

## Flows & Liquidity

Has bitcoin equalised with gold already?

- We believe that the valuation and position backdrop has become a lot more challenging for bitcoin at the beginning of the New Year.
- While we cannot exclude the possibility that the current speculative mania will propagate further, pushing the bitcoin price up towards the consensus region of between \$50k-\$100k, we believe that such price levels would prove unsustainable.
- Risk markets look vulnerable ahead of this week's Georgia runoffs.

- We note that the spectacular bitcoin rally of the past few weeks has moved bitcoin into more challenging territory not only in terms of its positioning backdrop, but also in terms of its valuation. We had previously used two valuation metrics for bitcoin, one based on its comparison to gold and one based on its mining cost or intrinsic value.
- Bitcoin's competition with gold has already started in our mind as evidenced by the more than \$3bn of inflows into the Grayscale Bitcoin Trust and the more than \$7bn of outflows from Gold ETFs since mid-October (Figure 1). There is little doubt that this competition with gold as an "alternative" currency will continue over the coming years given that millennials will become over time a more important component of investors' universe and given their preference for "digital gold" over traditional gold. Considering how big the financial investment into gold is, a crowding out of gold as an "alternative" currency implies big upside for bitcoin over the long term. As we had mentioned previously in the Oct 23<sup>rd</sup> F&L, "Bitcoin's competition with gold," private gold wealth is mostly stored via gold bars and coins the stock of which, excluding those held by central banks, amounts to 42,600 tonnes or \$2.7tr including gold ETFs. Mechanically, the market cap of bitcoin at \$575bn currently would have to rise by x4.6 from here, implying a theoretical bitcoin price of \$146k, to match the total private sector investment in gold via ETFs or bars and coins.
- But this long term upside based on an equalization of the market cap of bitcoin to that of gold for investment purposes is conditional on the volatility of bitcoin converging to that of gold over the long term. The reason is that, for most institutional investors, the volatility of each class matters in terms of portfolio risk management and the higher the volatility of an asset class, the higher the risk capital consumed by this asset class. It is thus unrealistic to expect that the allocations to bitcoin by institutional investors will match those of gold without a convergence in volatilities. A convergence in volatilities between bitcoin and gold is unlikely to happen quickly and is in our mind a multi-year process. This implies that the above \$146k theoretical bitcoin price target should be considered as a long-term target, and thus an unsustainable price target for this year.

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### Global Markets Strategy Global Quantitative & Derivatives Strategy

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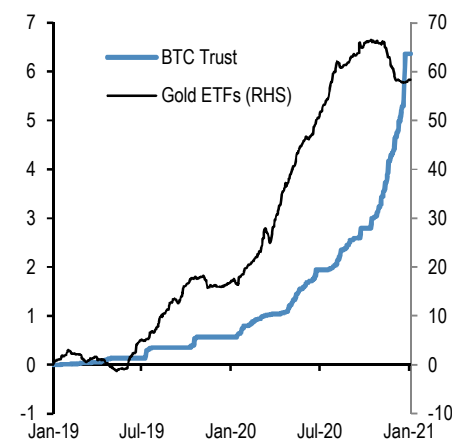
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**Figure 1: Cumulative Flows in Bitcoin Trust & Gold ETF holdings**

Both the y-axis in \$bn



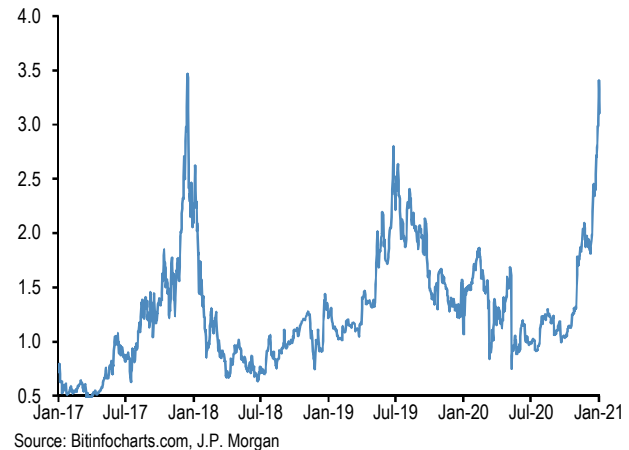
Source: Bloomberg Finance L.P., J.P. Morgan

- In fact, an argument can be made that, in terms of risk capital, bitcoin has largely equalized with gold already. To see this, one could compare the volatilities of bitcoin and gold or the volatilities of the biggest bitcoin and gold funds given many institutional investors are only allowed or prefer to invest in fund format. The 3m realized vol for bitcoin currently stands at 57% vs. 17% for gold. In other words, the ratio of the two vols suggests that bitcoin currently consumes x3.4 more risk capital than gold. This ratio rises further if one looks at the biggest bitcoin and gold funds. The 3m realized vol for the Grayscale Bitcoin Trust stands at 87% vs. 17% for GLD, the largest gold ETF by AUM. I.e., the ratio of the two vols suggests that the Grayscale Bitcoin Trust currently consumes x5.1 more risk capital than gold. Taking the average of the x3.4 and x5.1 ratios, suggests that bitcoin and its biggest fund on average consume x4.3 more risk capital than gold and its biggest fund, which is very much close to the x4.6 ratio needed to equalize the market cap of bitcoin to that of gold for investment purposes. In other words, bitcoin has already almost equalized gold in risk capital terms. In our opinion this challenges the consensus idea that a price in the region of \$50k-\$100k region is a sustainable bitcoin target for 2021 in the absence of a significant decline in bitcoin volatility.
- Our second valuation metric is based on the mining cost or intrinsic value of bitcoin. The ratio of the bitcoin market price to its intrinsic value is shown in Figure 2. The current ratio is higher than its previous mid-2019 peak and matches its end-2017 peak, again raising concerns about valuations. This is not say that the mining cost is driving the market value. The opposite is likely true. In the early years, bitcoin's production cost had naturally stronger influence on the price because new coin generation was a higher percentage of existing stock or supply. Now that more than 18m bitcoins have been mined already (vs. max supply of 21m) and new coin generation is a smaller percentage of the existing supply, the influence of the production cost on the price has likely diminished. Thus, in the current conjuncture, the market price is likely driving the production cost rather than the other way round. However, this causality does not mean that the bitcoin price would be diverging from its mining cost on a sustained basis. Similar to gold, when the bitcoin market price is well above the production cost, mining activity and mining difficulty should increase pushing the cost of production up towards the market price, thus inducing some convergence. But similar to previous episodes,

some of that convergence could happen with an adjustment in the market price also. We thus view the acute divergence of Figure 2 as another valuation challenge for bitcoin.

**Figure 2: Ratio of Bitcoin market price to intrinsic value**

Intrinsic value estimated using the cost of production approach following Hayes (2018)



- What about positioning? There is little doubt that the institutional flow impulse into bitcoin is what distinguishes 2020 from 2017. And there is no better metric to capture this institutional impulse than the flow trajectory of the Grayscale Bitcoin Trust in Figure 1. This is because many institutional investors are only allowed or prefer to invest in bitcoin in fund format for regulatory or other reasons. In fact, many of them are not even allowed to hold restricted shares of the Grayscale Bitcoin Trust via private placements given the 6-month lock up period, and are thus forced to pay a premium by buying these shares in the secondary market.
- It is, however, wrong to view all these institutional flows of last year as entirely driven by long-term investors. We believe that a significant component of last year's institutional flows into bitcoin reflect speculative investors seeking to front run other more real-money institutional investors. The frothy positioning in CME bitcoin futures is one manifestation of this speculative institutional flow which encompasses momentum traders such as CTAs and quantitative crypto funds. Indeed, bitcoin futures, the preferred vehicle of speculative investors, saw a sharp increase in open interest in recent weeks (Figure 3), pointing to intense buildup of futures positions. This is also true with our more carefully calculated bitcoin futures position proxy shown in Figure 4, which experienced a similarly steep ascent in recent weeks to unprecedented territory. As a

reminder to our readers, to infer positioning in bitcoin futures, we use our open interest position proxy methodology that we also apply to other futures contracts, where we look at the cumulative weekly absolute changes in the open interest multiplied by the sign of the futures price change every week. The rationale behind this position proxy is that when there is a price increase, the net long position of spec investors increases also with the magnitude of the increase determined by the absolute change in the open interest. It does not matter whether the open interest rises or falls, as the net long position can increase either via fresh longs (increase in open interest) or a reduction of previous shorts (reduction in open interest). And vice versa. When there is a price decrease, the net long position of spec investors decreases also, with the magnitude of the decrease determined by the absolute change in the open interest. It does not matter whether the open interest rises or falls, as the net long position can decrease either via fresh shorts (increase in open interest) or reduction of previous longs (reduction in open interest). Looking at Figure 3 and Figure 4 it is difficult to not be concerned about a buildup of institutional speculative long futures positions in bitcoin.

**Figure 3: Open interest in CME Bitcoin futures contracts**

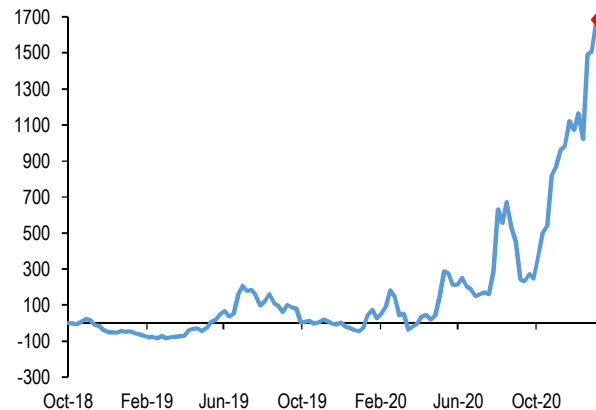
\$mn. Last obs. for 31<sup>st</sup> Dec 2020.



Source: CME, J.P. Morgan.

**Figure 4: Our Bitcoin position proxy based on open interest in CME Bitcoin futures contracts**

\$mn Last obs. for 31<sup>st</sup> Dec 2020.

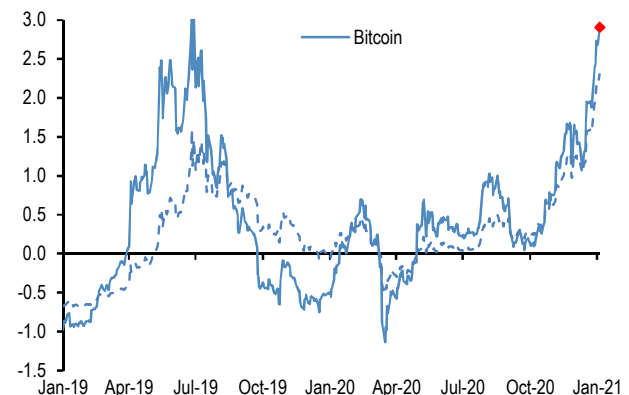


Source: J.P. Morgan

- What about momentum traders? There is little doubt that momentum traders, such as CTAs and quantitative crypto funds, amplified the past weeks' surge. How much vulnerability do these momentum traders pose for bitcoin at the moment? Clearly, the past weeks' price surge to above \$30k has shifted our bitcoin momentum signals to even higher territory. This is shown in Figure 5 which depicts our short and long lookback period momentum signals for bitcoin. Figure 5 shows that the short lookback period momentum signal rose this week to 3.0 stdevs, and the long lookback period to 2.3 stdevs, i.e. to even higher levels than the previous peaks of mid-2019. Both are well above our 1.5stdev threshold typically associated with overbought conditions and a high risk of mean reversion.

**Figure 5: 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.

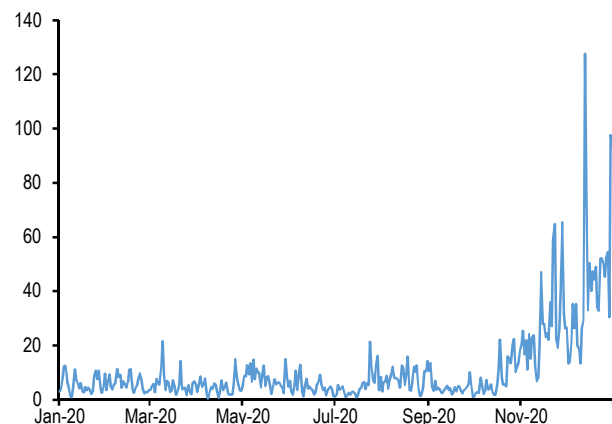


Source: Bloomberg Finance L.P., J.P. Morgan

- What about retail investors? The speculative mania by retail investors characterized the bitcoin surge during 2017. Unfortunately, there are some signs that retail interest has also increased sharply. For example, as we had argued previously the broadening of corporate support for bitcoin, e.g. via Paypal and Square, has been facilitating and enhancing over time the usage of bitcoin by Millennials. And while we do not yet have data for 4Q volumes, one way to gauge the impact from retail purchases via Paypal is to look at volumes on itBit. These volumes have increased markedly since Oct 21st when Paypal announced the launch of services to enable trading and holding of cryptocurrencies.

Figure 6: Daily volume on itBit

In \$mm per day

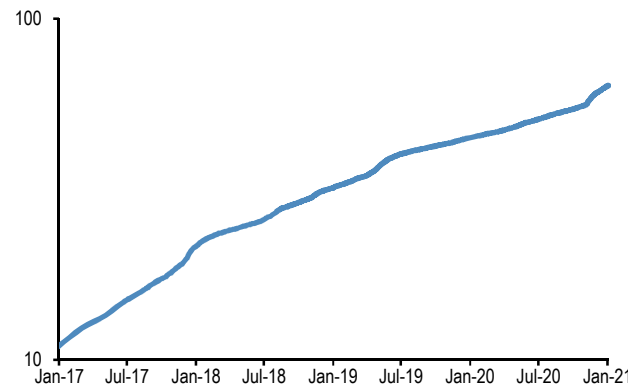


Source: cryptocompare.com, J.P. Morgan

- Another proxy suggesting increased retail participation is new account openings on 'traditional' cryptocurrency exchanges. Figure 7 below shows unique cryptocurrency wallet accounts on blockchain.com. While the number of accounts clearly has an increasing trend over time, there are sharp pickups in new wallet accounts during the retail-driven price spikes in end-2017 as well as mid-2019. Since the start of November 2020, there has been a proportionally similar rise in new wallet accounts to those two previous episodes.

Figure 7: Unique wallet accounts on blockchain.com

# of accounts, log scale.

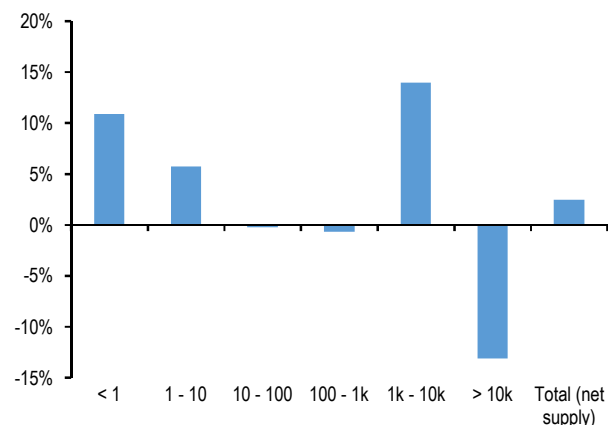


Source: Blockchain.com

- Moreover, data on the distribution of bitcoin balances held in wallet accounts is also suggestive of retail participation. Figure 8 shows percentage change in total bitcoin held in wallet accounts by bucket of bitcoin balance, e.g. < 1 shows the % change in bitcoin held in wallet accounts with a balance of less than one bitcoin. It shows that between the start of 2020 and 2021 accounts with less than one bitcoin or between one and ten bitcoin have seen a marked increase in holdings that is more likely to be retail driven. Similarly, there has been a significant increase in balances held in accounts between 1,000 and 10,000 bitcoin, which is more likely to be institutionally driven. By contrast, balances held in accounts with more than 10,000 bitcoin have declined significantly, suggesting early investors and miners have been selling bitcoin to facilitate the increase of new entrants.

Figure 8: % increase in bitcoin held in wallet accounts by bucket of wallet balance

In %



Source: Bitinfocharts.com, J.P. Morgan

- Taking all the above together, we believe that the valuation and position backdrop has become a lot more challenging for bitcoin at the beginning of the New Year. While we cannot exclude the possibility that the current speculative mania will propagate further pushing the bitcoin price up towards the consensus region of between \$50k-\$100k, we believe that such price levels would prove unsustainable.

### **Risk markets look vulnerable ahead of this week's Georgia runoffs**

- Risk markets rallied further during the last two weeks of the year. The equity selling due to pension fund rebalancing we had estimated for the end of last year was likely easily absorbed as other institutional and retail investors bought more equities. However, given momentum, we still see vulnerability for risk markets in the near term. This is not only because of elevated positioning by momentum traders, as shown by Chart A23 in the Appendix, but also because of the risk of an increase in volatility into this week's Georgia Senate runoffs. There is a risk that market focus could shift toward the near-term risk of tax rises in the event that Democrats win both run-offs, inducing a rise in volatility. In turn, a potential rise in volatility would induce position reduction by vol sensitive investors, who had previously propelled risk markets during November/December. Over the medium term, however, we still see the backdrop supportive given global non-bank investors' equity allocations are only modestly above their post-Lehman averages and ongoing strong liquidity support.

**Table A1: Weekly flow monitor**

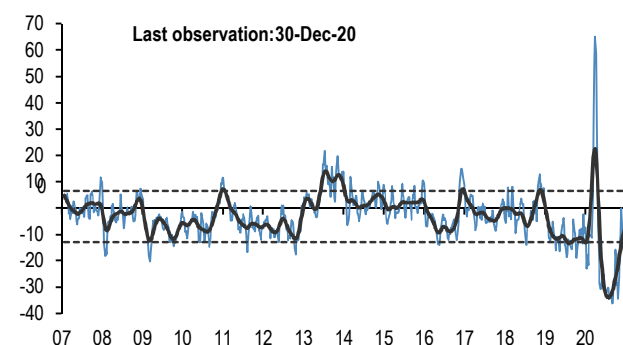
\$bn, Includes Global Mutual Fund flows from EPFR and globally domiciled ETF flows from Bloomberg Finance L.P.. US Equities includes US Domiciled MFs from ICI and ETF flows from Bloomberg Finance L.P.

MF & ETF Flows	30-Dec	4 wk avg	13 wk avg	2020 avg
All Equity	14.95	18.4	16.0	-3.4
All Bond	16.75	9.5	11.0	9.2
US Equity	0.61	-3.9	-9.0	-4.7
Intl. Equity	14.34	19.9	19.4	-1.15
Taxable Bonds	8.64	9.3	11.7	6.8
Municipal Bonds	0.30	1.8	1.7	2.0

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

**Chart A1: Fund flow indicator**

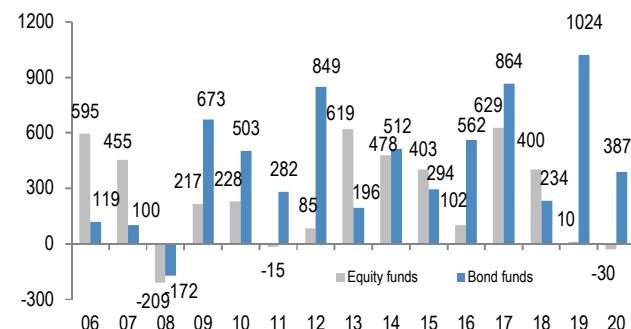
**Difference between flows into Equity and Bond funds:** \$bn per week. Flow includes US domiciled Mutual Fund and globally domiciled ETF flows. We exclude China On-shore funds from our analysis. The thin blue line shows the 4-week average of difference between Equity and Bond fund flows. Dotted lines depict  $\pm 1$  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 Q2'20). 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	18-Dec	4 wk avg	13 wk avg	y/y chng
Global IPOs	6.0	12.8	10.5	57%
Secondary Offerings	5.4	17.9	14.2	62%
<b>Corporate announcements</b>				
M&A - Global	76.0	116.0	107.7	-9%
- US Target	34.9	51.7	48.6	-23%
- Non-US Target	41.1	64.3	59.1	4%
<b>Net bond issuance</b>				
USD	78	115	63	28%
Non-USD	25	9	33	4%

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

**Table A3: Trading turnover monitor**

Volumes are monthly and Turnover ratio is annualized (monthly trading volume annualised divided by the amount outstanding). UST Cash 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 Nov-20	MIN	MAX	Turnover ratio	Vol (tr)	y/y chng
<b>Equities</b>					
EM Equity*			1.0	\$0.8	77%
DM Equity*			1.3	\$6.5	37%
<b>Govt Bonds</b>					
UST cash			12.1	\$12.4	2%
UST futures			0.8	\$11.7	-24%
JGBs*			24.6	¥2,037	14%
Bund futures			0.9	€4.5	-3%
<b>Credit</b>					
US HG			0.6	\$0.4	10%
US HY			0.9	\$0.1	16%
US Convertibles			1.8	\$0.0	23%
<b>Commodities</b>					
Gold			48.8	\$1.2	15%
Oil			61.4	\$1.1	-45%
Copper			2.2	\$0.4	-23%

\* Data with one month lag

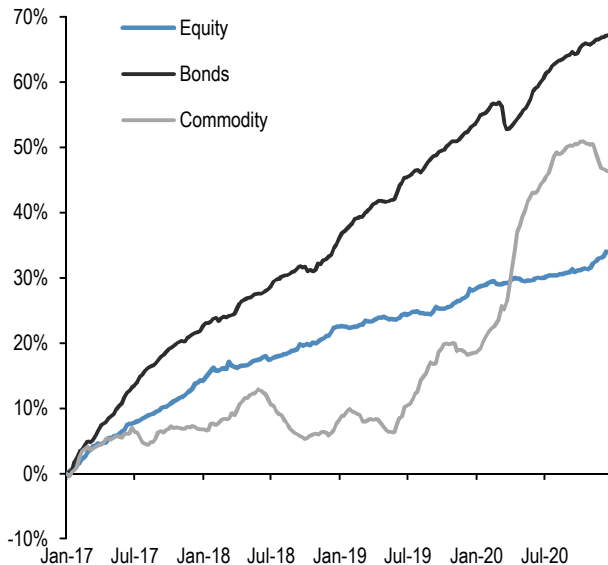
Source: Bloomberg Finance L.P., Federal Reserve, Trace, Japan Securities Dealer Association, WFE, J.P. Morgan. \* Data with one month lag.



## ETF Flow Monitor (as of Dec 30<sup>th</sup>)

### Chart A3: Global Cross Asset ETF Flows

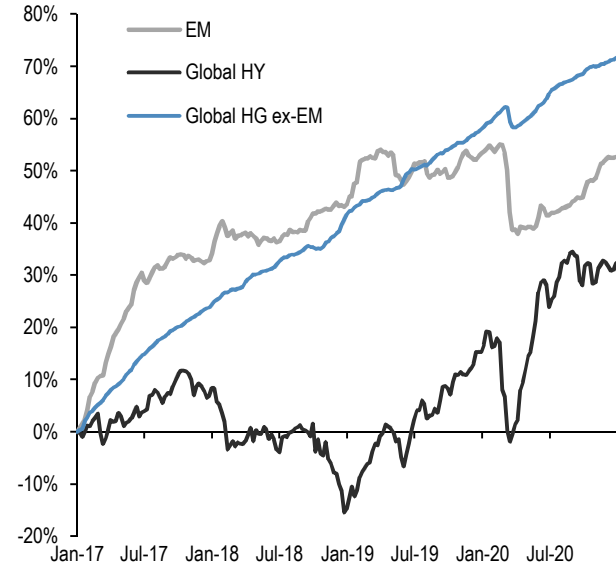
Cumulative flow into ETFs as a % of AUM



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

### Chart A4: Bond ETF Flows

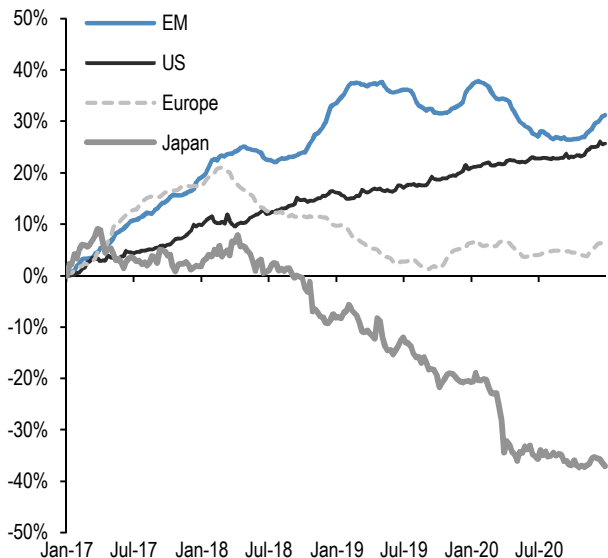
Cumulative flow into bond ETFs as a % of AUM



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

### Chart A5: Global Equity ETF Flows

Cumulative flow into global equity ETFs as a % of AUM

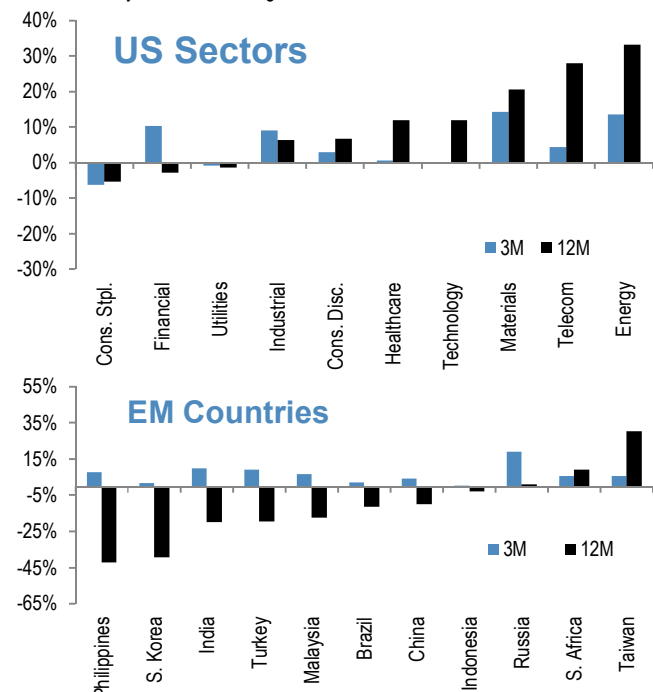


Source: J.P. Morgan. Bloomberg Finance L.P.

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

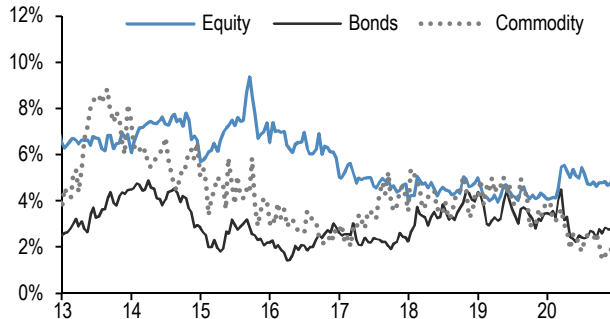


Source: J.P. Morgan. Bloomberg Finance L.P.

## ETF Short Interest Monitor (as of Dec 15)

### Chart A7: Cross Asset ETF Short Interest

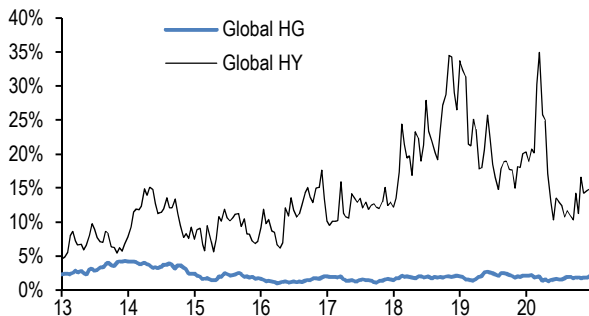
Short interest as a % of outstanding shares. Short interest is for US Domiciled ETFs and is available bi-monthly from Bloomberg Finance L.P. Short interest is weighted by AUM



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

### Chart A8: Bond ETF Short Interest

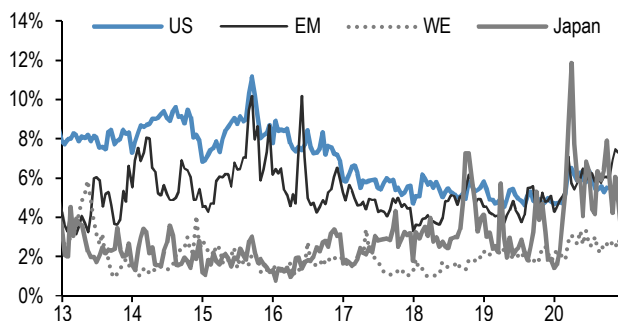
Short interest as a % of outstanding shares. Short interest is for US Domiciled ETFs and is available bi-monthly from Bloomberg Finance L.P. Short interest is weighted by AUM



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

### Chart A9: Equity ETF Short Interest

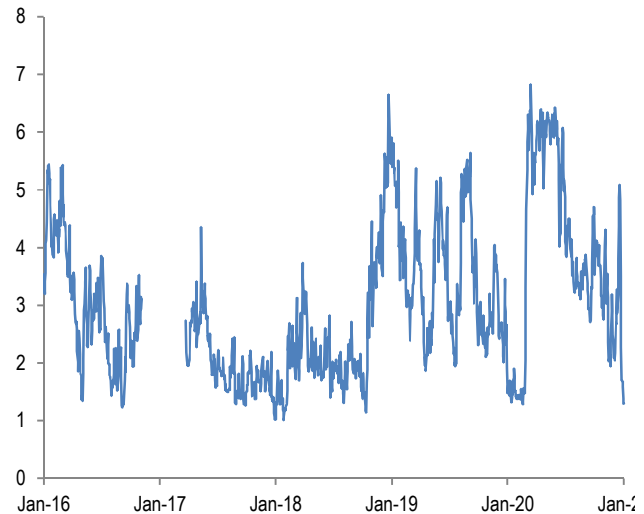
Short interest as a % of outstanding shares. Short interest is for US Domiciled ETFs and is available bi-monthly from Bloomberg Finance L.P. Short interest is weighted by AUM



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

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

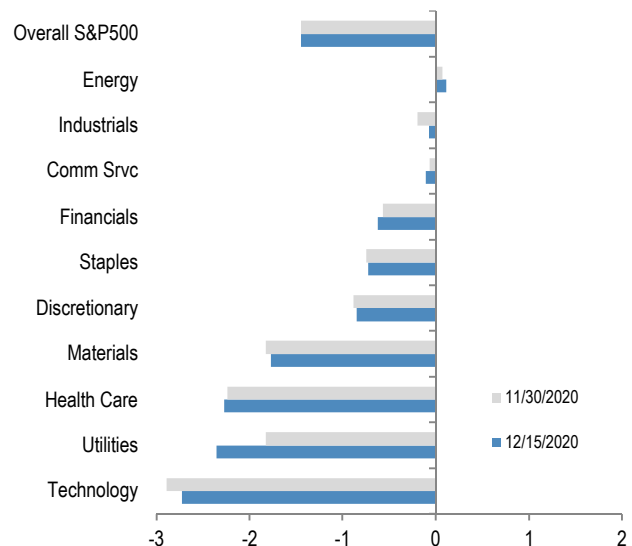
On loan quantity as a % share of share outstanding. Last obs is for 01st Jan 2021.



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)

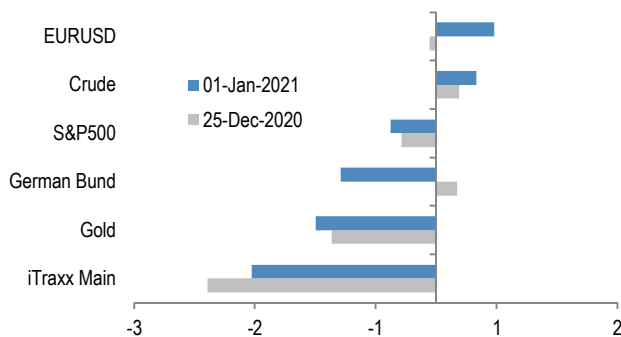


Source: NYSE, J.P. Morgan.



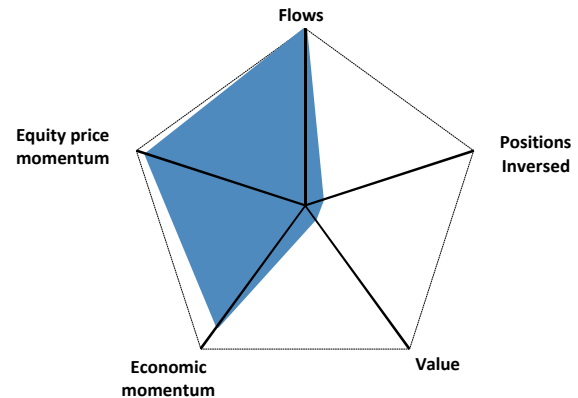
## Chart A11: Option skew monitors

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



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

## Chart A12: Market health map



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

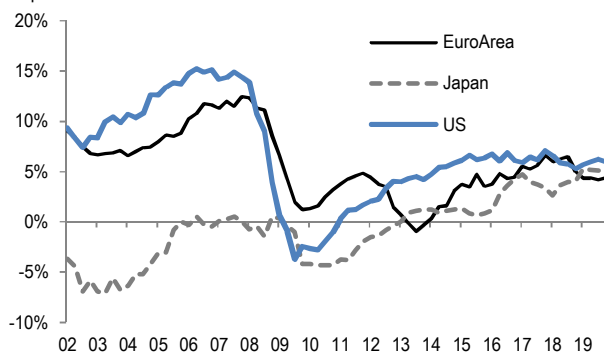
	1 Month	2 Month	3 Month	6 Month
S&P 500 Index	Down	Down	Up	Up
10Y UST Yield	Up	Up	Up	Up

**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, Loeys 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

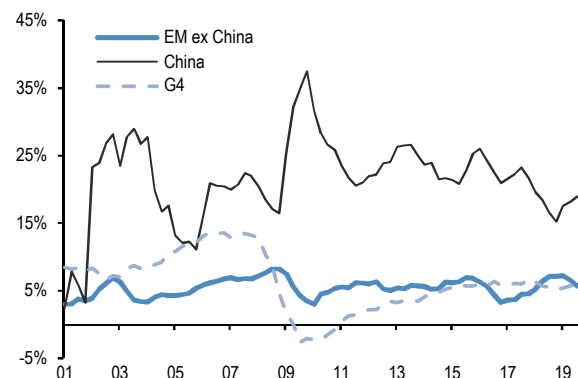
Rolling sum of 4 quarter credit creation as % of GDP. Credit creation includes both bank loans as well as net debt issuance by non-financial corporations and households. Last obs. is for Q4'19.



Source: Fed, ECB, BoJ, Bloomberg Finance L.P. 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.

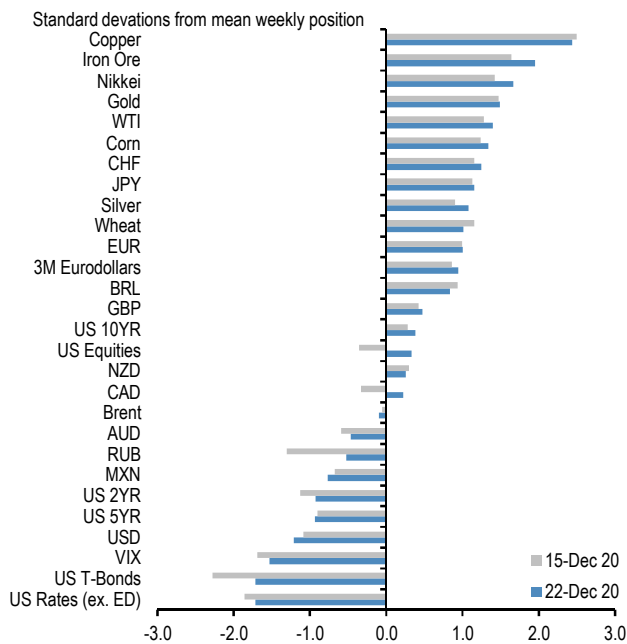


Source: G4 Central banks FoF, BIS, ICI, Barcap, Bloomberg Finance L.P., IMF and J.P. Morgan calculations.

## Spec position monitors

### Chart A15: Weekly Spec Position Monitor

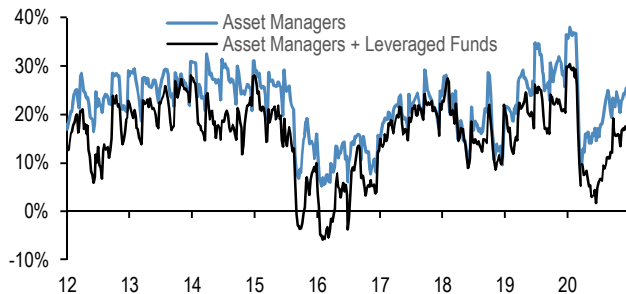
Net spec positions are proxied by the number of long contracts minus the number of short contracts using the speculative category of the Commitments of Traders reports (as reported by CFTC). To proxy for speculative investors for equity futures positions we use Asset managers (see Chart A16), whereas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

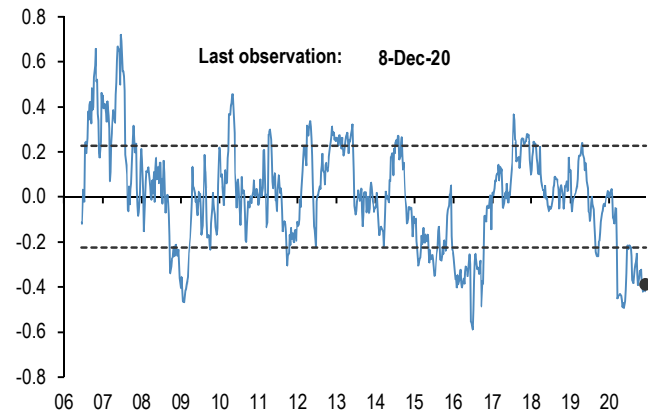


Source: CFTC, Bloomberg Finance L.P. and J.P. Morgan

### 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.

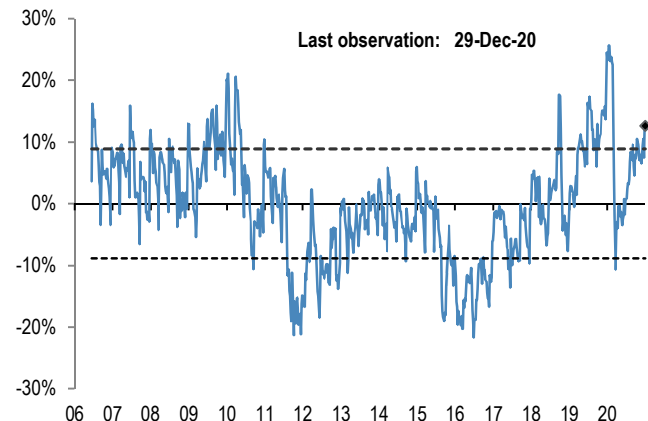


Source: CFTC, J.P. Morgan

### 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.

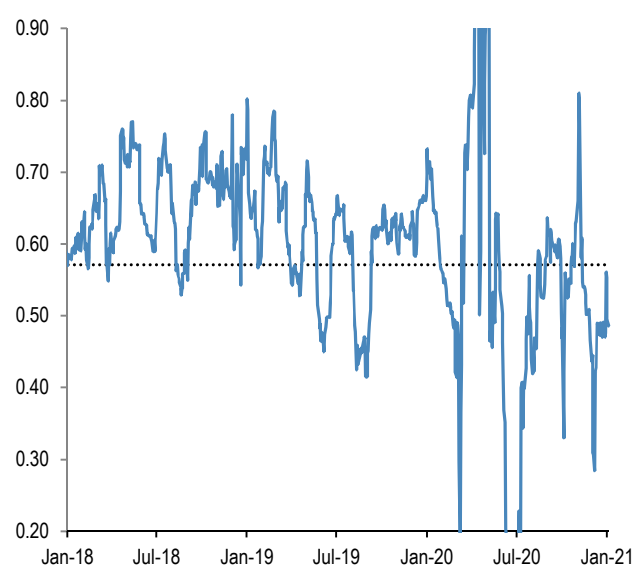


Source: CFTC, Bloomberg Finance L.P. and J.P. Morgan

## 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**

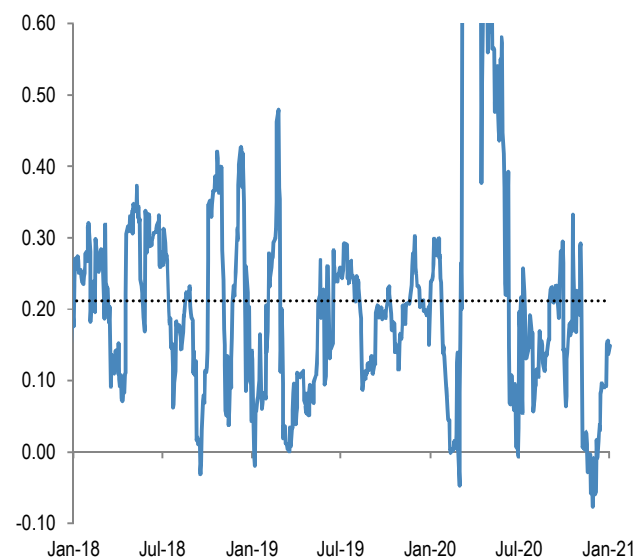
The dotted line shows the average beta since 2013.



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

**Chart A21: Performance of various type of investors**

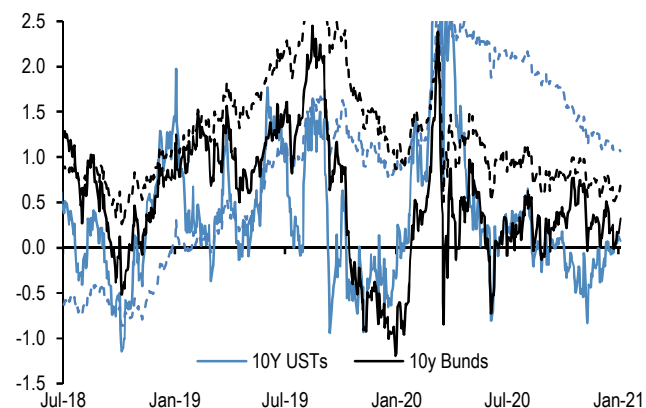
The table depicts the performance of various types of investors in % as of 31<sup>st</sup> Dec 2020.

Date	2015	2016	2017	2018	2019	2020
<b>Investors</b>						
Equity L/S	1.4%	2.2%	11.8%	-5.9%	12.8%	7.0%
Macro ex-CTAs	3.8%	2.8%	5.6%	9.8%	2.9%	6.6%
CTAs	0.0%	-6.1%	2.2%	-8.1%	9.2%	6.0%
Risk Parity Funds	-5.1%	10.0%	13.5%	-6.5%	18.4%	4.6%
US Balanced MFs	-0.5%	8.4%	14.0%	-4.9%	20.1%	13.2%
<b>Benchmark</b>						
MSCI AC World	-2.4%	7.9%	24.0%	-9.4%	26.6%	16.3%
Barclays Global Agg	1.0%	3.9%	3.0%	1.8%	8.2%	5.6%
60 US Equity : 40 US Bonds	1.2%	8.8%	14.3%	-1.9%	22.2%	13.2%
S&P Riskparity Vol 10	-4.9%	12.8%	10.4%	-4.3%	22.8%	11.5%

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

**Chart A22: Momentum signals for 10Y UST and 10Y Bunds**

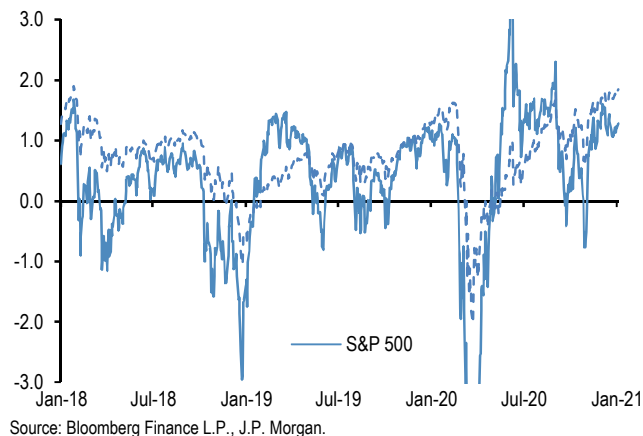
z-score of the momentum signal in our Trend Following Strategy framework shown in Tables A5 and A6 in the Appendix. Solid lines are for the shorter term and dotted lines for longer-term momentum.



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

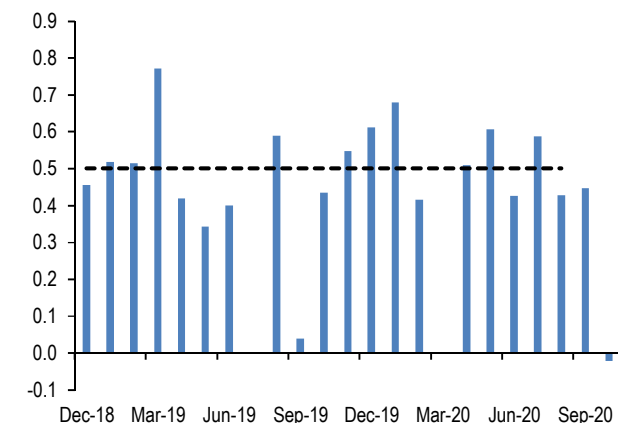
### Chart A23: Momentum signals for S&P 500

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.



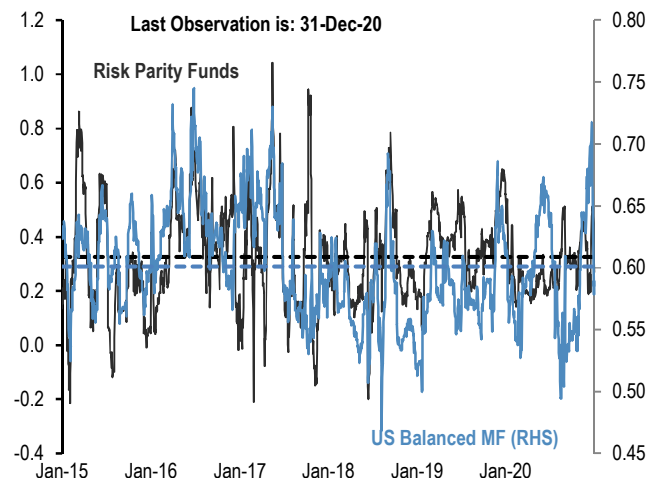
### Chart A25: Equity beta of monthly reporting Equity Long/Short hedge funds

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



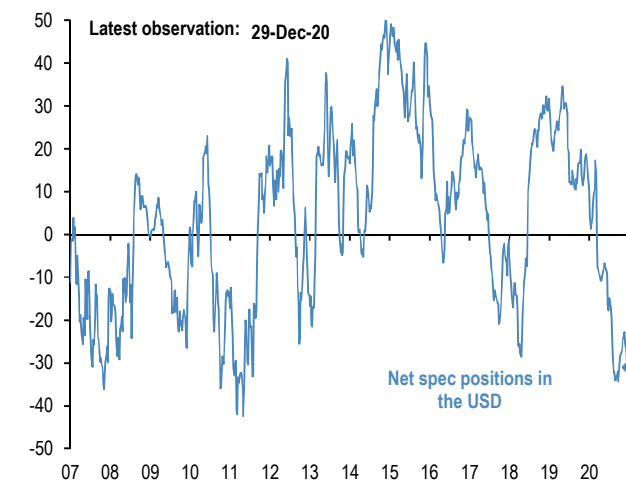
### Chart A24: Equity beta of US Balanced Mutual funds and Risk Parity funds

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 A26: USD exposure of currency hedge funds

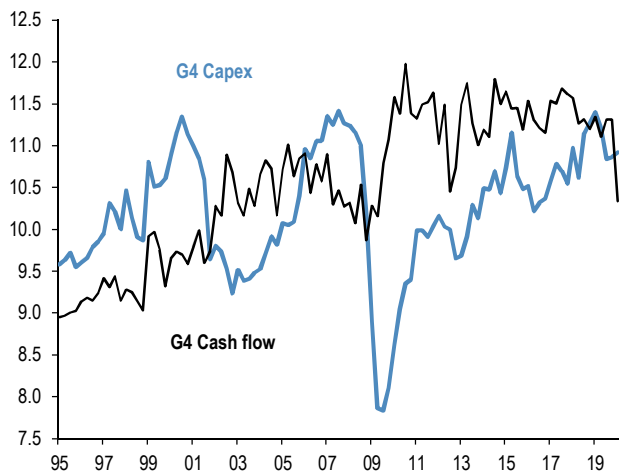
The net spec position in the USD as reported by the CFTC. Spec is the non-commercial category from the CFTC.



## Corporate activity

**Chart A27: G4 non-financial corporate capex and cash flow as % of GDP**

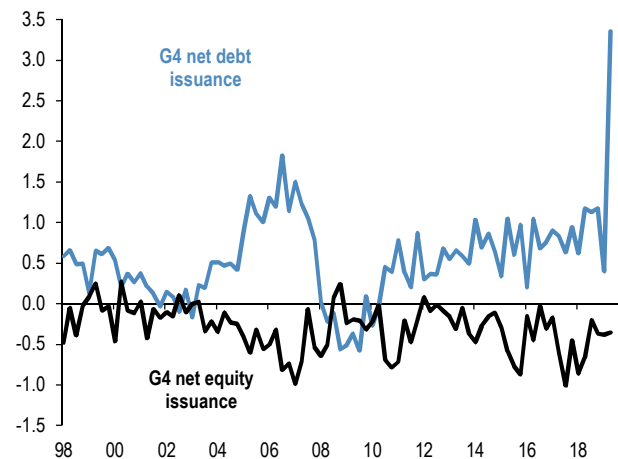
% of GDP, G4 includes the US, the UK, the Euro area and Japan. Last observation as of Q1 2020.



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

**Chart A28: G4 non-financial corporate sector net debt and equity issuance**

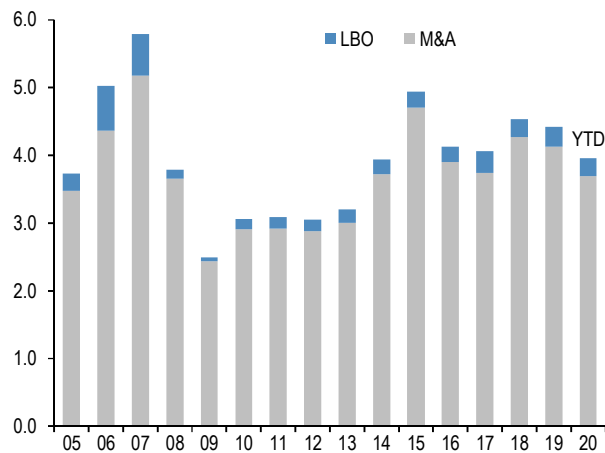
\$tr per quarter, G4 includes the US, the UK, the Euro area and Japan. Last observation as of Q1 2020.



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

**Chart A29: Global M&A and LBO**

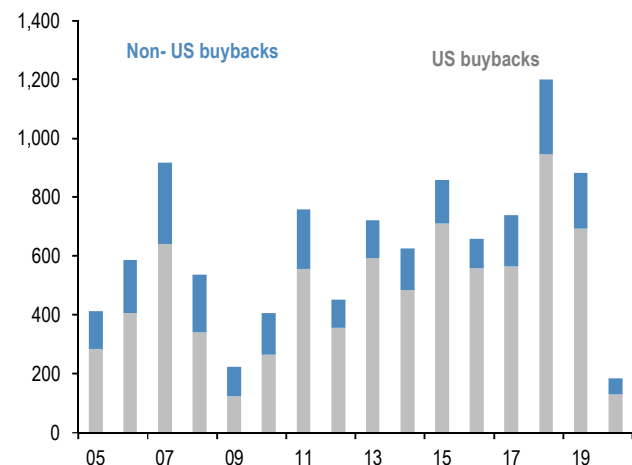
\$tr. YTD 2020 as of Dec 16. M&A and LBOs are announced.



Source: Dealogic, J.P. Morgan.

**Chart A30: US and non-US share buyback**

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

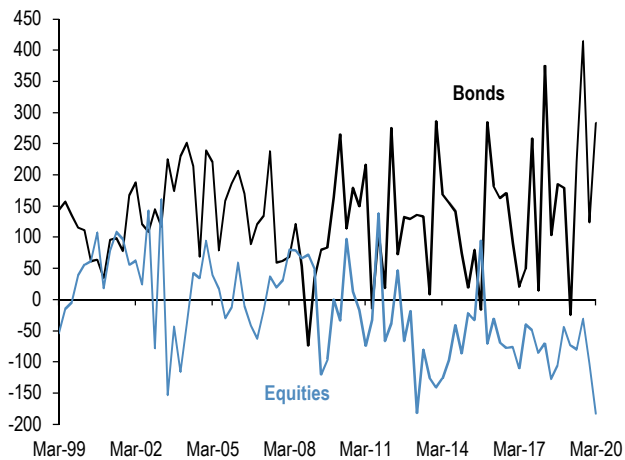


Source: Bloomberg Finance L.P., Thomson Reuters, J.P. Morgan

## Pension fund and insurance company flows

**Chart A31: G4 pension funds and insurance companies equity and bond flows**

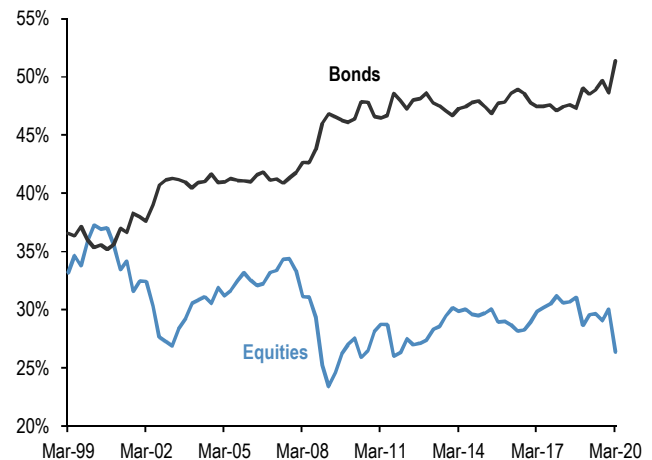
Equity and bond buying in \$bn per quarter. G4 includes the US, the UK, Euro area and Japan. Last observation is Q1 2020



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

**Chart A32: G4 pension funds and insurance companies equity and bond levels**

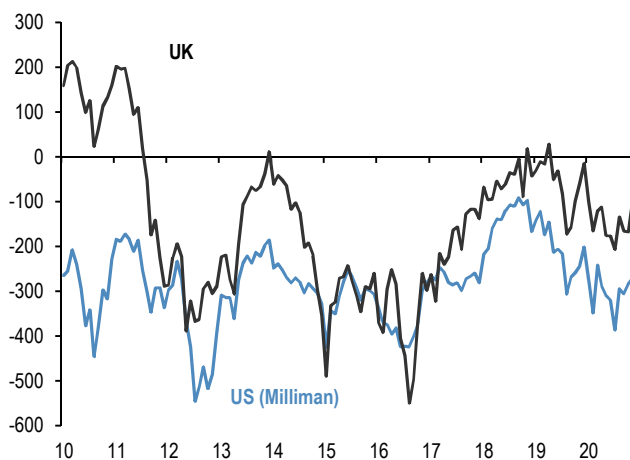
Equity and bond as % of total assets per quarter. G4 includes the US, the UK, Euro area and Japan. Last observation is Q1 2020.



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

**Chart A33: Pension fund deficits**

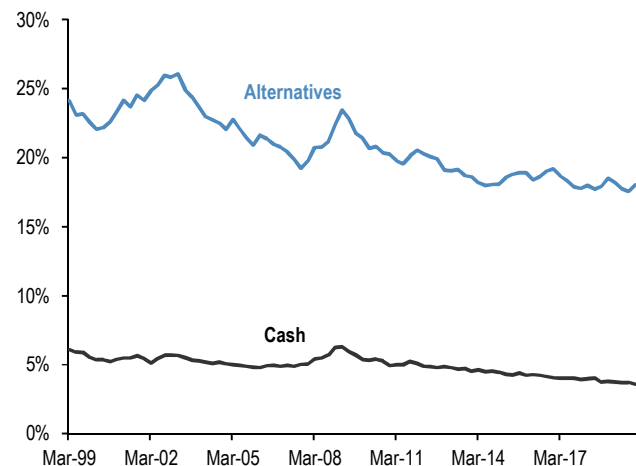
US\$bn. For US, funded status of the 100 largest corporate defined benefit pension plans, from Milliman. For UK, funded status of the defined benefit schemes eligible for entry to the Pension Protection Fund, converted to US\$ at today's exchange rates. Last obs. is Nov'20.



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

**Chart A34: 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.



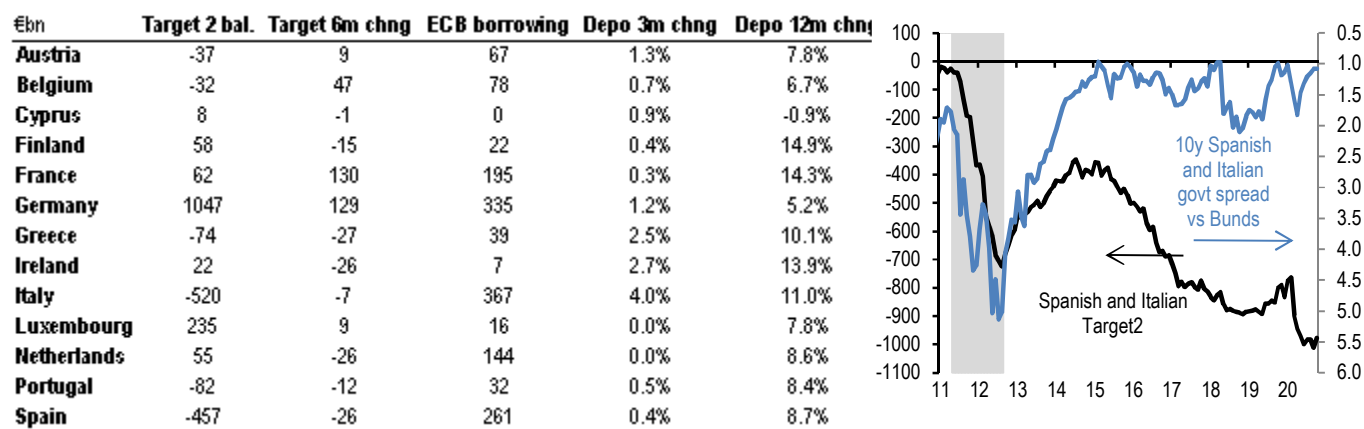
Source: ECB, BOJ, BOE, Federal Reserve flow of funds



## Funding market monitor

### Table A4: Bank deposits and ECB reliance

Deposits are non-seasonally adjusted Euro area non-bank, non-government deposits as of August 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.

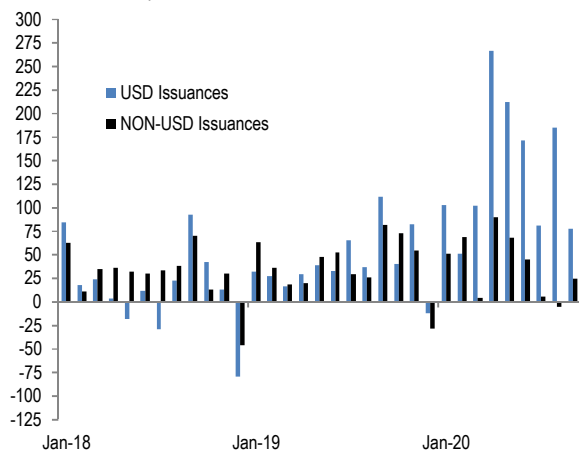


Source: Bloomberg Finance L.P., ECB, National Central Banks, J.P. Morgan

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

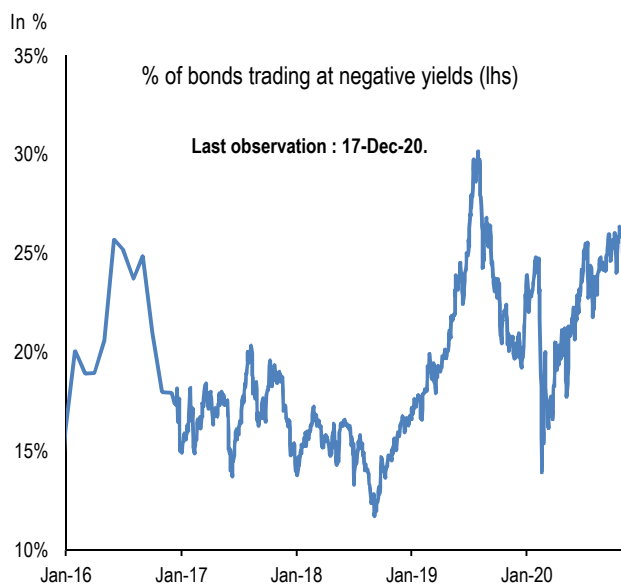
### Chart A35: USD and Non-USD net bond issuances

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 Sep 2020.



Source: Dealogic, J.P. Morgan

### Chart A36: Market value of negative yield bonds as a % of total outstanding in Bloomberg Barclays Global Agg Index

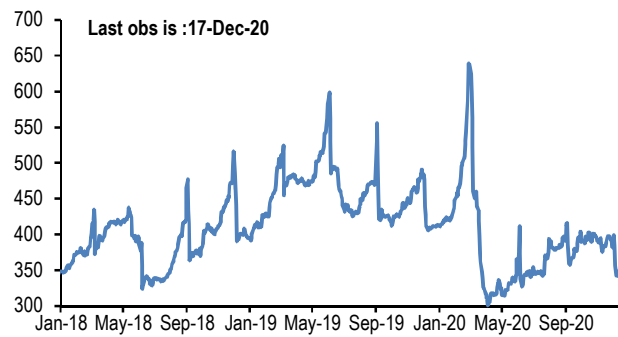


Source: J.P. Morgan

## Italian stress market monitor

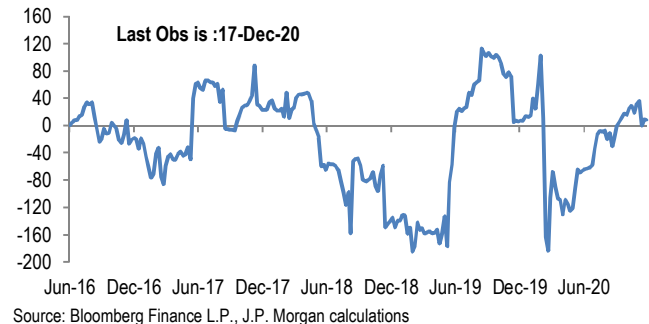
**Chart A37: Open Interest for 10Y Italian Government Bond Futures**

In thousands.



**Chart A38: 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.



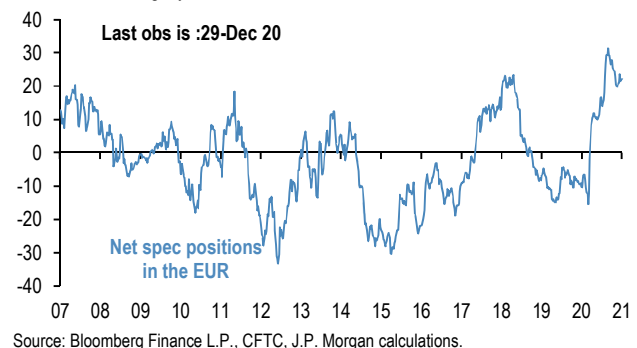
**Chart A39: Position proxy for 10Y French Government Bond Futures (OATA Comdty)**

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.



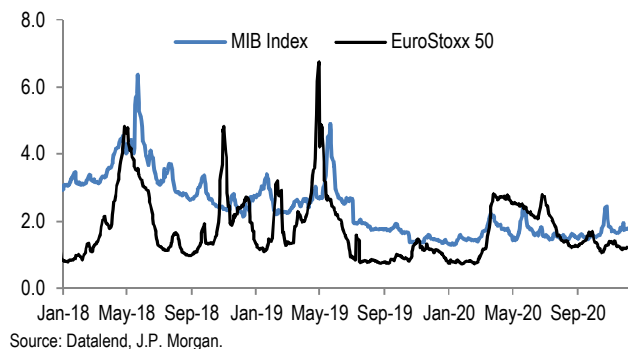
**Chart A40: Currency hedge fund EUR exposure**

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



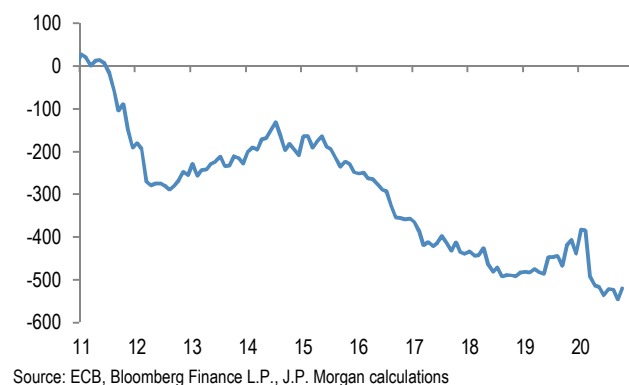
**Chart A41: Quantity on loan for MIB and EuroStoxx 50 index stocks**

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



**Chart A42: Italy Target 2 balance**

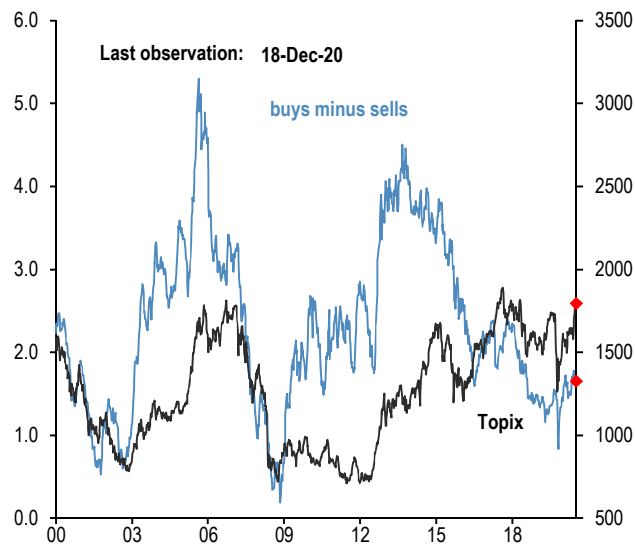
In €bns. Last observation is Oct'20



## Japanese flows and positions

**Chart A43: Tokyo Stock Exchange margin trading: total buys minus total sells**

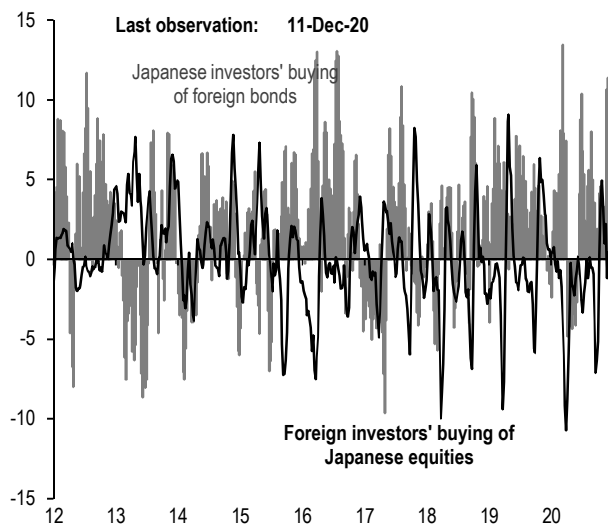
In bn of shares. Topix on right axis.



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

**Chart A45: Japanese equity buying by foreign investors. Japanese investors' buying of foreign bonds**

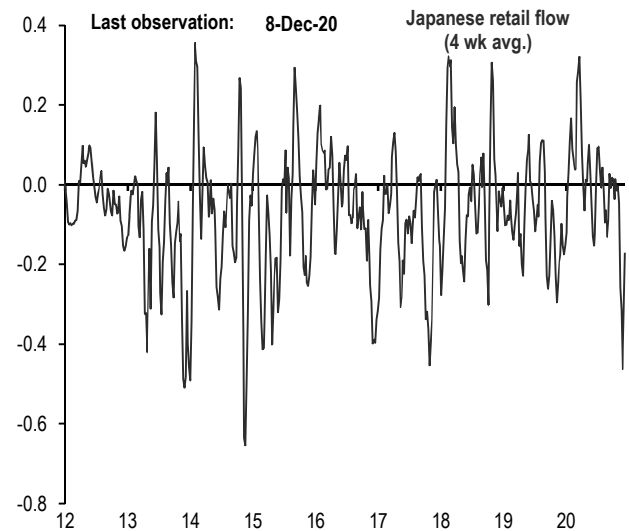
\$bn, 4 week moving average.



Source: Japan MoF, J.P. Morgan.

**Chart A44: Domestic retail flows**

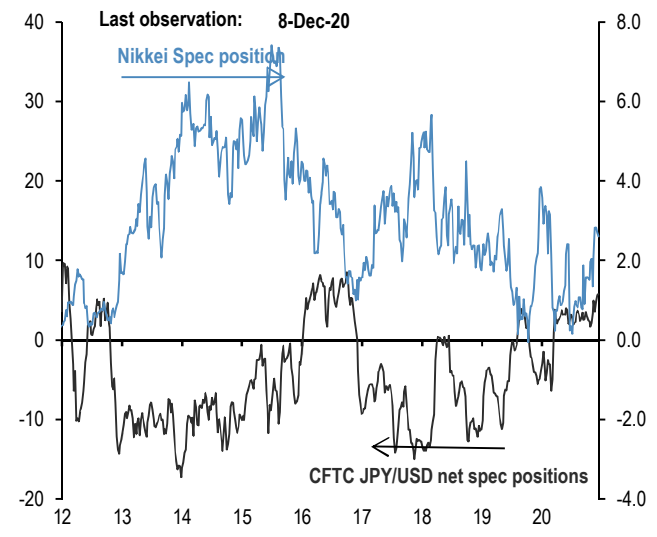
In JPY tr. Retail flows are from Tokyo stock exchange.



Source: TSE, J.P. Morgan calculations.

**Chart A46: 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.

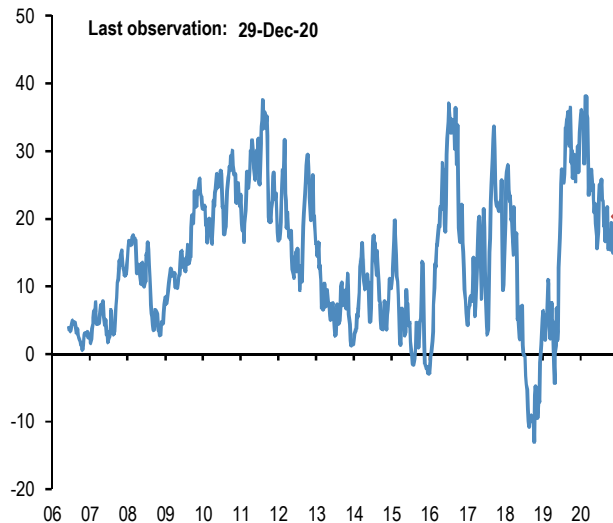


Source: Bloomberg Finance L.P., CFTC, J.P. Morgan calculations.

## Commodity flows and positions

### Chart A47: Gold spec positions

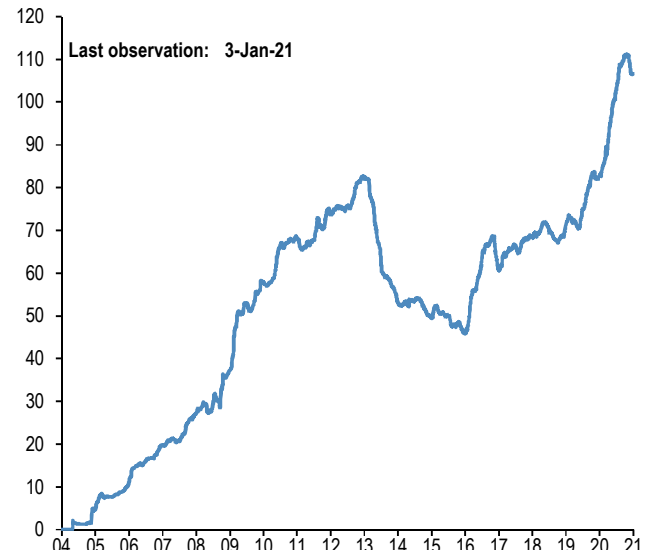
\$bn. CFTC net long minus short position in futures for the Managed Money category.



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

### Chart A48: Gold ETFs

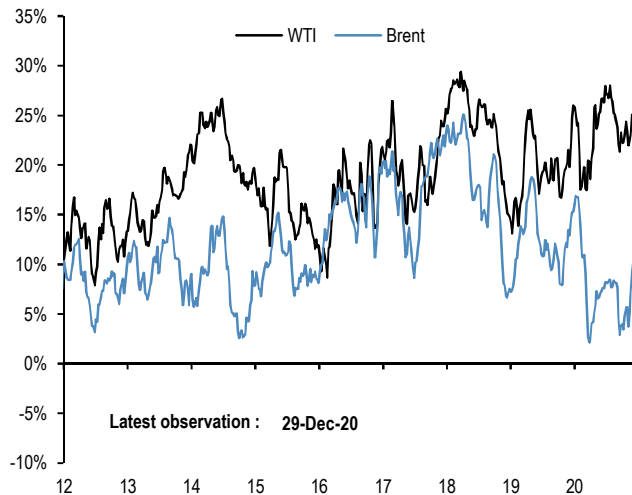
Mn troy oz. Physical gold held by all gold ETFs globally.



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

### Chart A49: Oil spec positions

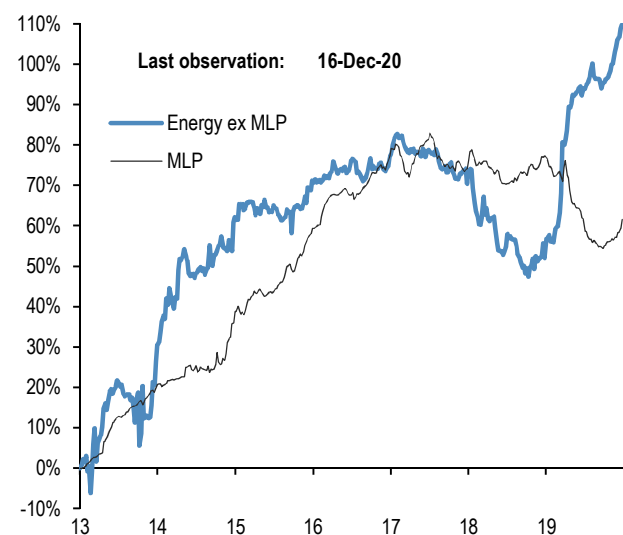
Net spec positions divided by open interest. CFTC futures positions for WTI and Brent are net long minus short for the Managed Money category.



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

### Chart A50: Energy ETF flows

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

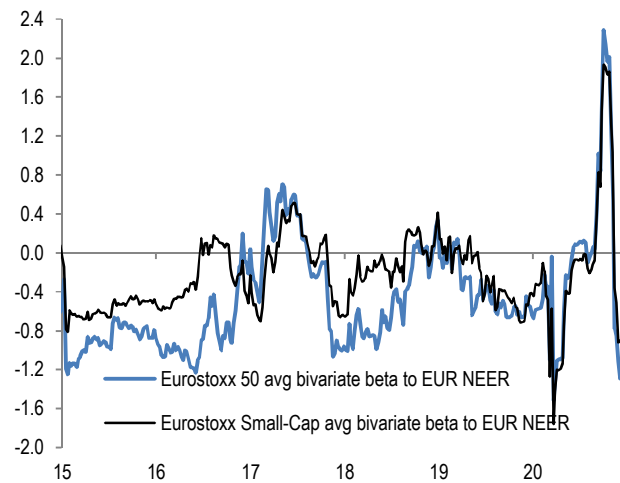


Source: CFTC, Bloomberg Finance L.P., J.P. Morgan

## Corporate FX hedging proxies

### Chart A51: Average beta of Eurostoxx 50 companies and Eurostoxx Small-Cap to trade weighted EUR

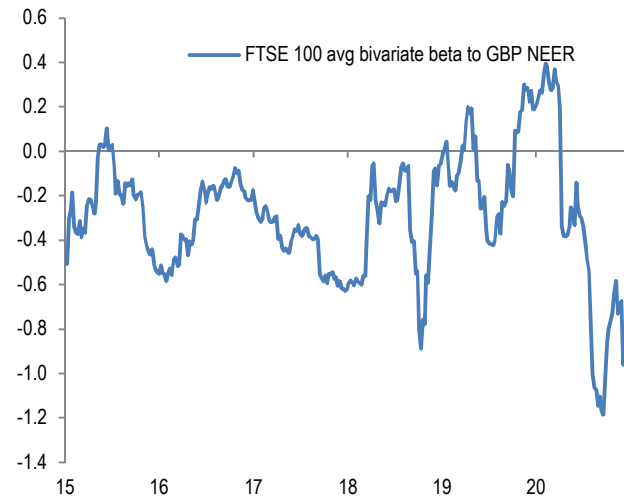
Rolling 26 weeks average betas based on a bivariate regression of the weekly returns of individual stocks in the Eurostoxx 50 index to the weekly returns of the MSCI AC World and JPM EUR Nominal broad effective exchange rate (NEER).



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

### Chart A52: Average beta of FTSE 100 companies to trade weighted GBP

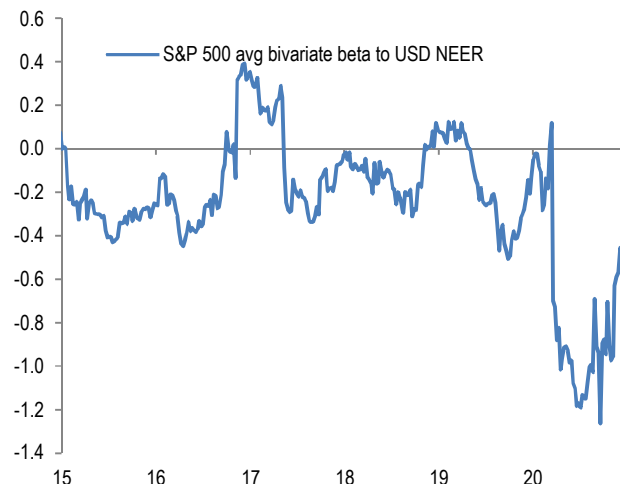
Rolling 26 weeks average betas based on a bivariate regression of the weekly returns of individual stocks in the FTSE 100 index to the weekly returns of the MSCI AC World and JPM GBP Nominal broad effective exchange rate (NEER).



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

### Chart A53: Average beta of S&P500 companies to trade weighted US dollar

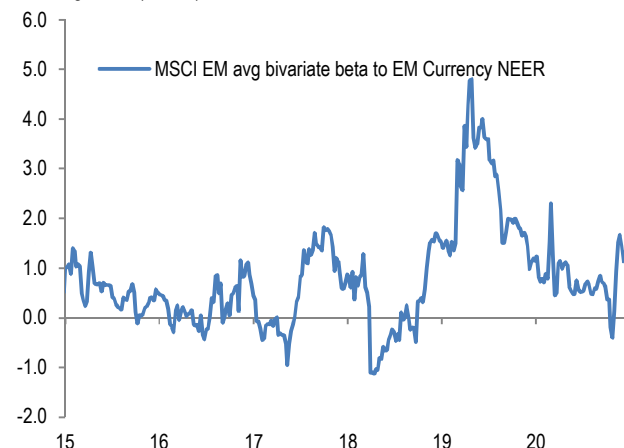
Rolling 26 weeks average betas based on a bivariate regression of the weekly returns of stocks in the S&P500 index to the weekly returns of the MSCI AC World and JPM USD Nominal broad effective exchange rate (NEER).



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

### Chart A54: 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.

## 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				1	13	1.0	6.4%
	long	504	10.2	22.4	0.45	-1	2	-1.5	-42.7%
Brent	short	105				1	19	1.1	14.9%
	long	504	7.4	21.8	0.34	-1	142	-0.5	-14.4%
Unleaded gas	short	105				1	23	1.3	18.1%
	long	462	4.4	23.9	0.18	-1	142	-0.2	-4.9%
Heat Oil	short	63				0	10	2.0	19.4%
	long	483	6.6	21.3	0.31	-1	31	-0.7	-17.9%
Gasoil	short	63				0	5	1.9	18.7%
	long	504	11.2	19.9	0.56	-1	32	-0.8	-24.3%
Nat gas	short	147				-1	32	-0.8	-16.1%
	long	294	19.5	34.9	0.56	-1	105	-1.1	-29.0%
Gold	short	21				1	2	1.0	2.7%
	long	504	4.0	10.7	0.37	1	28	1.3	15.8%
Silver	short	10				0	0	2.0	6.7%
	long	462	6.4	19.0	0.33	0	0	1.6	36.4%
Palladium	short	42				-1	10	-0.1	-0.5%
	long	273	15.8	20.6	0.77	1	124	0.4	8.5%
Platinum	short	105				1	7	1.4	12.5%
	long	273	7.9	17.3	0.46	1	23	1.1	16.6%
Aluminium	short	21				1	6	0.5	1.5%
	long	378	5.1	13.6	0.37	1	50	1.0	13.6%
Copper	short	147				0	0	1.5	19.9%
	long	399	10.3	17.8	0.58	1	122	1.3	30.4%
Lead	short	126				1	26	0.5	6.7%
	long	357	6.0	20.4	0.29	1	20	0.2	4.8%
Nickel	short	42				1	49	1.1	8.6%
	long	336	13.5	22.7	0.59	1	54	0.8	21.4%
Zinc	short	126				1	18	1.3	15.0%
	long	399	10.6	19.8	0.54	1	50	0.9	22.0%
Wheat	short	168				1	65	0.7	8.9%
	long	294	2.2	22.6	0.10	1	66	0.6	8.3%
Kansas wheat	short	147				1	38	1.1	13.5%
	long	504	8.1	20.3	0.40	1	53	0.6	12.5%
Corn	short	63				1	26	0.6	5.0%
	long	399	6.8	16.4	0.42	1	30	0.3	6.0%
Soybeans	short	42				1	13	1.0	5.6%
	long	231	6.7	14.7	0.45	0	28	2.0	26.1%
Cotton	short	168				1	100	1.2	16.9%
	long	483	4.5	18.2	0.24	1	48	0.5	13.5%
Sugar	short	63				1	1	0.2	1.8%
	long	252	8.1	22.3	0.37	1	57	0.5	9.8%
Coffee	short	63				1	15	1.3	10.7%
	long	315	5.2	23.0	0.22	1	5	0.4	6.8%
Cocoa*		10	4.8	28.5	0.17	-1	12	-0.5	-1.7%

\* 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 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.

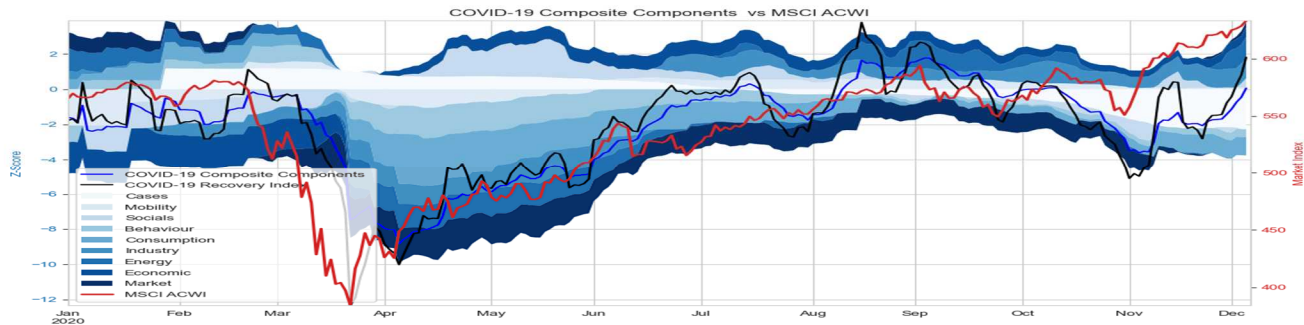
		Lookback (moving avg, days)	Annualized return (%)	Vol (%)	IR	Current signal	Time since last change (days)	Z-score	% Change of return index from its moving average
S&P500	short	63				1	6	1.4	6.5%
	long	357	6.7	11.9	0.57	0	17	1.8	18.6%
Nasdaq 100	short	64				1	31	1.0	8.5%
	long	462	7.6	14.7	0.52	0	32	2.1	41.1%
Nikkei	short	63				1	4	1.4	8.6%
	long	420	5.6	13.9	0.41	1	146	1.4	22.1%
FTSE 100	short	147				1	26	1.3	8.0%
	long	462	4.3	12.4	0.35	0	1	0.0	0.1%
Eurostoxx 50	short	21				1	2	0.4	1.4%
	long	357	3.4	13.4	0.25	1	26	0.6	7.5%
MSCI EM	short	42				1	33	1.2	6.6%
	long	357	14.2	11.4	1.24	1	120	1.4	28.5%
2Y US Ts	short	252				1	153	0.4	0.4%
	long	463	0.8	1.0	0.87	1	192	0.8	13%
5Y US Ts	short	252				1	94	0.4	0.9%
	long	378	1.9	2.8	0.67	1	90	0.8	2.2%
10Y US Ts	short	42				0	2	0.0	0.0%
	long	504	2.1	3.5	0.60	1	42	1.1	4.7%
2Y Schot	short	252				-1	1	-0.1	-0.1%
	long	441	0.3	0.8	0.40	-1	2	-0.1	-0.1%
5y Bobl	short	64				0	1	0.0	0.0%
	long	463	1.6	1.8	0.93	1	194	0.3	0.6%
10y Bund	short	105				1	10	0.2	0.4%
	long	462	2.7	3.2	0.82	1	196	0.6	2.2%
10Y JGB	short	168				0	0	0.0	0.0%
	long	273	1.0	2.2	0.44	0	3	0.0	-0.1%
10Y Gilt	short	105				-1	2	-0.1	-0.3%
	long	504	1.4	3.8	0.38	1	92	0.8	3.3%
Euro	short	42				1	25	1.2	2.7%
	long	273	3.2	6.4	0.51	1	128	1.2	7.3%
Yen	short	21				1	4	0.6	1.0%
	long	399	1.7	6.3	0.28	1	104	0.5	3.4%
Sterling	short	168				1	107	1.3	5.6%
	long	294	2.3	7.3	0.31	1	58	1.0	5.7%
AUD	short	42				0	0	1.5	4.3%
	long	378	5.0	7.7	0.65	1	121	1.2	10.6%
CAD	short	252				1	97	1.1	5.5%
	long	504	0.9	6.4	0.14	1	33	0.7	4.7%

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



## Gauging the Economic Normalization

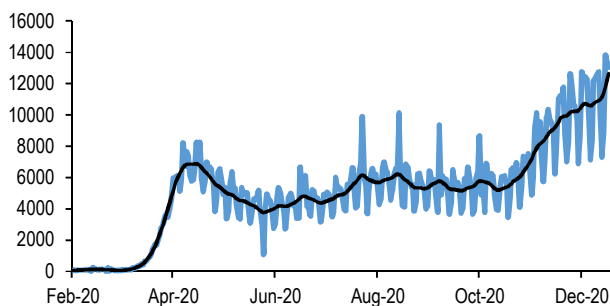
**Chart A55: COVID-19 Composite showing the individual components' contributions YTD 2020**



Source: J.P. Morgan.

**Chart A56: Daily change in number of COVID-19 Deaths smoothed by HP filter**

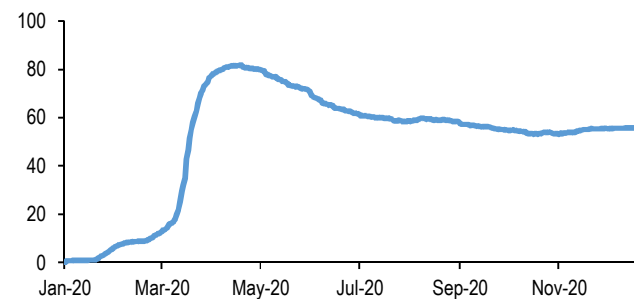
Number of deaths per day. HP filter uses lambda of 50. Last obs. is 17 Dec 2020.



Source: Worldometer, J.P. Morgan.

**Chart A57: Average score of lockdown stringency Index across 147 countries as compiled by Oxford University**

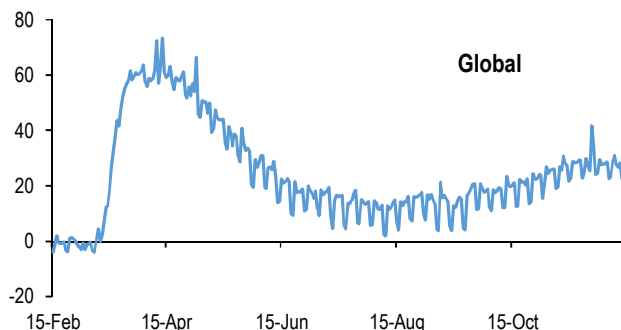
Last obs. is 17 Dec 2020



Source: Oxford University Research, J.P. Morgan

**Chart A58: Google mobility data – Visits and length of stays at Residential areas minus Other areas**

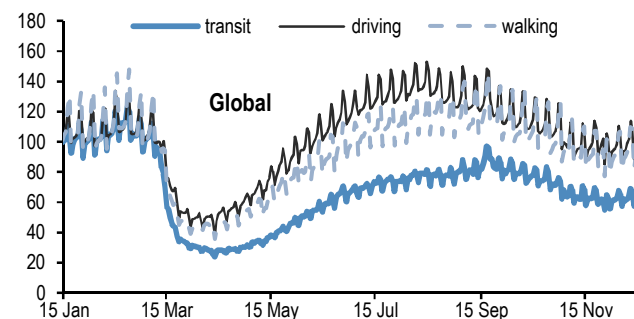
Other areas include Workplace, Transit station, Parks, Grocery & Pharmacy and Retail & Recreational places. Data is aggregated for 125 countries and are weighted based on their GDP. Baseline is defined as median volume between 3<sup>rd</sup> Jan – 6<sup>th</sup> Feb. Last obs. is 13 Dec 2020.



Source: Google mobility data, J.P. Morgan

**Chart A59: 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 13<sup>th</sup> Jan 2020. Last obs. is 16 Dec 2020.



Source: Apple mobility data, J.P. Morgan

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