# Russia/Ukraine investor implications

**March 2022**

Michael Cembalest, Chairman of Market and Investment Strategy

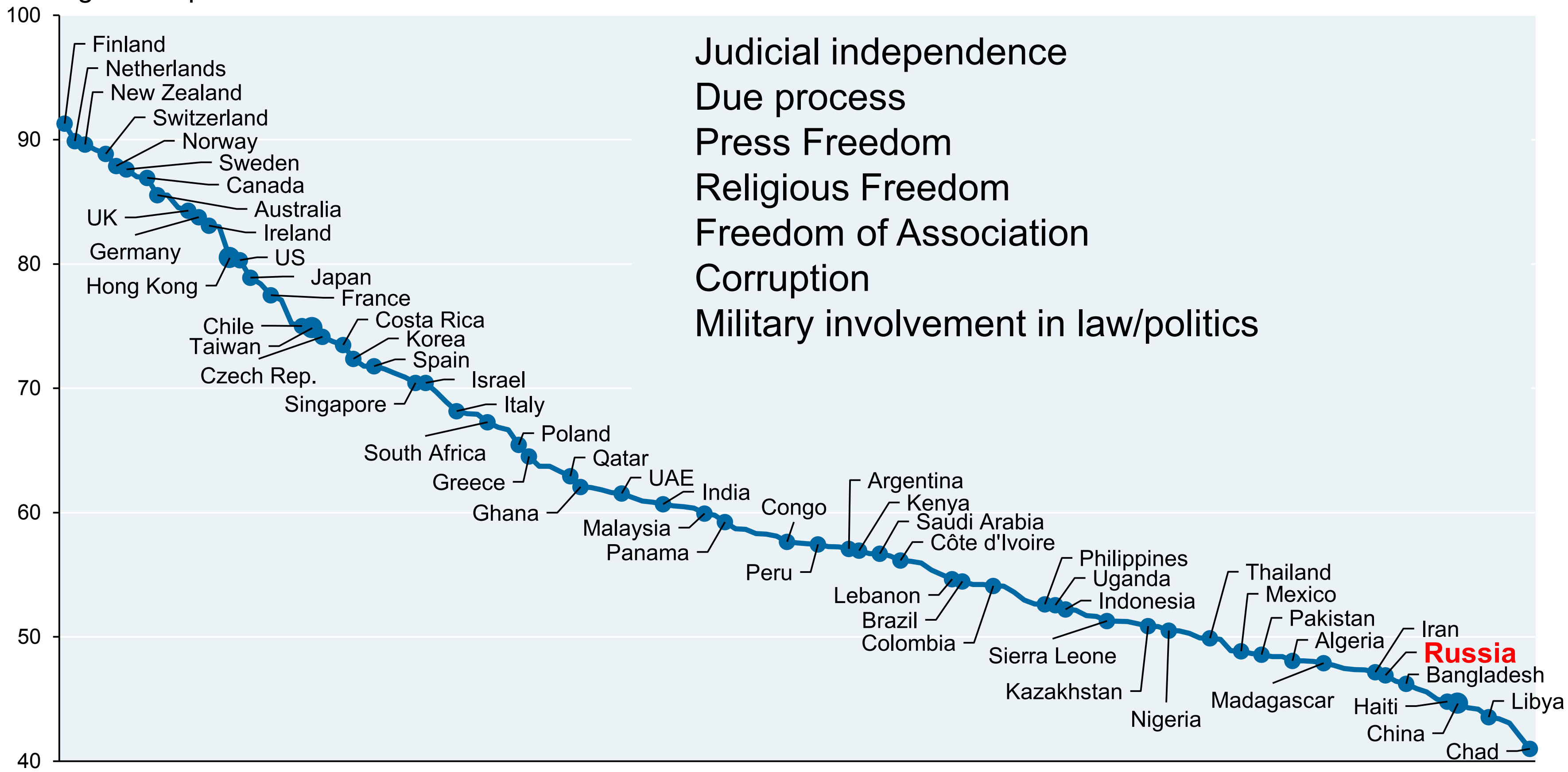


J.P.Morgan

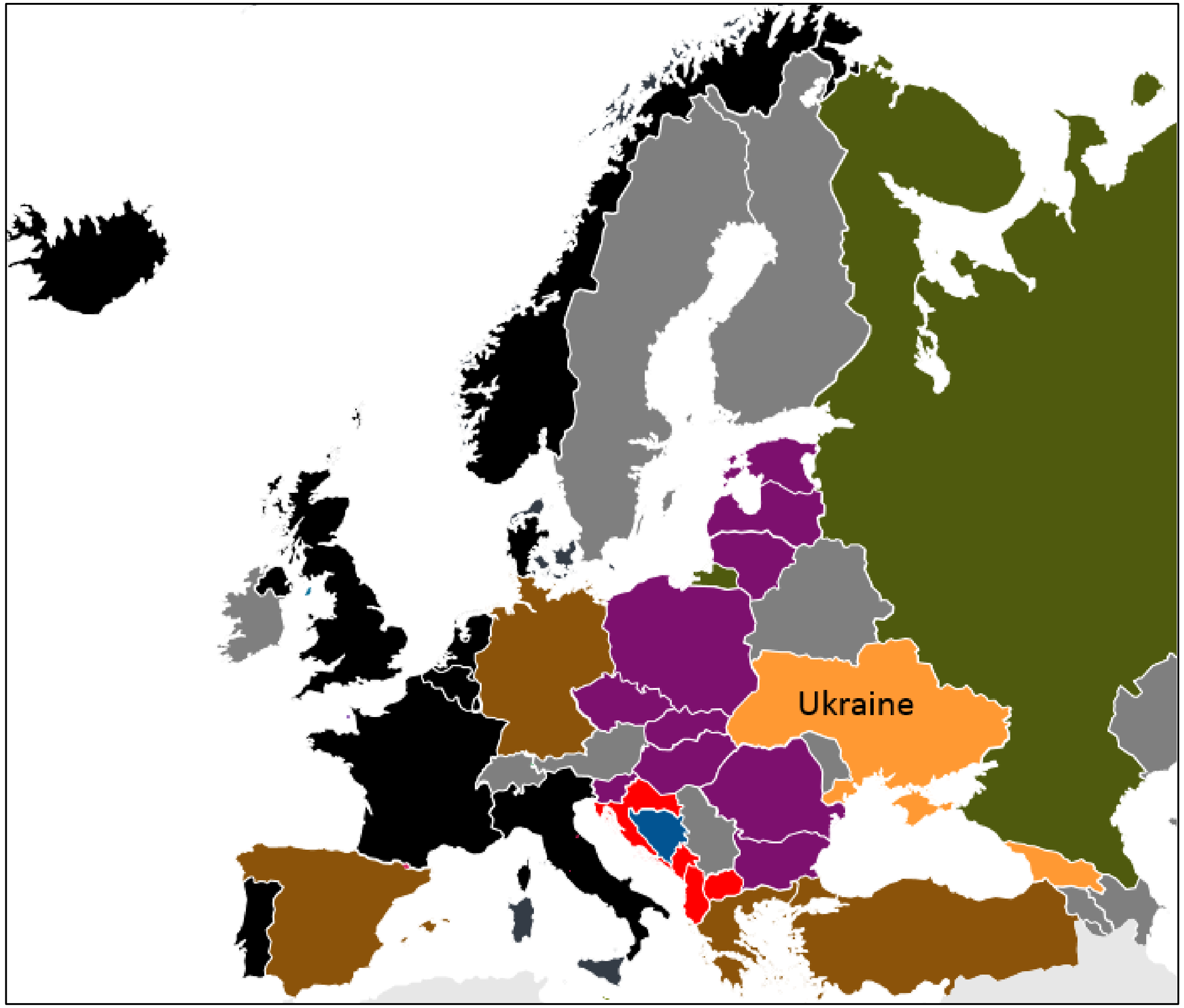
# Liberalism vs Realism in the postwar era

**The Rights of the Individual versus the State**

100 = greatest protections of the Individual



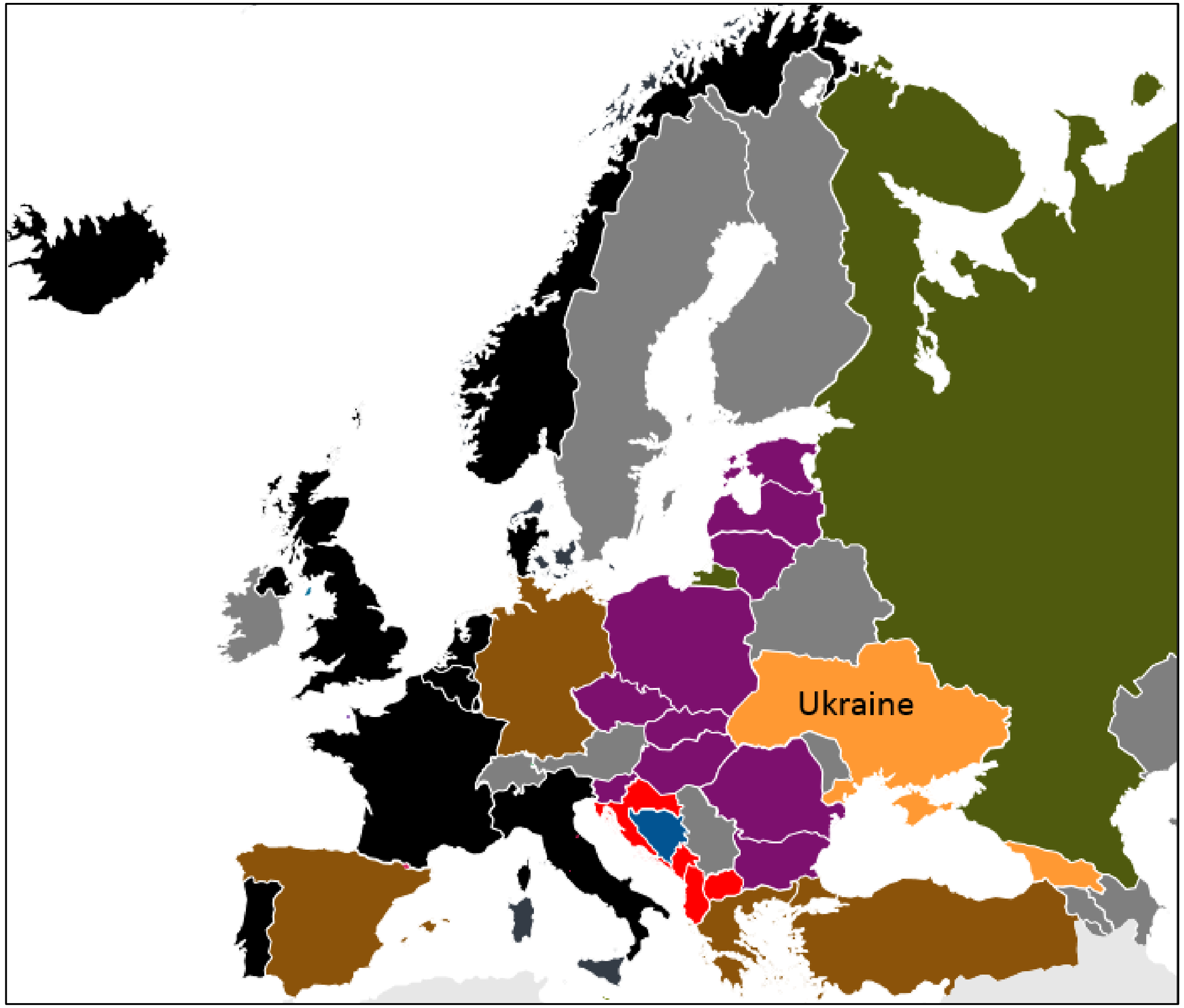

Source: World Economic Forum, CATO Institute, Fraser Institute, J.P. Morgan Asset Management. 2019.




**NATO enlargement**

**Black**: Original members (1949)
**Brown**: 1950-1980
**Purple**: 1999-2004
**Red**: 2009-2020
**Blue**: NATO Membership Action Plan
**Orange**: “Intensified NATO dialogue”
Gray: not in NATO

## Liberalism vs Realism in the postwar era




1994: Budapest Memorandum offered Ukraine security assurances against future use of force by the US, UK and Russia in exchange for dismantling nuclear weapons

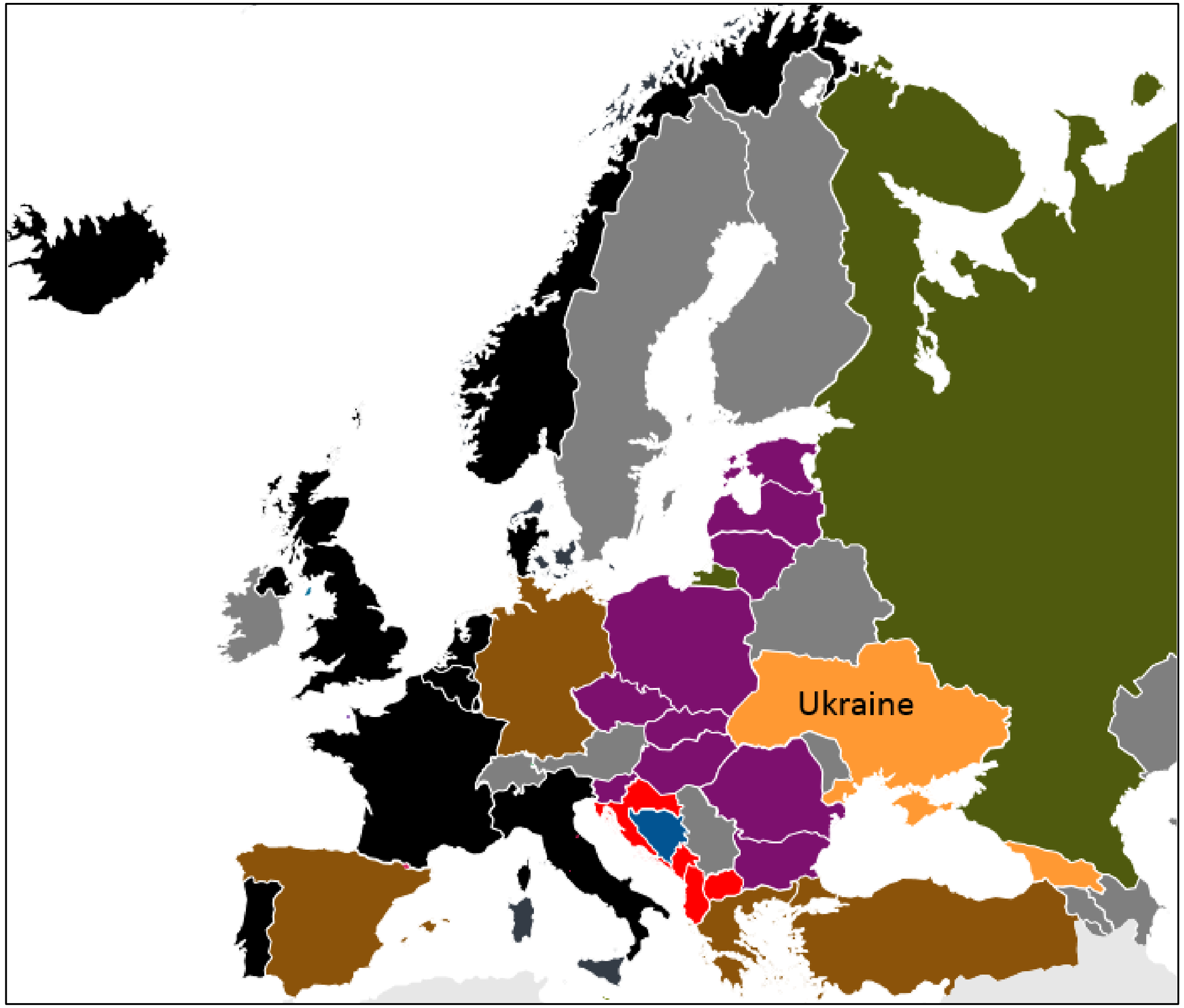
2008: NATO leaders: "Georgia and Ukraine will become members of NATO"

2008: Russia invades Georgia

2014: Pro-Russian president of Ukraine overthrown in Maidan Revolution, Ukraine pursues closer ties with the EU, Russia annexes Crimea, Russia backed separatists control Donetsk and Luhansk regions of Ukraine

2022: Biden Administration refuses to rule out Ukraine membership in NATO, or renegotiate NATO deployments in Eastern Europe

## 20/20 foresight department:
## Finlandization of the Ukraine might not have been the worst option




"*Opposition to NATO Expansion*", by 50 foreign policy experts, politicians and military officers, June 1997

- Bill Bradley, Gary Hart, Sam Nunn
- Paul Nitze (Secretary of the Navy)
- Stansfield Turner (Navy Admiral, President of Naval War College, commander of Second Fleet, Supreme Allied Commander NATO Southern Europe and CIA Director of Central Intelligence)
- Robert McNamara(Secretary of Defense)

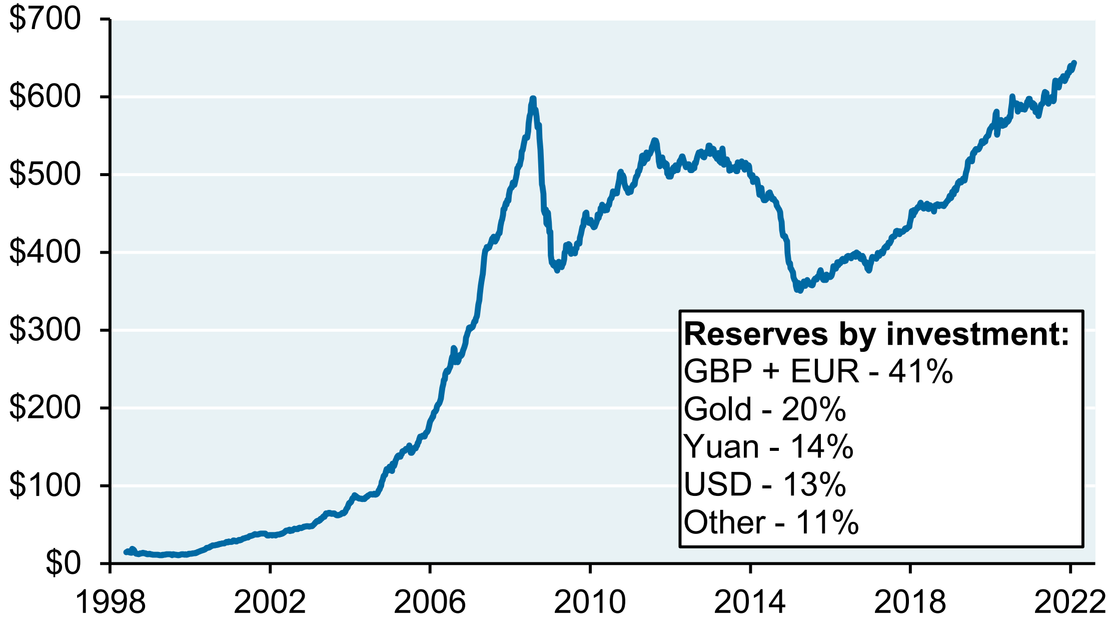
"I think the Russians will gradually react quite adversely and it will affect their policies. I think it's a tragic mistake. There was no reason for this whatsoever. No one was threatening anyone else"
– George Kennan in 1998

*"Why the Ukraine Crisis Is the West's Fault: The Liberal Delusions That Provoked Putin",* John Mearsheimer, University of Chicago, 2014

# A different Russia than in the late 1990's

## Russia foreign exchange reserves

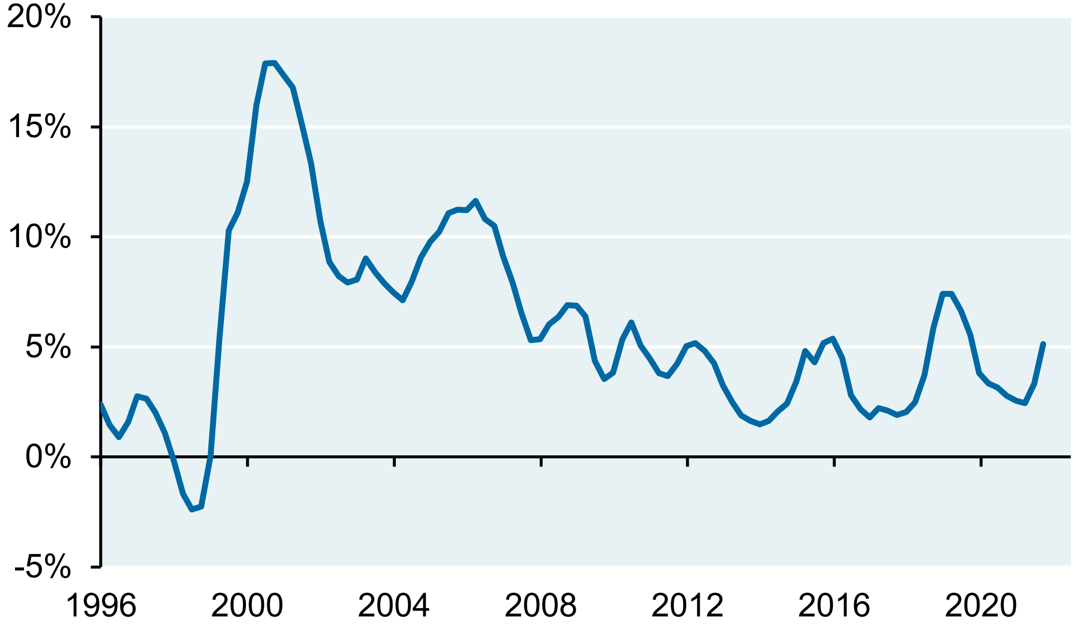
US$, billions




Source: Bloomberg. February 18, 2022.

## Russia current account balance

Percent of GDP




Source: Bloomberg, JPMAM, Q3 2021.



J.P.Morgan

## Sanctions checklist

- Sanctions on Russian banks including VEB, VTB and Sberbank (60% of all Russian deposits and 50%+ of Russian wage/pension payments)
  - Exempts transactions related to energy and agricultural exports
- Certain Russian banks blocked from SWIFT network
- Limits on Russian Central Bank FX activity
- Export restrictions on telecom and technology exports to Russia (49 firms added to Commerce Dep't entity list)
- Expanded list of Russian companies walled off from investment and lending
- US entities prohibited from transacting in secondary market for Russian sovereign debt (primary market and direct lending to gov't entities already prohibited)
- Germany freezes Nord Stream 2 gas pipeline project
- Sanctions on 5 families "close to Putin"

**Not yet**

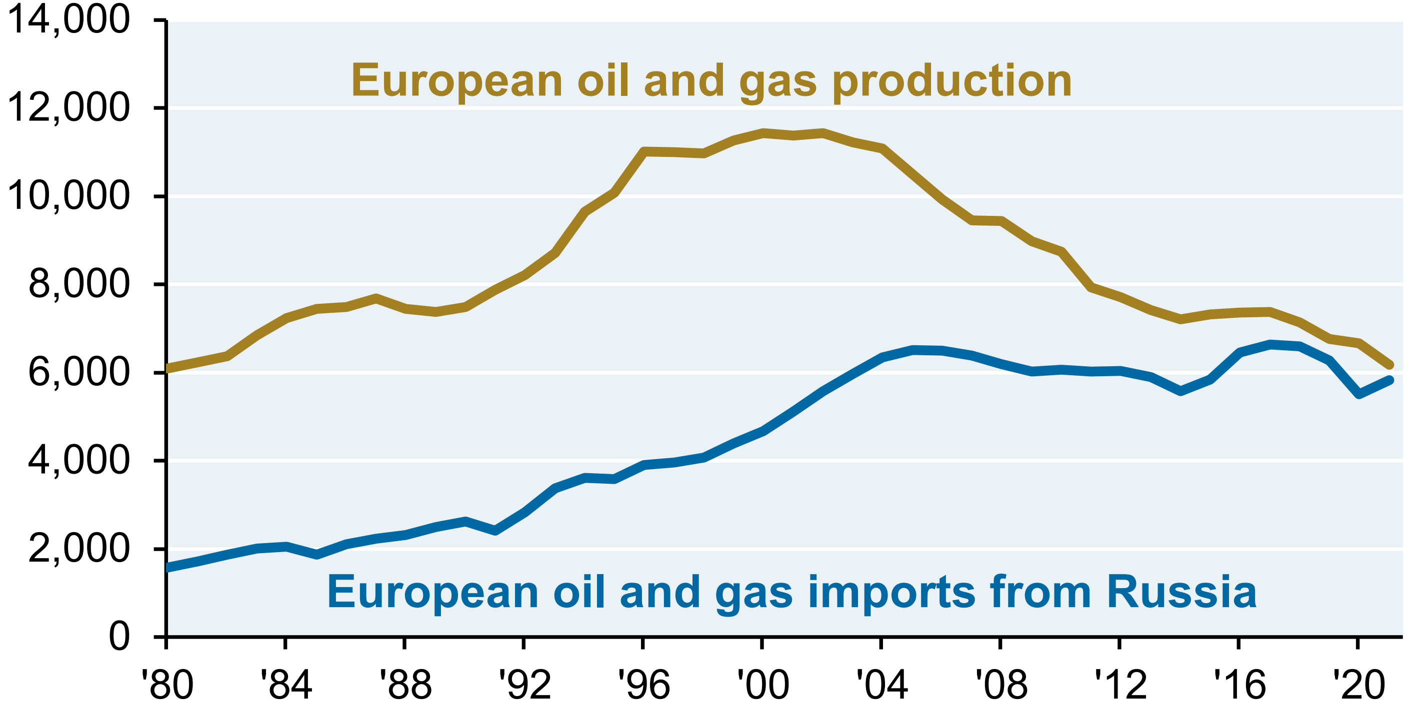
- Explicit energy flow import or export restrictions
- Biden: we will try and shield US consumers from impact

# Russia galvanizes opposition in unusual places

- Germany to supply anti-aircraft and other weapons to Ukraine
- Additional small arms contributions from Netherlands and Belgium
- Germany to close airspace to Russian aircraft
- BP to exit Rosneft stake
    - 19.75% stake accounted for 1/3 of BP oil and gas production and more than half of its reserves
- What about the Daimler AG joint venture with Russian Kamaz which produces vehicles for the Russian military?
- Norway sovereign wealth fund to dump Russian assets
- Even the Swiss are considering greater sanctions participation

## European reliance on Russian energy

Thousand barrels per day of oil equivalent



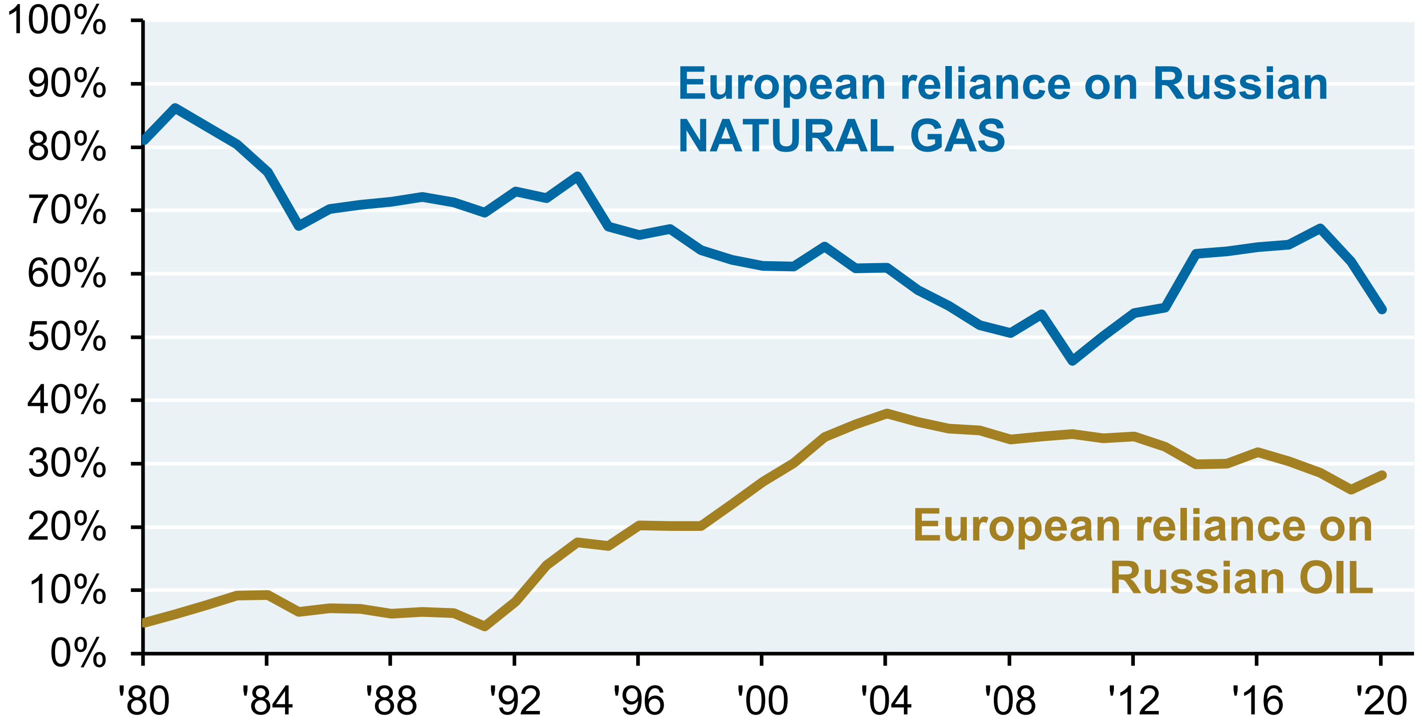

Source: BP, Gazprom, Eurostat, Perovic et al, Russia Federal Customs Service, JPMAM calculations. 2021.

Most exposed: Germany, Italy and the Netherlands



J.P.Morgan

**Europe: greater counterparty reliance on Russia for natural gas,** percent of total European imports



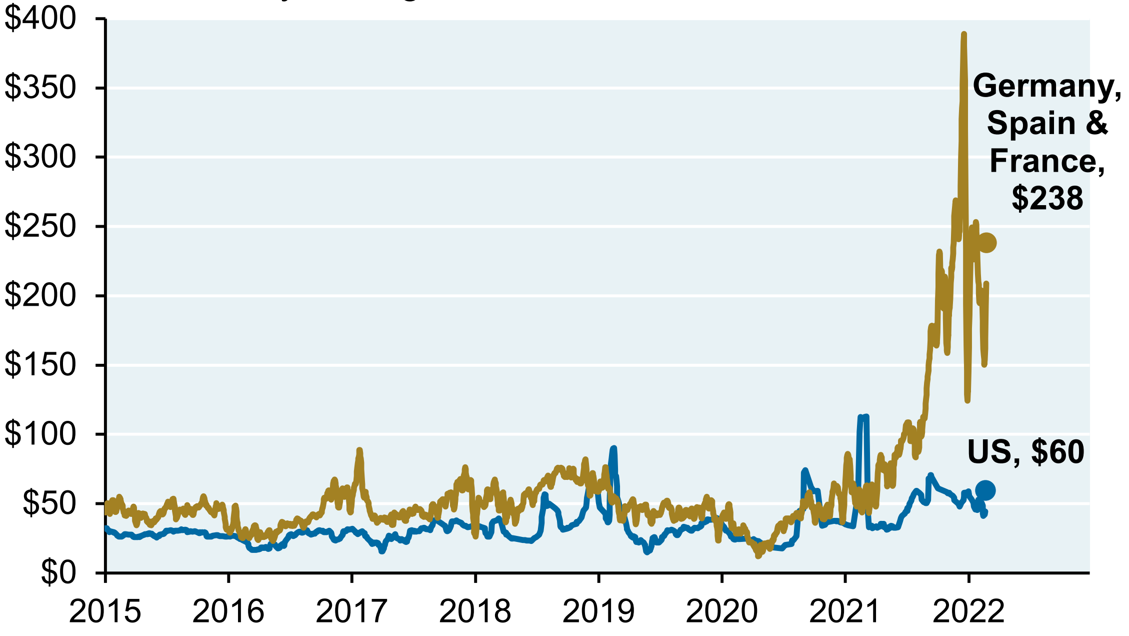

Source: BP Statistical Review of World Energy, Gazprom, Eurostat, Perovic et al, JPMAM calculations. 2021.

Most exposed: Germany, Italy and the Netherlands

## And the price is high

### US vs Europe: Wholesale electricity prices

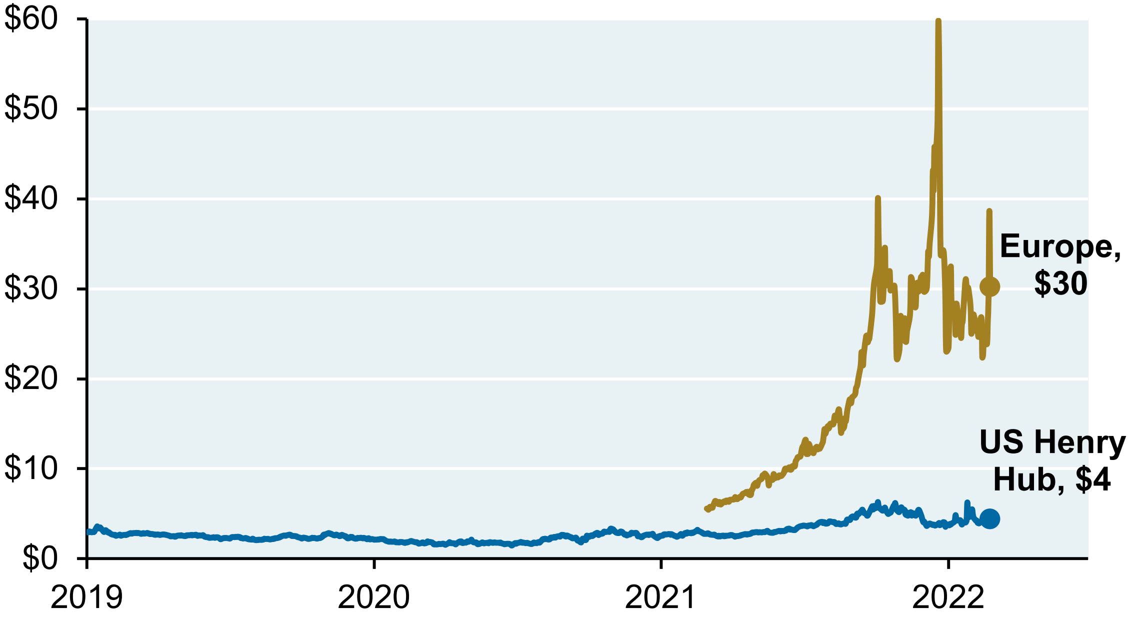
US$ / MWh, 7 day average




Source: Bloomberg. February 26, 2022. Dots represent latest daily prices.

### US vs Europe: Wholesale natural gas prices

$/MMBTU

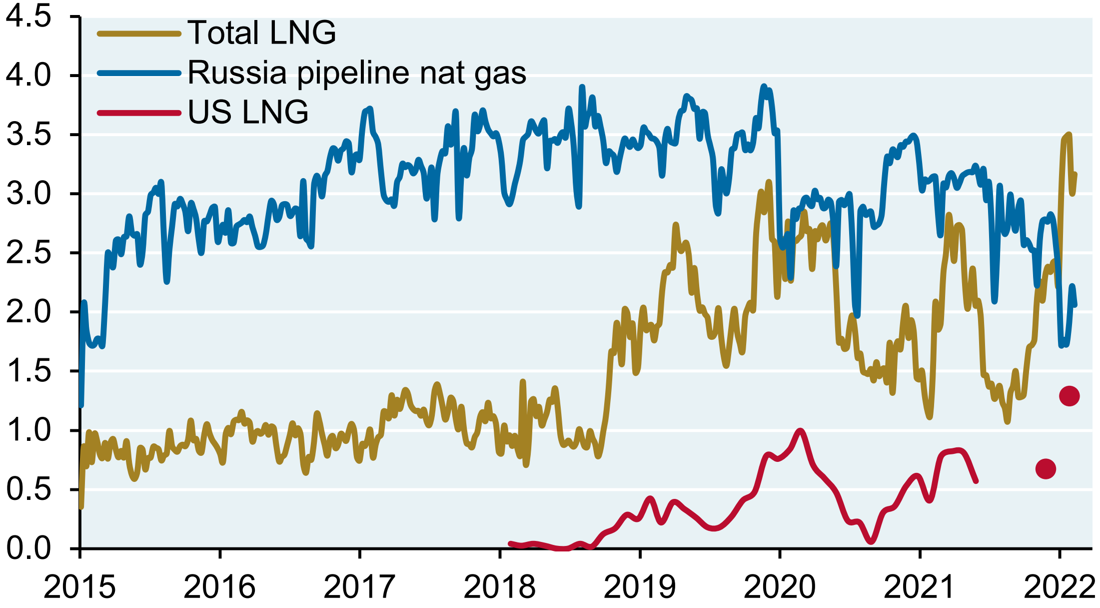



Source: Bloomberg. February 25, 2022. Dots represent latest daily prices.

## US LNG to the rescue? In flow terms maybe, but not in cost terms

### European natural gas imports: Russia vs LNG

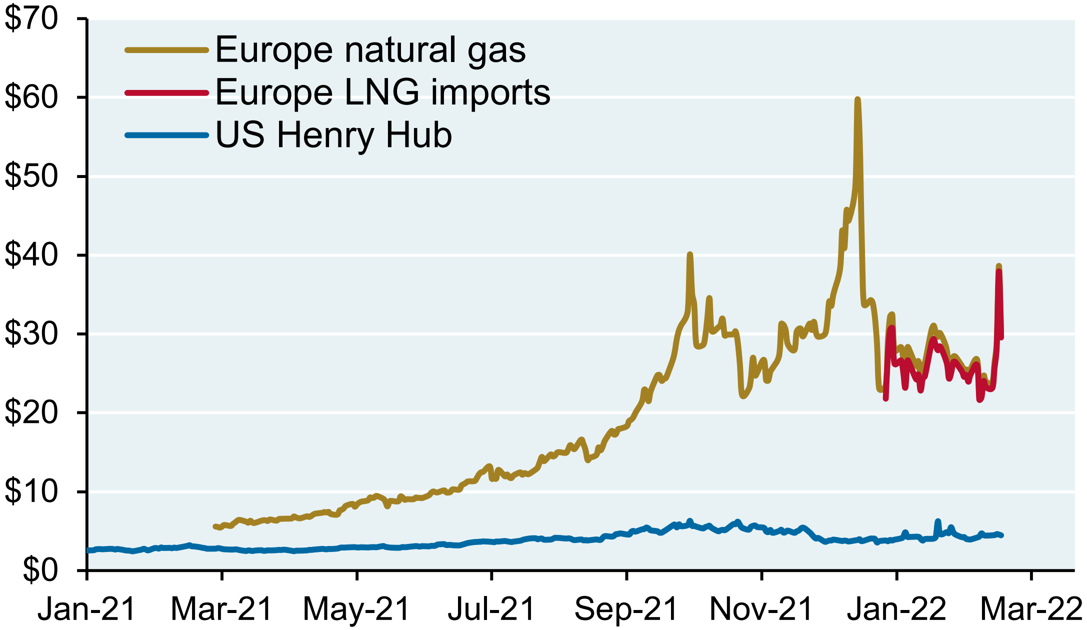
Billion cubic meters per week




Source: Bruegel, EIA, Diesel & Gas Turbine, JPMAM. February 11, 2022.

### Wholesale natural gas prices

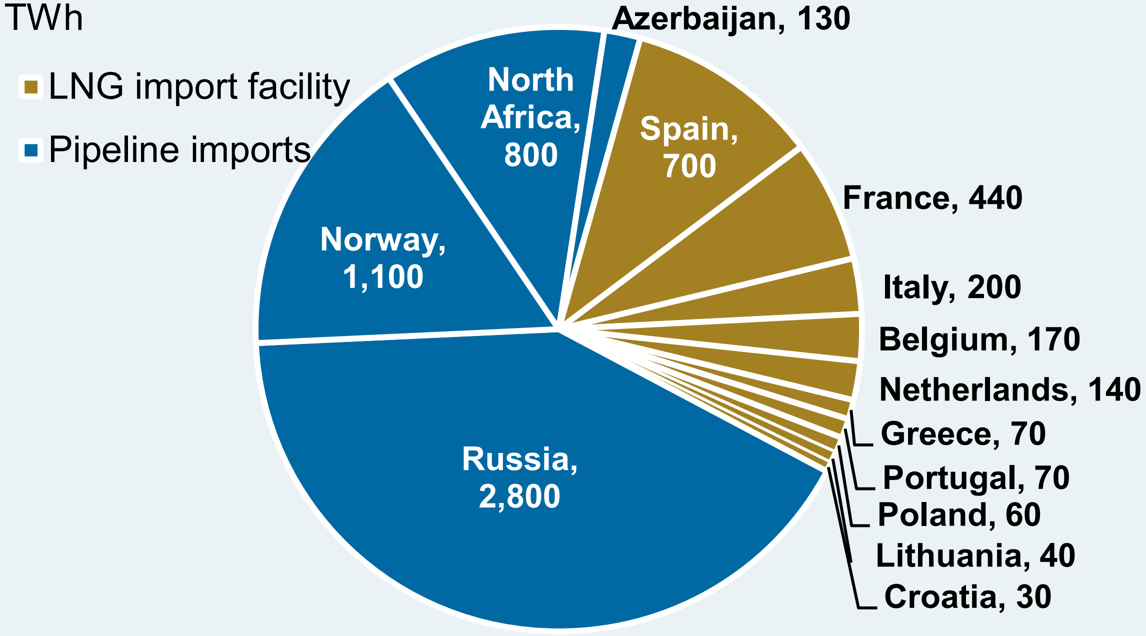
$/MMBTU




Source: Bloomberg, S&P Global. February 25, 2022.

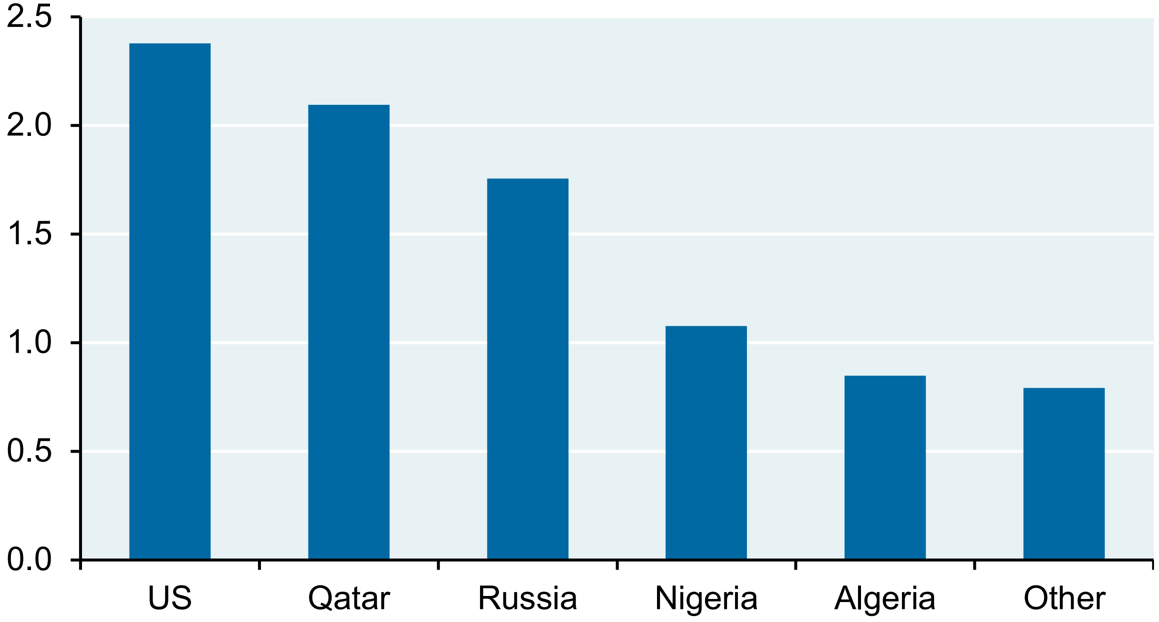
# US LNG to the rescue?  Not enough import capacity in Europe yet

**Annual capacity of EU27 natural gas imports**
TWh




Source: Bruegel, JPMAM. 2022.

**Europe 2021 LNG imports by source country**
Billion cubic feet per day

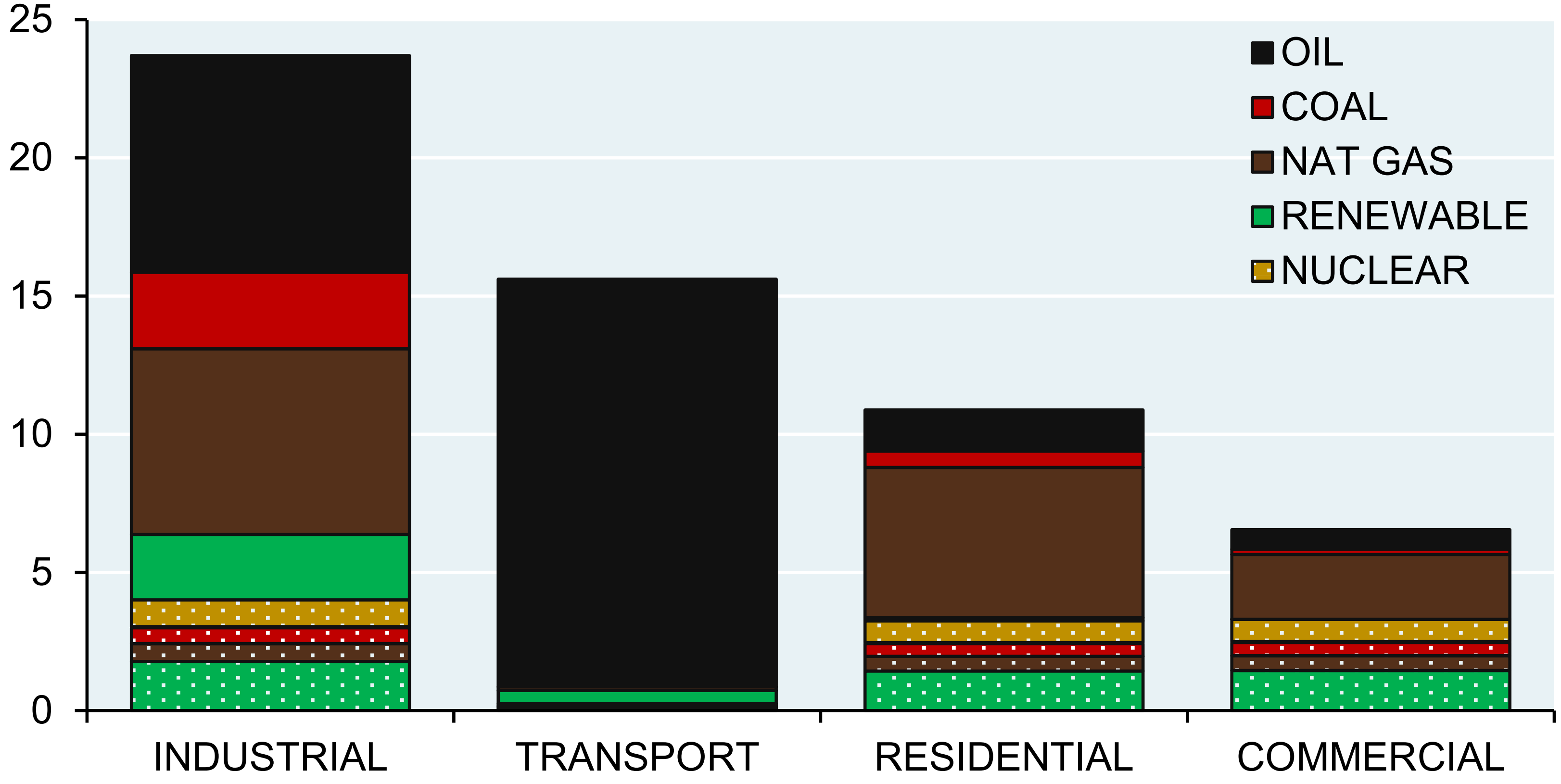



Source: EIA, JPMAM. 2021.

## Europe: Decarbonizing the grid is very different than decarbonizing energy use

**OECD Europe energy consumed by end-use sector and fuel type**

Quadrillion BTUs of final energy consumed;  dotted segments = electricity consumed




Source: EIA, JPMAM. 2021.



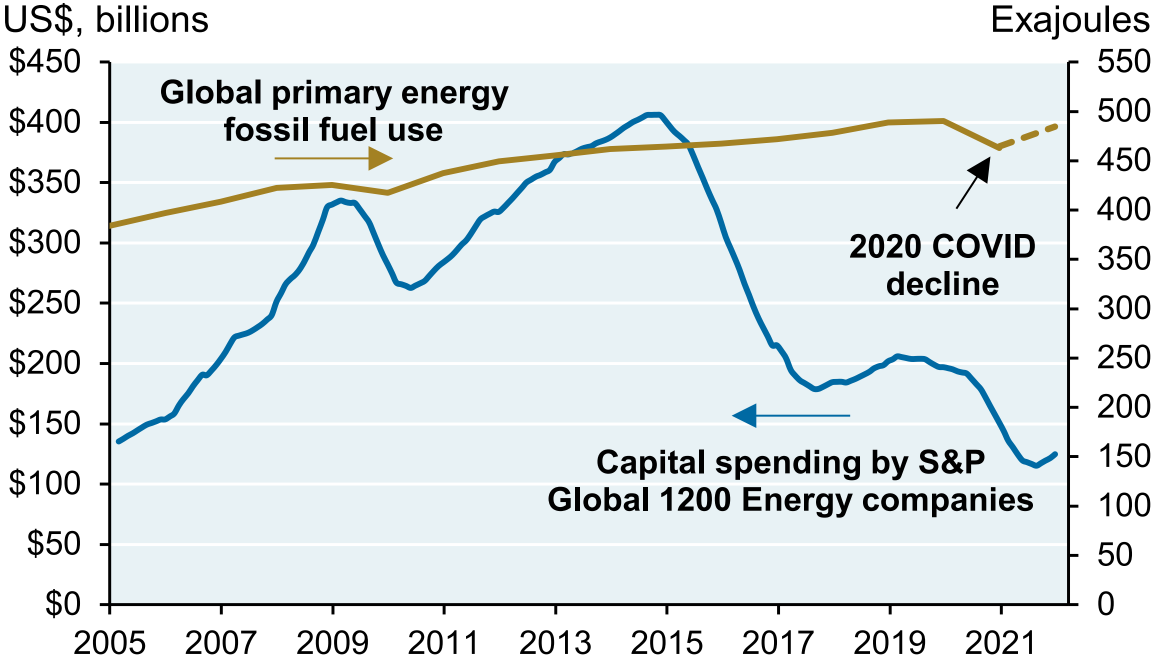
J.P.Morgan

## Oil maneuvers: next steps

- Russian oil: currently supplying 2 mm bpd to Western Europe, 0.75 mm bpd to Eastern Europe, 0.2 mm bpd to the US
- Russia could divert ~1 mm bpd to China
- US working on release of oil from Strategic Petroleum Reserve
- French, Russian and UK negotiators appear to be reviving nuclear agreement with Iran, potentially adding 1 mm bpd from Iranian floating storage, with Iran ramping up production from 2.5 to 3.3 mm bpd by December
- All things considered: ~$100 oil for the next few months with interim spikes
- China may help Russia withstand G7 sanctions with loans, as they did in 2014; Russia is the biggest recipient of loans from Chinese official sector institutions

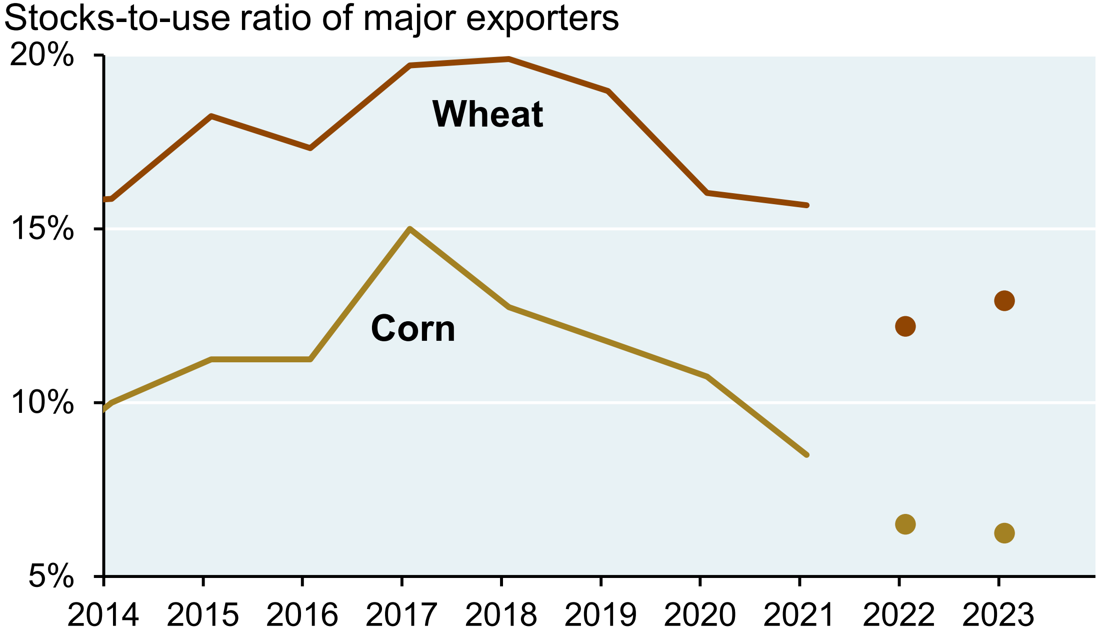
## Russia/Ukraine war exacerbates existing tight conditions in energy and grain markets

### Global fossil fuel use vs energy capital spending




Source: BP, Bloomberg, IEA, JPMAM. Dec 2021. Dotted lines = estimates.

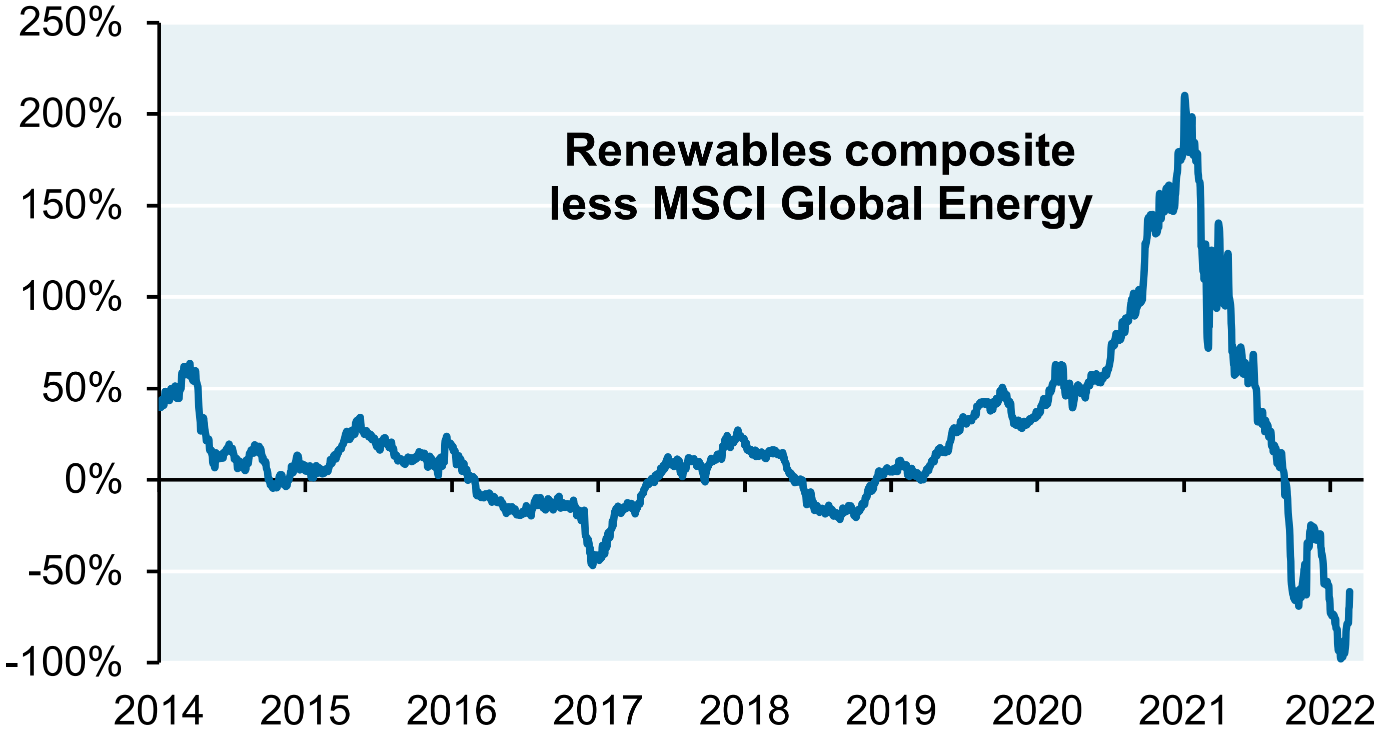
### Wheat and corn supply remains tight




Source: USDA, JP Morgan Commodities Research. November 2021. Dots = JPM forecasts.

## Excess return of renewables vs fossil fuels

%, rolling annual out (under) performance




Source: Bloomberg, JPMAM. February 24, 2022. Renewables composite is the average of 5 energy indices: CELS, ECO, EORE, SPGTCED, SUNIDX.

# Agriculture and industrial metals

## Agriculture price index
Index (100 = Jan 1990)


Source: Bloomberg, JPMAM. February 24, 2022.

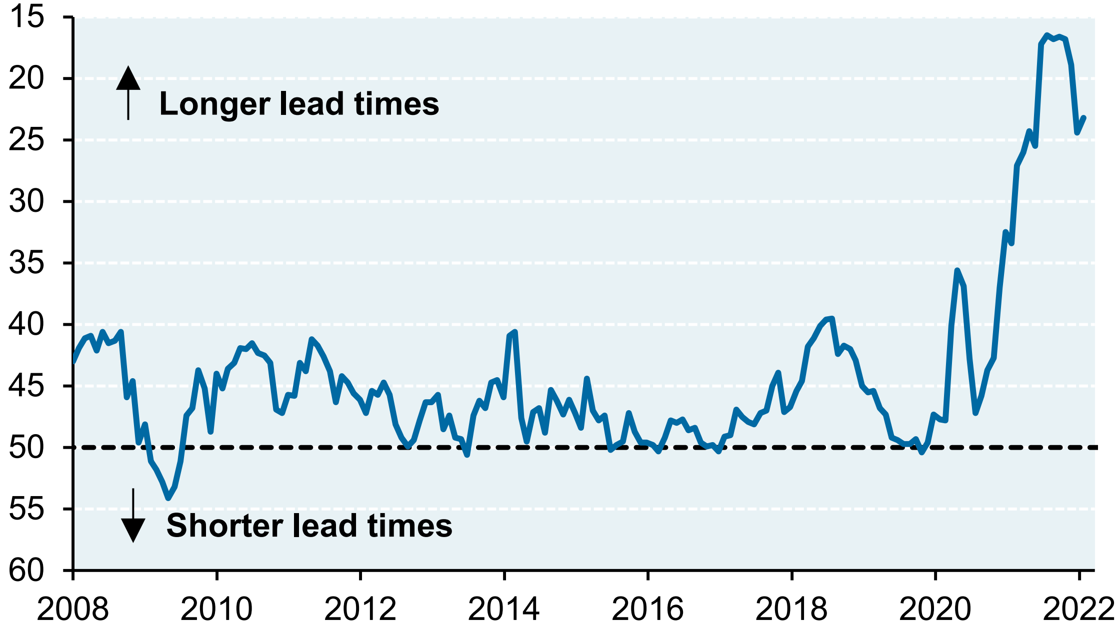
## Industrial metals price index
Index (100 = Jan 1990)


Source: Bloomberg, JPMAM. February 24, 2022.

## Supply chain conditions not set up for war-related disruptions, which are usually inflationary

### US manufacturing delivery times

Index

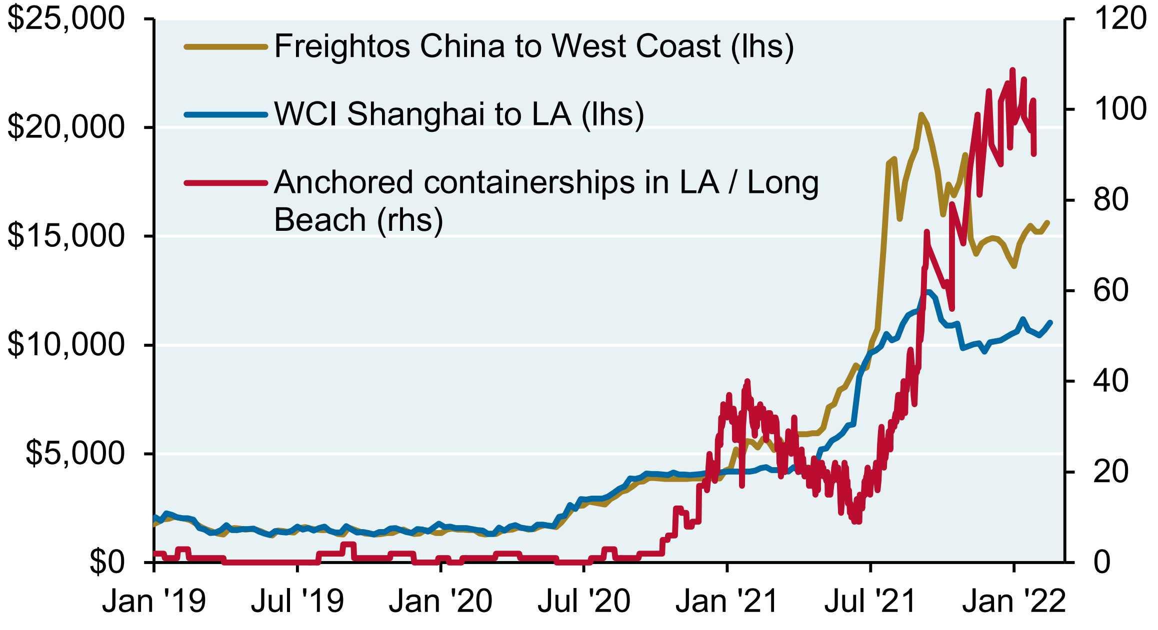



Source: Bloomberg, JP Morgan Economic Research. January 2022.

### Container freight rate and anchored containerships

Freight rate, US$ / 40ft box

Number of containerships

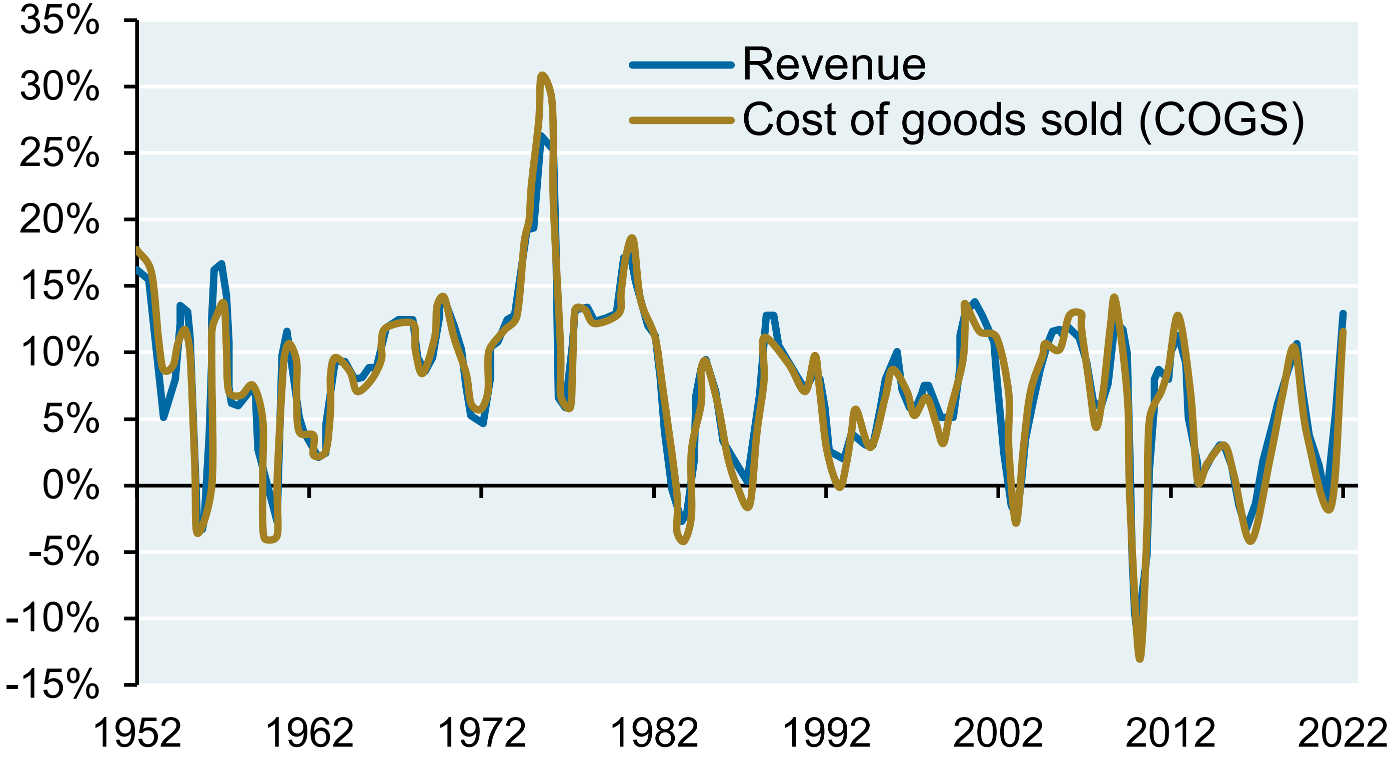



Source: Cornerstone Macro, Bloomberg. February 24, 2022.

## Rising input costs almost always translate into rising revenues
## The bigger question: will there be a recession

### Annual change in S&P 500 revenue and COGS

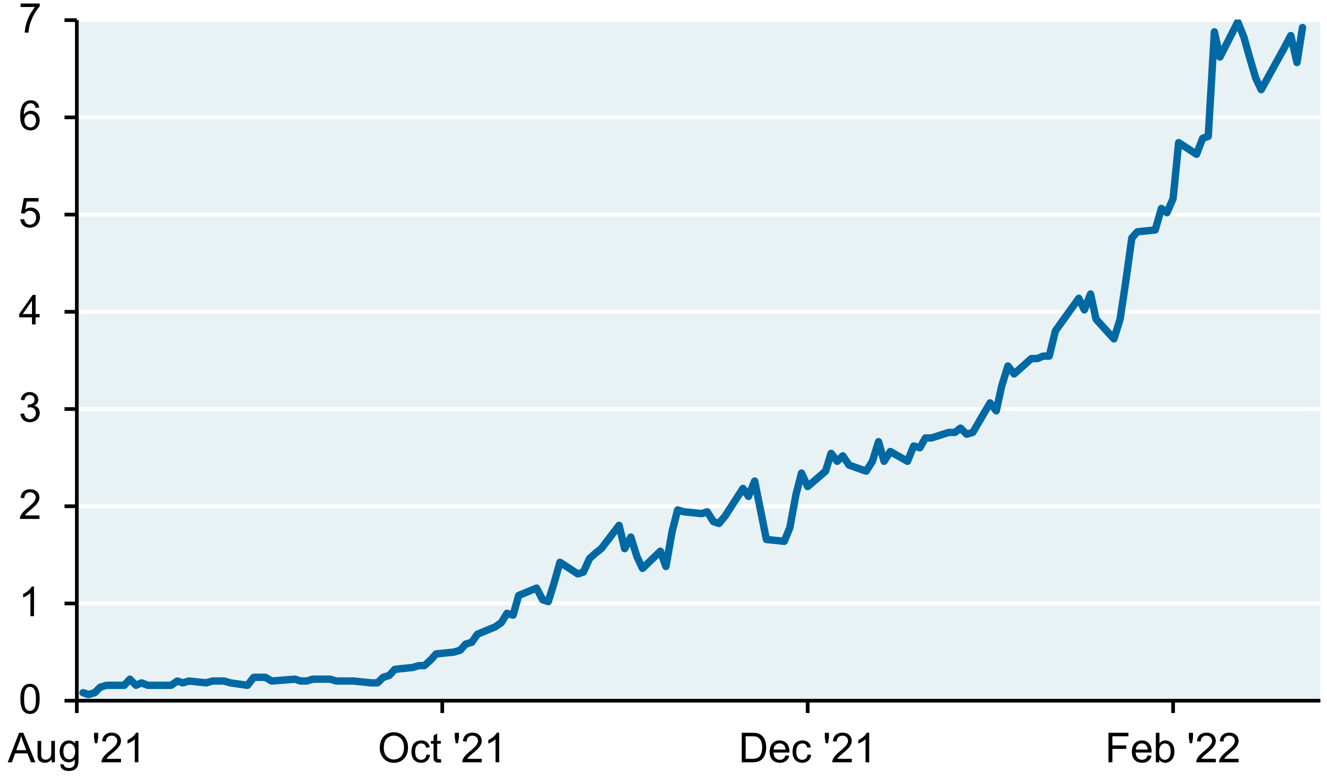
y/y % change




Source: Empirical Research. Feb 9, 2022. Ex. financials, real estate & utilities.

## Market implied Fed hikes, derived from futures market

Number of expected 25 bp hikes over the next 12 months



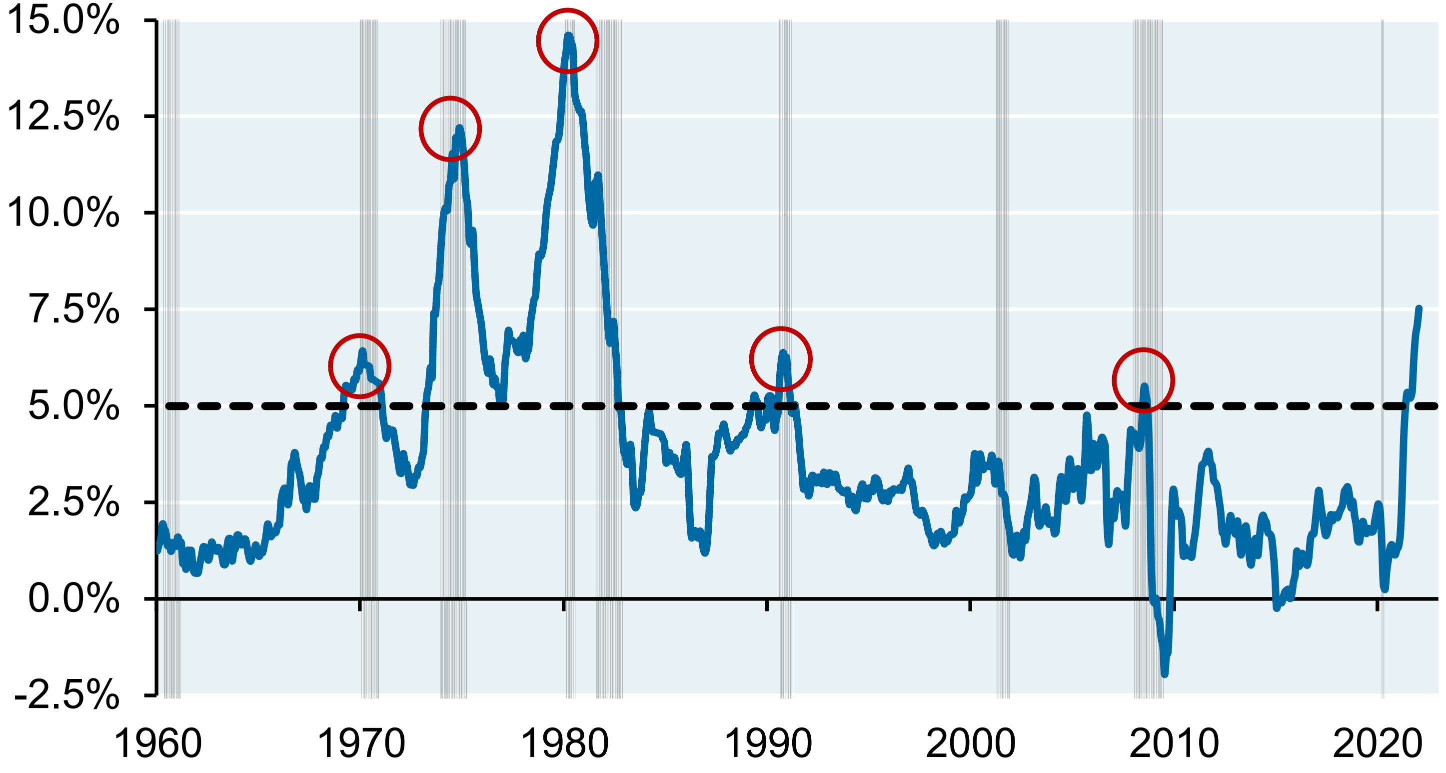

Source: Bloomberg. February 25, 2022.

- Russia and Ukraine account for less than 1% of US imports and exports
- $10 increase in oil prices = minimal impact on core inflation, lowers real GDP growth by 0.1%
- Wage-price dynamic will drive the Fed to tighten as planned absent major escalation outside Ukraine

## Fed needs to accomplish first non-recessionary landing on record now that headline inflation is > 5%

**Headline CPI**

y/y% change

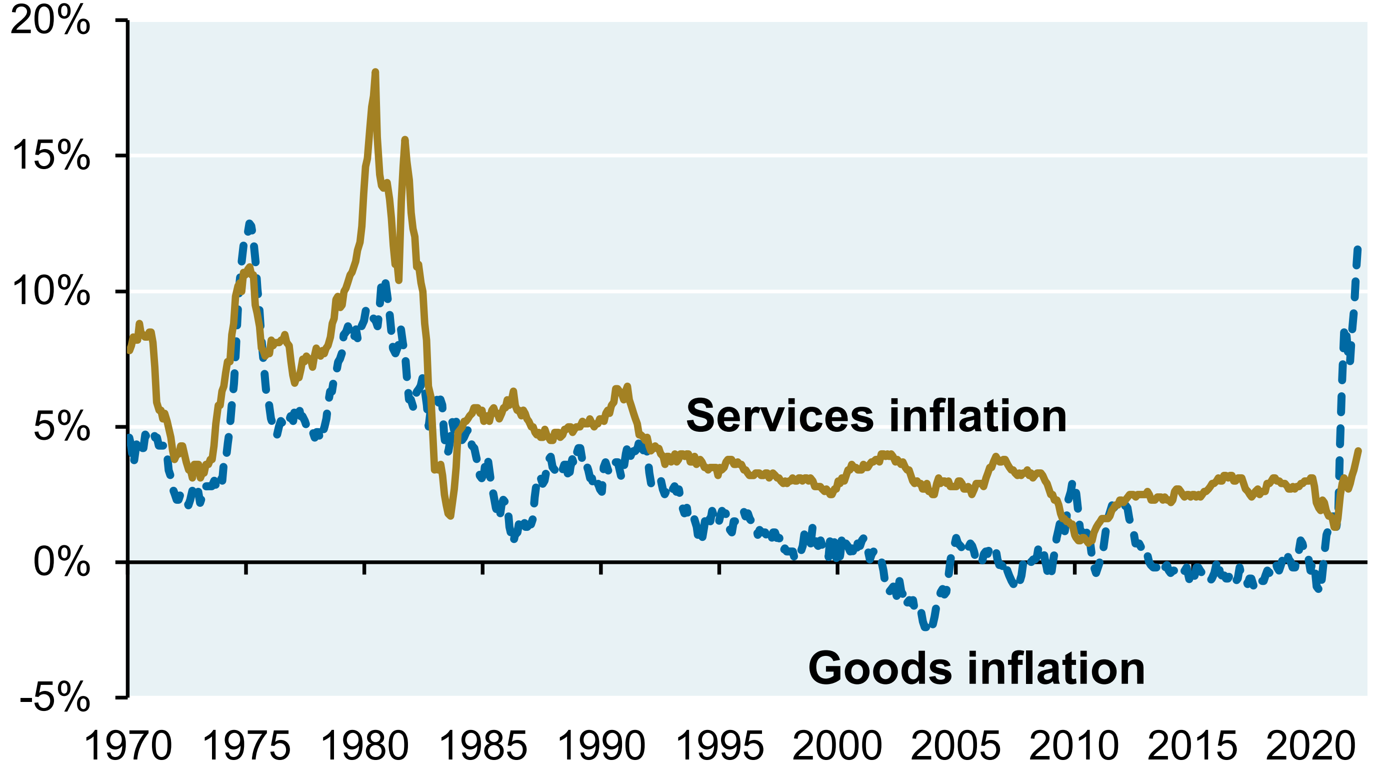



Source: BLS, NBER. January 2022. Shading represents recessions.

# This might be the Fed's best chance: most of the inflationary spike still appears related to supply chain disruptions in goods markets

## US goods vs services inflation

y/y % change in core CPI



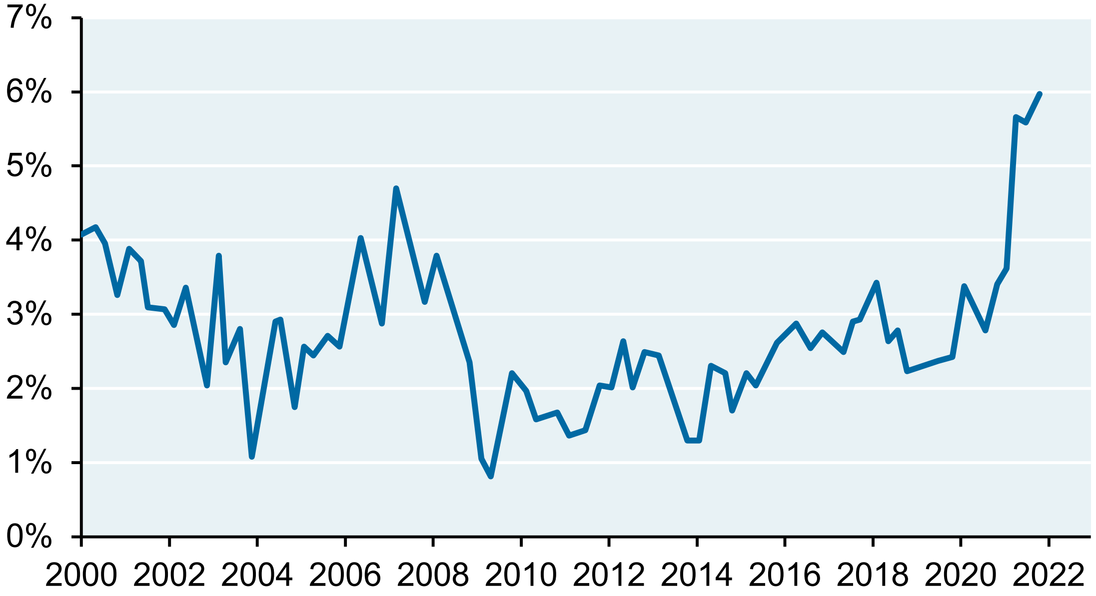

Source: BLS, JPMAM. January 2022.

## But pressure on the Fed is increasing

- Inflation broadening to services
- Regional median CPI measures rising as well
- Wage-price spiral risks rising
- Tight real estate markets resulting in 8%-15% annual increase in new/existing leases

**Wage tracker**

%, composite of avg hourly earnings and employment cost index

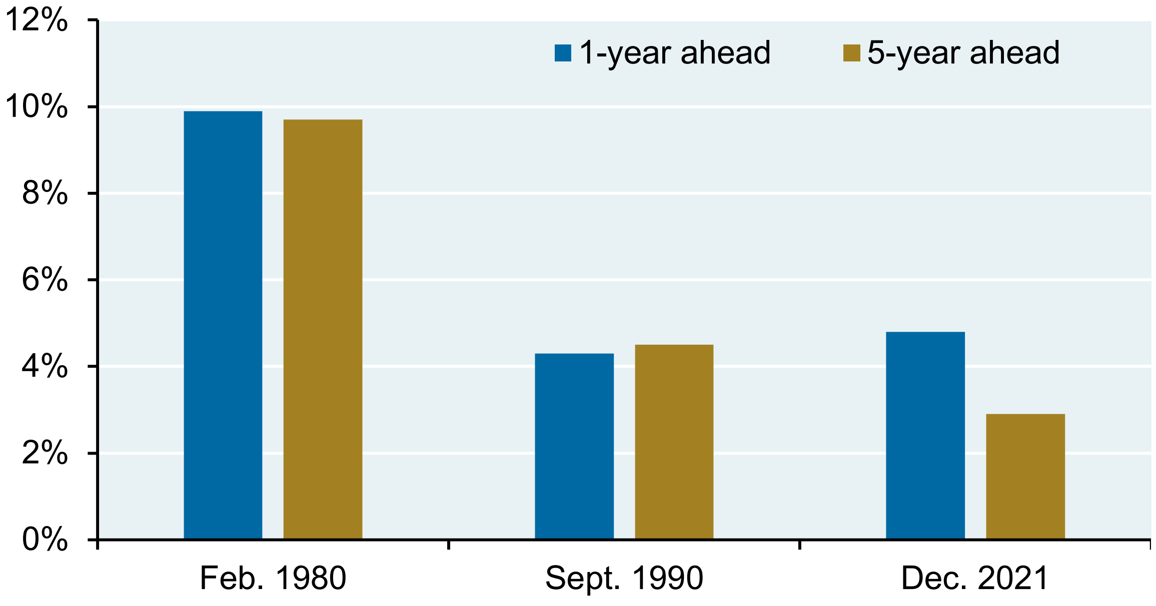



Source: GS US Economics Analyst. 2022

## Silver lining for the Fed: Consumers are not expecting inflation spike to last more than one year

**Inflation expectations**

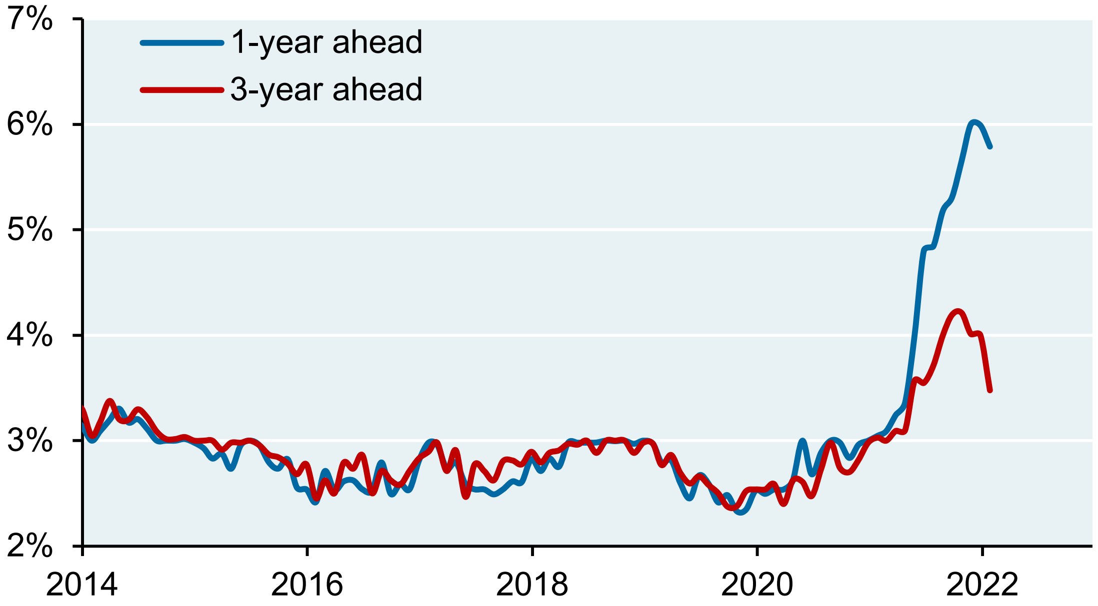
%, median expected inflation rate




Source: University of Michigan. December 2021.

**Inflation expectations**

%, median expected inflation rate




Source: Fed. January 2022

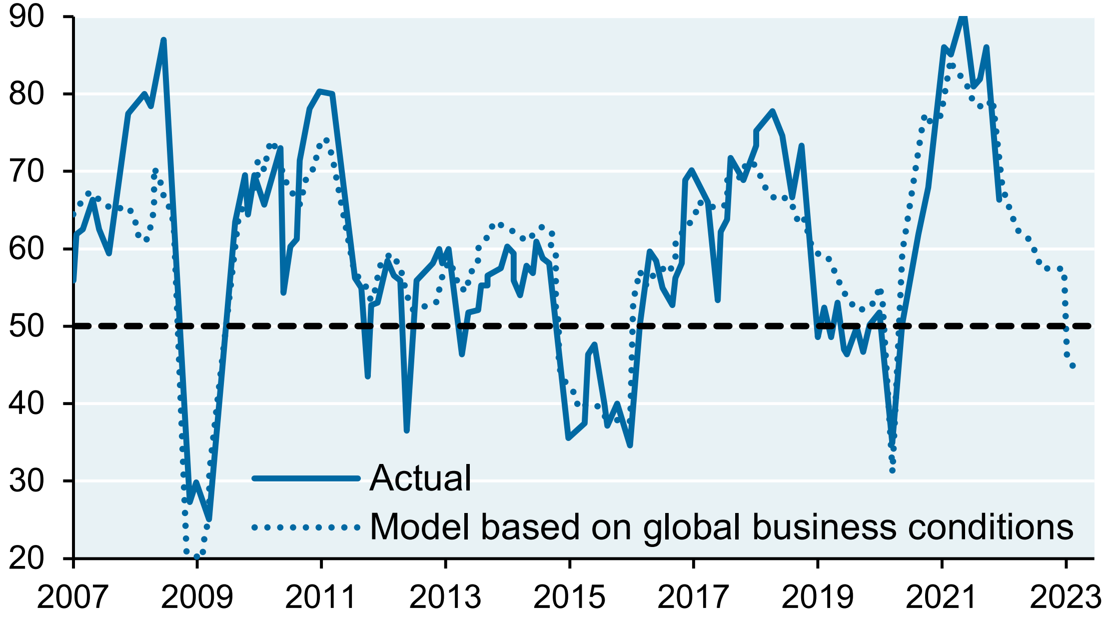


J.P.Morgan

# Some of the models we follow agree: producer and consumer prices should fall along with global business conditions

## US manufacturing PMI prices paid

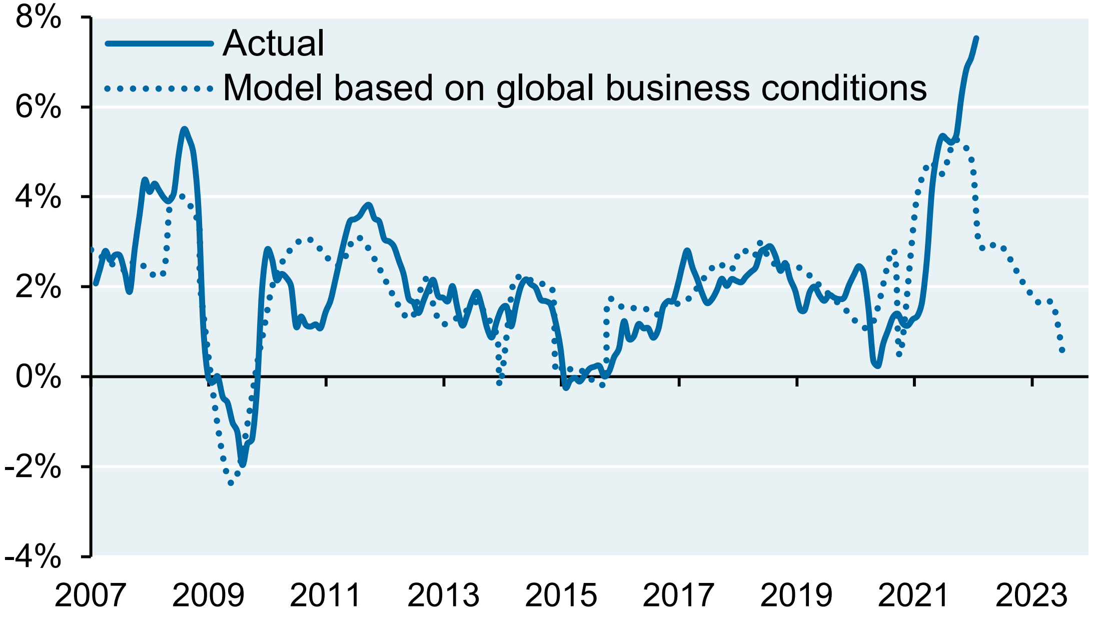
Index (50+ = expansion)




Source: Piper Sandler. February 27, 2022.

## US headline CPI

y/y % change



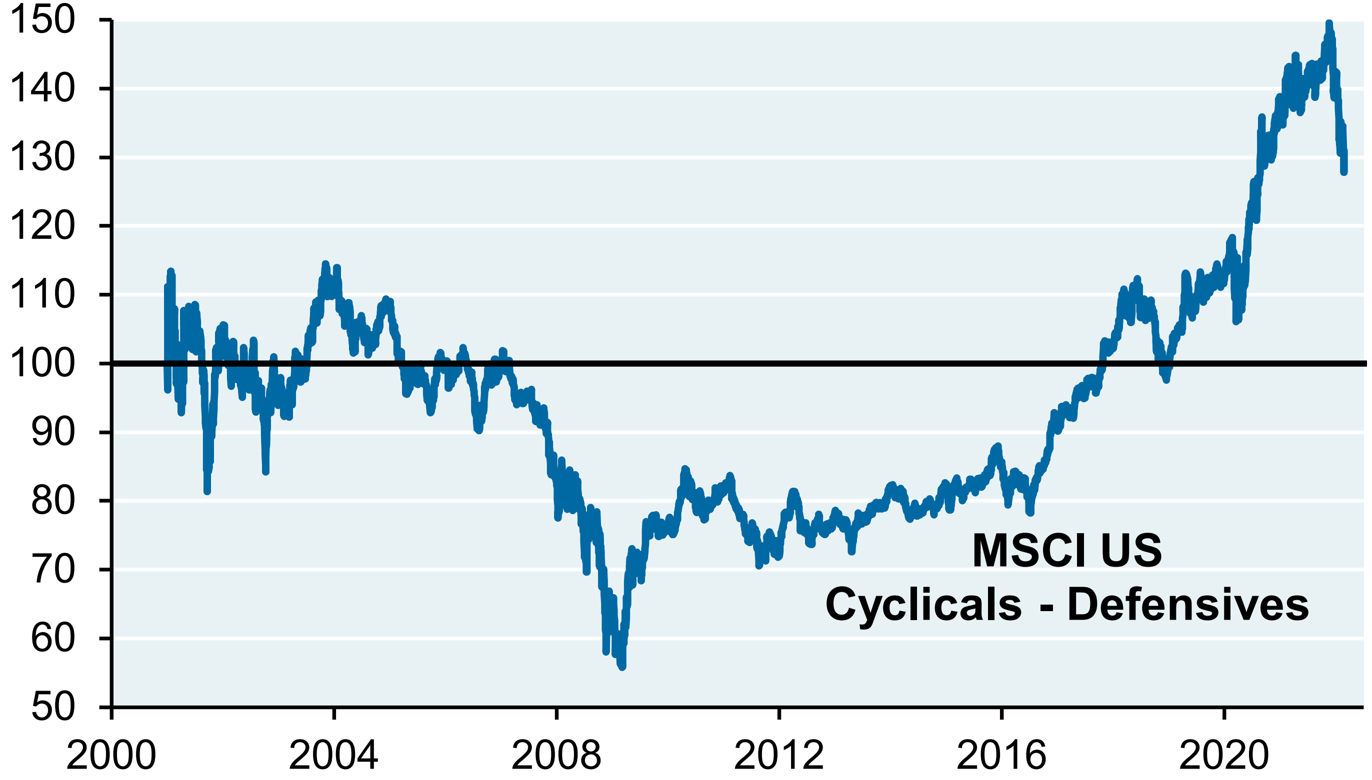

Source: BLS, Piper-Sandler. February 27, 2022.



J.P.Morgan

## Cyclicals vs defensives

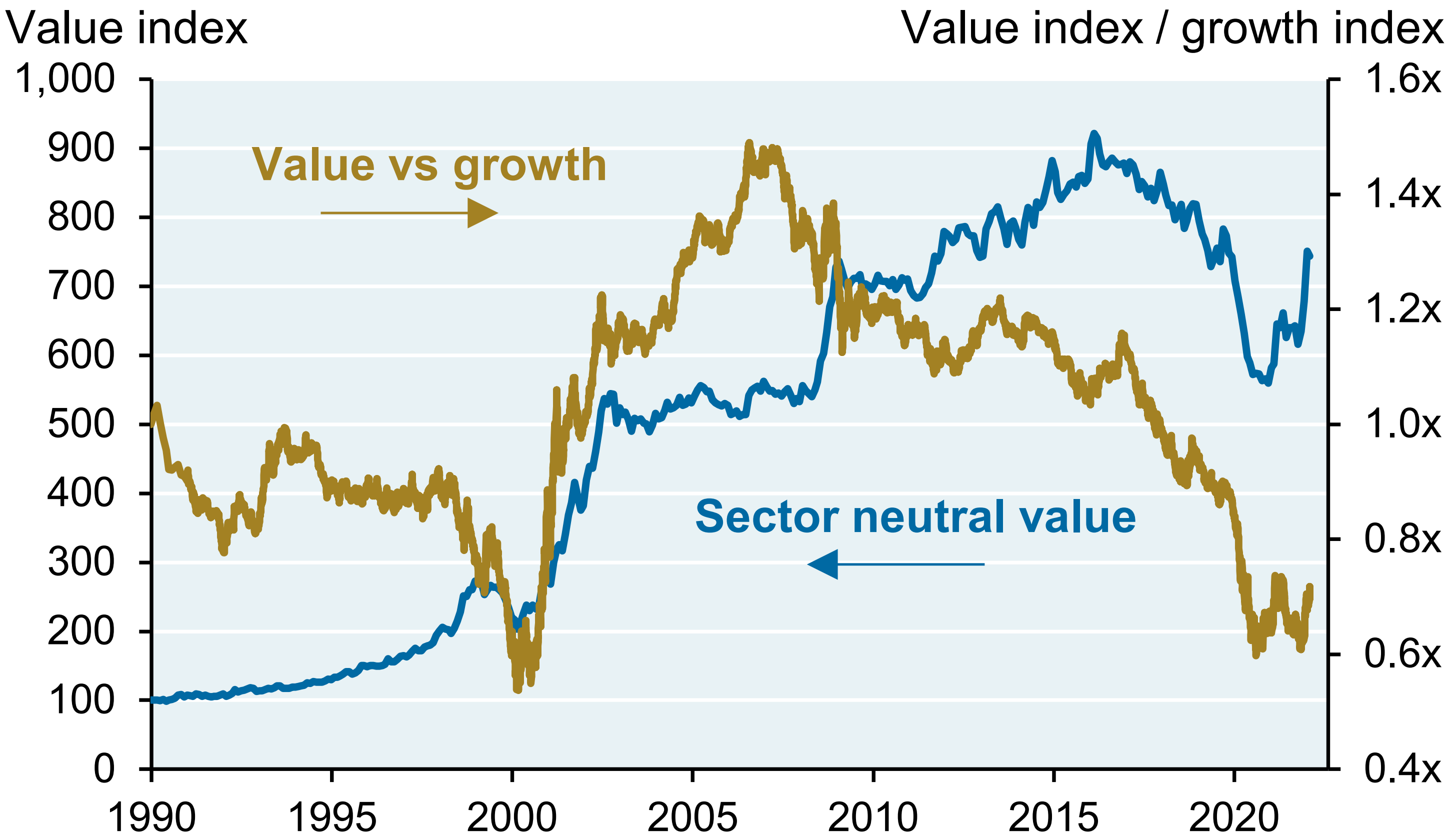
Index (100 = Jan 2001)




Source: Bloomberg, JPMAM. February 24, 2022.

# Equity market reactions: value stocks have regained some ground, but growth stocks still way ahead

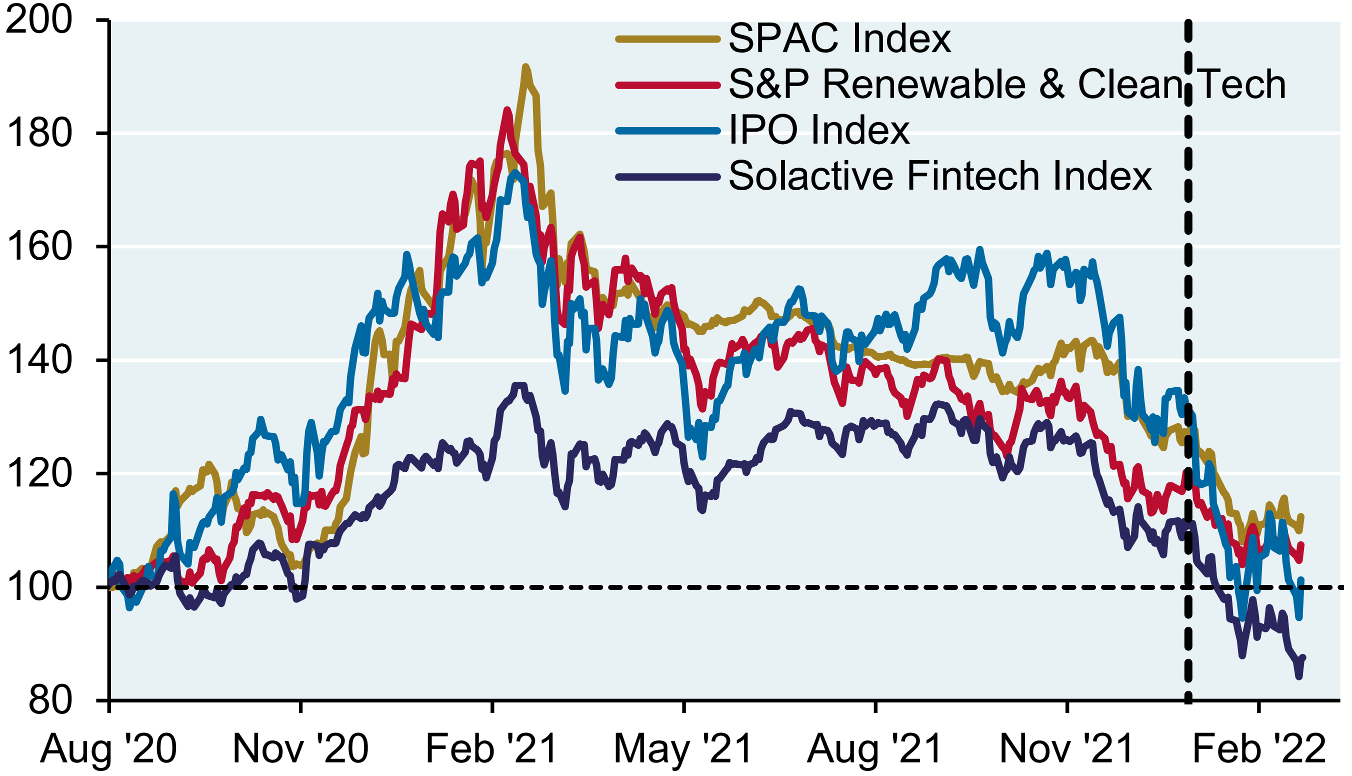
## Russell 1000 value vs growth: performance




Source: Bloomberg, JPMAM. February 25, 2022.

## Weak links crumbling

Total return index (Aug 2020 = 100)




Source: Bloomberg. February 25, 2022.

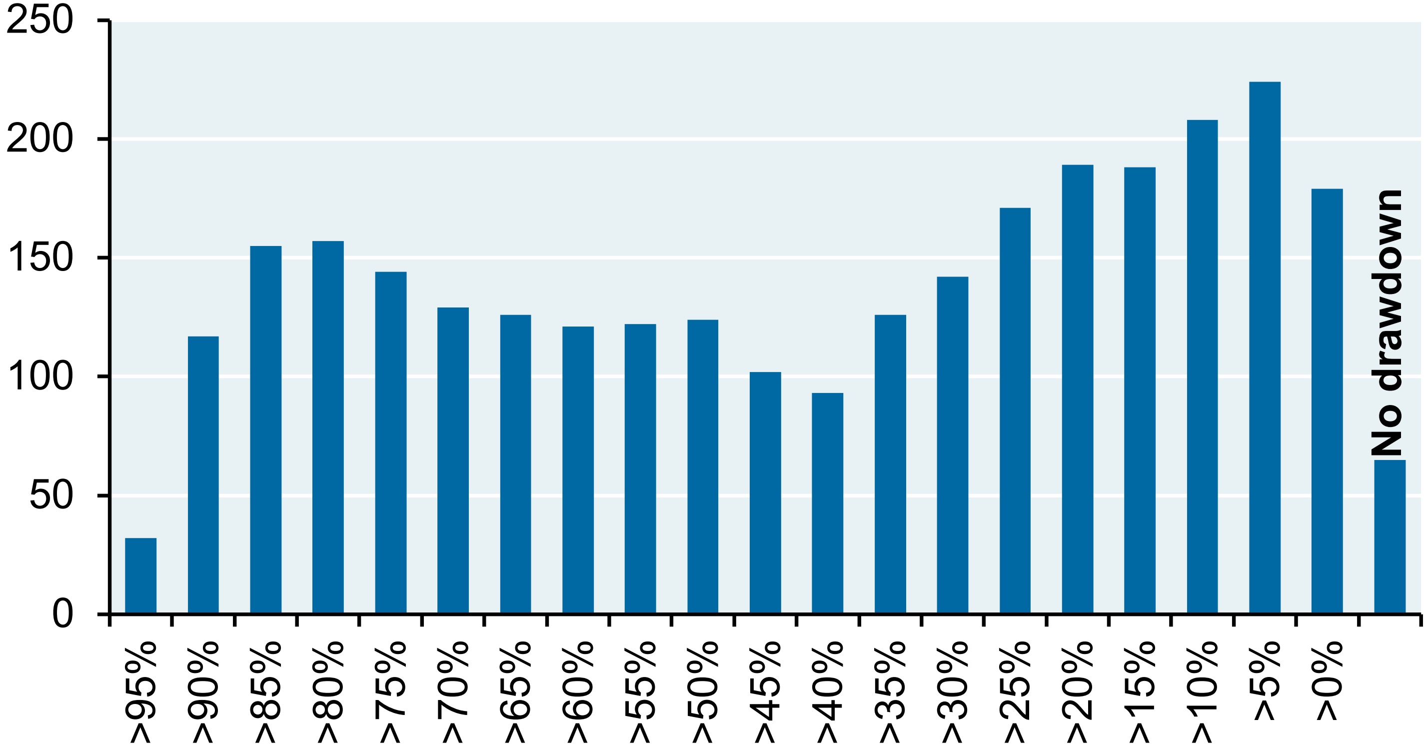
## Relative return of low operating margin companies

Percent, cumulative return


Source: MS. February 28, 2022.

## Market repricing: average NASDAQ stock down ~40% from peak levels

**Drawdowns of individual NASDAQ stocks from their respective peaks,** Number of stocks




Source: Bloomberg, JPMAM. February 24, 2022. N = 2914.

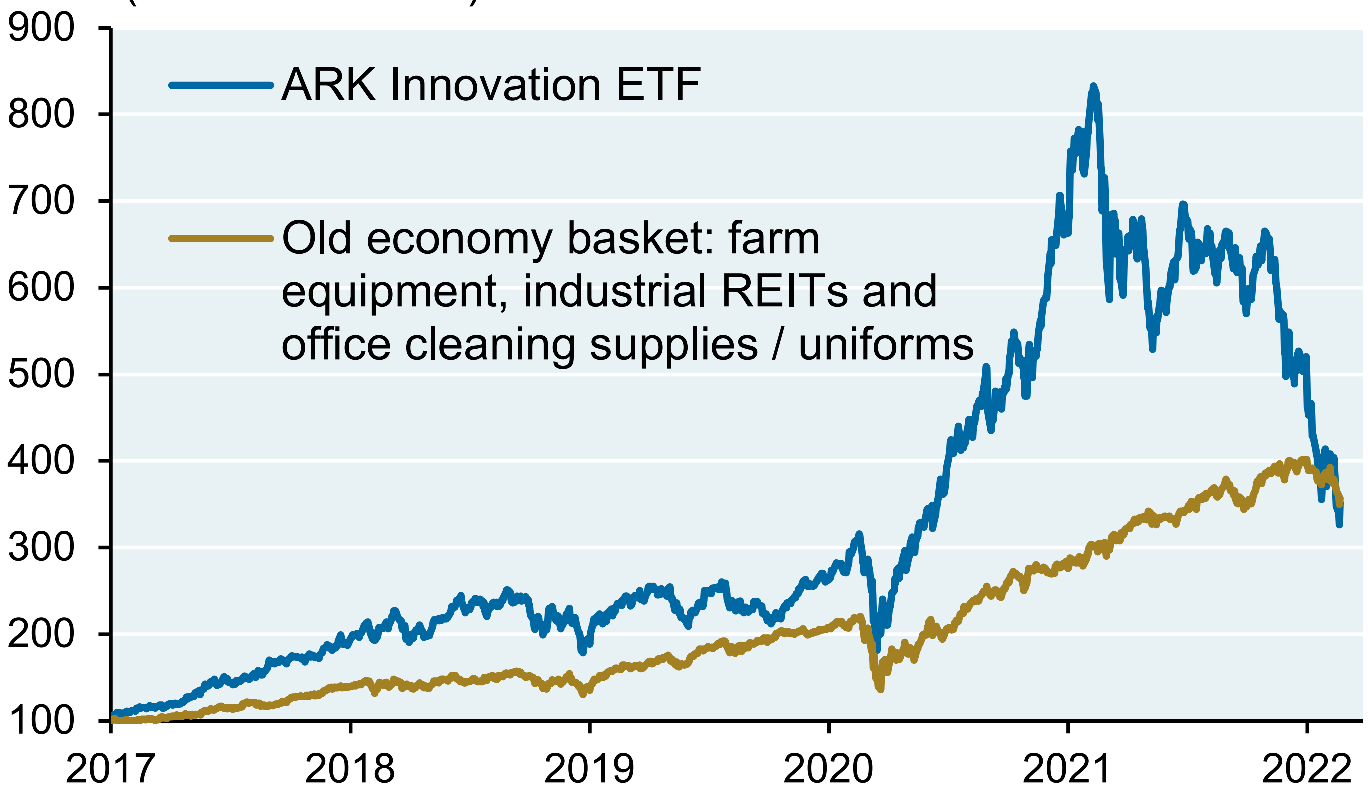


J.P.Morgan

## Market repricing: the price for “innovation” is getting cheaper

### The Tortoise and the Hare

Index (100 = Dec 2016)




Source: Bloomberg, JPMAM. February 24, 2022.

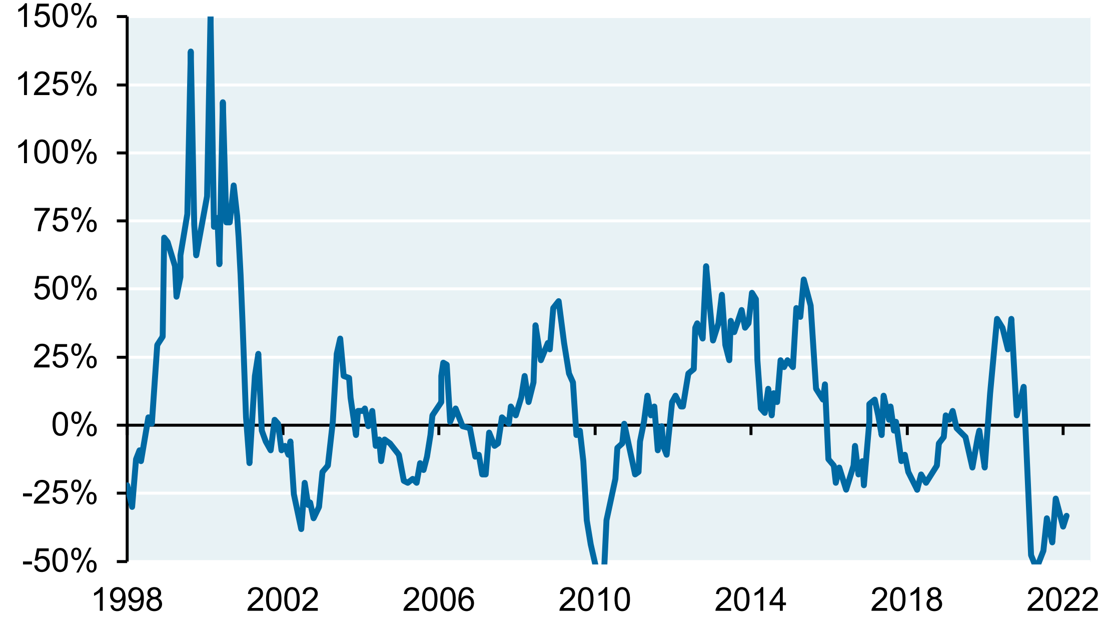


J.P.Morgan

## Market repricing: biotech is now in deep value territory

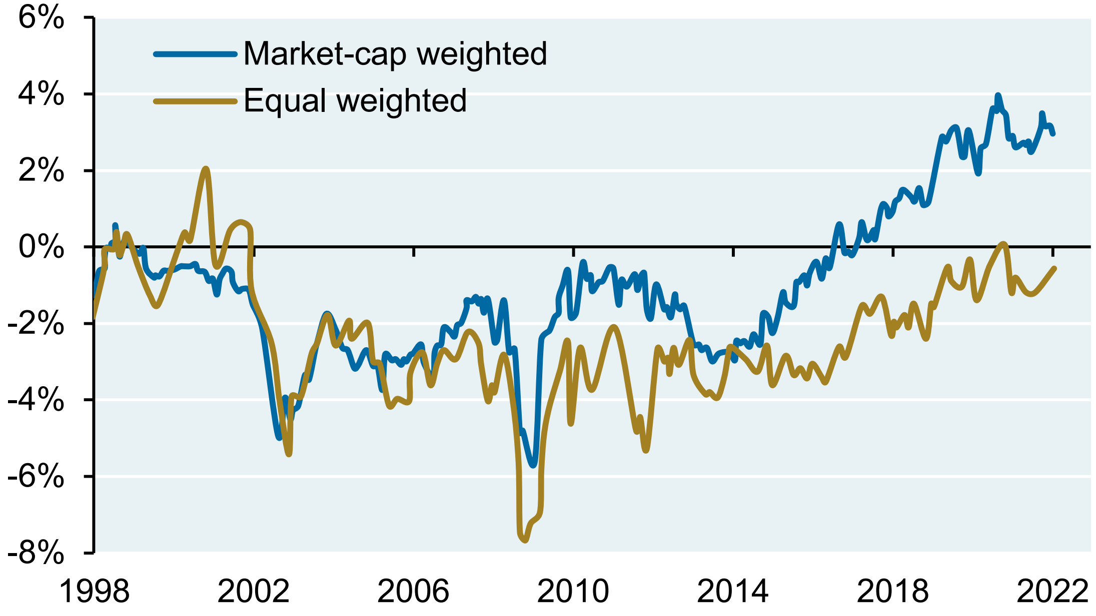
### Large cap biotech relative return vs US large cap stocks

%, twelve-month relative returns




Source: Empirical Research. February 23, 2022. Equal weighted indexes.

### Free cash flow yield of large cap biotech relative to tech & interactive media stocks




Source: Empirical Research. February 23, 2022. Biotech excludes Moderna.



J.P.Morgan

## Bright spots: capital spending and growth impulses were positive, pre-war

### US Business Roundtable CEO capital spending survey

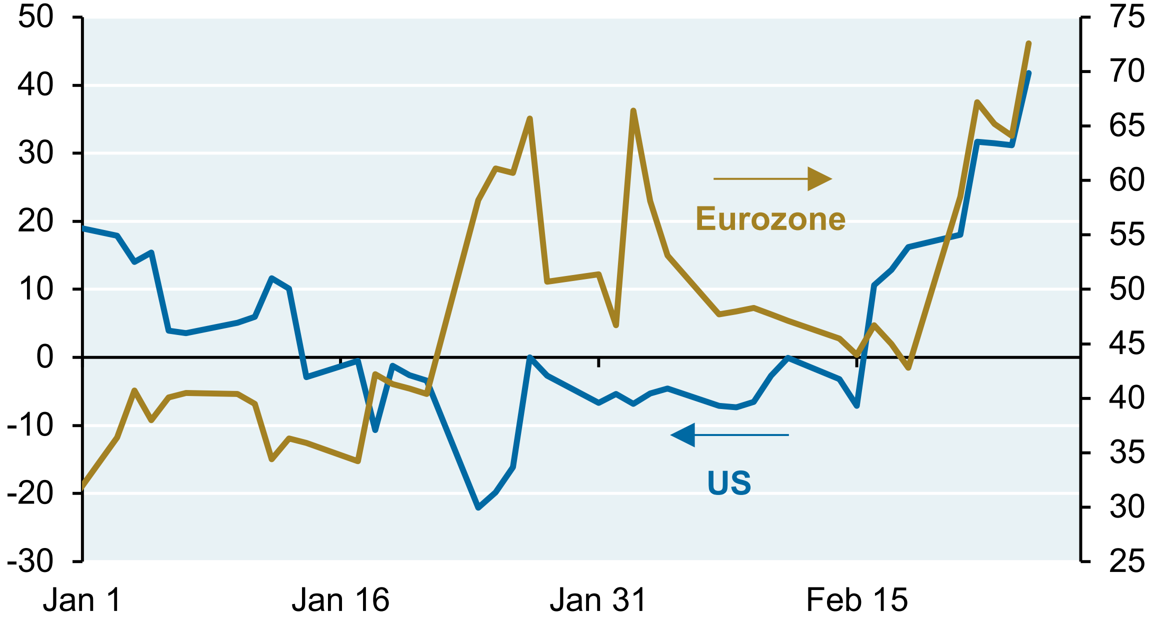
Index (50+ = expansionary)


Source: Bloomberg. Q4 2021.

### US and European economic surprises

Citi Economic Surprise Index

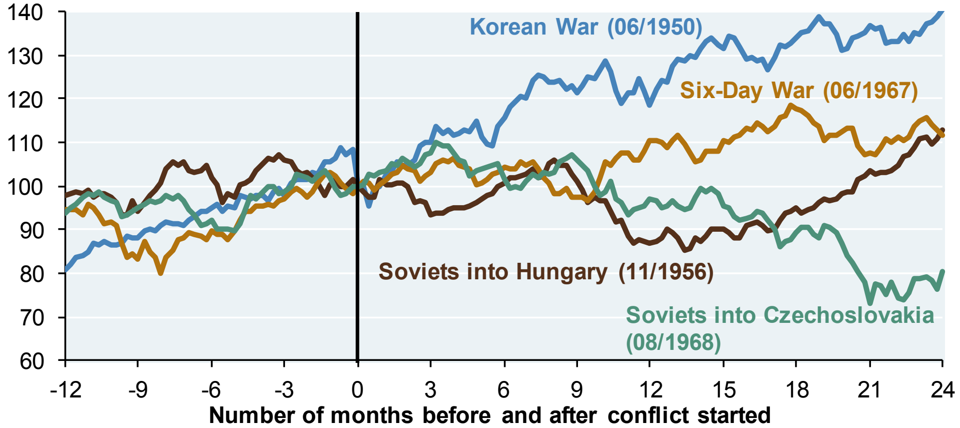
Citi Economic Surprise Index




Source: Bloomberg. February 25, 2022.

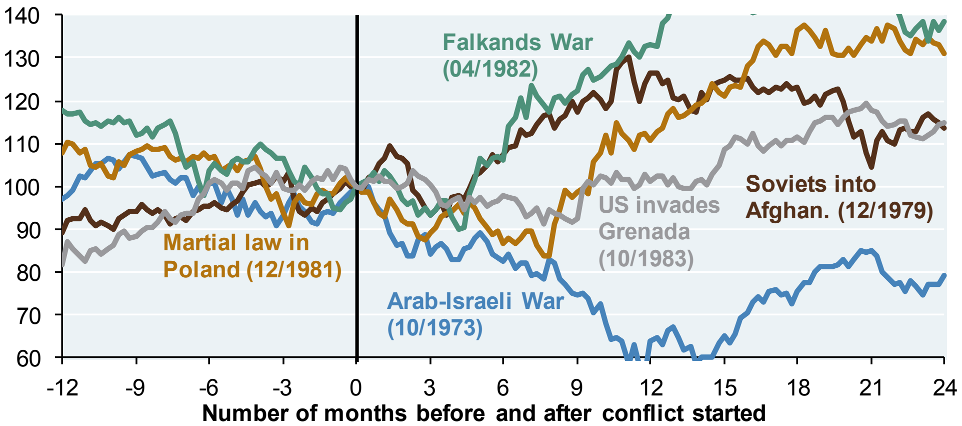
# Geopolitics are usually not drivers of equity markets 3-6 months later (July 2014 *Eye on the Market)*
# But the exception is the 1973 Arab Israeli war and its energy consequences…

**S&P 500 Index around military invasions and conflicts (1950 - 1968)**
Index, month of invasion = 100



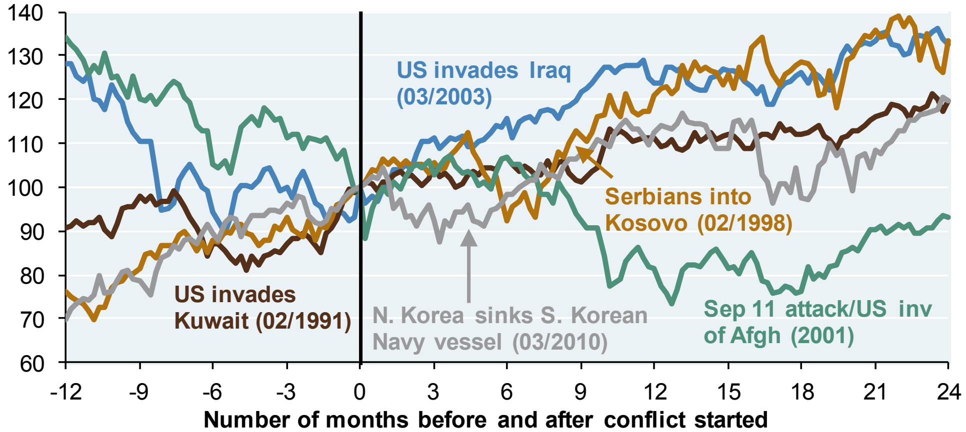

Source: Bloomberg. April 2014. Equity index represents price returns.

**S&P 500 Index around military invasions and conflicts (1973 - 1983)**
Index, month of invasion = 100




Source: Bloomberg. April 2014. Equity index represents price returns.

**S&P 500 Index around military invasions and conflicts (1991 - today)**
Index, month of invasion = 100




Source: Bloomberg. April 2014. Equity index represents price returns.

Pre-conflict market and economic trends are almost always what drives equity markets

The exception: Israeli-Arab War of 1973, which led to a Saudi oil embargo against the US and a quadrupling of oil prices

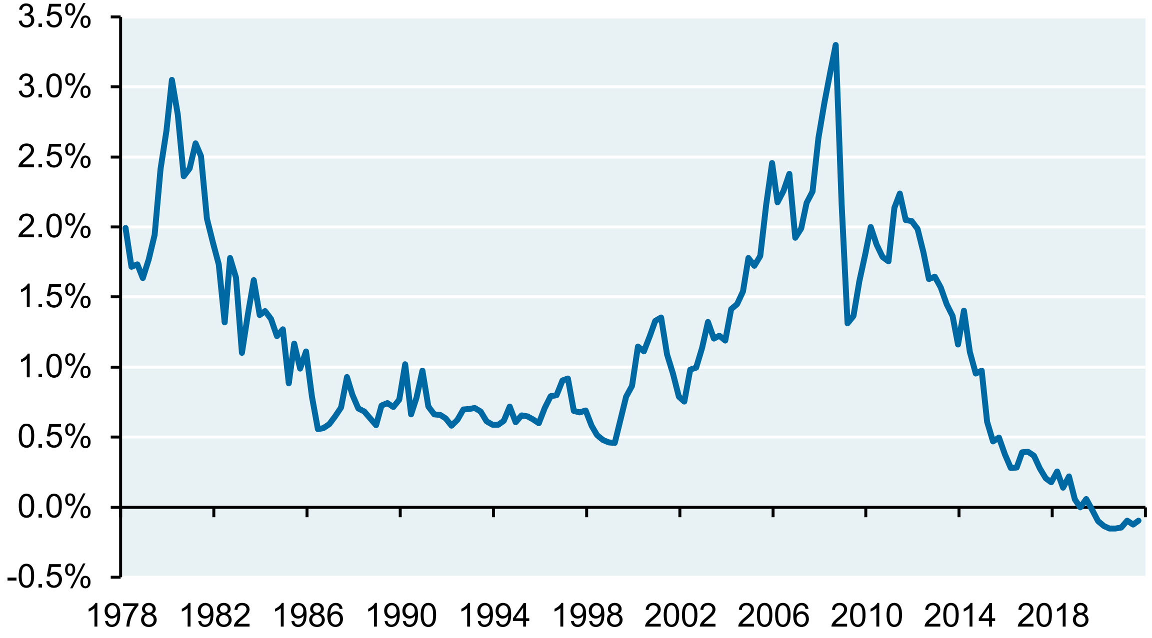


J.P.Morgan

## …which is yet another reminder of how important energy independence can be

### US net energy deficit, in dollar terms

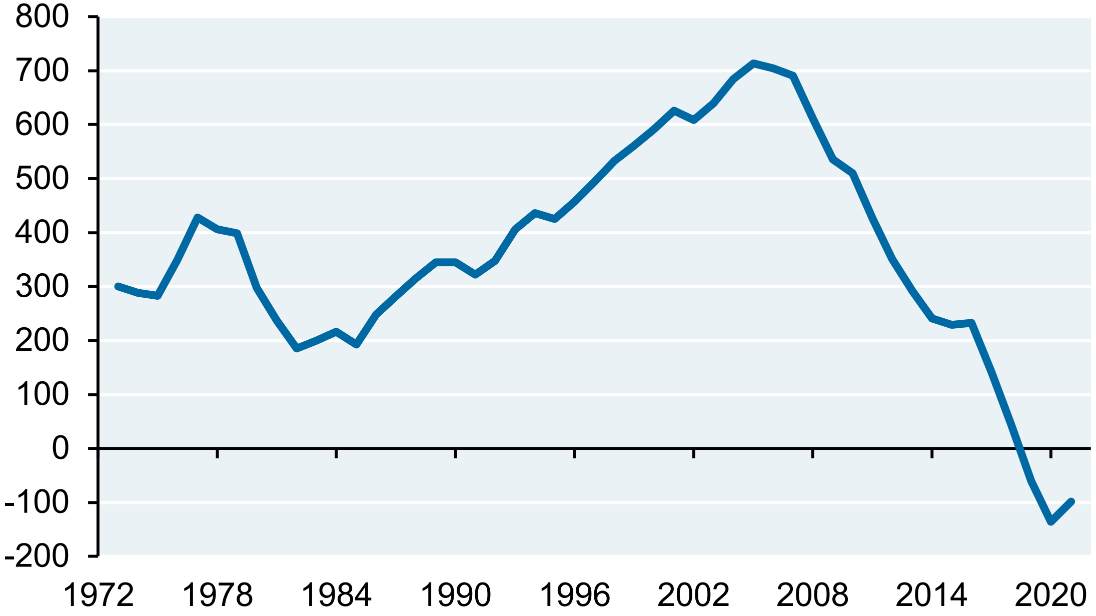
Energy imports - energy exports, % of GDP




Souce: Bureau of Economic Analysis, Haver Analytics, JPMAM. Q3 2021.

### US net energy deficit, in energy terms

Net imports of oil, natural gas and coal in million tonnes of oil equiv.




Source: EIA, JPMAM. November 2021.

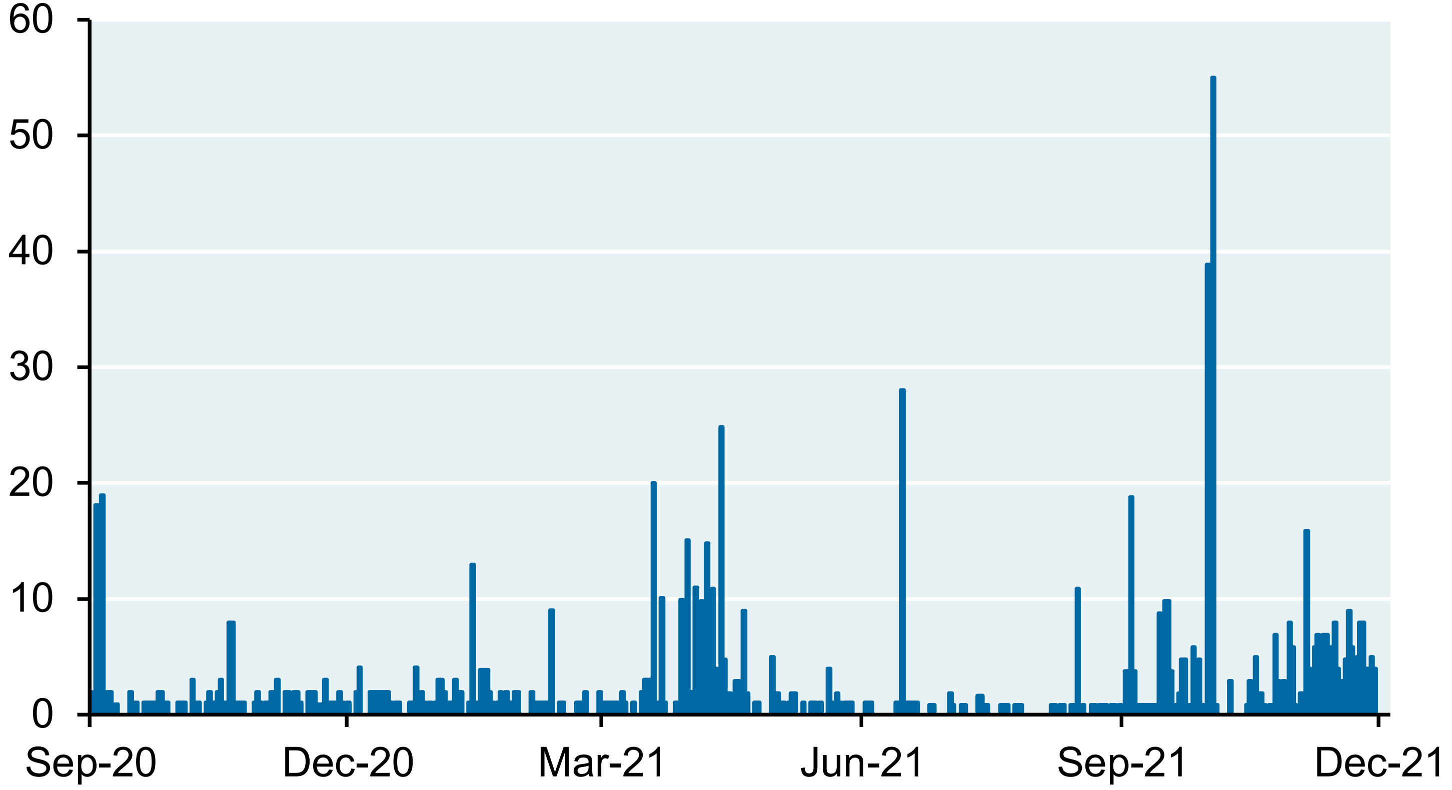
## Wrapping up

- Near term equity market reaction may continue to be negative since most institutional and individual investors were not positioned for largest land war in Europe since WWII, and the largest jobs-workers gap as well
  - As usual, it will be difficult to time the bottom absent a global recession
  - A lot of the growth premium has now been eliminated, particularly for unprofitable YUC companies
- Energy consequences for Europe may result in eventual Western acceptance of the facts on the ground, even as tougher sanctions remain in place
- Fed to continue tightening and has difficult challenge ahead, but the unorthodox nature of the inflation spike due to the pandemic should help
  - Both policy rates and long rates still negative in real terms by end of 2022
- Still expecting 3.0% real US GDP growth in 2022, although year-end core inflation may still be over 3.5% and not decline to 2.5% until end of 2023

## One day, we may discuss Taiwan and the decision by the West to accept China into the World Trade Organization in the early 2000's…but that is a topic for another time

**Chinese military incursions to Taiwan**

Number of Chinese military aircrafts entering Taiwan's defense zone




Source: Ministry of National Defense (Taiwan). 2021.



J.P.Morgan

# Important Information

**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.

# Important Information

**<u>For J.P. Morgan Private Bank Clients</u>:**
**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 **"JPMCB"**) 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 ("JPMS")**, a member of FINRA and SIPC. JPMCB and JPMS are affiliated companies under the common control of JPM. Products not available in all states.
In **Luxembourg**, this material is issued by **J.P. Morgan Bank Luxembourg S.A. (JPMBL)**, with registered office at European Bank and Business Centre, 6 route de Treves, L-2633, Senningerberg, Luxembourg. R.C.S Luxembourg B10.958. Authorized and regulated by Commission de Surveillance du Secteur Financier (CSSF) and jointly supervised by the European Central Bank (ECB) and the CSSF. J.P. Morgan Bank Luxembourg S.A. is authorized as a credit institution in accordance with the Law of 5th April 1993. In the **United Kingdom**, this material is issued by **J.P. Morgan Bank Luxembourg S.A., London Branch**, registered office at 25 Bank Street, Canary Wharf, London E14 5JP. Authorised and regulated by Commission de Surveillance du Secteur Financier (CSSF) and jointly supervised by the European Central Bank (ECB) and the CSSF. Deemed authorised by the Prudential Regulation Authority. Subject to regulation by the Financial Conduct Authority and limited regulation by the Prudential Regulation Authority. Details of the Temporary Permissions Regime, which allows EEA-based firms to operate in the UK for a limited period while seeking full authorisation, are available on the Financial Conduct Authority's website.
In **Spain**, this material is distributed by **J.P. Morgan Bank Luxembourg S.A., Sucursal en España**, with registered office at Paseo de la Castellana, 31, 28046 Madrid, Spain. J.P. Morgan Bank Luxembourg S.A., Sucursal en España is registered under number 1516 within the administrative registry of the Bank of Spain and supervised by the Spanish Securities Market Commission (CNMV). In **Germany**, this material is distributed by **J.P. Morgan Bank Luxembourg S.A., Frankfurt Branch**, registered office at Taunustor 1 (TaunusTurm), 60310 Frankfurt, Germany, jointly supervised by the Commission de Surveillance du Secteur Financier (CSSF) and the European Central Bank (ECB), and in certain areas also supervised by the Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin). In **Italy**, this material is distributed by **J.P. Morgan Bank Luxembourg S.A., Milan Branch**, registered office at Via Catena Adalberto 4, Milan 20121, Italy
and regulated by Bank of Italy and the Commissione Nazionale per le Società e la Borsa (CONSOB). In the **Netherlands**, this material is distributed by J**.P. Morgan Bank Luxembourg S.A., Amsterdam Branch**, with registered office at World Trade Centre, Tower B, Strawinskylaan 1135, 1077 XX, Amsterdam, The Netherlands. J.P. Morgan Bank Luxembourg S.A., Amsterdam Branch is authorized and regulated by the Commission de Surveillance du Secteur Financier (CSSF) and jointly supervised by the European Central Bank (ECB) and the CSSF in Luxembourg; J.P. Morgan Bank Luxembourg S.A., Amsterdam Branch is also authorized and 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 Bank Luxembourg S.A. under registration number 71651845. In **Denmark**, this material is distributed by **J.P. Morgan Bank Luxembourg, Copenhagen Br, filial af J.P. Morgan Bank Luxembourg S.A.** with registered office at Kalvebod Brygge 39-41, 1560 København V, Denmark. J.P. Morgan Bank Luxembourg, Copenhagen Br, filial af J.P. Morgan Bank Luxembourg S.A. is authorized and regulated by Commission de Surveillance du Secteur Financier (CSSF) and jointly supervised by the European Central Bank (ECB) and the CSSF. J.P. Morgan Bank Luxembourg, Copenhagen Br, filial af J.P. Morgan Bank Luxembourg S.A. is also subject to the supervision of Finanstilsynet (Danish FSA) and registered with Finanstilsynet as a branch of J.P. Morgan Bank Luxembourg S.A. under code 29009. In **Sweden**, this material is distributed by **J.P. Morgan Bank Luxembourg S.A., Stockholm Bankfilial**, with registered office at Hamngatan 15, Stockholm, 11147, Sweden. J.P. Morgan Bank Luxembourg S.A., Stockholm Bankfilial is authorized and regulated by Commission de Surveillance du Secteur Financier (CSSF) and jointly supervised by the European Central Bank (ECB) and the CSSF. J.P. Morgan Bank Luxembourg S.A., Stockholm Bankfilial is also subject to the supervision of Finansinspektionen (Swedish FSA). Registered with Finansinspektionen as a branch of J.P. Morgan Bank Luxembourg S.A. In **France**, this material is distributed by **JPMorgan Chase Bank, N.A. ("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**, which is regulated in Switzerland by the Swiss Financial Market Supervisory Authority (FINMA).

# Important Information

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 Hong Kong, 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 to exercise caution in relation to this document. If you are in any doubt about any of the contents of this document, you should obtain independent professional advice. For materials which constitute product advertisement under the Securities and Futures Act and the Financial Advisers Act, this advertisement has not been reviewed by the Monetary Authority of Singapore. 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.

JPMS is a registered foreign company (overseas) (ARBN 109293610) incorporated in Delaware, U.S.A. Under Australian financial services licensing requirements, carrying on a financial services business in Australia requires a financial service provider, such as J.P. Morgan Securities LLC (JPMS), to hold an Australian Financial Services Licence (AFSL), unless an exemption applies. J**PMS is exempt from the requirement to hold an AFSL under the Corporations Act 2001 (Cth) (Act) in respect of financial services it provides to you, and is regulated by the SEC, FINRA and CFTC under U.S. laws, which differ from Australian laws.** Material provided by JPMS in Australia is to "wholesale clients" only. The information provided in this material is not intended to be, and must not be, distributed or passed on, directly or indirectly, to any other class of persons in Australia. For the purposes of this paragraph the term "wholesale client" has the meaning given in section 761G of the Act. Please inform us immediately 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.
References to "J.P. Morgan" are to JPM, its subsidiaries and affiliates worldwide. "J.P. Morgan Private Bank" is the brand name for the private banking business conducted by JPM. This material is intended for your personal use and should not be circulated to or used by any other person, or duplicated for non-personal use, without our permission. If you have any questions or no longer wish to receive these communications, please contact your J.P. Morgan team.

# Important Information

**For J.P. Morgan Wealth Management Clients:**

Purpose of This Material: This material is for information purposes only. The views, opinions, estimates and strategies expressed herein constitutes Michael Cembalest's judgment based on current market conditions and are subject to change without notice, and 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.**

J.P. Morgan is committed to making our products and services accessible to meet the financial services needs of all our clients. If you are a person with a disability and need additional support, please contact your J.P. Morgan representative or email us at accessibility.support@jpmorgan.com for assistance.

J.P. Morgan Wealth Management is a business of JPMorgan Chase & Co., which offers investment products and services through **J.P. Morgan Securities LLC** (JPMS), a registered broker-dealer and investment advisor, member 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. Certain custody and other services are provided by JPMorgan Chase Bank, N.A. (JPMCB). JPMS, CIA and JPMCB are affiliated companies under the common control of JPMorgan Chase & Co. Products not available in all states.

This material is intended for your personal use and should not be circulated to or used by any other person, or duplicated for non-personal use, without our permission. If you have any questions or no longer wish to receive these communications, please contact your J.P. Morgan representative.

**LEGAL ENTITY, BRAND & REGULATORY INFORMATION**

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 an advice or a recommendation to buy or sell any investment in any jurisdiction and there is no guarantee that any of the views expressed will materialize. Any forecasts, figures, opinions or investment techniques and strategies set out are for information purposes only; based on certain assumptions, current market conditions and are subject to change without prior notice. All information presented herein is considered to be accurate at the time of writing, but no warranty of accuracy is given and no liability in respect of any error or omission is accepted. 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, investors 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 investors may not get back the full amount invested. Both past performance and yield may not be a reliable guide to future performance.
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.
J.P. Morgan Asset Management is the brand for the asset management business of JPMorgan Chase & Co. and its affiliates worldwide. J.P. Morgan Institutional Investments, Inc.

- **For J.P. Morgan Private Bank Clients:** Please read the **Legal Disclaimer**.
- **For J.P. Morgan Asset Management Clients:** Please read the **Legal Disclaimer**
- **For J.P. Morgan Securities:** Please read the **Legal Disclaimer**.
- **For Chase Private Client:** Please read the **Legal Disclaimer**