Topics: Bear market barometers, a “Maltese Falcoin” crypto update and a COVID apology

Summary: The slowdown induced by central bank tightening is just starting. Be patient when adding risk to portfolios. Valuations have declined materially but the price paid for high earnings growth is still elevated. A bottom for equities is likely to coincide with a peak in inflation, since that will signify how much central banks have to tighten. A lot of Wall Street research claims that inflation is peaking now, and a recent IMF report came to similar conclusions. As per the first chart, the IMF sees US inflation peaking around current levels. Even so, I don’t think we’re there yet. Inflation has already blown past the IMF forecast for Europe and as shown below, there’s evidence of a wage-price spiral in the US in low wage industries; US labor markets are still at their tightest levels in the post-war era; and supply chain pressures which spiked last year have yet to abate (some of which is due to the China lockdowns). On top of all that, rising food and energy prices are now feeding into airlines, restaurant and lodging prices. Bottom line: there’s a lot riding on when inflation peaks. Even if that happens now (which I doubt), the Fed has a ways to go before it can stop tightening.

1 “War Dims Global Economic Outlook as Inflation Accelerates”, IMF, April 19, 2022

2 The wage-price spiral chart is meant to indicate that companies that hire a lot of lower wage workers are paying large wage increases which they are passing along to customers. On inflation, we show the equal-weighted wage growth in industries such as restaurants, hotels, casinos, nursing homes, child care, hair salons and laundry services. For wages, we show average hourly earnings for leisure and retail. For more information, see “Are major advanced economies on the verge of a wage-price spiral?”, BIS, May 4, 2022

3 The more cyclical service industries (airlines, restaurants) are experiencing 10% inflation, a figure not seen since the Volcker era in the early 1980’s.
Inflation, central banks and P/E multiples. As shown in the next chart, when real Treasury yields went negative in 2020 (i.e., Treasury rates fell below inflation), that’s when P/E multiples shot up over 20x. Now that real yields are moving into positive territory again, P/E multiples are declining. And the more positive real yields become, the more equity multiples are likely to fall. That’s why I am less focused on earnings right now; this correction (so far) is all about overpriced multiples finally coming down.

The market barometers on the following page show how valuations have declined. Before we get into that, see the second chart: while the premium investors pay for growth has come down a lot, it’s still high vs history. The barometers tell a similar story: the COVID stimulus boost to valuations has now been unwound, but for the most part, investors are still paying a large premium for companies with high expected earnings growth, at least relative to history. US equity markets are also not pricing in a recession yet: according to Goldman Sachs, S&P 500 pricing for cycicals vs defensives implies an ISM reading of 49 and GDP growth of 0%-1%.

Economic growth is likely to fall as central banks tighten. Leading indicators point to a decline in manufacturing activity this fall (third chart), and the lean inventory positions of a year ago are gone. As shown in the last chart, rising inventory levels in the US have now converged with falling sales. Large declines in manufacturing and bloated inventory conditions usually result in large earnings declines. For anyone looking to add risk to portfolios this year, more bad news is now in the price for equities (the S&P selloff of 18% from its peak is ~70% of the average selloff during the prior 11 recessions), but still I think you can be patient.
Bear market barometers: equities

This cycle is reminiscent of 2001 and 1987: extended valuations finally coming back down to earth alongside what might be a shallow recession. It’s quite different than 2008 and 1991 when the primary issues were banking sector solvency, overleveraged households and a housing crash. That’s why most of the damage is seen in equities rather than in credit spreads.

P/E ratios: Megacap, Core, Growth and Value

Price / consensus 12 month forward earnings per share

P/E ratios: US by market cap and Europe

Price / consensus 12 month forward earnings per share

Drawdowns of NASDAQ and Russell 1000 Growth stocks from their respective peaks

Cumulative percent of stocks with drawdowns greater than threshold

Fixed rate preferred securities option adjusted spread

P0P1 index, basis points

China internet stocks 2022 vs NASDAQ 2001

Index (100 = peak)

MSCI China equity index drawdowns

% decline from prior peak
Bear market barometers: fixed income

US and emerging market high yield credit spreads

- EM high yield sovereign spread (JPBYHYSW Index)
- US high yield spread (CSI BARC Index)


US investment grade credit spreads

% corporate BAA 10 year spread (BICLB10Y Index)


S&P 500 leveraged loan price index

SPBDALB index


US 10 year municipal bond yields

% (LM10TR Index)


US commercial paper spread vs 3 month Treasury

basis points


AAA asset backed securities spreads

basis points, spread versus Treasury

COVID apology

COVID vaccines continue to yield massive public health benefits. Data from multiple states show a large gap between vaccinated and unvaccinated hospitalizations and deaths during the Omicron variant surge last winter. These benefits are critical now that Omicron variants are becoming more transmissible, more resistant to monoclonal antibodies and more prone to “immunity escape” (i.e., lower cross-immunity for unvaccinated people who had BA.1). Still, some people do not believe that vaccines work based on theories which have been described by my science advisory group as unsubstantiated and false (and those are their kinder words).

That said, I have an apology to make. On two occasions this year in the Eye on the Market, I disparagingly mentioned how someone I’ve known for 20 years has differing views on COVID vaccines based on research he published and some personal correspondence we had. I was wrong to do that; I described his views rather than pointing people to where they could read them for themselves; I did not allow him to articulate his point of view in these pages in a point-counterpoint discussion; and I did not acknowledge that his primary focus was not epidemiology but the impact on markets if the vaccines are as ineffective as he believes they are.

As things stand now, each of us believes that the other is hopelessly lost in a sea of disinformation. I am still not sure how to deal with that, but preserving the relationship has turned out to be more important to me than rupturing it over our inability to see things the same way. As shown in the bar chart, COVID has done this to a lot of people: lost tempers, damaged relationships and a lot of stress. So, no more judgments from me; just the data and the latest research on our portal which everyone can interpret for themselves.

### Impact of COVID-19 disagreements on relationships

<table>
<thead>
<tr>
<th>% of COVID Family Impact Survey respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caused relationship stress</td>
</tr>
<tr>
<td>Stopped socializing</td>
</tr>
<tr>
<td>Damaged family relationships</td>
</tr>
<tr>
<td>Lost temper</td>
</tr>
</tbody>
</table>

Source: South Dakota State University. September 2021.

### Omicron variant update

<table>
<thead>
<tr>
<th>BA.1</th>
<th>BA.2</th>
<th>BA.2.12.1</th>
<th>BA.4 and BA.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmissibility increase</td>
<td>Reference</td>
<td>30% increase</td>
<td>25% over BA.2</td>
</tr>
<tr>
<td>Immune escape</td>
<td>Reference</td>
<td>+</td>
<td>++</td>
</tr>
<tr>
<td>Ability to infect cells</td>
<td>Reference</td>
<td>+</td>
<td>++</td>
</tr>
<tr>
<td>Cross-Immunity w/ BA.1</td>
<td>Reference</td>
<td>Mostly preserved</td>
<td>Reduced</td>
</tr>
<tr>
<td>Resistance to monoclonal antibodies</td>
<td>Reference</td>
<td>Outcompeted</td>
<td>&gt;100 countries</td>
</tr>
<tr>
<td>Places where dominant</td>
<td>Outcompeted</td>
<td>&gt;100 countries</td>
<td>US regions (NJ, NY)</td>
</tr>
<tr>
<td>2 shot effic. vs hospitalization</td>
<td>32%</td>
<td>50%</td>
<td>TBD</td>
</tr>
<tr>
<td>3 shot effic. vs hospitalization</td>
<td>81%</td>
<td>83%</td>
<td>TBD</td>
</tr>
</tbody>
</table>


---

4 NYC: the unvaccinated hospitalization rate was 16x higher than the vaccinated rate from February to April.

5 Pfizer has tested a vaccine/booster based on BA.1. Results are expected by the end of June after which the FDA will make vaccine recommendations for the fall. The limited protection that BA.1 infection provides against new subvariants in lab studies has raised questions about how useful new Omicron-specific vaccines might be. The virus may be evolving too quickly for strain-specific vaccines to keep up.
Crypto update since our “Maltese Falcon” piece: Fortune may not favor the brave after all

Tales from the Crypt
% return since November 2021

-100% -80% -60% -40% -20% 0%

SANDBOX: Gaming token used by people buying virtual land, possibly to plant tulips on
BINANCE COIN: Token/exchange; welcome to France, global epicenter of entrepreneurship (see p7)
BITCOIN: Store of value? Volatility 5x S&P, 0.8 correlation with NASDAQ, zero inflation hedge
ETHEREUM: DeFi application platform; Ethereum 2.0 is coming, may improve speed/scale and reduce fees
RIPPLE: Used for currency remittances, also Fred Sanford’s favorite drink; SEC lawsuit finally underway
SILVERGATE: Crypto lending bank down more than double KBW Bank Index
DECENTRALAND: Gaming token; Less than 1,000 active daily users according to CoinDesk
CARDANO: DeFi application platform; faster and cheaper than Bitcoin due to larger block sizes, same awful price/volatility characteristics
TERRA: Algorithmic stablecoin; collapsed when unsustainable 20% yields to holders were about to expire
ROBINHOOD: Brokerage firm with 25% of transaction based revenue from crypto
SOLANA: DeFi application platform; Seven outages in 2022 as bots crash network
COINBASE: Crypto brokerage; ARK Innovation ETF continues to accumulate shares as its largest holder
BINGEO: This dog has fleas
DOGECOIN: This dog has fleas
BITCOIN CASH: Faster and cheaper than Bitcoin due to larger block sizes, same awful price/volatility characteristics
DECENTRALAND: Gaming token; Less than 1,000 active daily users according to CoinDesk
SILVERGATE: Crypto lending bank down more than double KBW Bank Index
RIPPLE: Used for currency remittances, also Fred Sanford’s favorite drink; SEC lawsuit finally underway
BITCOIN MINER ETF: Each Bitcoin transaction consumes energy to power typical US home for 6 weeks
ETHEREUM: DeFi application platform; Ethereum 2.0 is coming, may improve speed/scale and reduce fees
BITCOIN: Store of value? Volatility 5x S&P, 0.8 correlation with NASDAQ, zero inflation hedge
BINANCE COIN: Token/exchange; welcome to France, global epicenter of entrepreneurship (see p7)
SANDBOX: Gaming token used by people buying virtual land, possibly to plant tulips on

Crypto valuation theories

- “Store of Value” argument continues to disintegrate given Bitcoin volatility that is 5x the S&P 500, and its 0.8 correlation with the NASDAQ
- “Crypto as an inflation hedge” repudiated as crypto prices plummet while inflation rises
- Bitcoin as a means of exchange? Not yet; confirmed transactions per day still below 2018-2020 levels
- DeFi lending use case also crumbling as expected: since most DeFi lending is collateralized by crypto, DeFi lending activity has declined 25% YTD along with declining crypto prices
- Gaming tokens financed by venture capitalists plummet as Metaverse user base falls short of expectations. Decentraland, Axie Infinity and Sandbox tokens have higher valuations and fewer users than non-blockchain games like Fortnite, Candy Crush, etc. Sandbox and Decentraland average daily users were around 1,000 people in late April. I think that’s the number of people still using Lotus 1-2-3
- Some crypto collapses can be linked to unsustainably high “staking” yields paid to crypto holders that eventually reset closer to prevailing short term interest rates
- Growing list of developing countries with full or partial bans on crypto as a means of payment
- Coinbase claimed to have 3 million users on its NFT waitlist but since launch has yet to see more than 200 NFT transactions on any given day
- Increase in daily verified Ethereum contracts per day since February report (i.e., a scarce positive)
- Stablecoins Tether and USDC continue to trade close to par. As explained in our piece, stablecoin valuations have little relevance for directional crypto prices when they are collateralized by liquid reserves. The adoption of blockchain applications using stablecoins also has no relevance for directional crypto prices. On Tether, the company has reportedly disclosed it holds $40 billion in government bonds and cash out of its $79 billion in total reserves; the rest of its reserve composition is a mix of commercial paper, CDs, money market funds, loans, corporate bonds, precious metals and other digital tokens

Regulatory

- Terra’s CEO reportedly founded another stablecoin called Basis Cash (using a pseudonym from the animated *Rick & Morty* show) which failed when it lost its peg in 2021 and is now trading at 1 cent on the dollar. Some believe that the Terra collapse resulted from a coordinated attack or manipulation, which I find strange since “pump and dump” schemes and other activities that would be prohibited in regular securities markets are by definition not illegal on decentralized blockchains.

- **Cryptocurrency investors are not paying the IRS** at least half of the taxes they owe on their virtual-currency trades according to Barclays. The IRS has begun to crack down on tax evasion among crypto investors and in 2023 will begin requiring brokers to report transactions worth at least $10,000.

- Fidelity announced plans to allow customers to put some of their retirement savings into Bitcoin, which was immediately met by “statements of concern” and reminders of “fiduciary care” by the Department of Labor.

- Crypto exchange Binance reportedly shared information with the Russian gov’t on its users that donated to imprisoned Putin opponent Alexei Navalny, raising questions about how anonymous crypto holders are depending on where and how they transact. This also raises questions about the decision by France to be the first European country to give Binance a regulatory stamp of approval.

- Gensler/SEC highlights problems in crypto market due to insufficient Chinese walls across custody, market making and trading at crypto exchanges.

- **Cryptocurrency crime** hit a new all-time high in 2021 with illicit addresses receiving $14 billion over the course of the year, up from $7.8 billion in 2020. As of early 2022, illicit addresses held at least $10 billion of cryptocurrency with the vast majority held by wallets associated with cryptocurrency theft.

Sources: Bloomberg, Fortune, Forbes, Blockchain.com, Etherscan, DeFi Pulse, TechCrunch, Cointelegraph, Reuters, Chainalysis, CoinDesk, Barron’s, CNBC. “Fortune Favors the Brave” refers to a Crypto.Com commercial which aired during the Super Bowl in 2022. Tales from the Crypt refers to a US television show which aired from 1989 to 1996.
IMPORTANT INFORMATION
This report uses rigorous security protocols for selected data sourced from Chase credit and debit card transactions to ensure all information is kept confidential and secure. All selected data is highly aggregated and all unique identifiable information, including names, account numbers, addresses, dates of birth, and Social Security Numbers, is removed from the data before the report’s author receives it. The data in this report is not representative of Chase’s overall credit and debit cardholder population.

The views, opinions and estimates expressed herein constitute Michael Cembalest’s judgment based on current market conditions and are subject to change without notice. Information herein may differ from those expressed by other areas of J.P. Morgan. This information in no way constitutes J.P. Morgan Research and should not be treated as such.

The views contained herein are not to be taken as advice or a recommendation to buy or sell any investment in any jurisdiction, nor is it a commitment from J.P. Morgan or any of its subsidiaries to participate in any of the transactions mentioned herein. Any forecasts, figures, opinions or investment techniques and strategies set out are for information purposes only, based on certain assumptions and current market conditions and are subject to change without prior notice. All information presented herein is considered to be accurate at the time of production. This material does not contain sufficient information to support an investment decision and it should not be relied upon by you in evaluating the merits of investing in any securities or products. In addition, users should make an independent assessment of the legal, regulatory, tax, credit and accounting implications and determine, together with their own professional advisers, if any investment mentioned herein is believed to be suitable to their personal goals. Investors should ensure that they obtain all available relevant information before making any investment. It should be noted that investment involves risks, the value of investments and the income from them may fluctuate in accordance with market conditions and taxation agreements and investors may not get back the full amount invested. Both past performance and yields are not reliable indicators of current and future results.

Non-affiliated entities mentioned are for informational purposes only and should not be construed as an endorsement or sponsorship of J.P. Morgan Chase & Co. or its affiliates.

For J.P. Morgan Asset Management Clients:
J.P. Morgan Asset Management is the brand for the asset management business of JPMorgan Chase & Co. and its affiliates worldwide.
To the extent permitted by applicable law, we may record telephone calls and monitor electronic communications to comply with our legal and regulatory obligations and internal policies. Personal data will be collected, stored and processed by J.P. Morgan Asset Management in accordance with our privacy policies at https://am.jpmorgan.com/global/privacy.

ACCESSIBILITY
For U.S. only: If you are a person with a disability and need additional support in viewing the material, please call us at 1-800-343-1113 for assistance. This communication is issued by the following entities: In the United States, by J.P. Morgan Investment Management Inc. or J.P. Morgan Alternative Asset Management, Inc., both regulated by the Securities and Exchange Commission; in Latin America, for intended recipients’ use only, by local J.P. Morgan entities, as the case may be; in Canada, for institutional clients’ use only, by JPMorgan Asset Management (Canada) Inc., which is a registered Portfolio Manager and Exempt Market Dealer in all Canadian provinces and territories except the Yukon and is also registered as an Investment Fund Manager in British Columbia, Ontario, Quebec and Newfoundland and Labrador. In the United Kingdom, by JPMorgan Asset Management (UK) Limited, which is authorized and regulated by the Financial Conduct Authority; in other European jurisdictions, by JPMorgan Asset Management (Europe) S.à r.l. In Asia Pacific (“APAC”), by the following issuing entities and in the respective jurisdictions in which they are primarily regulated: JPMorgan Asset Management (Asia Pacific) Limited, or JPMorgan Funds (Asia) Limited, or JPMorgan Asset Management Real Assets (Asia) Limited, each of which is regulated by the Securities and Futures Commission of Hong Kong; JPMorgan Asset Management (Singapore) Limited (Co. Reg. No. 197601586K), which this advertisement or publication has not been reviewed by the Monetary Authority of Singapore; JPMorgan Asset Management (Taiwan) Limited; JPMorgan Asset Management (Japan) Limited, which is a member of the Investment Trusts Association, Japan, the Japan Investment Advisers Association, Type II Financial Instruments Firms Association and the Japan Securities Dealers Association and is regulated by the Financial Services Agency (registration number “Kanto Local Finance Bureau (Financial Instruments Firm) No. 330”); in Australia, to wholesale clients only as defined in section 761A and 761G of the Corporations Act 2001 (Commonwealth), by JPMorgan Asset Management (Australia) Limited (ABN 55143832080) (AFSL 376919). For all other markets in APAC, to intended recipients only.

For J.P. Morgan Private Bank Clients:
ACCESSIBILITY
J.P. Morgan is committed to making our products and services accessible to meet the financial services needs of all our clients. Please direct any accessibility issues to the Private Bank Client Service Center at 1-866-265-1727.

LEGAL ENTITY, BRAND & REGULATORY INFORMATION
In the United States, bank deposit accounts and related services, such as checking, savings and bank lending, are offered by JPMorgan Chase Bank, N.A. Member FDIC.
JPMorgan Chase Bank, N.A. and its affiliates (collectively “JPMC”) offer investment products, which may include bank-managed investment accounts and custody, as part of its trust and fiduciary services. Other investment products and services, such as brokerage and advisory accounts, are offered through J.P. Morgan Securities LLC (“JPM Securities”), a member of FINRA and SIPC. Annuities are made available through Chase Insurance Agency, Inc. (CIA), a licensed insurance agency, doing business as Chase Insurance Agency Services, Inc. in Florida. JPMCB, JPM and CIA are affiliated companies under the common control of JPM.
Products not available in all states.
In Germany, this material is issued by J.P. Morgan SE, with its registered office at Taunustor 1 (TaunusTurm), 60310 Frankfurt am Main, Germany, authorized by the Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin) and jointly supervised by the BaFin, the German Central Bank (Deutsche Bundesbank) and the European Central Bank (ECB). In Luxembourg, this material is issued by J.P. Morgan SE – Luxembourg Branch, with registered office at European Bank and Business Centre, 6 route de Trèves, L-2633, Senningerberg, Luxembourg, authorized by the Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin) and jointly supervised by the BaFin, the German Central Bank (Deutsche Bundesbank) and the European Central Bank (ECB): J.P. Morgan SE – Luxembourg Branch is also supervised by the Commission de Surveillance du Secteur Financier (CSSF); registered under R.C.S. Luxembourg B255938. In the United Kingdom, this material is issued by J.P. Morgan SE – London Branch, registered office at 25 Bank Street, Canary Wharf, London E14 5JP, authorized by the Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin) and jointly supervised by the BaFin, the German Central Bank (Deutsche Bundesbank) and the European Central Bank (ECB); J.P. Morgan SE – London Branch is also supervised by the Financial Conduct Authority and Prudential Regulation Authority. In Spain, this material is
distributed by J.P. Morgan SE, Sucursal en España, with registered office at Paseo de la Castellana, 31, 28046 Madrid, Spain, authorized by the Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin) and jointly supervised by the BaFin, the German Central Bank (Deutsche Bundesbank) and the European Central Bank (ECB); J.P. Morgan SE, Sucursal en España is also supervised by the Spanish Securities Market Commission (CNMV); registered with Bank of Spain as a branch of J.P. Morgan SE under code 1567. In Italy, this material is distributed by J.P. Morgan SE – Milan Branch, with its registered office at Via Cordusio, n.3, Milan 20123, Italy, authorized by the Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin) and jointly supervised by the BaFin, the German Central Bank (Deutsche Bundesbank) and the European Central Bank (ECB); J.P. Morgan SE – Milan Branch is also supervised by Bank of Italy and the Commissione Nazionale per le Società e la Borsa (CONSOB); registered with Bank of Italy as a branch of J.P. Morgan SE under code 8076; Milan Chamber of Commerce Registered Number: REA MI 2536325. In the Netherlands, this material is distributed by J.P. Morgan SE – Amsterdam Branch, with registered office at World Trade Centre, Tower B, Stawinskiyaan 1135, 1077 XX, Amsterdam, The Netherlands, authorized by the Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin) and jointly supervised by the BaFin, the German Central Bank (Deutsche Bundesbank) and the European Central Bank (ECB); J.P. Morgan SE – Amsterdam Branch is also supervised by De Nederlandsche Bank (DNB) and the Autoriteit Financiële Markten (AFM) in the Netherlands. Registered with the Kamer van Koophandel as a branch of J.P. Morgan SE under registration number 72610220. In Denmark, this material is distributed by J.P. Morgan SE – Copenhagen Branch, filial af J.P. Morgan SE, Tyskland, with registered office at Kalvebod Brygge 39-41, 1560 København V, Denmark, authorized by the Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin) and jointly supervised by the BaFin, the German Central Bank (Deutsche Bundesbank) and the European Central Bank (ECB); J.P. Morgan SE – Copenhagen Branch, filial af J.P. Morgan SE, Tyskland is also supervised by Finanstilsynet (Danish FSA) and is registered with Finanstilsynet as a branch of J.P. Morgan SE under code 29010. In Sweden, this material is distributed by J.P. Morgan SE – Stockholm Bankfilial, with registered office at Hamngatan 15, Stockholm, 11147, Sweden, authorized by the Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin) and jointly supervised by the BaFin, the German Central Bank (Deutsche Bundesbank) and the European Central Bank (ECB); J.P. Morgan SE – Stockholm Bankfilial is also supervised by Finansinspektionen (Swedish FSA); registered with Finansinspektionen as a branch of J.P. Morgan SE. In France, this material is distributed by JPMCB, Paris branch, which is regulated by the French banking authorities Autorité de Contrôle Prudentiel et de Résolution and Autorité des Marchés Financiers. In Switzerland, this material is distributed by J.P. Morgan (Suisse) SA, with registered address at rue de la Confédération, 8, 1211, Geneva, Switzerland, which is authorised and supervised by the Swiss Financial Market Supervisory Authority (FINMA), as a bank and a securities dealer in Switzerland. Please consult the following link to obtain information regarding J.P. Morgan’s EMEA data protection policy: https://www.jpmorgan.com/privacy.

In Hong Kong, this material is distributed by JPMCB, Hong Kong branch. JPMCB, Hong Kong branch is regulated by the Hong Kong Monetary Authority and the Securities and Futures Commission of Hong Kong. In Singapore, we will cease to use your personal data for our marketing purposes without charge if you so request. In Singapore, this material is distributed by JPMCB, Singapore branch. JPMCB, Singapore branch is regulated by the Monetary Authority of Singapore. Dealing and advisory services and discretionary investment management services are provided to you by JPMCB, Hong Kong/Singapore branch (as notified to you). Banking and custody services are provided to you by JPMCB Singapore Branch. The contents of this document have not been reviewed by any regulatory authority in Hong Kong, Singapore or any other jurisdictions. You are advised not to act in reliance on this document. In any doubt with respect to countries in Latin America, the distribution of this material may be restricted in certain jurisdictions. We may offer and/or sell to you securities or other financial instruments which may not be registered under, and are not the subject of a public offering under, the securities or other financial regulatory laws of your home country. Such securities or instruments are offered and/or sold to you on a private basis only. Any communication by us to you regarding such securities or instruments, including without limitation the delivery of a prospectus, term sheet or other offering document, is not intended by us as an offer to sell or a solicitation of an offer to buy any securities or instruments in any jurisdiction in which such an offer or a solicitation is unlawful. Furthermore, such securities or instruments may be subject to certain regulatory and/or contractual restrictions on subsequent transfer by you, and you are solely responsible for ascertaining and complying with such restrictions. To the extent this content makes reference to a fund, the Fund may not be publicly offered in any Latin American country, without previous registration of such fund’s securities in compliance with the laws of the corresponding jurisdiction. Public offering of any security, including the shares of the Fund, without previous registration at Brazilian Securities and Exchange Commission—CVM is completely prohibited. Some products or services contained in the materials might not be currently provided by the Brazilian and Mexican platforms. JPMorgan Chase Bank, N.A. is a national banking association chartered under the laws of the United States, and as a body corporate, its shareholder’s liability is limited.

With respect to countries in Latin America, the distribution of this material may be restricted in certain jurisdictions. We may offer and/or sell to you securities or other financial instruments which may not be registered under, and are not the subject of a public offering under, the securities or other financial regulatory laws of your home country. Such securities or instruments are offered and/or sold to you on a private basis only. Any communication by us to you regarding such securities or instruments, including without limitation the delivery of a prospectus, term sheet or other offering document, is not intended by us as an offer to sell or a solicitation of an offer to buy any securities or instruments in any jurisdiction in which such an offer or a solicitation is unlawful. Furthermore, such securities or instruments may be subject to certain regulatory and/or contractual restrictions on subsequent transfer by you, and you are solely responsible for ascertaining and complying with such restrictions. To the extent this content makes reference to a fund, the Fund may not be publicly offered in any Latin American country, without previous registration of such fund’s securities in compliance with the laws of the corresponding jurisdiction. Public offering of any security, including the shares of the Fund, without previous registration at Brazilian Securities and Exchange Commission—CVM is completely prohibited. Some products or services contained in the materials might not be currently provided by the Brazilian and Mexican platforms.

JPMorgan Chase Bank, N.A. (JPMCBNA) (ABN 43 074 112 011/AFS Licence No: 238367) is regulated by the Australian Securities and Investment Commission and the Australian Prudential Regulation Authority. Material provided by JPMCBNA in Australia is to “wholesale clients” only. For the purposes of this paragraph the term “wholesale client” has the meaning given in section 761G of the Corporations Act 2001 (Cth). Please inform us if you are not a Wholesale Client now or if you cease to be a Wholesale Client at any time in the future.

JPMorgan Chase Bank, N.A. (JPMCBNA) (ABN 43 074 112 011/AFS Licence No: 238367) is regulated by the Australian Securities and Investment Commission and the Australian Prudential Regulation Authority. Material provided by JPMCBNA in Australia is to "wholesale clients" only. For the purposes of this paragraph the term "wholesale client" has the meaning given in section 761G of the Corporations Act 2001 (Cth). Please inform us if you are not a Wholesale Client now or if you cease to be a Wholesale Client at any time in the future.

This material has not been prepared specifically for Australian investors. It:

- May contain references to dollar amounts which are not Australian dollars;
- May contain financial information which is not prepared in accordance with Australian law or practices;
- May not address risks associated with investment in foreign currency denominated investments; and
- Does not address Australian tax issues.

Access our full coronavirus analysis web portal here.