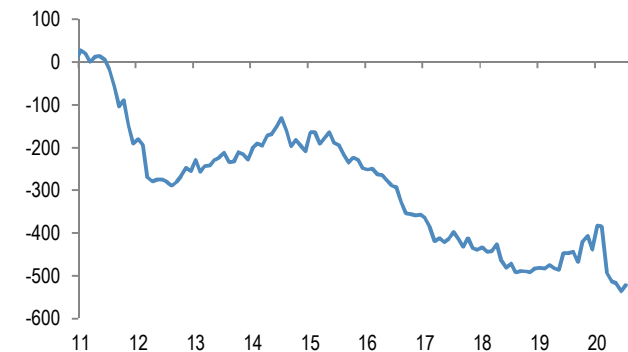
Quantity on Loan as a % shares outstanding. The Quantity on Loan on individual stock are weighted by their market cap.



Source: Datalend, J.P. Morgan.

Chart A47: Italy Target 2 balance

In €bns. Last observation is Jul'20

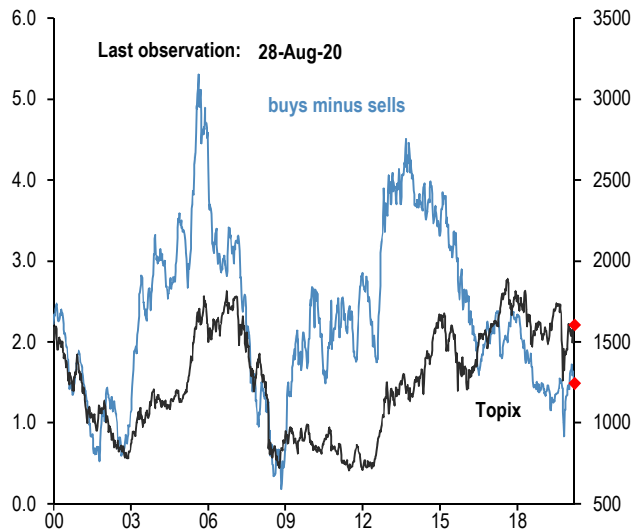


Source: ECB, Bloomberg, J.P. Morgan calculations

Japanese flows and positions

Chart A48: Tokyo Stock Exchange margin trading: total buys minus total sells

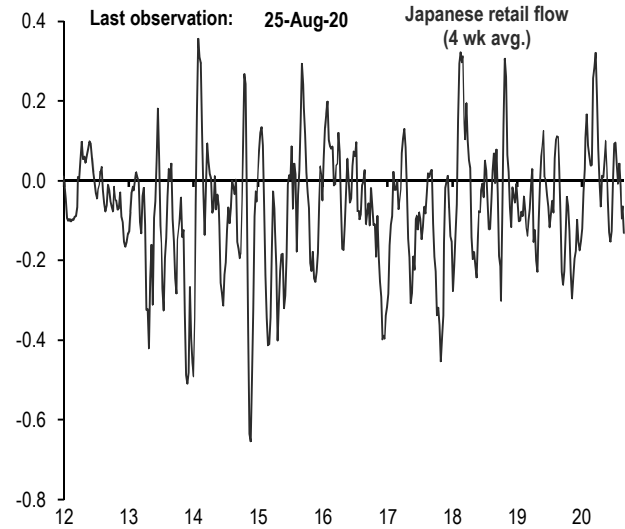
In bn of shares. Topix on right axis.



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

Chart A49: Domestic retail flows

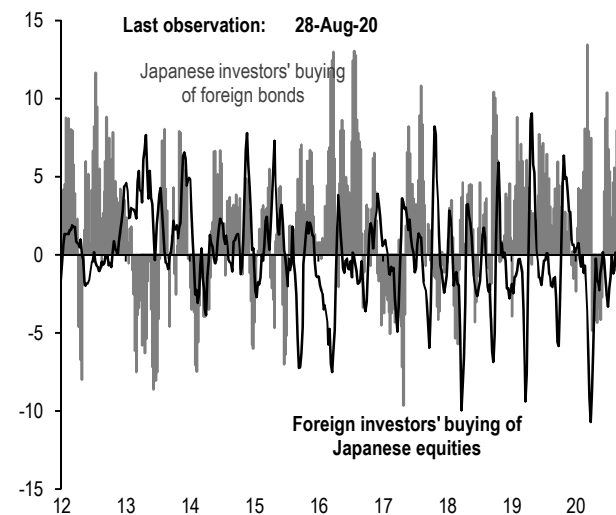
In JPY tr. Retail flows are from Tokyo stock exchange.



Source: TSE, J.P. Morgan calculations.

Chart A50: Japanese equity buying by foreign investors. Japanese investors' buying of foreign bonds

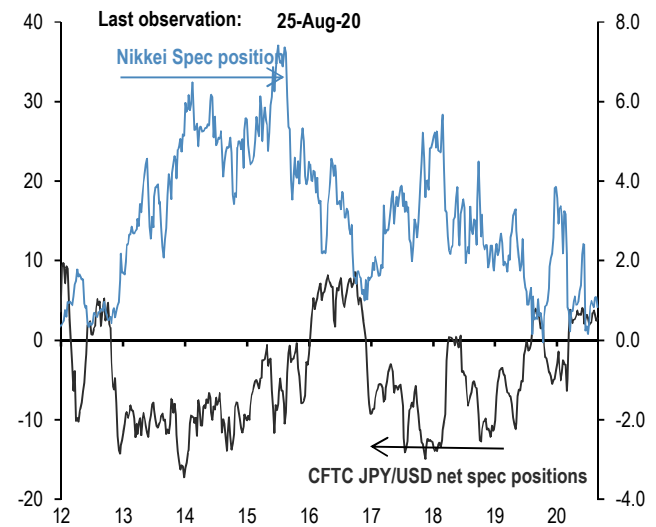
\$bn, 4 week moving average.



Source: Japan MoF, J.P. Morgan.

Chart A51: 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.

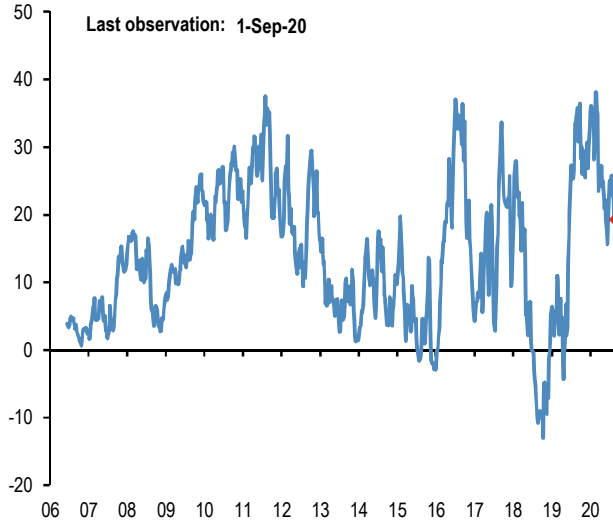


Source: Bloomberg, CFTC, J.P. Morgan calculations.

Commodity flows and positions

Chart A52: Gold spec positions

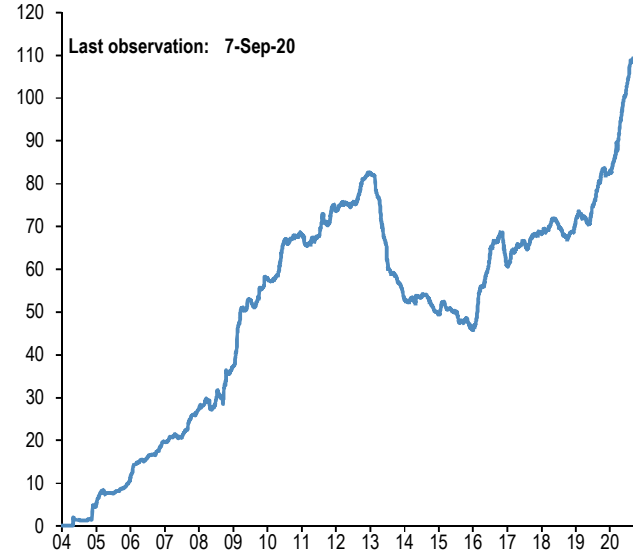
\$bn. CFTC net long minus short position in futures for the Managed Money category.



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

Chart A53: Gold ETFs

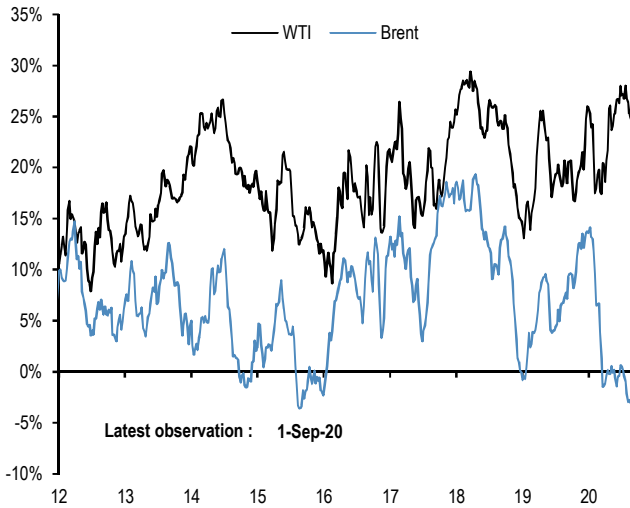
Mn troy oz. Physical gold held by all gold ETFs globally.



Source: Bloomberg, J.P. Morgan.

Chart A54: Oil spec positions

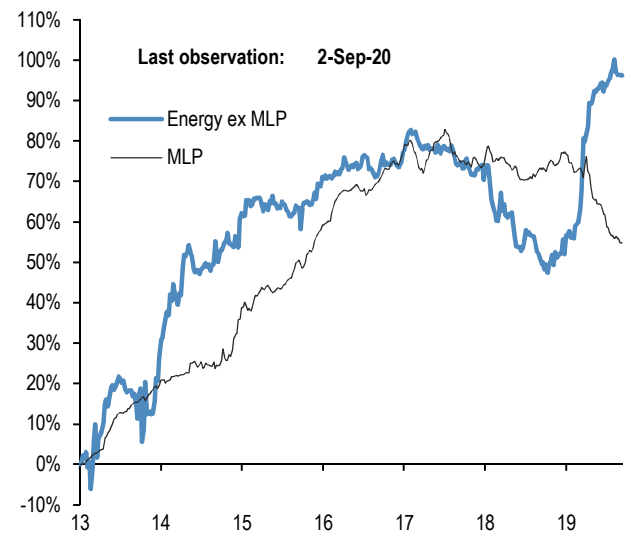
Net spec positions divided by open interest. CFTC futures positions for WTI and Brent are net long minus short for the Non-Commercial category.



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

Chart A55: Energy ETF flows

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

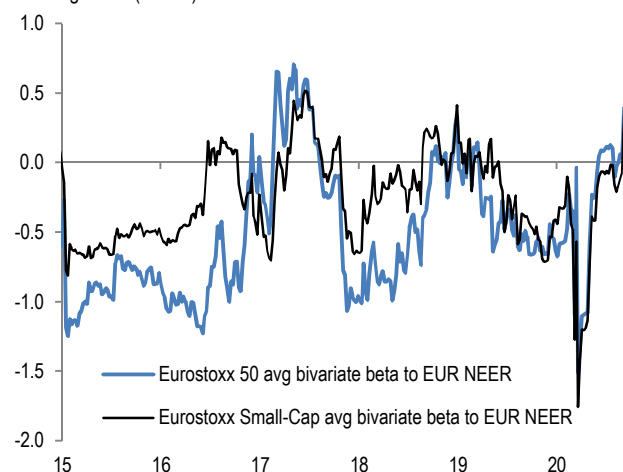


Source: CFTC, Bloomberg, J.P. Morgan.

Corporate FX hedging proxies

Chart A56: Average beta of Eurostoxx 50 companies and Eurostoxx Small-Cap to trade weighted EUR

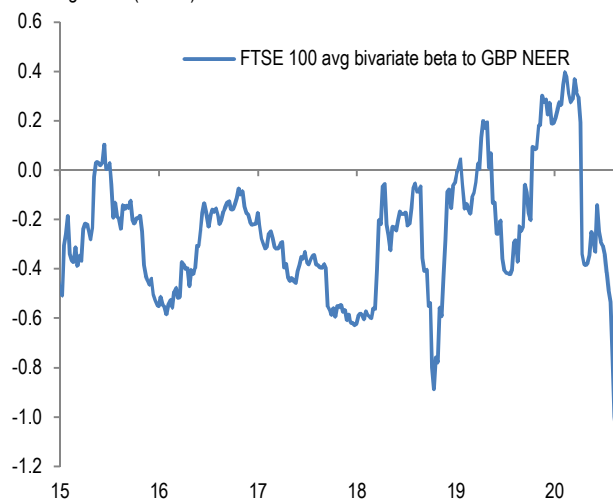
Rolling 26 weeks average betas based on a bivariate regression of the weekly returns of individual stocks in the Eurostoxx 50 index to the weekly returns of the MSCI AC World and JPM EUR Nominal broad effective exchange rate (NEER).



Source: Bloomberg, J.P. Morgan

Chart A57: Average beta of FTSE 100 companies to trade weighted GBP

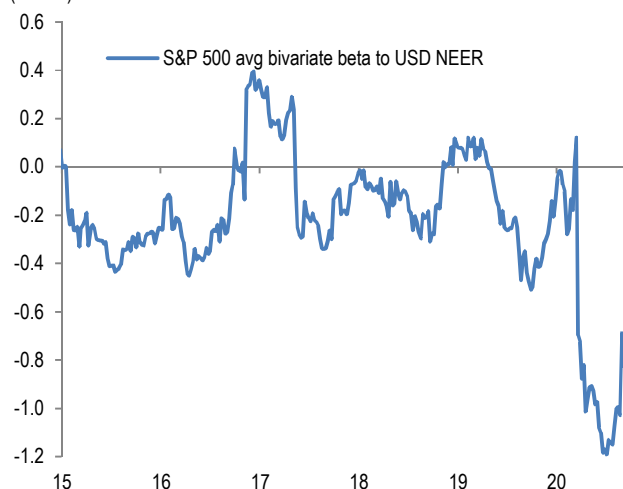
Rolling 26 weeks average betas based on a bivariate regression of the weekly returns of individual stocks in the FTSE 100 index to the weekly returns of the MSCI AC World and JPM GBP Nominal broad effective exchange rate (NEER).



Source: Bloomberg, J.P. Morgan

Chart A58: Average beta of S&P500 companies to trade weighted US dollar

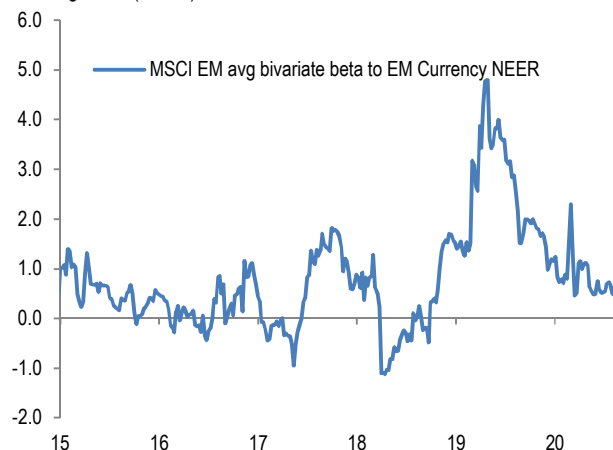
Rolling 26 weeks average betas based on a bivariate regression of the weekly returns of stocks in the S&P500 index to the weekly returns of the MSCI AC World and JPM USD Nominal broad effective exchange rate (NEER).



Source: Bloomberg, J.P. Morgan

Chart A59: 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, J.P. Morgan.

CTAs - Trend following investors' momentum indicators

Table A5: 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	10.5	22.4	0.47	-1	1	-0.4	-2.8%
	long	504				0	126	-1.9	-55.8%
Brent	short	105	7.8	21.7	0.36	1	15	0.8	11.2%
	long	504				-1	67	-1.1	-29.8%
Unleaded gas	short	105	5.5	24.0	0.23	1	3	1.1	15.0%
	long	462				-1	67	-0.9	-22.3%
Heat Oil	short	63	6.4	21.2	0.30	-1	3	-0.7	-6.4%
	long	483				0	0	-1.5	-38.8%
Gasoil	short	63	11.4	19.6	0.58	-1	1	-0.8	-8.1%
	long	504				-1	48	-1.4	-42.6%
Nat gas	short	147	19.2	34.8	0.55	1	14	0.4	7.8%
	long	294				-1	30	-0.6	-15.5%
Gold	short	21	4.5	10.7	0.42	-1	1	-0.7	-1.9%
	long	504				0	62	2.1	25.8%
Silver	short	10	5.8	19.0	0.30	-1	1	-0.6	-1.9%
	long	462				0	31	2.3	51.4%
Palladium	short	42	16.8	20.5	0.82	1	25	0.8	6.2%
	long	273				1	49	0.7	17.9%
Platinum	short	105	8.6	17.1	0.50	1	11	0.3	2.5%
	long	273				-1	0	-0.1	-1.0%
Aluminium	short	21	4.8	13.6	0.35	-1	0	-0.1	-0.3%
	long	378				-1	1	-0.1	-1.4%
Copper	short	147	9.5	17.8	0.54	1	64	1.1	14.6%
	long	399				1	47	0.4	10.4%
Lead	short	126	6.6	20.4	0.32	1	43	0.7	8.6%
	long	357				0	1	0.0	0.0%
Nickel	short	42	13.4	22.8	0.59	1	49	0.8	6.2%
	long	336				1	22	0.3	7.7%
Zinc	short	126	10.1	19.9	0.51	0	13	1.6	19.2%
	long	399				1	13	0.3	7.2%
Wheat	short	168	2.1	22.5	0.09	1	5	0.2	2.0%
	long	294				1	6	0.2	3.4%
Kansas wheat	short	147	8.0	20.2	0.39	0	1	0.0	-0.3%
	long	504				-1	260	-0.4	-7.3%
Corn	short	63	6.9	16.5	0.42	1	8	0.4	2.9%
	long	399				-1	287	-0.8	-13.2%
Soybeans	short	42	6.1	14.8	0.41	1	15	1.3	7.0%
	long	231				1	7	0.5	5.9%
Cotton	short	168	3.9	18.3	0.21	1	25	0.4	5.2%
	long	483				-1	360	-0.2	-5.4%
Sugar	short	63	8.2	22.3	0.37	-1	0	-0.2	-1.6%
	long	252				-1	0	-0.1	-2.9%
Coffee	short	63	6.0	23.0	0.26	0	7	2.3	19.1%
	long	315				1	15	0.7	13.4%
Cocoa*		10	5.0	28.6	0.17	1	8	1.0	3.4%

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

Source: Bloomberg, J.P. Morgan calculations

Table A6: 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.

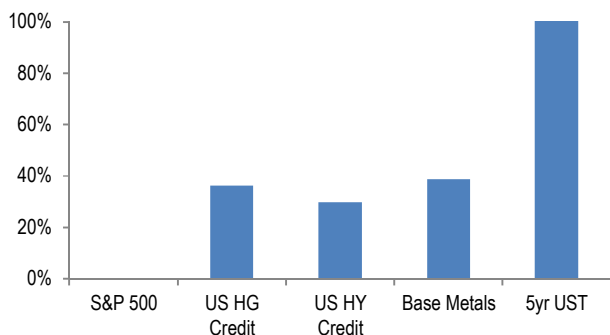
		Lookback (moving avg, days)	Annualized return (%)	Vol (%)	IR	Current signal	Time since last change (days)	Z-score	% Change of return index from its moving average
S&P 500	short	63	6.9	11.9	0.58	1	0	1.4	6.4%
	long	357				1	0	1.4	15.5%
Nasdaq 100	short	84	7.6	14.7	0.52	0	16	1.6	12.9%
	long	462				0	47	2.2	43.1%
Nikkei	short	63	4.8	13.9	0.35	1	23	0.6	3.6%
	long	420				1	71	0.6	9.5%
FTSE 100	short	147	4.8	12.3	0.39	-1	7	-0.5	-3.1%
	long	462				-1	96	-1.0	-12.0%
Eurostoxx 50	short	21	3.4	13.3	0.25	0	0	0.0	0.1%
	long	357				0	1	0.0	-0.6%
MSCI EM	short	42	13.9	11.5	1.21	1	31	0.4	2.1%
	long	357				1	45	0.6	10.7%
2Y USTs	short	252	0.9	1.0	0.89	1	78	1.0	1.0%
	long	483				1	117	1.1	1.8%
5Y USTs	short	252	2.0	2.8	0.71	1	19	1.3	2.8%
	long	378				1	16	1.5	4.0%
10Y USTs	short	42	2.2	3.5	0.63	1	1	0.2	0.3%
	long	504				0	137	1.9	8.1%
2Y Schatz	short	252	0.3	0.8	0.42	0	0	0.0	0.0%
	long	441				-1	21	-0.1	-0.1%
5y Bobl	short	84	1.7	1.8	0.94	1	1	0.2	0.3%
	long	483				1	119	0.4	0.9%
10y Bund	short	105	2.7	3.2	0.84	1	1	0.3	0.6%
	long	462				1	123	0.8	2.9%
10Y JGB	short	168	1.0	2.2	0.46	-1	20	-0.3	-0.3%
	long	273				-1	124	-0.5	-0.7%
10Y Gilts	short	105	1.5	3.8	0.40	0	1	0.0	0.0%
	long	504				1	17	1.3	5.4%
Euro	short	42	3.3	6.4	0.51	1	19	0.5	1.1%
	long	273				1	53	0.9	5.6%
Yen	short	21	1.8	6.3	0.28	-1	1	-0.1	-0.2%
	long	399				1	29	0.1	1.0%
Sterling	short	168	2.2	7.2	0.30	1	32	1.1	4.7%
	long	294				1	32	0.8	4.6%
AUD	short	42	4.7	7.8	0.61	1	51	0.7	2.1%
	long	378				1	46	0.7	6.6%
CAD	short	252	0.9	6.4	0.14	1	22	0.5	2.4%
	long	504				1	16	0.2	1.5%

Source: Bloomberg and J.P. Morgan

How much of a US recession is priced in?

Chart A60: Probability of US recession as currently priced across asset classes

In %, as of Sep 07, 2020.



Source: J.P. Morgan

Chart A61: US HG spreads during recessions

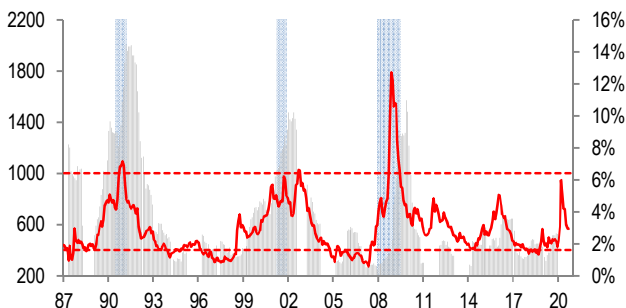
Spreads in bps. JULI Index. Blue bars are marked for recession. Last observation is of Sep 07, 2020.



Source: Bloomberg, J.P. Morgan.

Chart A62: US HY spreads and HY default rates during recessions

Spreads in bps (LHS). Grey background area is 12-month rolling default rate in % (RHS). Blue bars are marked for recession. Last observation is of Sep 07, 2020.



Source: Bloomberg, J.P. Morgan.

Probability of US recession as currently priced across asset classes

Equities - we use the average 26% decline in the S&P500 index over the previous eleven US recessions. So far the S&P500 index is at peak so equity markets mechanically price in a 0/26=0% chance of a typical or average US recession.

US HG - we should expect average spreads of 235bp in a recession and 125bp in an expansion. As such, we believe that US HG spreads indicate a $(165-125)/(235-125)=36\%$ likelihood of US recession.

US HY - we should expect average spreads of 1000bp in a recession and 400bp in an expansion. As such, we believe that US HY spreads indicate a $(579-400)/(1000-400)=30\%$ likelihood of US recession.

Base Metals - we use the average 43% decline in the GSCI Industrial Metals index over the previous five recessions. So far the GSCI Industrial Metals index has declined by 16.7% from its peak, so commodity markets mechanically price in a $16.7/43=39\%$ chance of a typical US recession.

5yr UST - we use the 265bps decline in its yield over the previous three recessions. So far the 5yr treasury yield has declined by 281bps from its November 2018 peak pricing about 100% of an average recession.

Table A7: US equities during past 11 recessions

We separate recessions into DEEP and MILD based on whether S&P earnings fell by more or less than the median amount over the past 11 US recessions.

S&P500 peak	S&P500 trough	S&P500 price decline peak-to-trough	S&P500 EPS decline peak-to-trough	Earnings decline
Jun-48	Jun-49	-17%	-3%	Mild
Jan-53	Sep-53	-11%	-12%	Mild
Jul-56	Dec-57	-17%	-22%	Deep
Jan-60	Oct-60	-13%	-12%	Mild
Dec-68	Jul-70	-34%	-13%	Mild
Jan-73	Dec-74	-46%	-15%	Deep
Feb-80	Apr-80	-15%	-5%	Mild
Nov-80	Aug-82	-27%	-19%	Deep
Dec-89	Oct-90	-16%	-26%	Deep
Mar-00	Sep-01	-37%	-23%	Deep
Oct-07	Mar-09	-56%	-45%	Deep

Average	-26%	-18%
Median	-17%	-15%
Average in Deep	-33%	-25%
Average in Mild	-18%	-9%

Source: Bloomberg, J.P. Morgan

Table A8: Performance of base metals during recessions

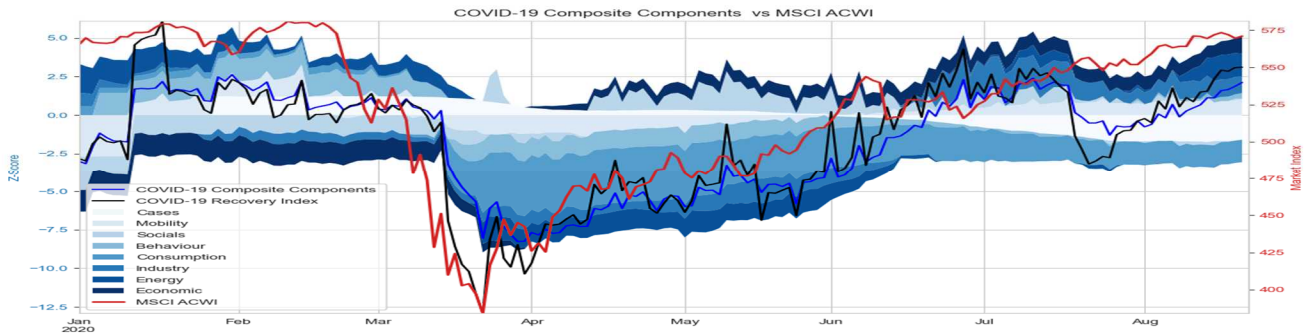
GSCI Industrial Metals excess return from the peak to the trough.

Recession	Peak to trough
1980	-44%
1981	-43%
1990	-29%
2001	-31%
2007	-66%
Average	-43%

Source: Bloomberg, J.P. Morgan

Gauging the Economic Normalization

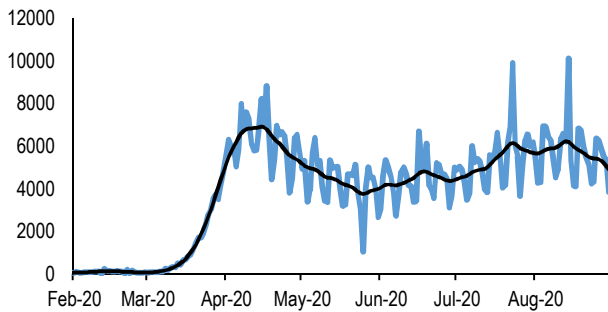
Chart A63: COVID-19 Composite showing the individual components' contributions YTD 2020



Source: J.P. Morgan.

Chart A64: Daily change in number of COVID-19 Deaths smoothed by HP filter

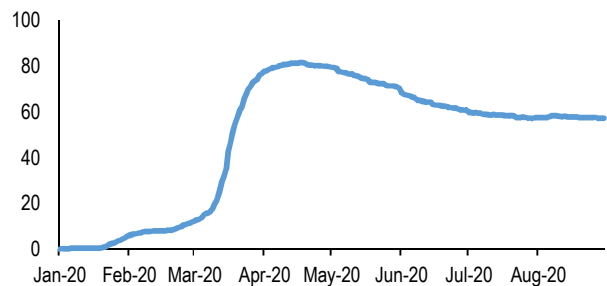
Number of deaths per day. HP filter uses lambda of 50. Last obs. is 30th Aug 2020.



Source: Github, J.P. Morgan.

Chart A65: Average score of lockdown stringency Index across 147 countries as compiled by Oxford University

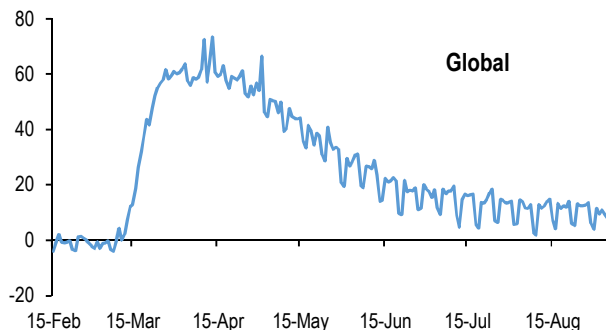
Last obs. is 30th Aug 2020.



Source: Oxford University Research, J.P. Morgan

Chart A66: Google mobility data – Visits and length of stays at Residential areas minus Other areas

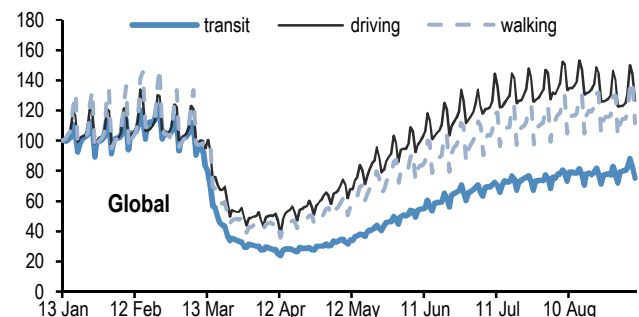
Other areas include Workplace, Transit station, Parks, Grocery & Pharmacy and Retail & Recreational places. Data is aggregated for 125 countries and are weighted based on their GDP. Baseline is defined as median volume between 3rd Jan – 6th Feb. Last obs. is 04th Sep 2020.



Source: Google mobility data, J.P. Morgan

Chart A67: Apple mobility data – Volume of requests for directions for transit, driving and walking activity as compared to baseline

Data are aggregated for 63 countries and weighted based on their GDP. Baseline is defined as volume on 13th Jan 2020. Last obs. is 06th Sep 2020.



Source: Apple mobility data, J.P. Morgan

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