

A more challenging global environment: Soft landing, hard task

NCSL Regional Fiscal Leaders Meeting | June 2022

Chair of Global Research

Joyce Chang ^{AC}

(1-212) 834-4203

joyce.chang@jpmorgan.com

J.P. Morgan Securities LLC

See end pages for analyst certification and important disclosures, including investment banking relationships.

Charts are taken from presentations from Global equities, economics, rates, FX, commodities, US fixed income, and EM research groups.

Agenda

		Page
1	Economic Outlook and Macro Drivers: Higher inflation, tight labor markets, supply constraints and higher commodity prices weigh on growth	1
2	Risks ahead: Higher debt, fiscal costs, tighter financial conditions and increased US-China tensions	17

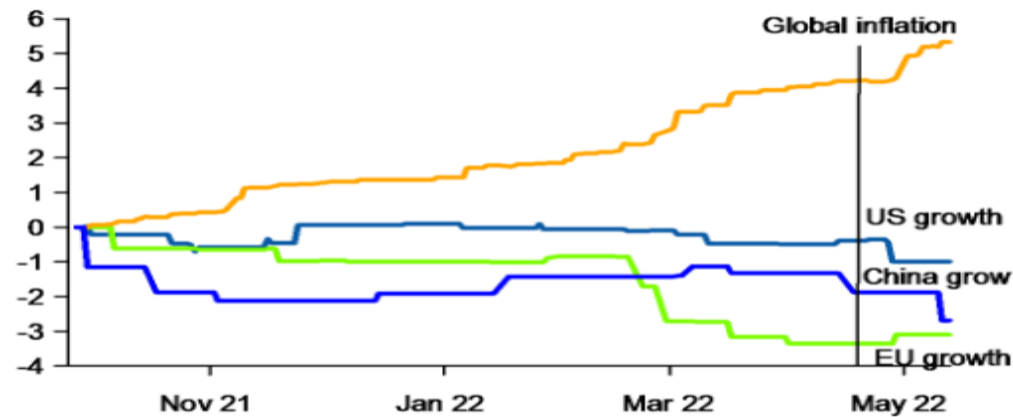
We have downgraded near-term growth forecasts materially to below potential - Near term US recession risks remain low but rise into 2023 if inflation remains elevated

J.P. Morgan forecasts, 2022

	Current					Revisions since Feb 18				
	Real GDP			CPI (%oya)		Real GDP			CPI (%oya)	
	1H	2H	4Q/4Q	2Q	4Q	1H	2H	4Q/4Q	2Q	4Q
Global	1.3	3.4	2.3	7.1	6.4	-2.7	-0.4	-1.6	2.1	2.8
DM	1.4	2.5	1.9	7.3	6.3	-2.1	-0.8	-1.4	2.1	3.0
US	0.9	2.4	1.6	8.1	6.5	-1.8	-0.6	-1.2	1.7	2.6
Euro area	1.7	2.9	2.3	7.9	7.2	-3.3	-1.4	-2.3	3.2	4.8
EM	1.2	4.7	2.8	6.9	6.7	-3.5	0.2	-1.8	2.3	2.4
EM Asia	1.9	6.2	3.9	3.3	3.7	-3.7	0.9	-1.5	1.2	1.2
ex China	4.6	3.7	4.1	5.3	5.1	-1.4	-1.0	-1.2	1.7	1.8
China	0.7	7.4	3.9	2.3	3.0	-5.0	1.9	-1.7	1.0	0.9
EMEA EM	-4.5	0.1	-2.7	27.9	25.1	-6.9	-3.4	-5.6	9.9	10.4
CE4	6.1	2.3	4.1	13.7	13.4	1.4	-2.5	-0.7	5.3	5.9
Russia	-15.7	-2.5	-10.1	18.2	17.3	-17.0	-4.3	-11.6	10.0	11.6
Latam	1.6	0.2	0.9	10.0	8.0	0.2	-0.9	-0.4	1.9	2.7

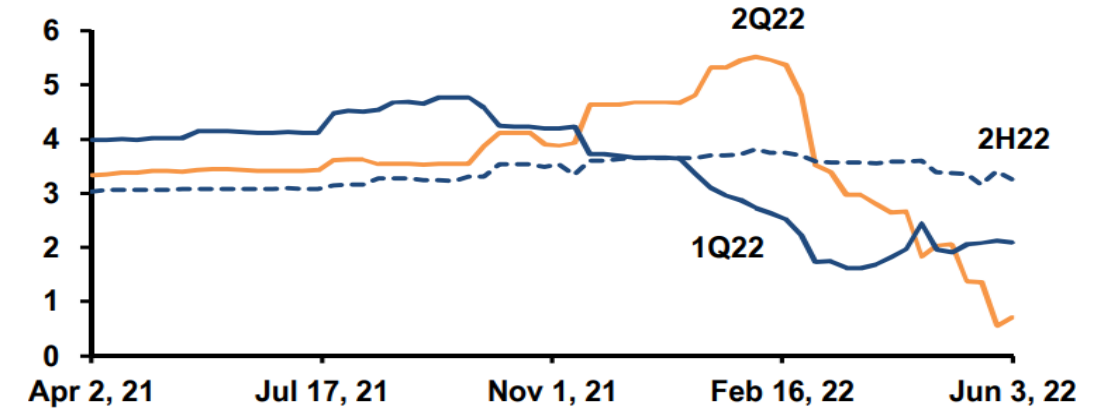
From US exceptionalism to a global slowdown - China growth downgraded again, but so has the US with Eurozone still vulnerable

Cumulative change in J.P. Morgan growth and inflation forecast revision indices; %pts



J.P. Morgan global GDP

% change, q/q saar; forecast by date made



US GDP growth to fall below potential to 1.5% by 1H23 as tighter financial conditions, a stronger dollar, lower equity prices, and higher mortgage rates weigh on demand growth

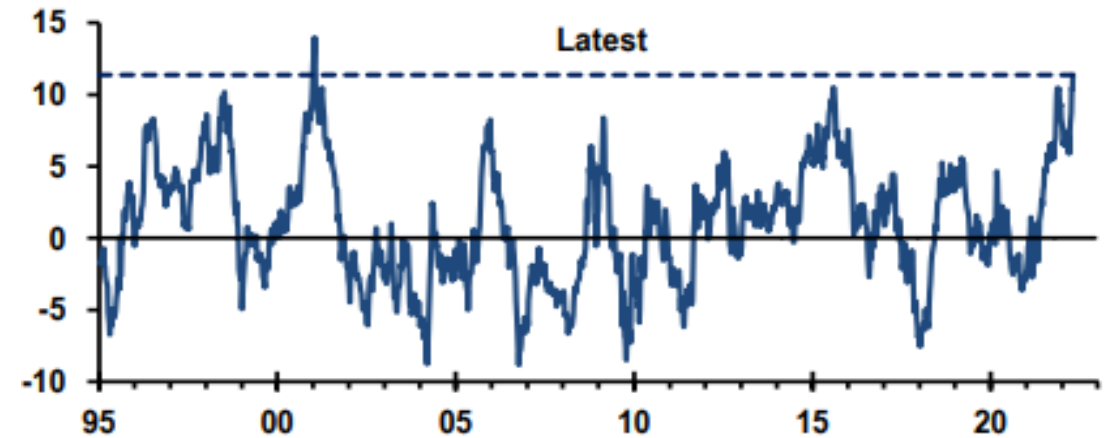
J.P. Morgan forecast summary

Avg. by half year	2H22	1H23	2H23
Real GDP (%ch, saar)	2.4	1.5	1.0
<i>Prior</i>	3.0	2.1	1.4
Real dom. final sales (%ch, saa)	2.8	2.5	2.1
<i>Prior</i>	3.3	2.7	2.4
Unemployment rate (%)	3.4	3.4	3.5
<i>Prior</i>	3.4	3.3	3.2

Source: J.P. Morgan

Real, trade-weighted dollar

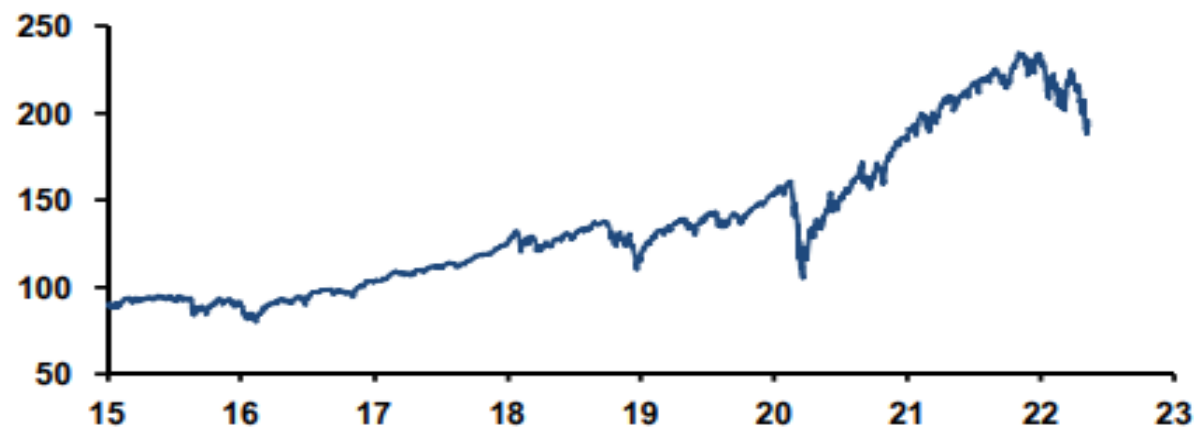
% ch., oya



Source: Census Bureau, J.P. Morgan

Wilshire 5000 total return index

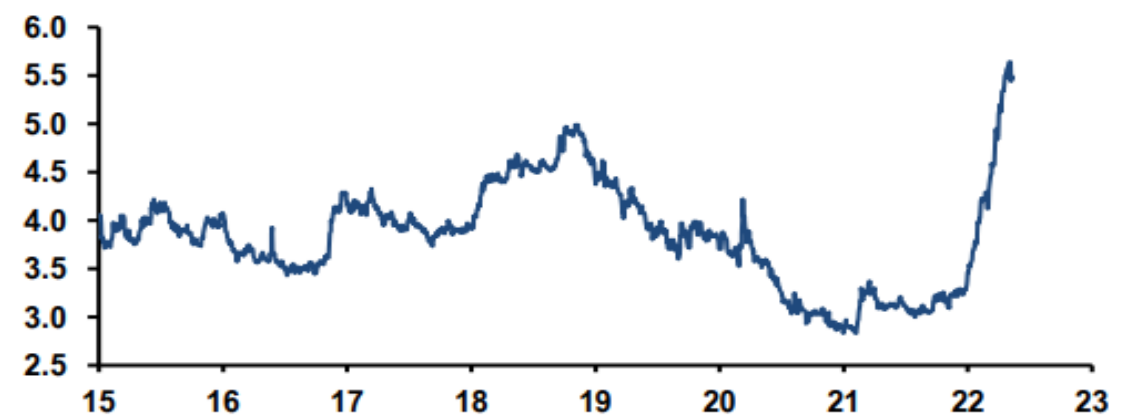
Index



Source: Wilshire, J.P. Morgan

30-year fixed-rate mortgage rates

%



Source: Wall Street Journal, J.P. Morgan

Cruel summer: US gasoline prices to break above \$6

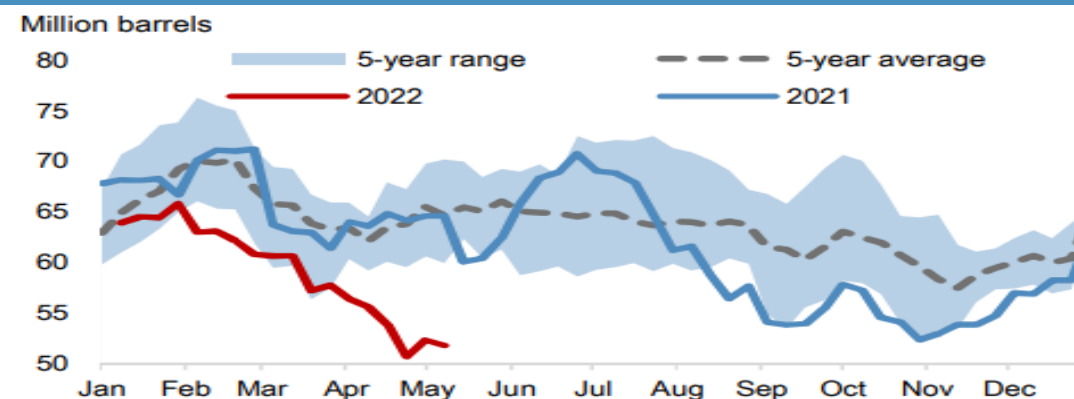
Incremental investment required for US to produce 20 mbd by 2026

\$ billion

	Crude oil pipelines	Natural gas pipelines	Oil export buildout	LNG Facilities	NG processing	Frac Equipment	Rigs	Well Costs	Total Cost
2023	\$10	\$15	\$3	\$21	\$2	\$5	\$3	\$15	\$74
2024	\$12	\$18	\$0	\$12	\$2	\$0	\$0	\$35	\$79
2025	\$14	\$20	\$0	\$14	\$3	\$0	\$0	\$61	\$111
2026	\$0	\$23	\$0	\$16	\$4	\$0	\$0	\$94	\$136
Total	\$36	\$77	\$3	\$61	\$11	\$5	\$3	\$205	\$400

Source: Reuters, INGAA, NS Energy, RBN Energy, Rystad.

Gasoline inventories in the US East Coast



Source: EIA

J.P. Morgan crude oil price forecasts (US\$/bbl)

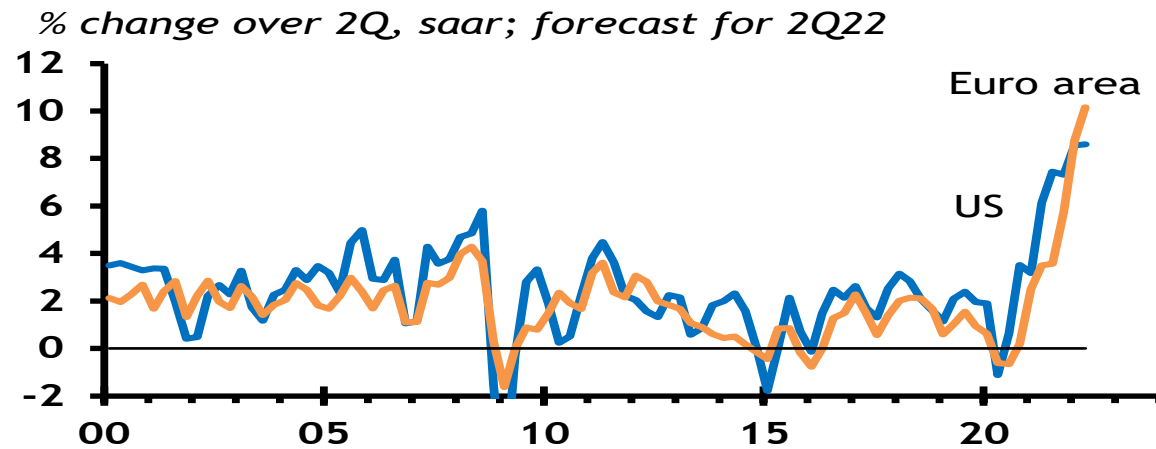
Price and forecasts are quarterly and annual spot averages

		2021	1Q22	2Q22	3Q22	4Q22	2022	1Q23	2Q23	3Q23	4Q23	2023
Brent	Avg	71	98	114	102	101	104	96	98	97	99	98
	EoP	75	115	104	104	101	101	95	94	101	101	101
WTI	Avg	68	95	111	99	98	101	92	94	93	95	94
	EoP	75	112	101	101	98	98	91	90	97	97	97
WTI - Brent Spread	Avg	-2.7	-3.0	-3.0	-3.5	-3.5	-3.3	-4.0	-4.0	-4.0	-4.0	-4.0
Forward Curve	Brent				110	103	108	98	95	92	90	94
	WTI			113	107	99	106	94	90	87	85	89

Source: ICE, NYMEX, Bloomberg Finance LP, J.P. Morgan Commodities Research

Russian commodity shock hits Europe hardest...

CPI



Source: J.P. Morgan Global Economics

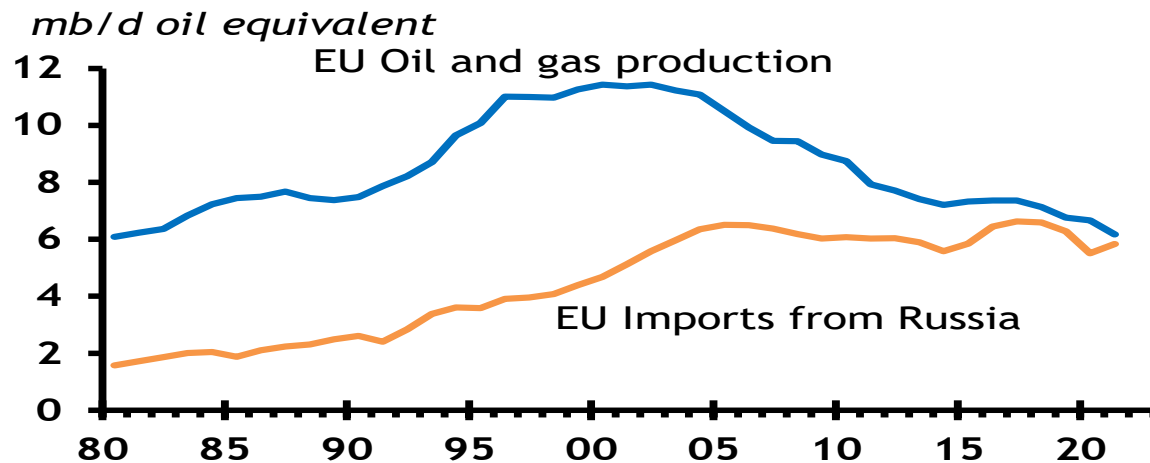
Russia's share in global commodity production

Percent

	2018	2019	2020
Oil	12.2	12.3	12.1
Natural gas	17.4	17.1	16.6
Coal	5.6	5.5	5.2
Copper	4.3	4.3	4.3
Aluminum	5.9	6.2	6.1
Nickel	6.8	6.3	6.1
Zinc	1.9	1.5	1.5
Gold	8.1	9.1	9.5
Silver	5.1	5.3	5.4
Platinum	10.8	11.7	14.1
Palladium	39.4	41.0	43.9
Wheat	9.8	9.7	11.0

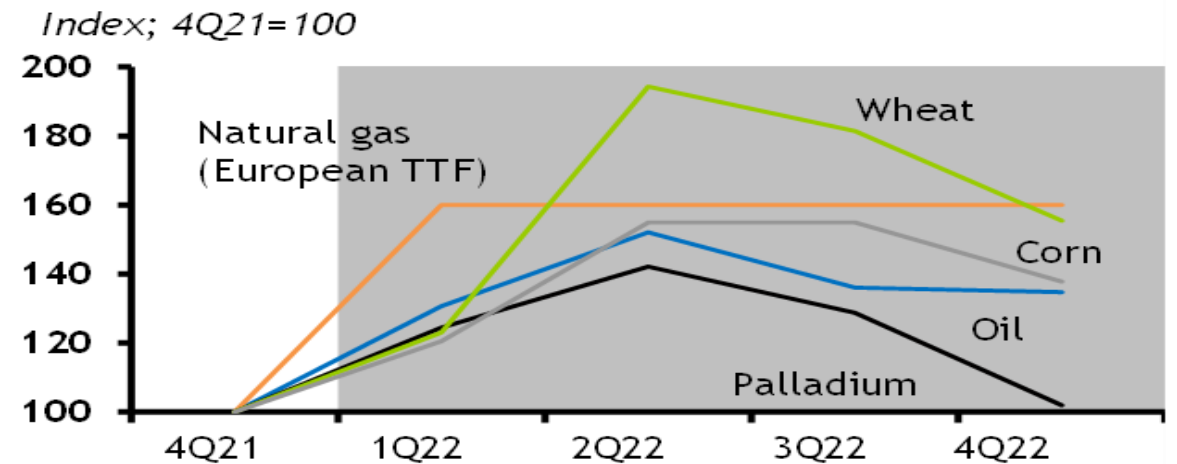
Source: J.P. Morgan Commodities Research

EU oil/gas production vs imports from Russia



Source: BP, Gazprom, Eurostat, Russia Federals Customs service, JPMAM calculations

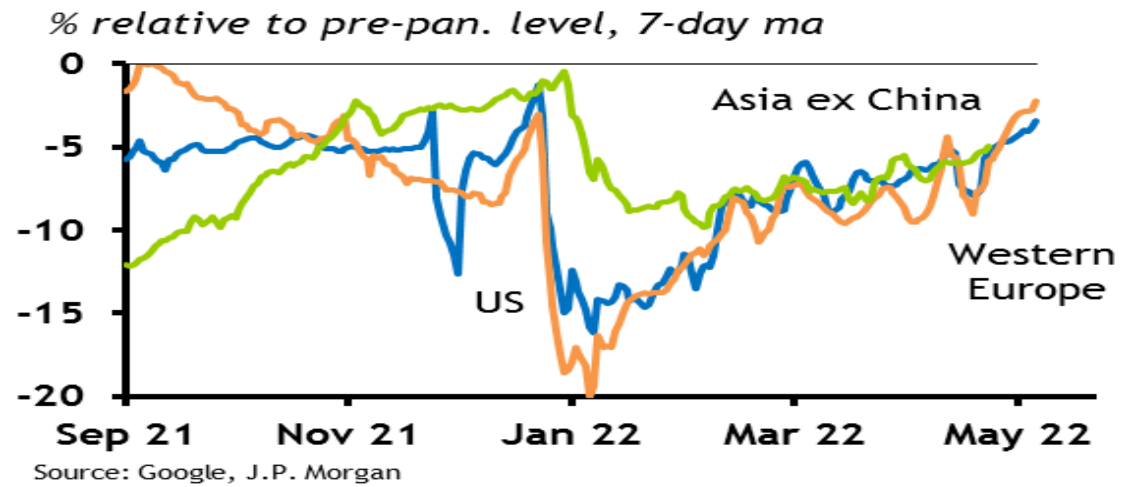
Commodity prices



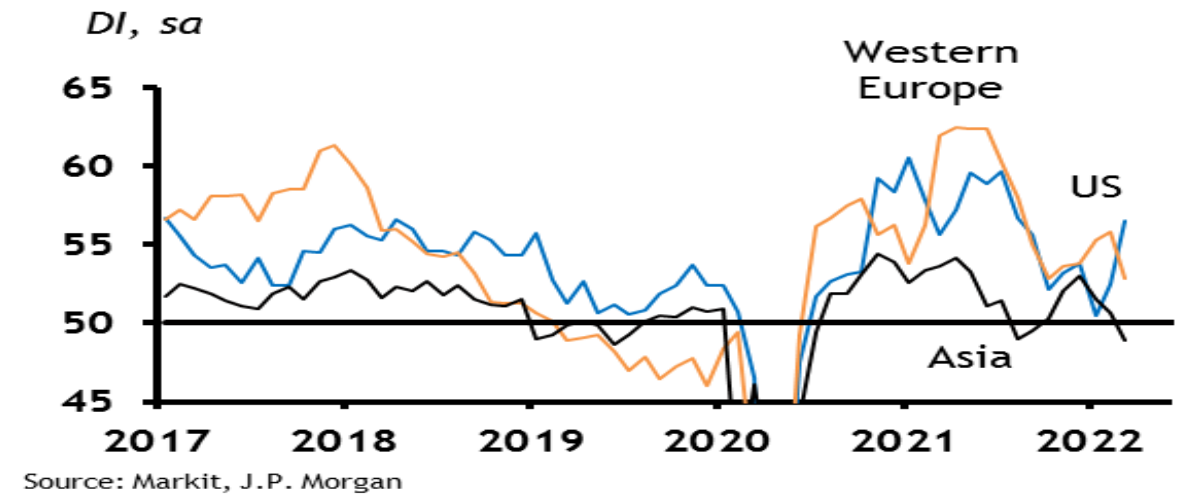
Source: J.P. Morgan

...alongside an Asia COVID drag concentrated in China

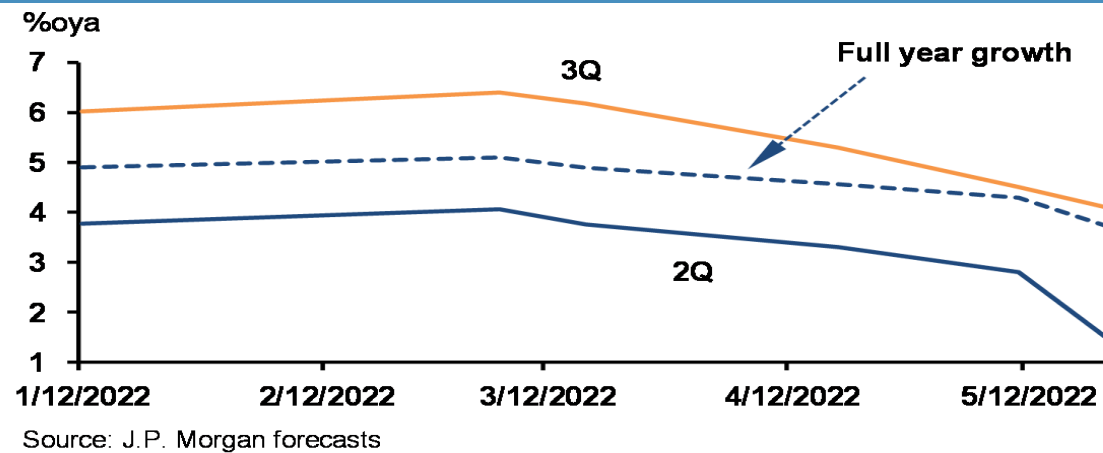
Global Mobility, GAI



Global Manufacturing Output PMI



China forecast revision

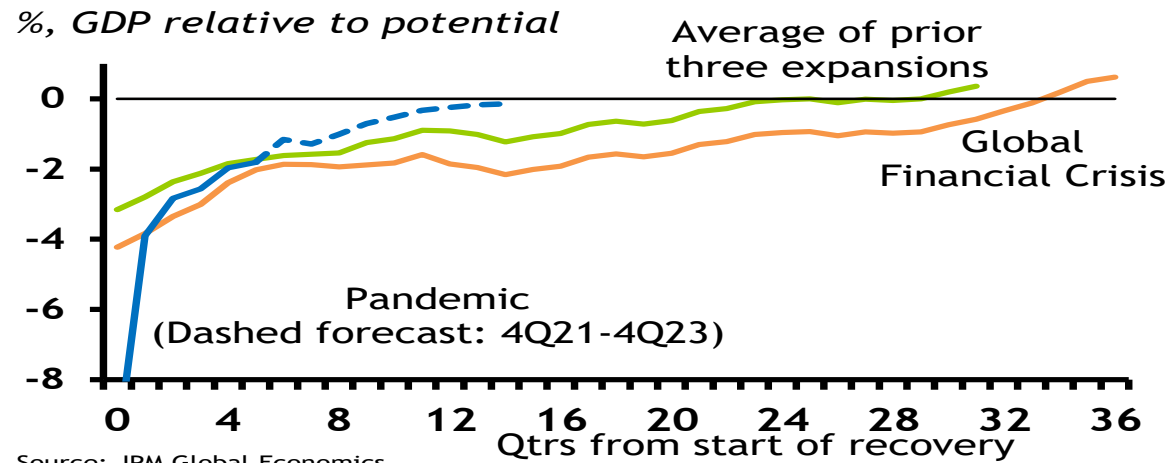


Global Manufacturing PMI



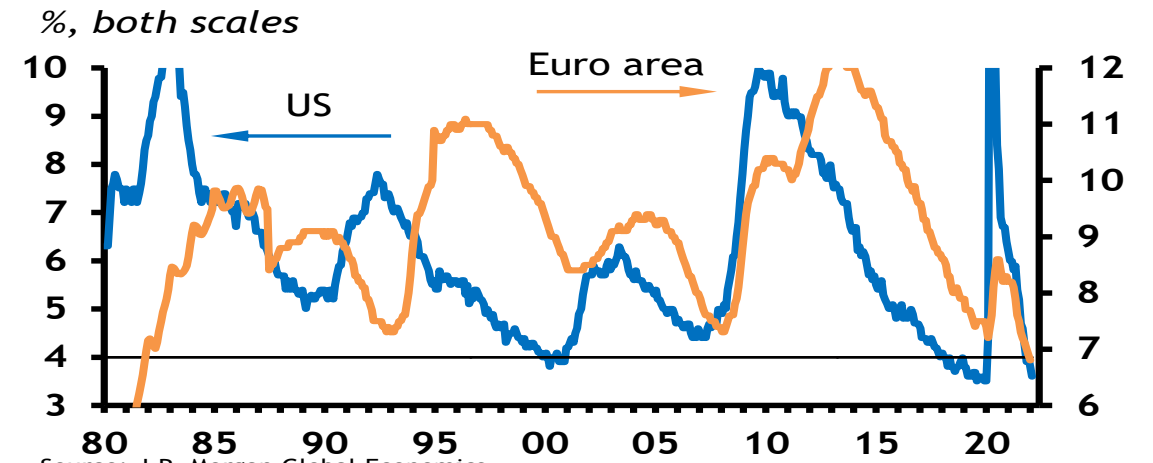
This time is different: Little slack, which is being eaten rapidly

Global output gap

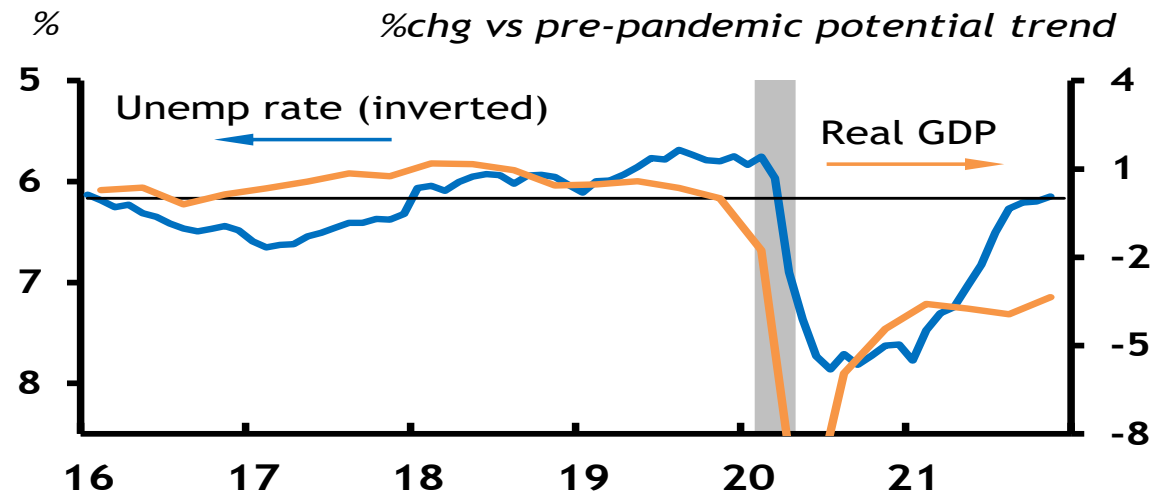


Source: JPM Global Economics

DM unemployment rates

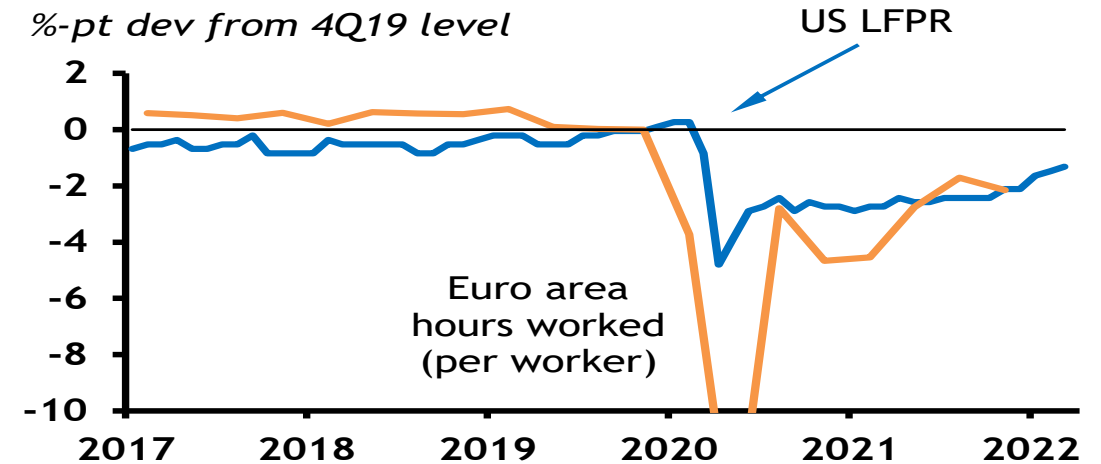


EM unemployment and real GDP



Source: J.P. Morgan Global Economics; EM excludes China and India

DM labor markets

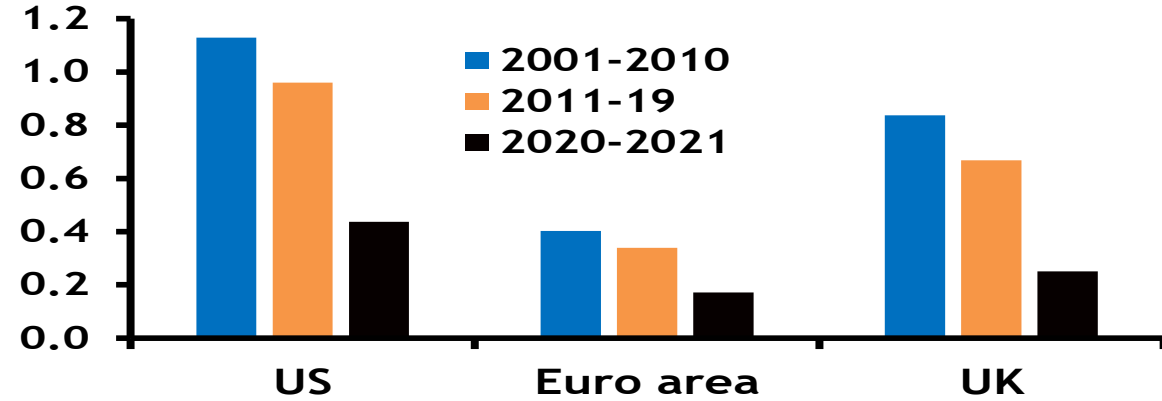


Source: BLS, Eurostat, J.P. Morgan

A risk of lasting changes to global supply

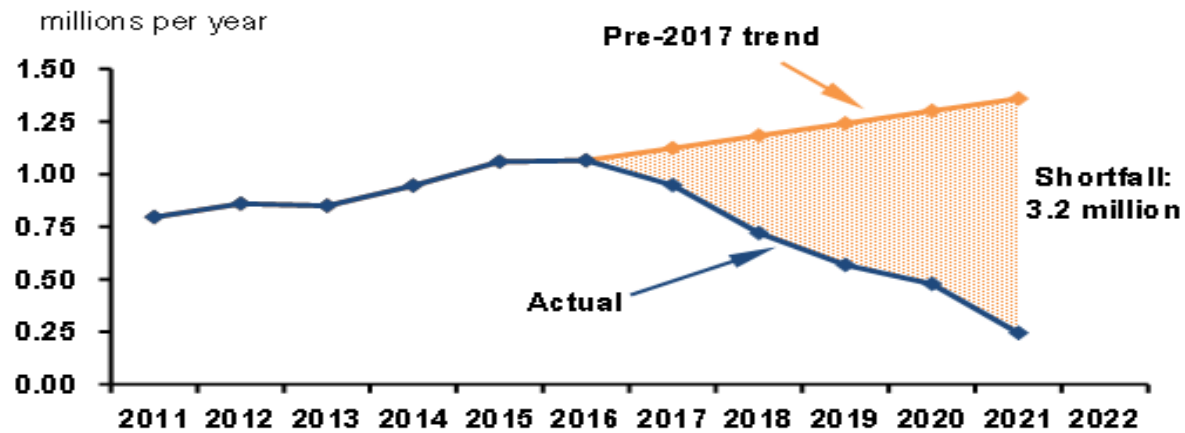
Population growth

Average annual % change



Source: J.P. Morgan Global Economics

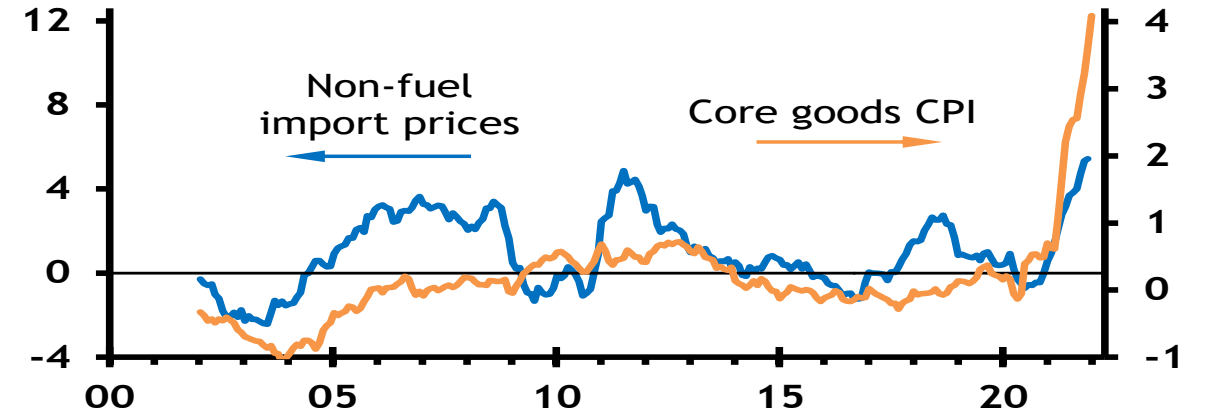
Contribution of net immigration to US population growth



Source: Census Bureau, J.P. Morgan

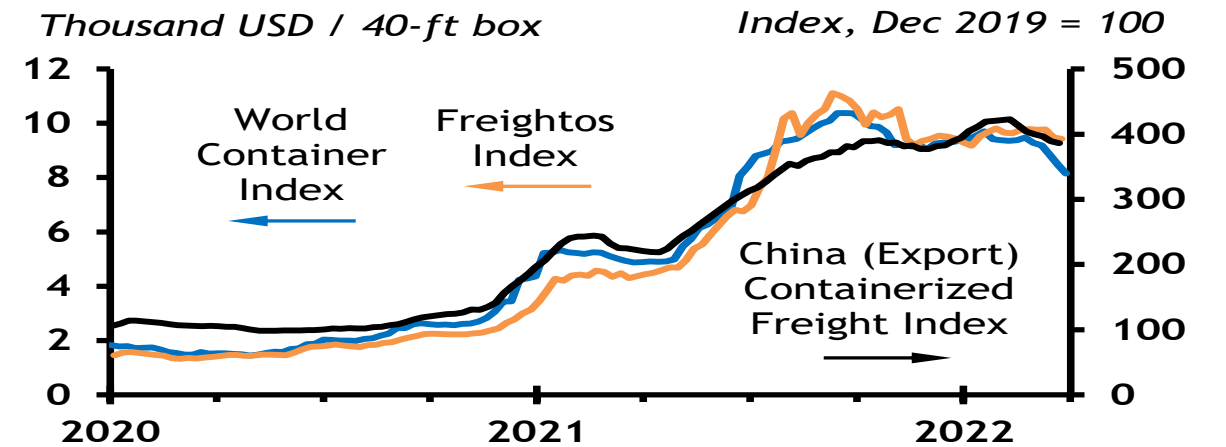
G-4 import prices and core goods CPI

%24m chg; both scales



Source: J.P. Morgan Global Economics

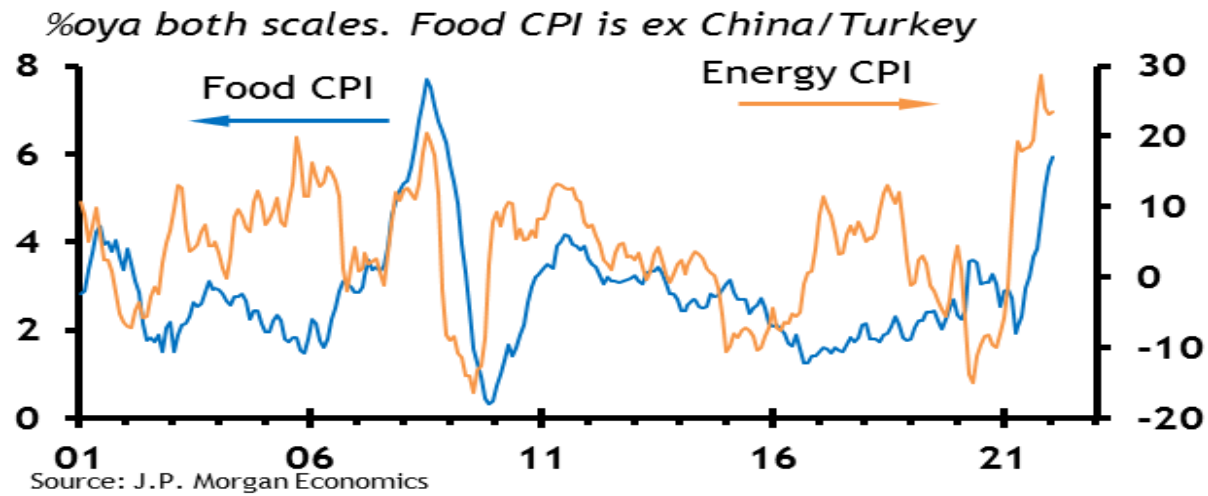
Global container shipping rates



Source: Drewry, Freightos, SSE, VHSS, J.P. Morgan

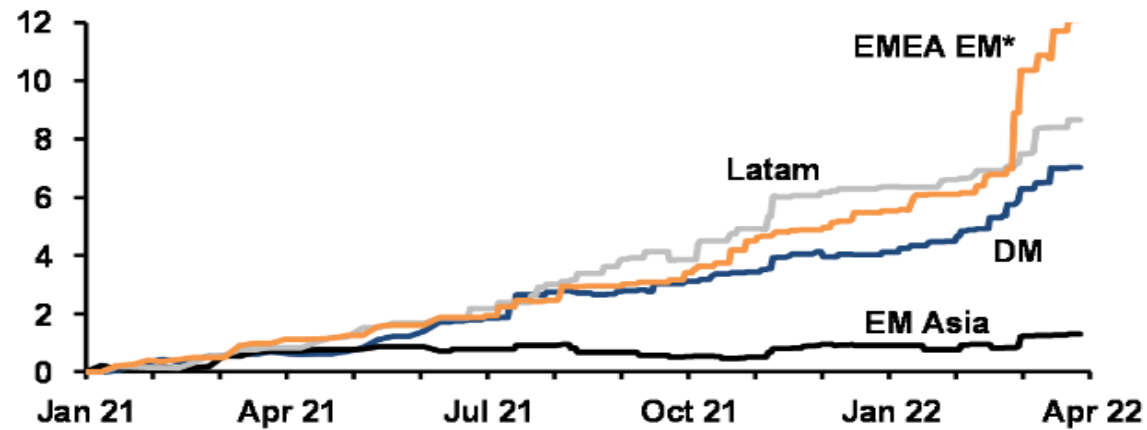
Global inflation has reached its highest level in 40 years, and the shock is broad-based...

Global food and energy CPI



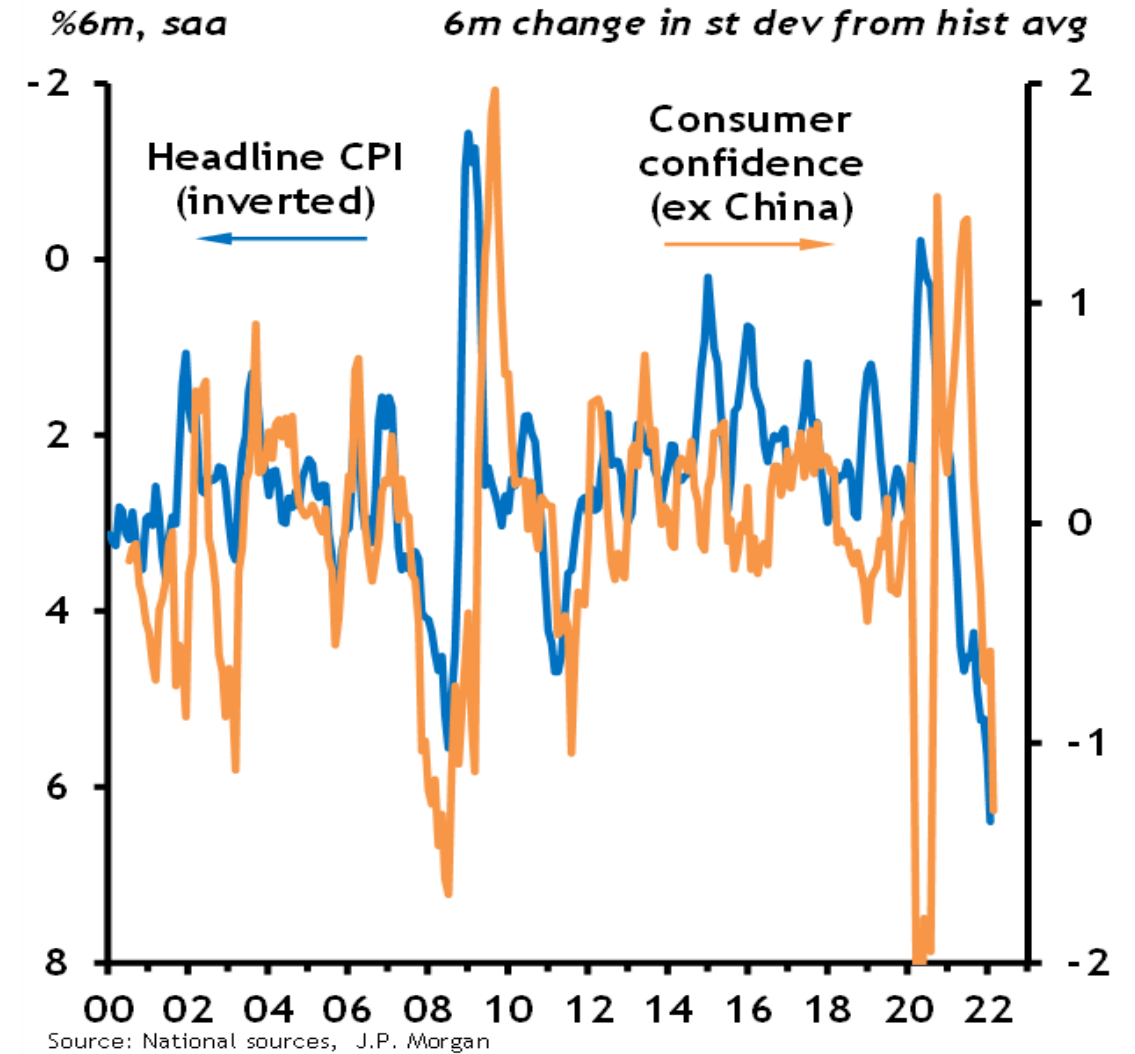
J.P. Morgan Forecast Revision Index, headline CPI

Cumulative %pt chg to rolling year-ahead CPI forecast



Source: J.P. Morgan Global Economics. *Excludes Turkey

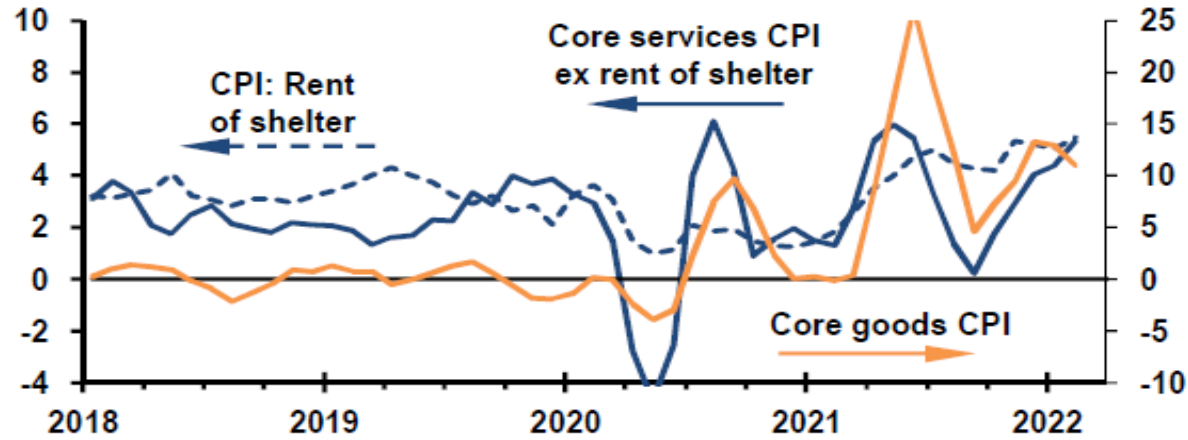
Consumer confidence and CPI, global



US inflationary pressures extend beyond commodities as labor cost pressures are building and rent inflation hits new highs

US core CPI decomposition

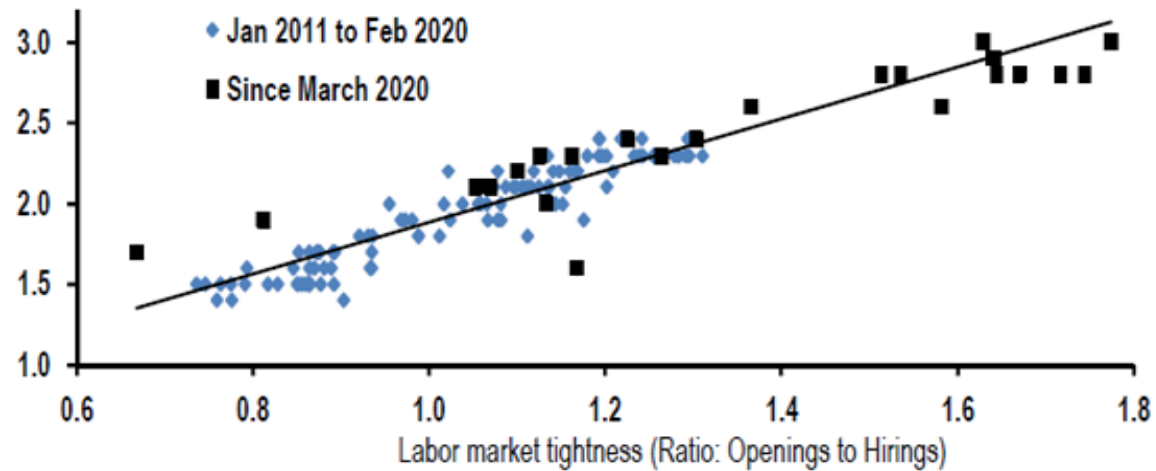
%3m, saar; both axes



Source: BLS, Haver Analytics, J.P. Morgan

Ratio of job openings to hires and the quit rate

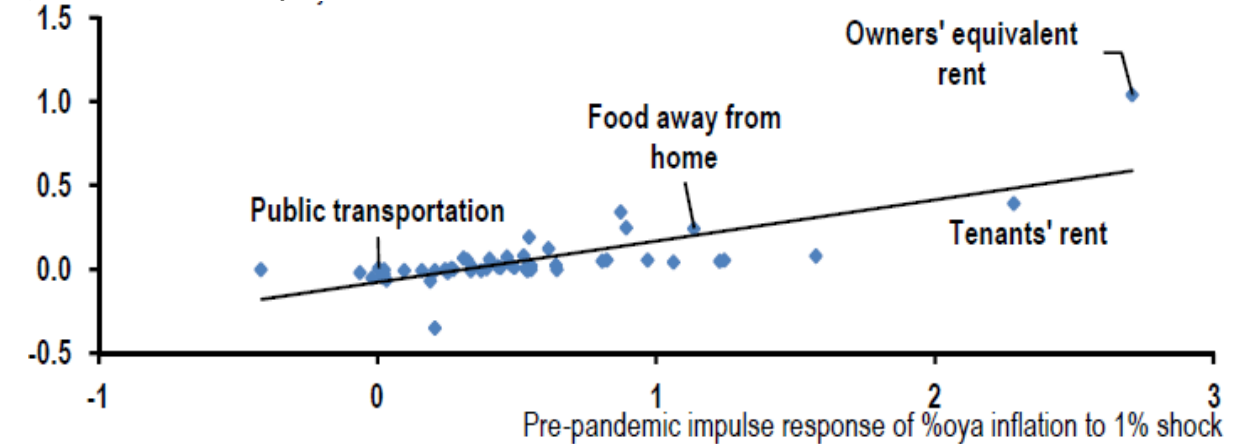
Quit rate



Source: BLS, J.P. Morgan

Contributions to headline CPI and degree of persistence

%, contribution to headline oya inflation in Feb 22

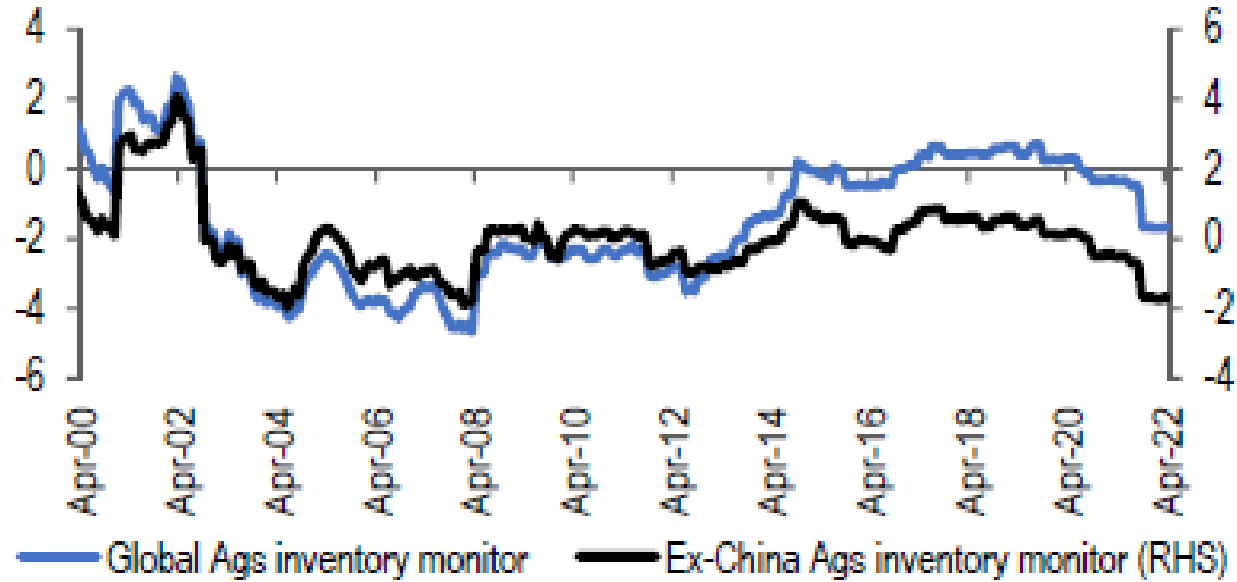


Source: BLS, J.P. Morgan; see note "Inertial inflation to pressure prices in 2022" for details

Rising commodity prices squeeze purchasing power

Agri inventories are critically tight

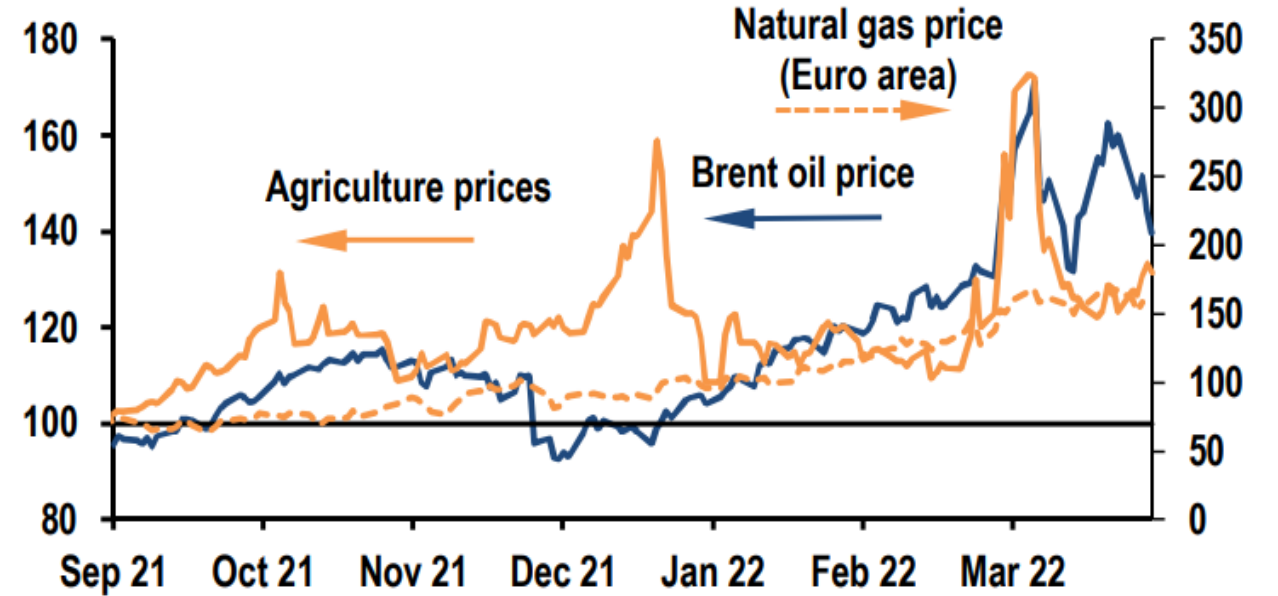
Z-scores of agri commodities inventories as days of use



Source: USDA, Green Pool, Bloomberg Finance L.P., J.P. Morgan Commodities Research

Food and energy commodity prices

Index: September 2021 = 100, both scales

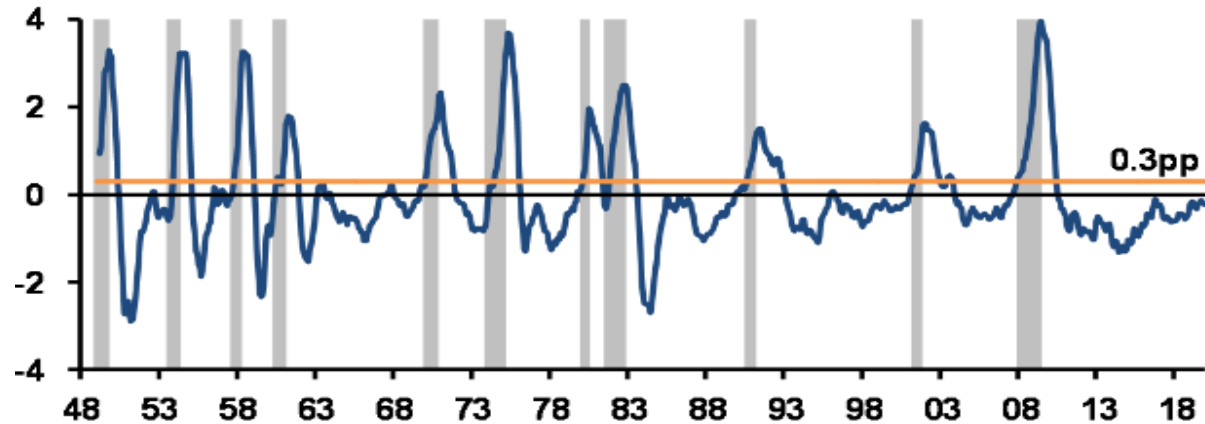


Source: J.P. Morgan Global Economics

Labor tightness is real and, together with the Fed's reactive policy setting, raises the risk that this cycle will not end with a soft landing

Whenever the 3-month moving average of the unemployment rate moved up 0.3%-point or more, over any time period, it was a sign the economy was in a recession or about to enter one

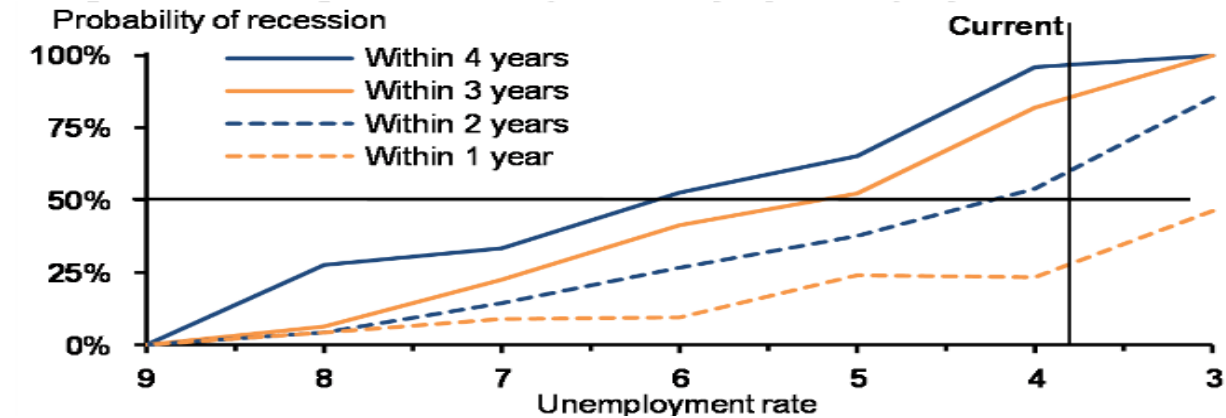
Unemployment rate, 12-mo change in 3mma



Source: BLS, J.P. Morgan

At the current level of the unemployment rate, there is a greater than even chance of recession within the next two years

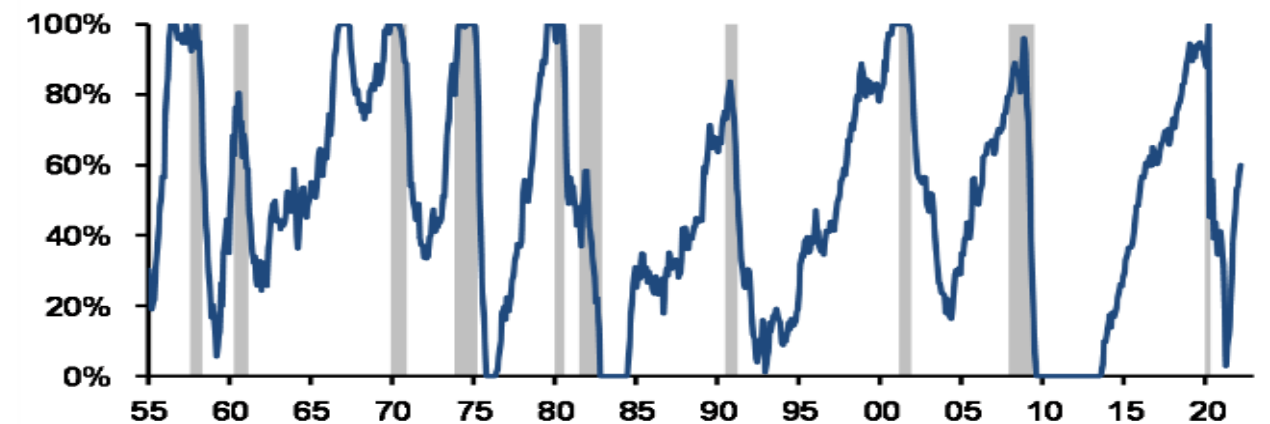
Average recession probability by unemployment rate



Source: BLS, J.P. Morgan; Vertical line is current unemployment rate

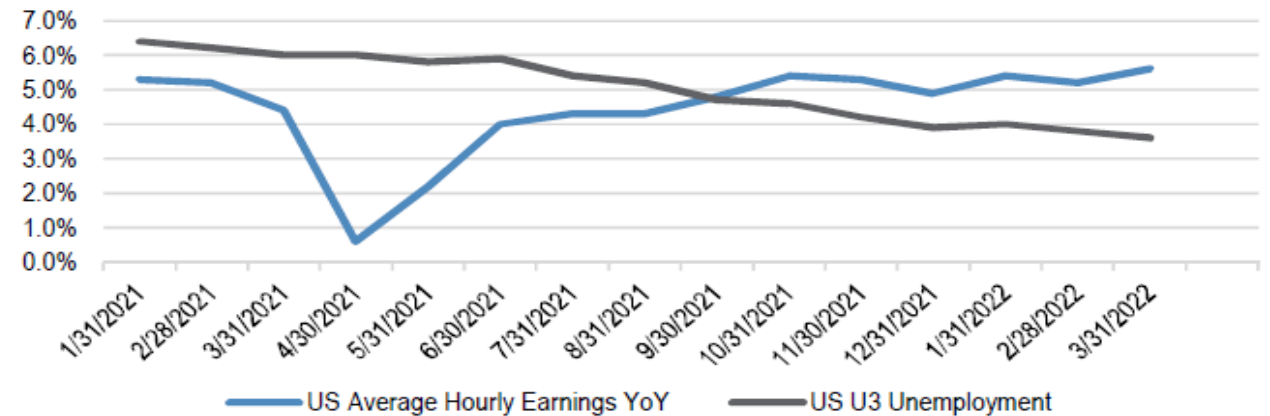
The empirical regularity behind the Dudley rule is one important factor why our recession models are showing elevated recession risks over the medium-term horizon

JPM model-based 3-year recession probability



Source: Various government and non-government sources, J.P. Morgan

Labor market tightness is real

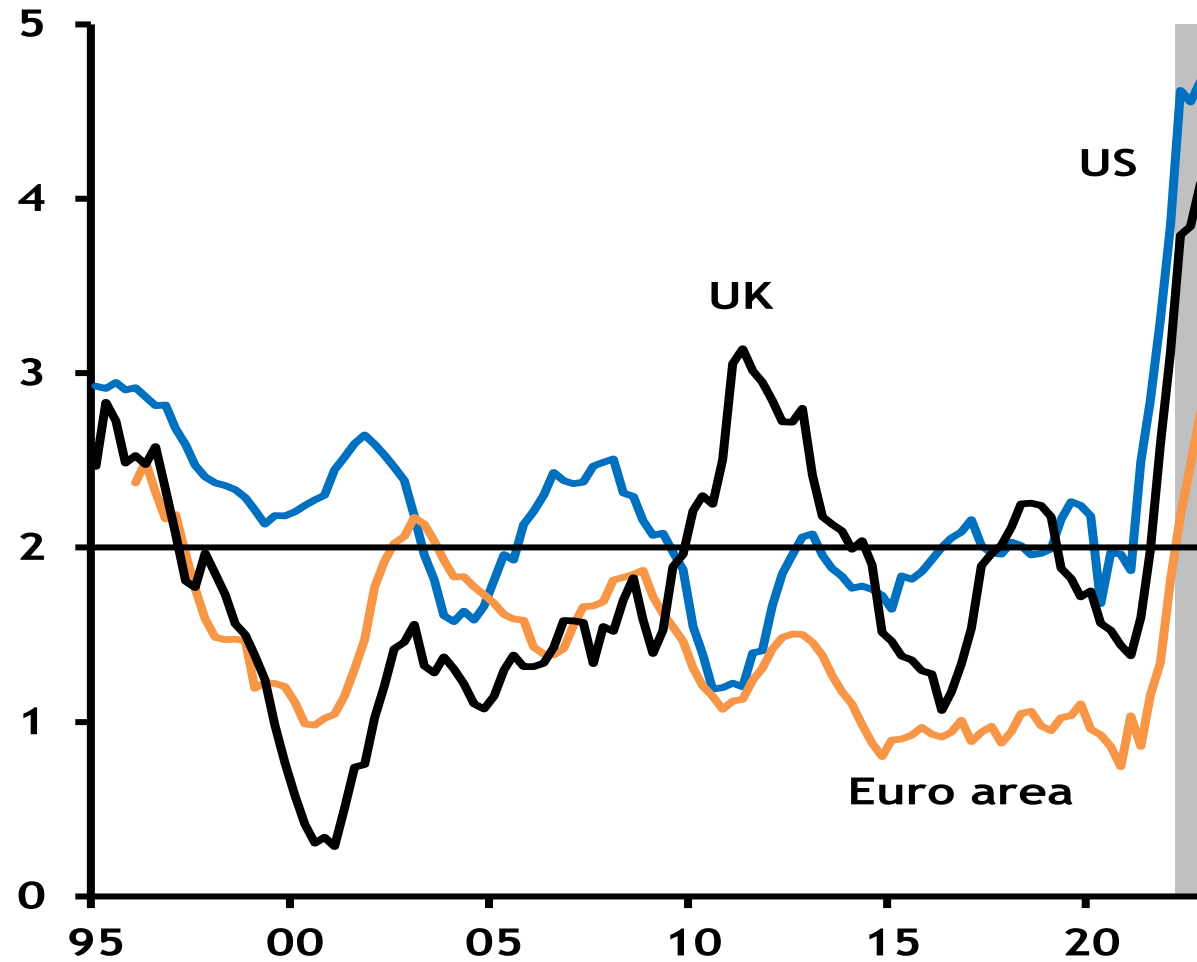


Source: BLS and J.P. Morgan estimates.

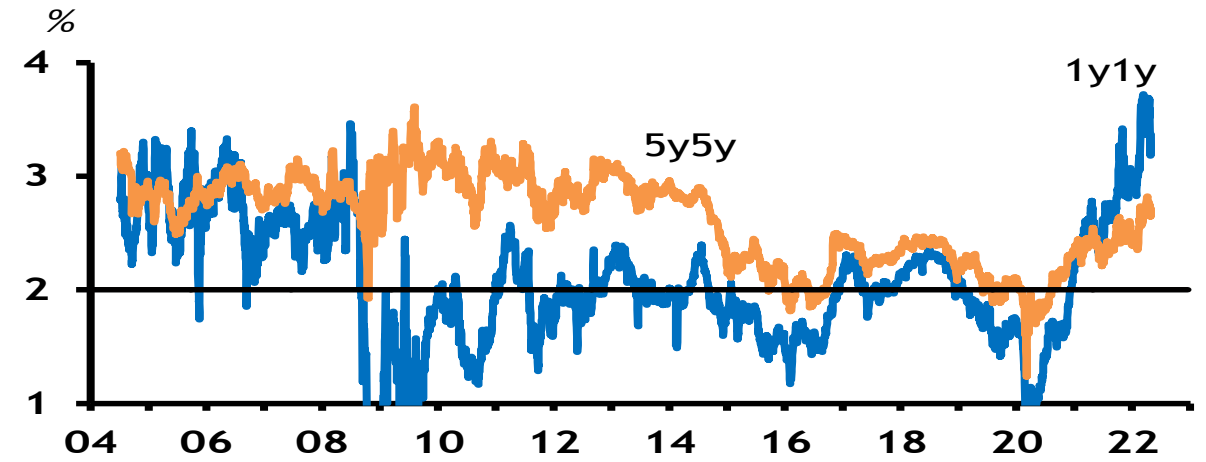
Rising concerns that the inflation process is shifting

Core CPI

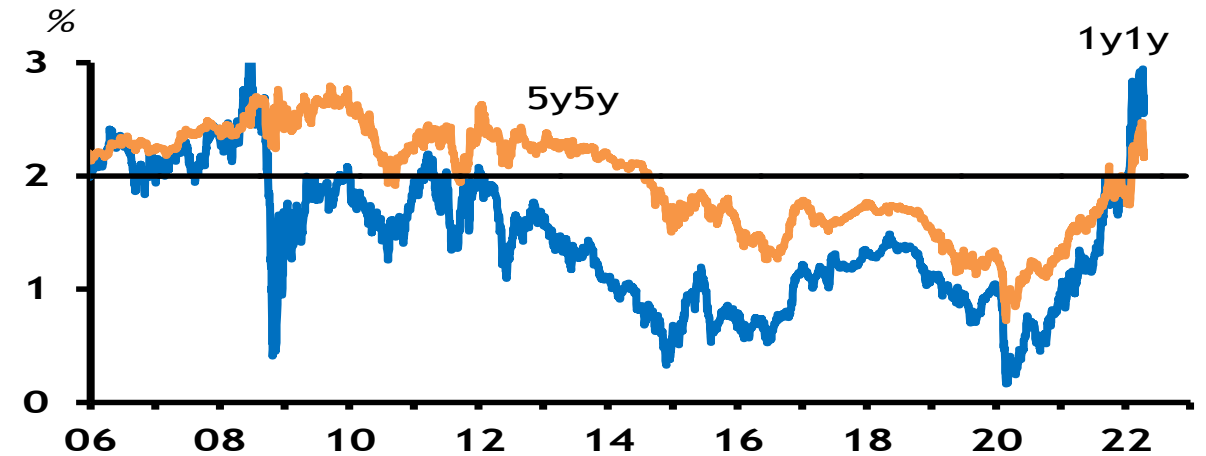
% change over 8 quarters, saar



US inflation swaps



Euro area inflation swaps

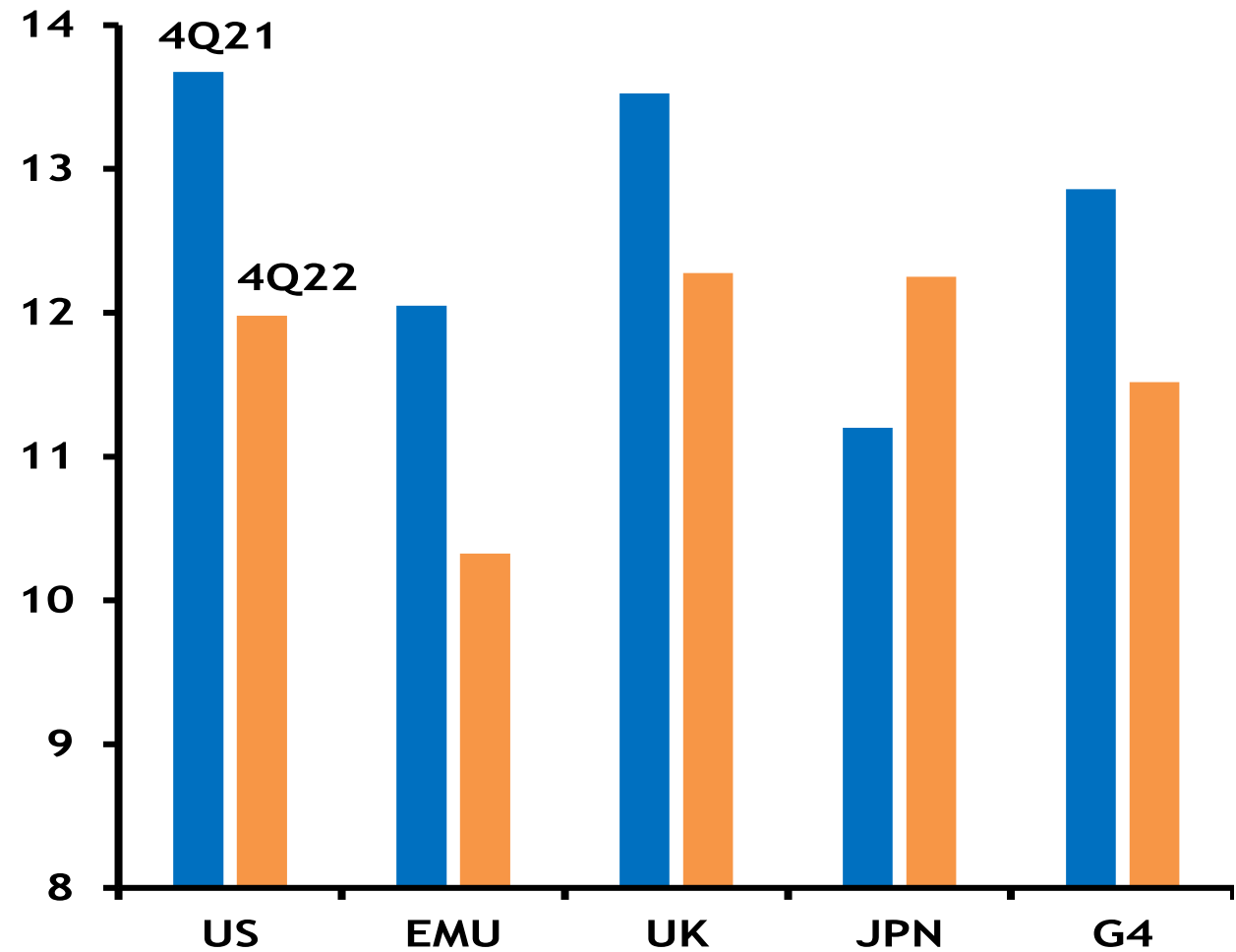


Source for all charts: J.P. Morgan Global Economics

Silver lining: Household balance sheets are remarkably healthy, making this time different...

Excess household saving forecast, G4

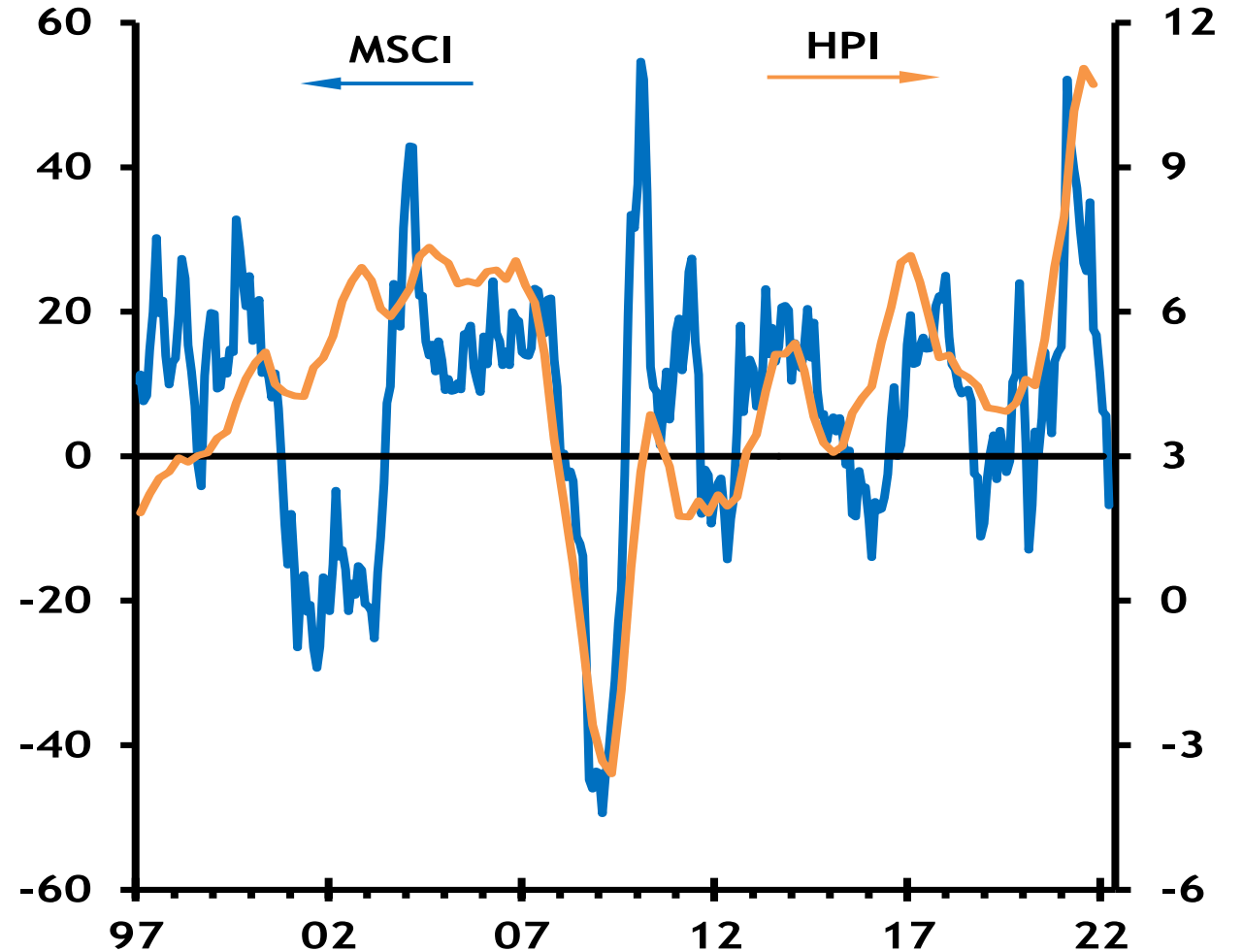
% of HH income, cum. saving since 4Q19 less 2019 pace



Source: J.P. Morgan Global Economics

Equity and house prices, global

% oya; both scales

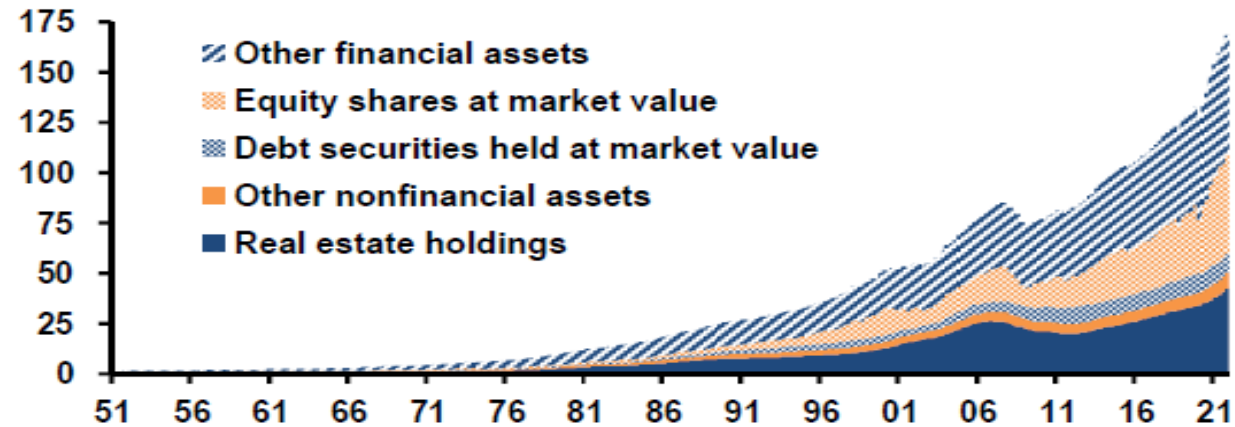


Source: MSCI, Bloomberg Finance, L.P., J.P. Morgan Global Economics

...but household wealth has fallen by \$5tn-\$8tn YTD, and US and European savings rates will return to long-term averages by year-end

Assets of households and nonprofits

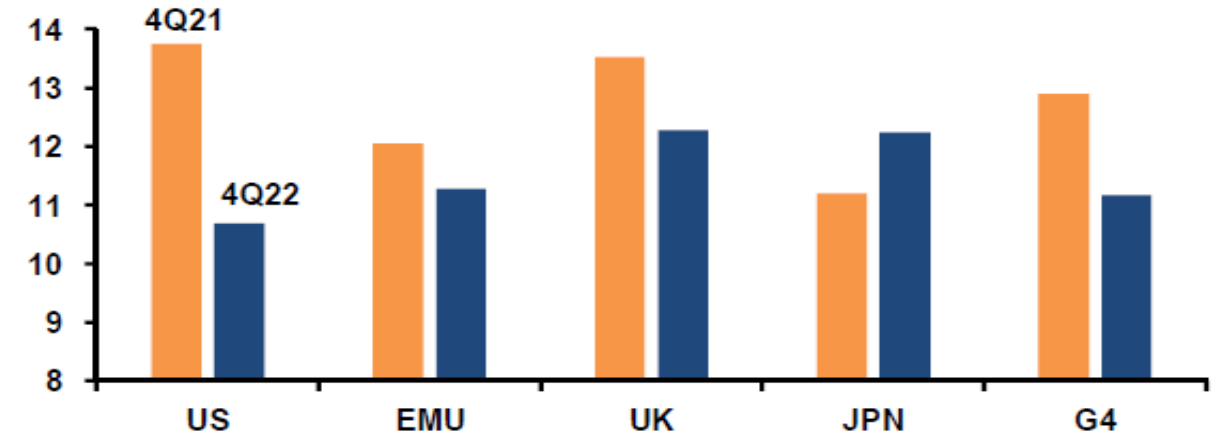
\$tr, end of quarter



Source: Federal Reserve Board, J.P. Morgan

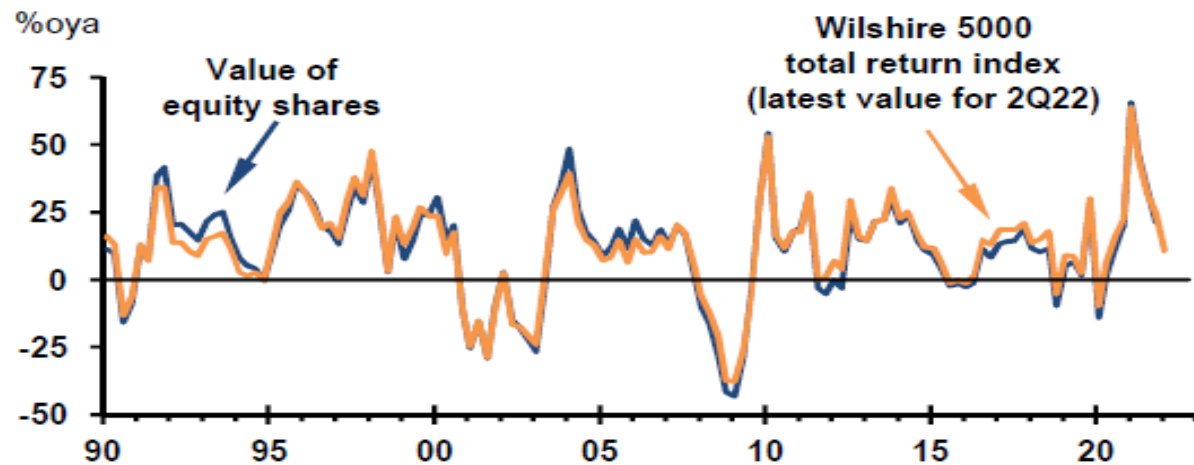
Excess household saving forecast, G4

% of household income, cumulative saving since 4Q19 less 2019 pace



Source: J.P. Morgan Global Economics

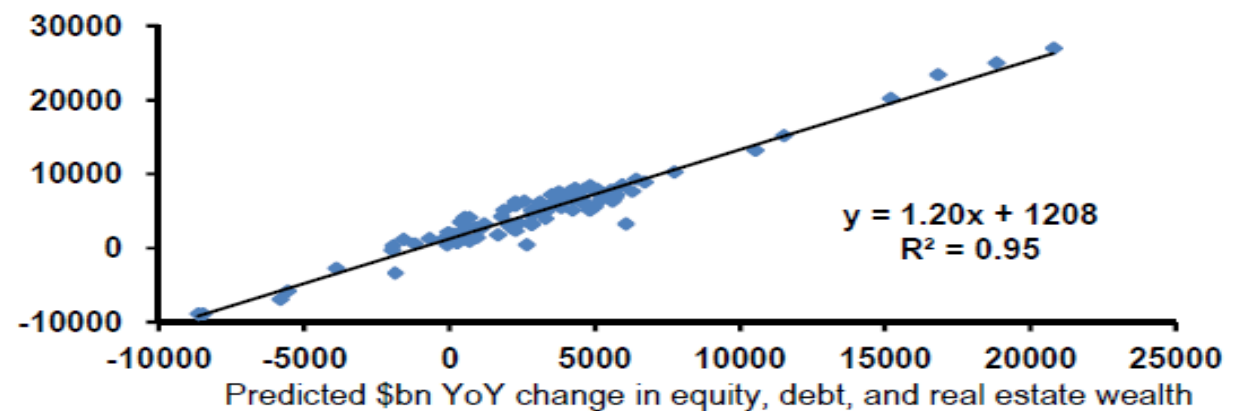
Equity shares at market value and stock prices



Source: Federal Reserve Board, Wilshire, J.P. Morgan

Total assets & predicted equity, debt, and real estate wealth

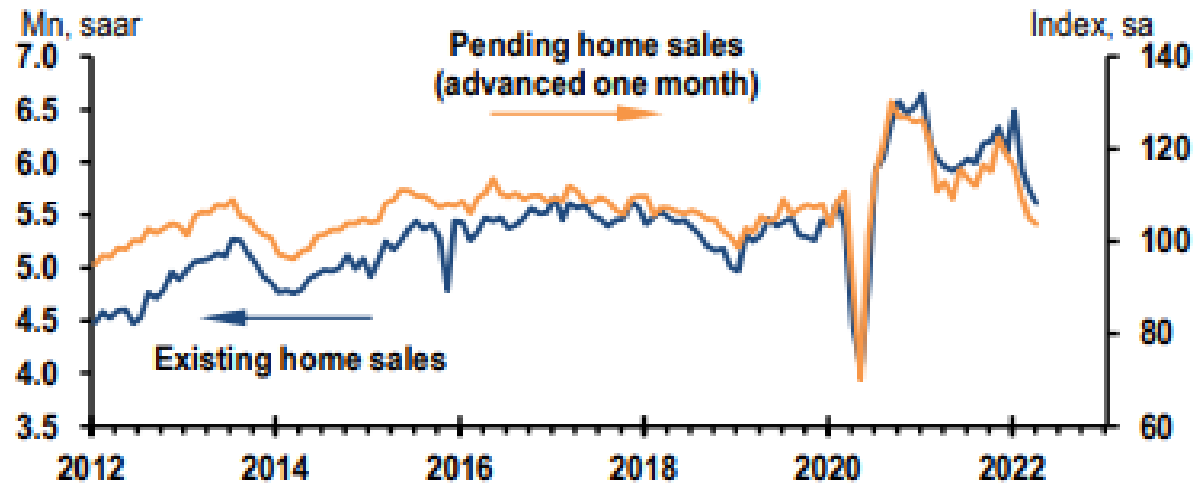
\$bn YoY change in total assets



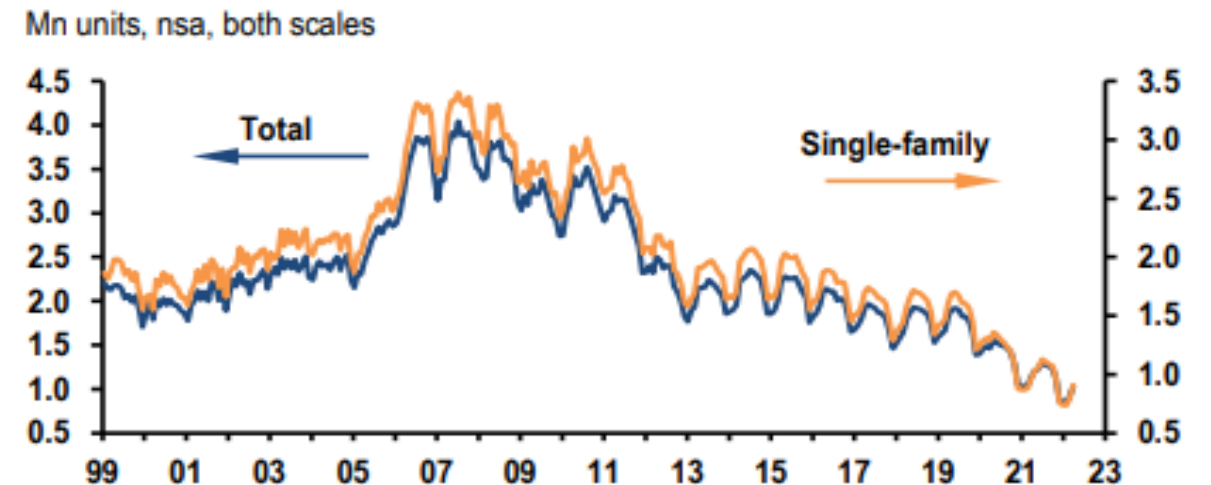
Source: Dow Jones, Federal Reserve Board, Wilshire, S&P, J.P. Morgan
 Predicted \$-changes based on over-year-ago percent changes in related price data

Demand for housing is being negatively impacted by the move up in mortgage rates

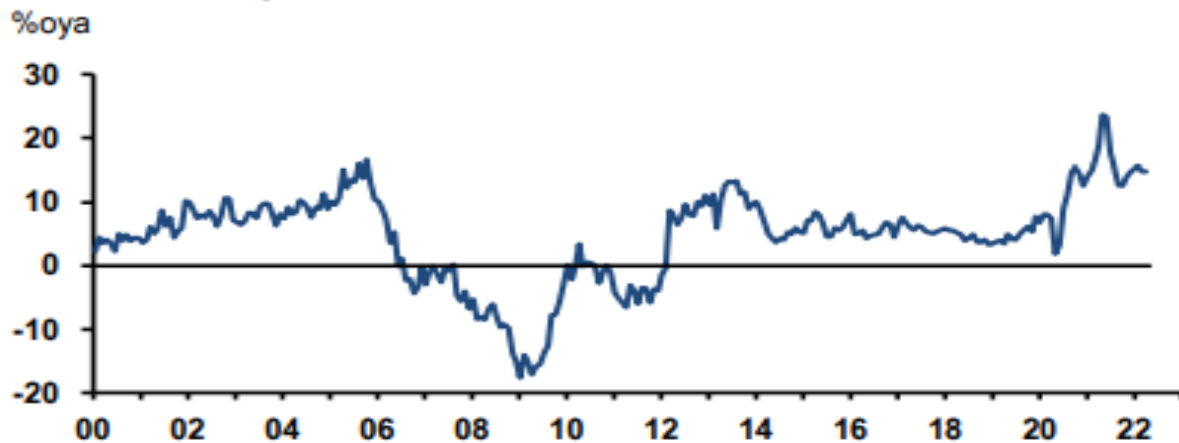
Existing and pending home sales



Existing homes available for sale



Median existing home sale price

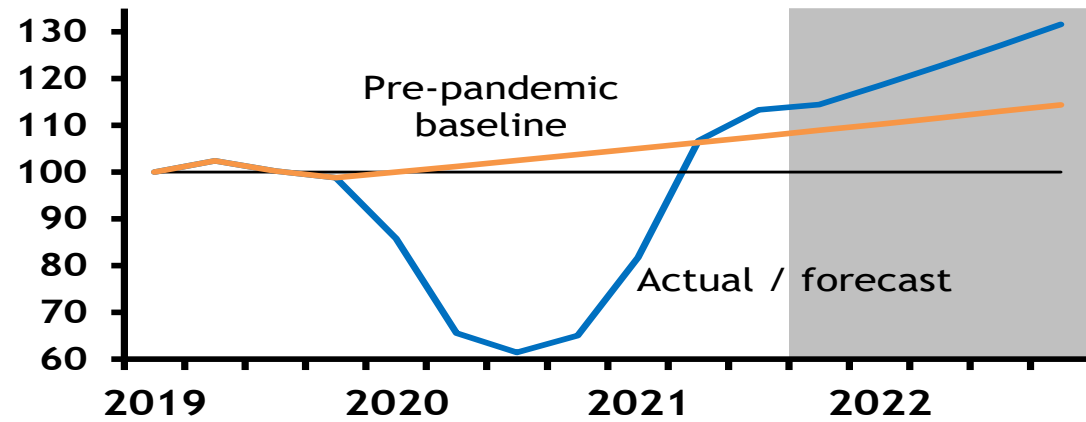


Source: NAR, J.P. Morgan

...but corporate liquidity and profits remain strong

Global corporate profits, level

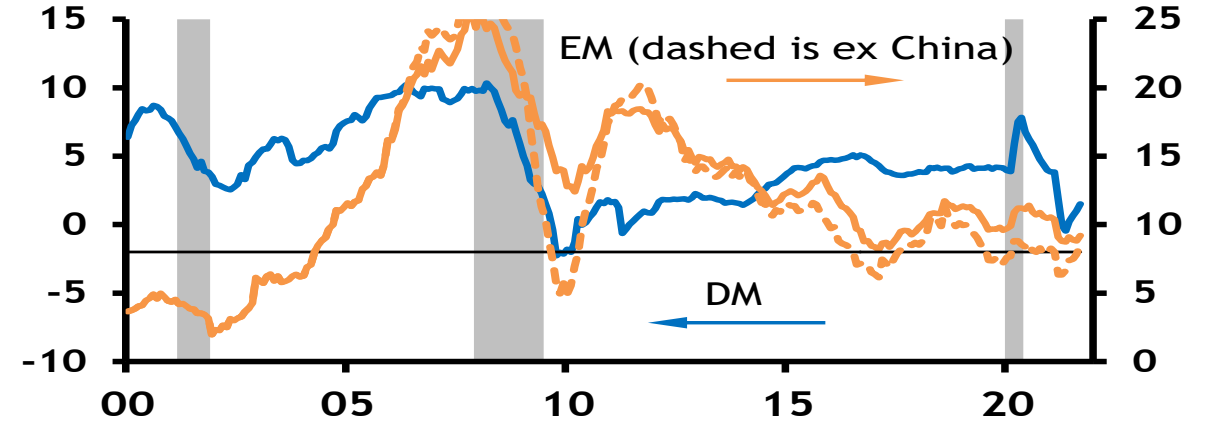
Index, 4-quarter average



Source: J.P. Morgan; GDP-weighted MSCI (Bloomberg Finance L.P.) by country

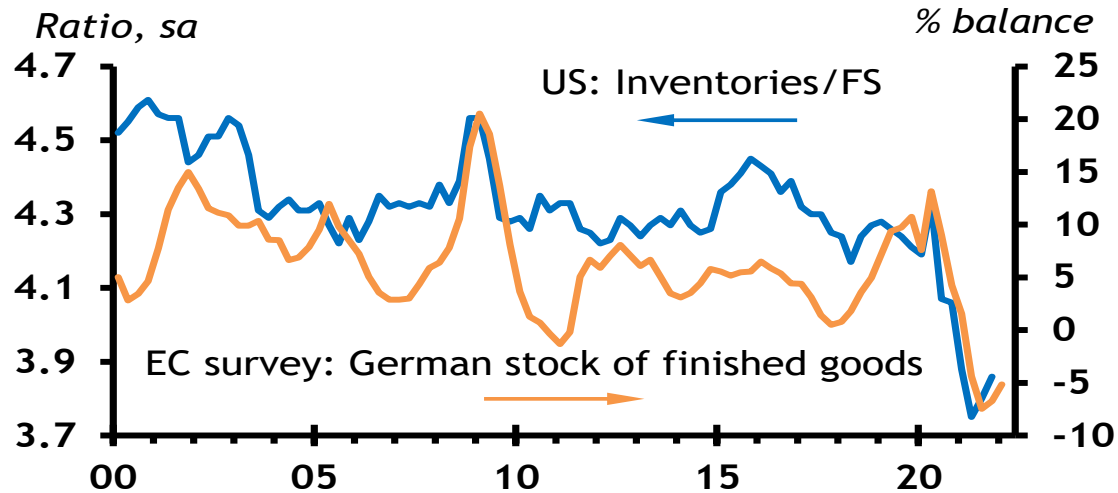
Domestic bank loans

% oya, both scales



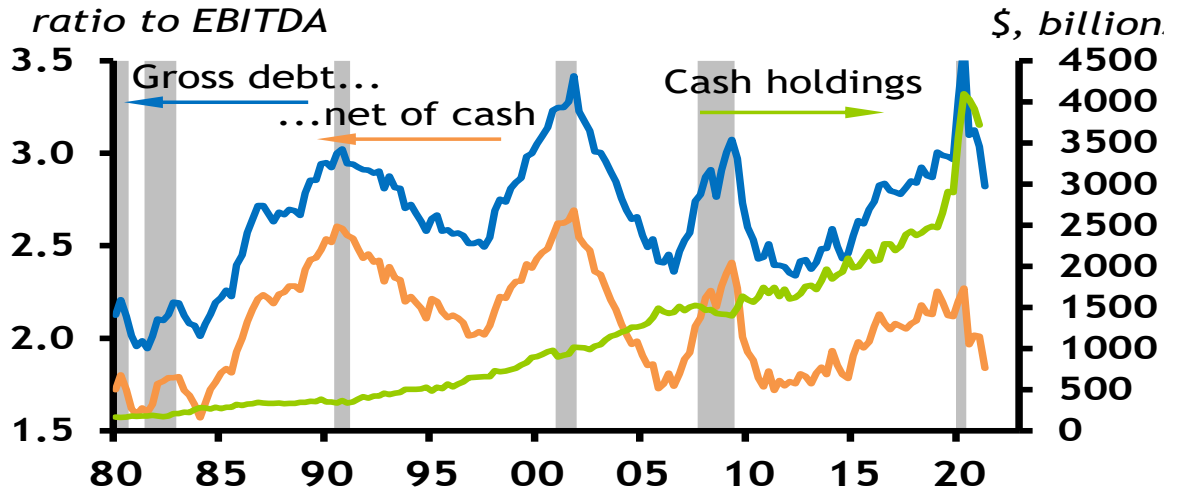
Source: J.P. Morgan Global Economics

Inventory cycle indicators



Source: BEA, European Commission, J.P. Morgan

US nonfinancial corporate balance sheet



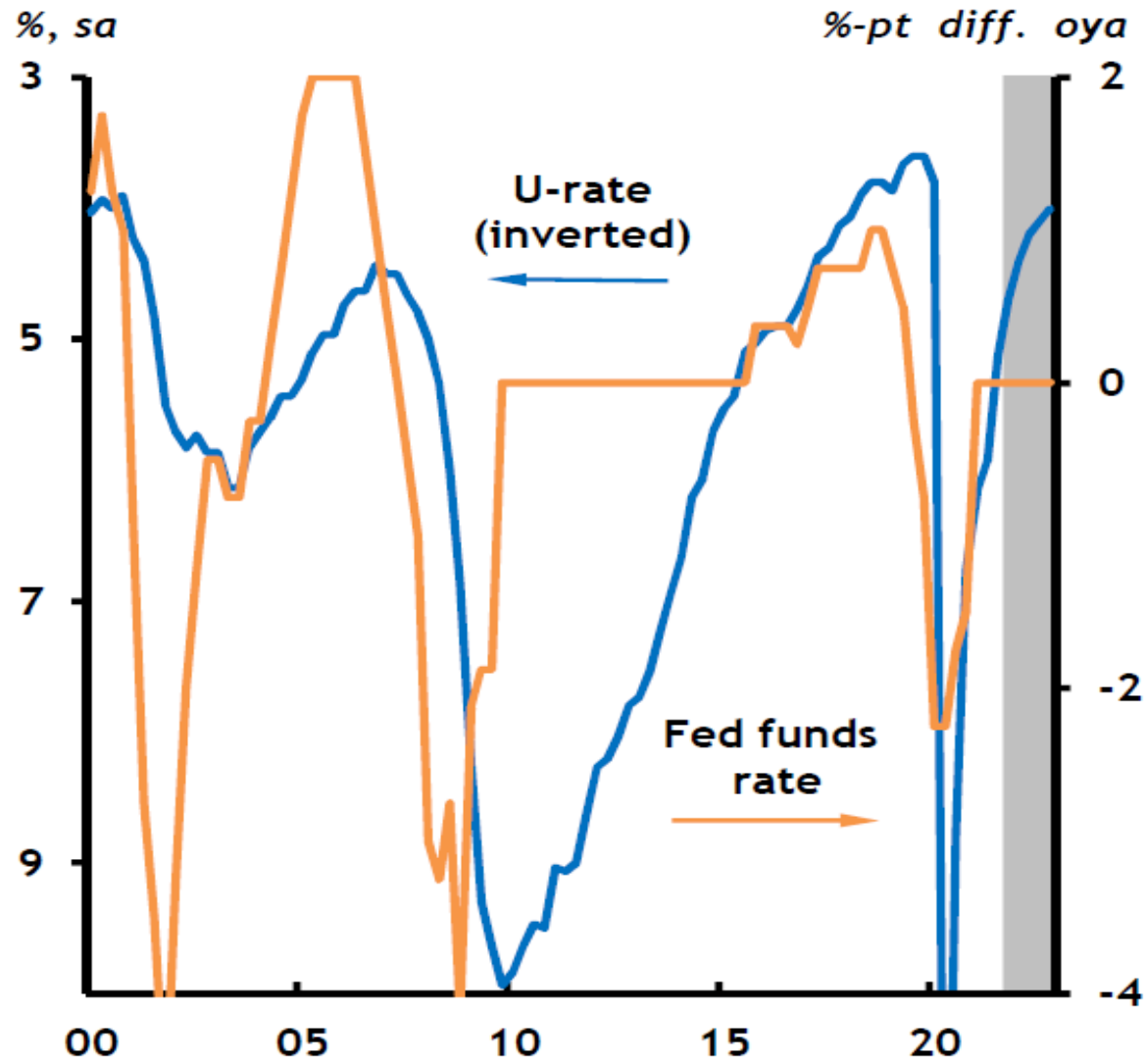
Source: Federal Reserve, BEA, J.P. Morgan

Agenda

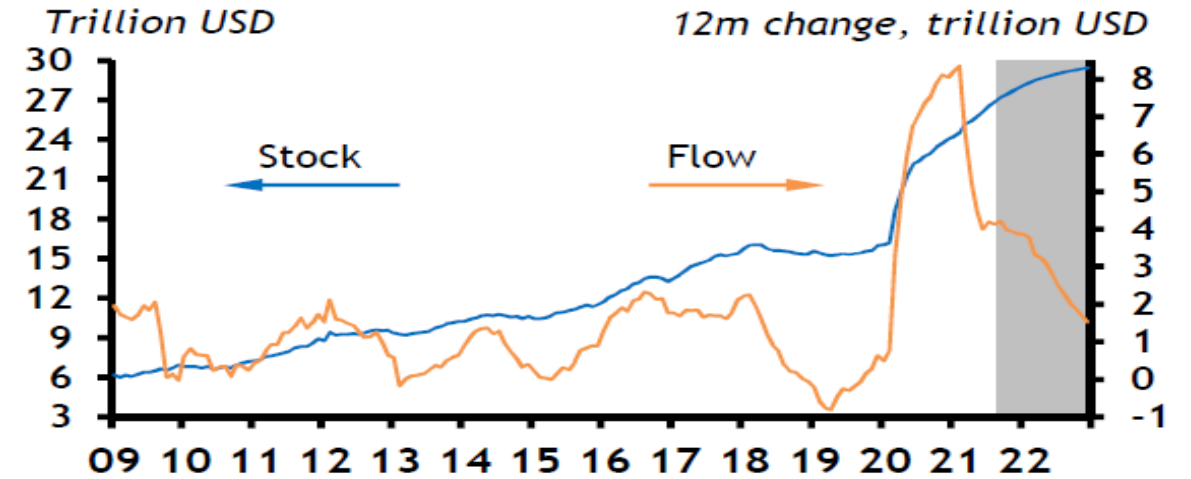
		Page
1	Economic Outlook and Macro Drivers: Higher inflation, tight labor markets, supply constraints and higher commodity prices weigh on growth	1
2	Risks ahead: Higher debt, fiscal costs, tighter financial conditions and increased US-China tensions	17

Calculating the cost of the pandemic: DM central bank balance sheets ballooned while policy rates remained at the lower bound

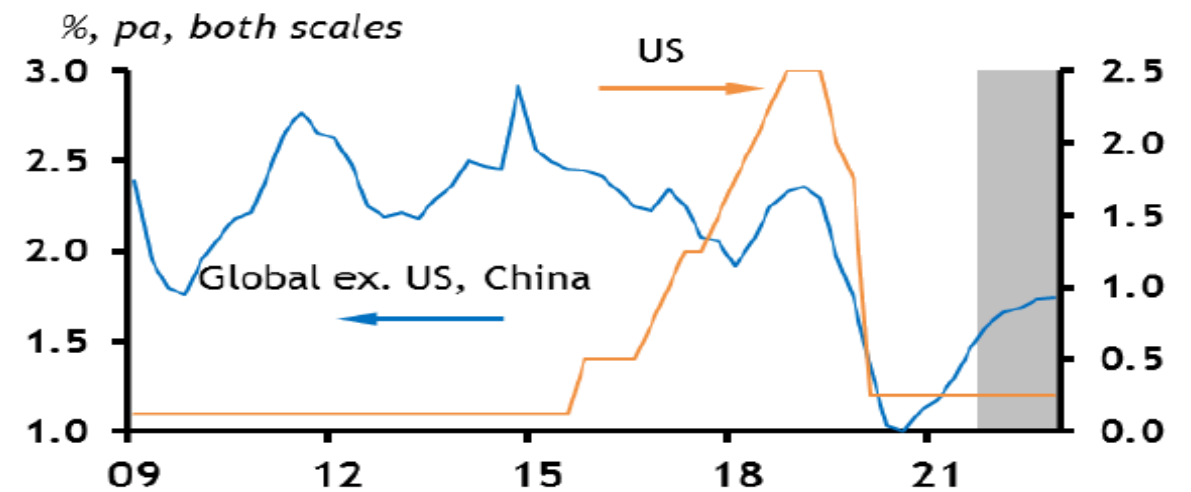
US U-rate & Fed funds rate



DM central bank balance sheet



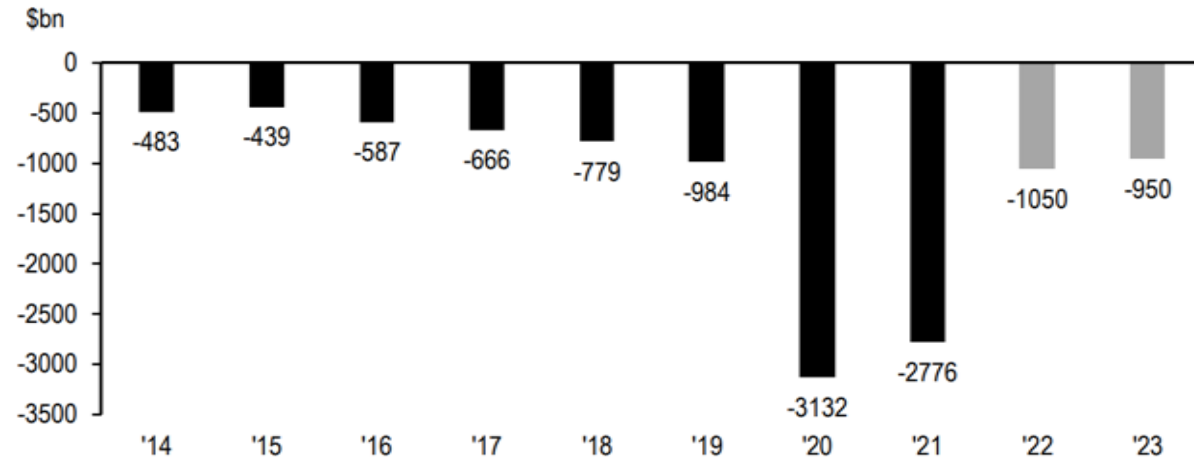
Central bank policy rates



Source for all charts: J.P. Morgan Global Economics

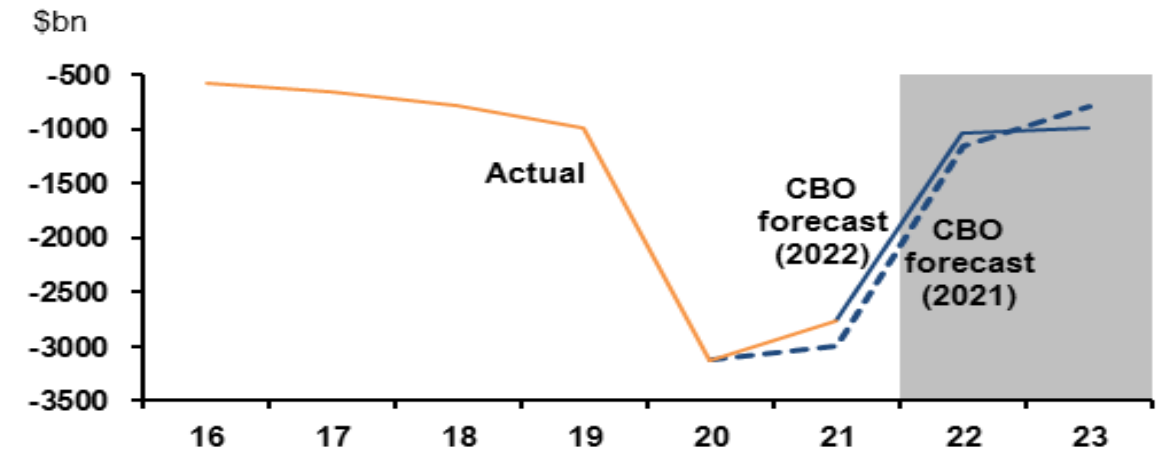
Federal budget deficit soared to 20% of GDP in 2020 and should decline sharply from the pandemic years with a projected budget deficit of \$1.05trn in FY22

Annual budget balance by fiscal year*



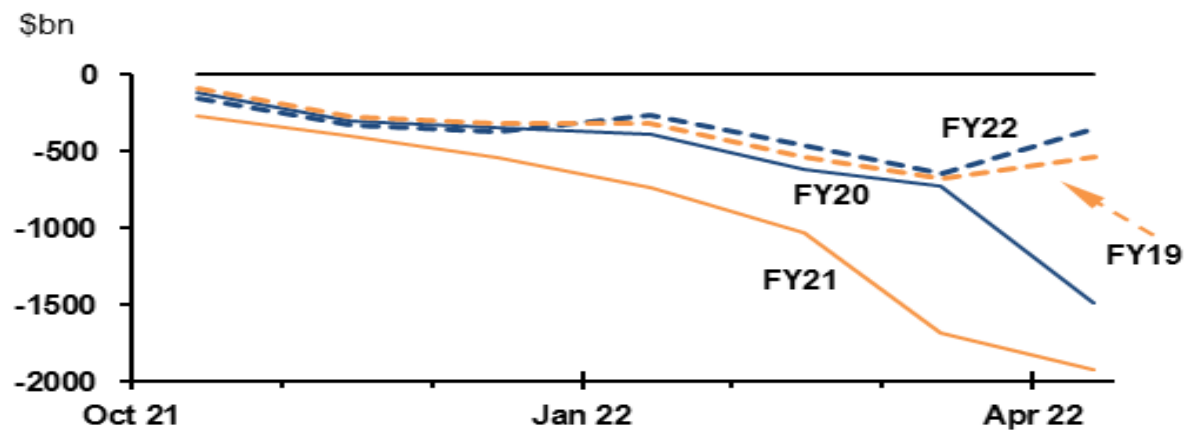
Source: J.P. Morgan, US Treasury
*FY22 and FY23 are J.P. Morgan forecasts

Federal budget deficit, CBO and realized



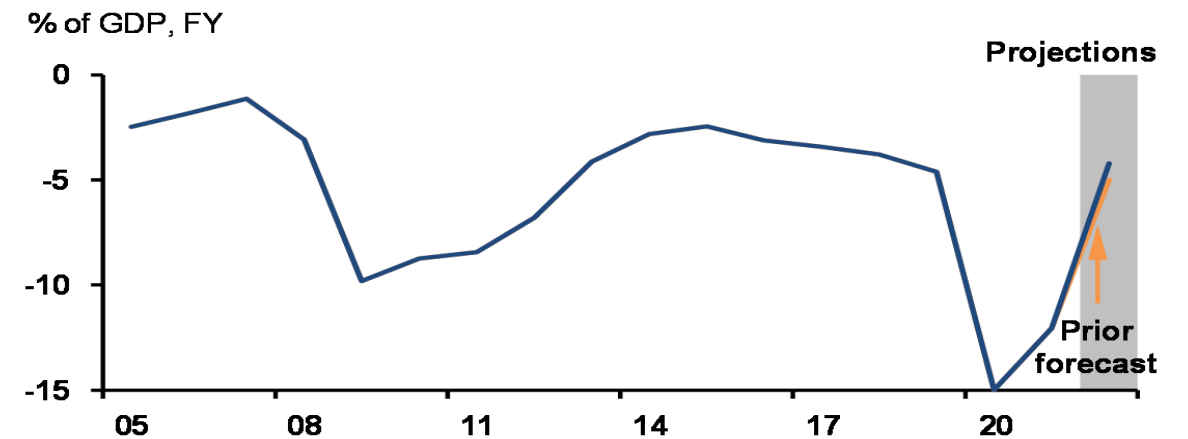
Source: CBO, US Treasury, J.P. Morgan

Federal budget deficit, first half of fiscal years



Source: J.P. Morgan, US Treasury

Federal budget surplus/deficit

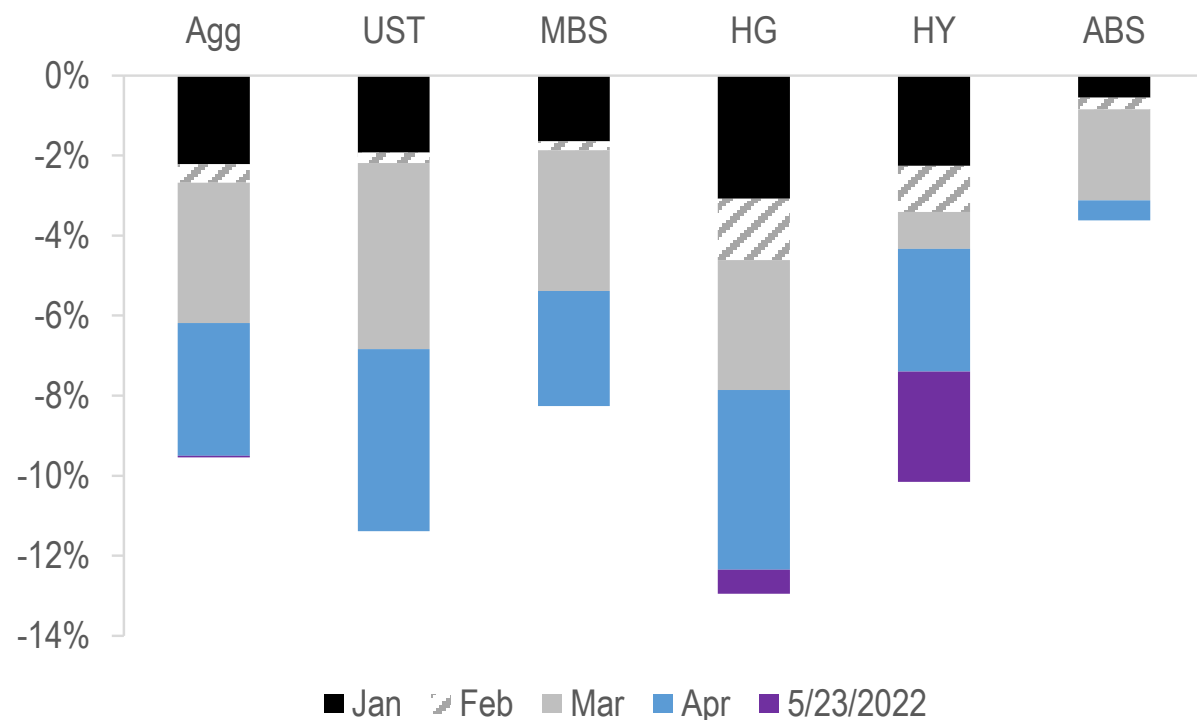


Source: OMB, J.P. Morgan forecasts

Rising concerns on financial stability as rise in rates fuels weakest US fixed income total returns in 40+ years, while US equities are having their 4th worst start of the past century

The sharp rise in rates is fueling the weakest total returns in 40+ years

Cumulative YTD total returns by asset class through 5/23/22; %



AGG = Bloomberg US Aggregate; UST = JPM GBI-US; MBS = JPM MAXX; HG = JPM JULI;
 HY = JPM HY Index; ABS = Bloomberg ABS Index.
 Source: J.P. Morgan; Bloomberg Finance L.P.

Worst starts in last 95 years

Using Daily Data, As of 24 May 2022 Close

Worst Starts Since 1927 (As of 5/24)

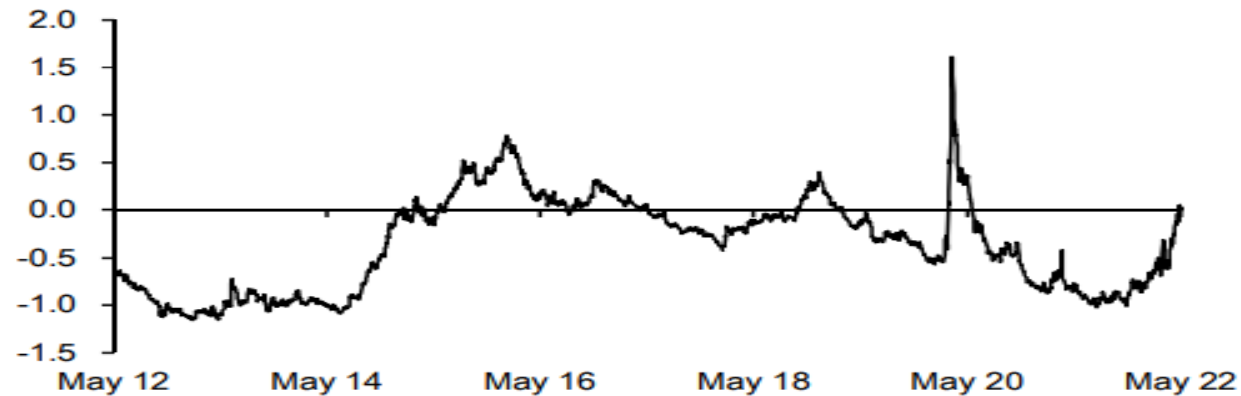
#	Year	Events	YTD	5/20 to YE
1	1932	Great Depression	-35.8%	32.8%
2	1940	World War II	-26.5%	15.5%
3	1970	Vietnam War/Tightening	-21.5%	27.5%
4	2022	Current	-17.3%	?
5	1962	Kennedy Slide	-15.3%	4.1%
6	1939	World War II	-13.0%	9.0%
7	1941	World War II	-10.8%	-7.9%
8	1973	Oil Shock	-9.2%	-9.0%
9	1974	OPEC Embargo/Stagflation	-9.2%	-22.6%
10	1931	Great Depression	-9.1%	-41.8%

Source: J.P. Morgan Equity Macro Research

Financial conditions have tightened while market liquidity has dropped across markets

Financial conditions have tightened rapidly over the last 6 months, reaching levels last seen in late-2018

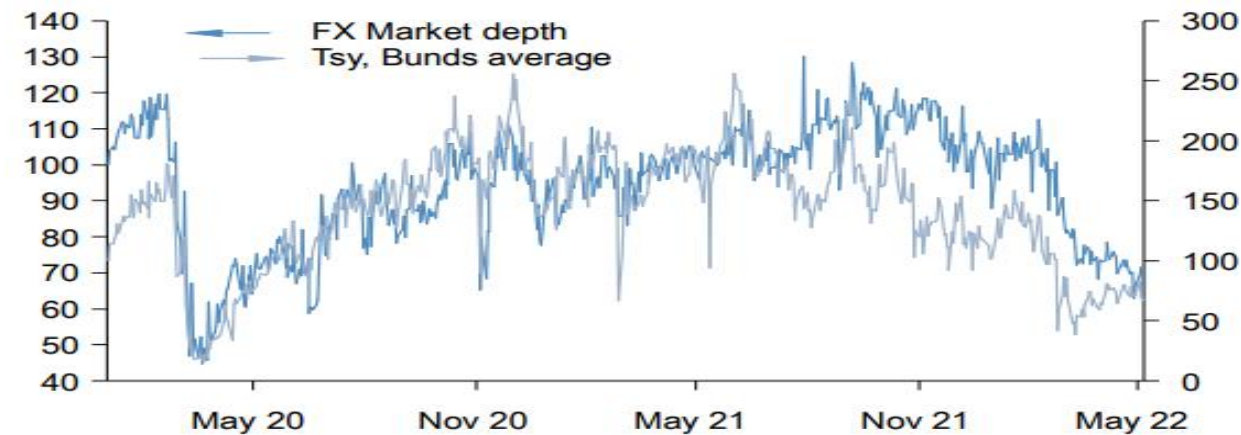
Average 10-year z-score of 10-year Treasury yields (%), JULI spread to Treasuries (bp), J.P. Morgan broad nominal USD index (unitless), Brent oil futures contract (\$/bbl), and S&P 500* (points); positive number indicates tighter financial conditions



Source: J.P. Morgan

Market depth has plunged across macro markets

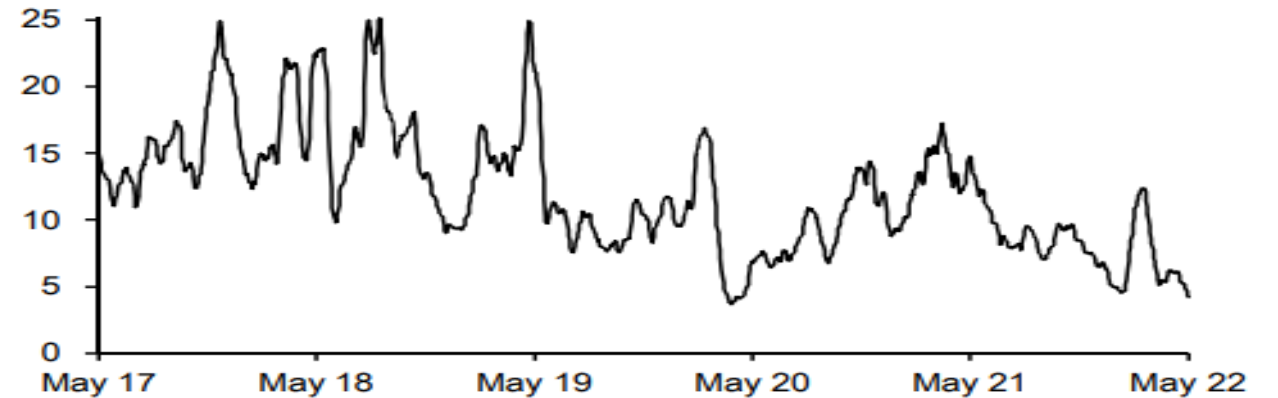
Market depth*; indexed at 100



Source: J.P. Morgan

TIPS liquidity, as estimated by our depth proxy, has declined to its lowest level since spring 2020

TIPS market depth proxy*

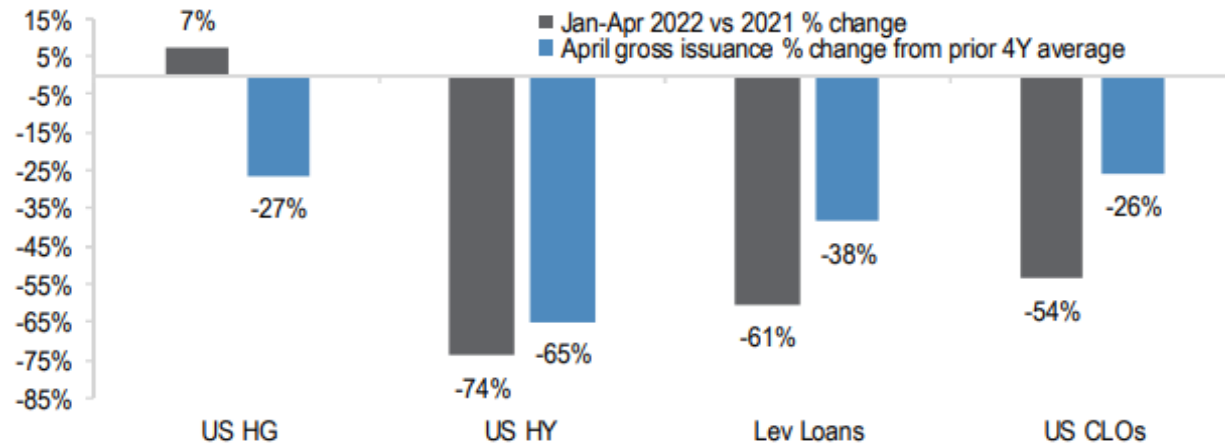


* Depth proxy is one-month moving average of dealer transactions in TIPS divided by one-week average of the magnitude of daily changes in 10-year TIPS breakevens.

Source: NY Fed primary dealer statistics, J.P. Morgan

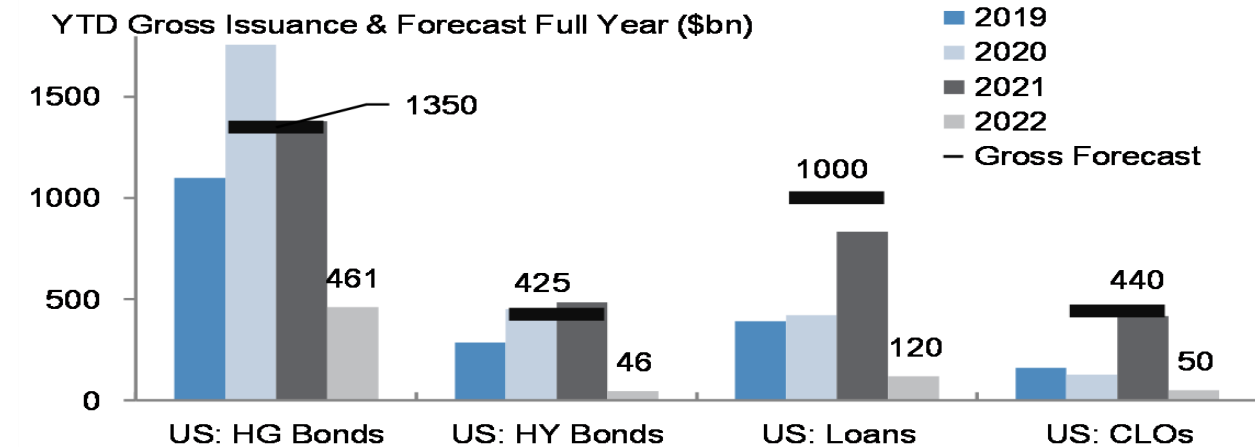
Divergence between HG vs HY & EM corporate issuance with HG companies issuing more than the prior 4-year April average driven by M&A-related financing...

Supply is up in HG y/y while it has been light in other US credit markets



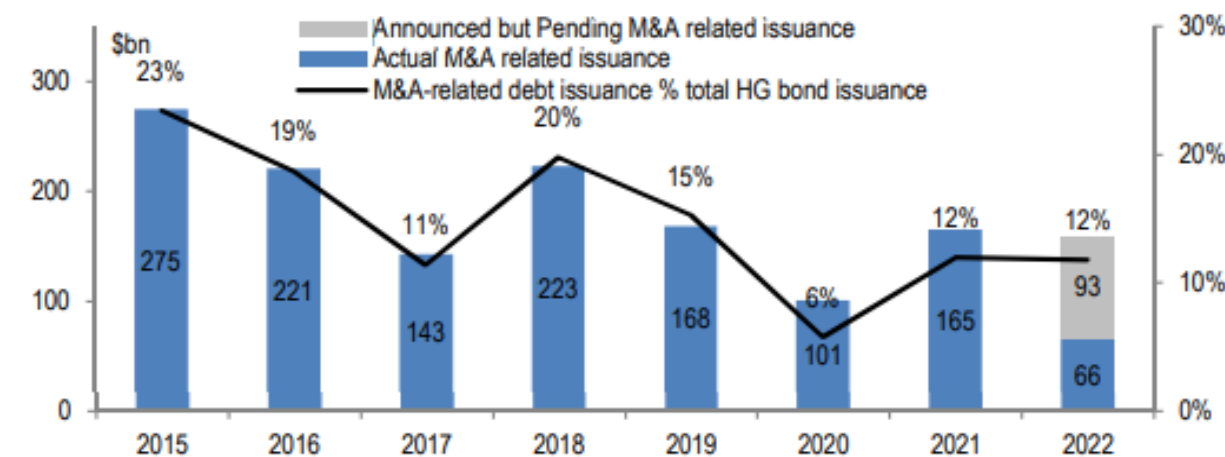
Source: J.P. Morgan

2019-2021 full-year gross issuance versus YTD



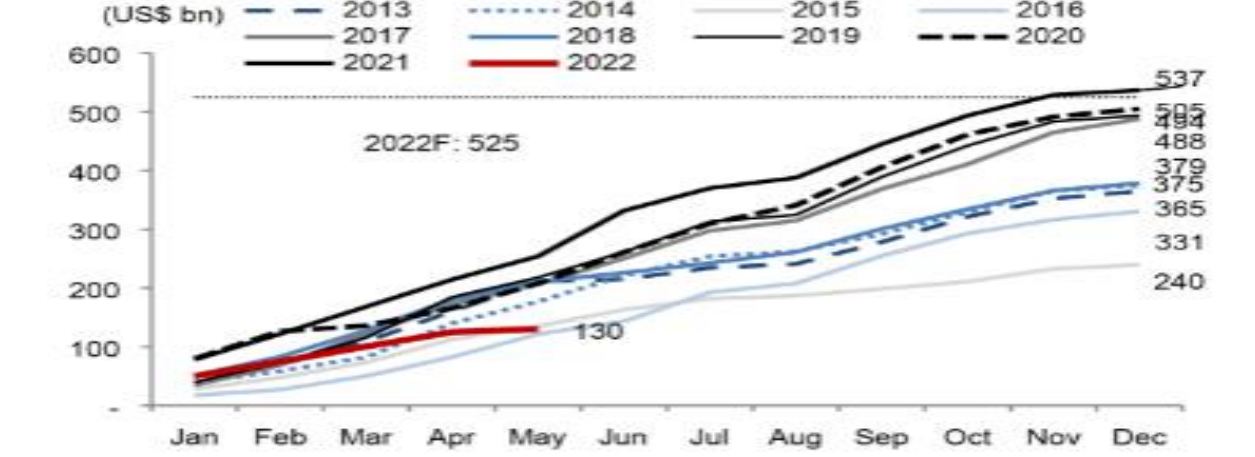
Source: J.P. Morgan

M&A related issuance



Source: J.P. Morgan

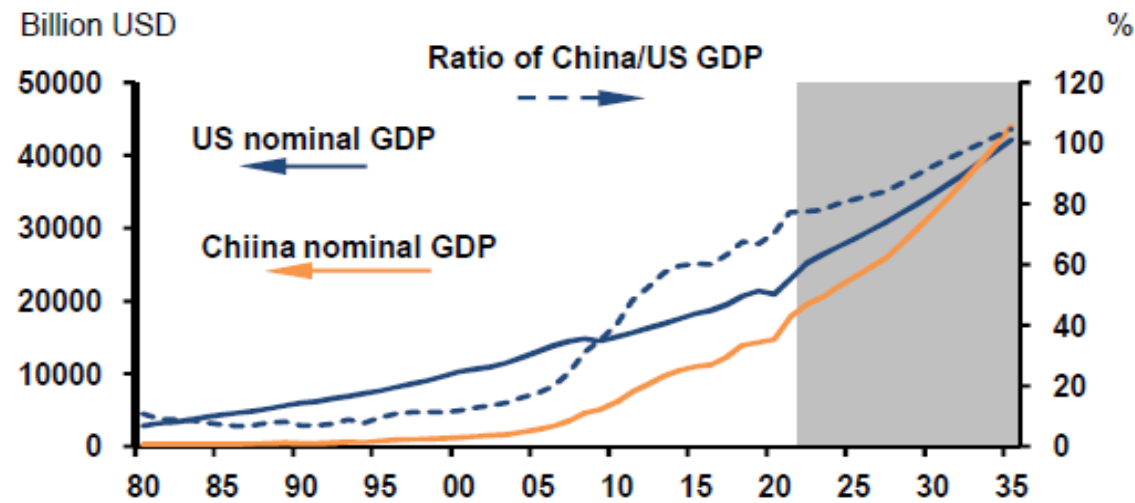
EM corporate external bond monthly issuance trend



Source: Bond Radar and J.P. Morgan

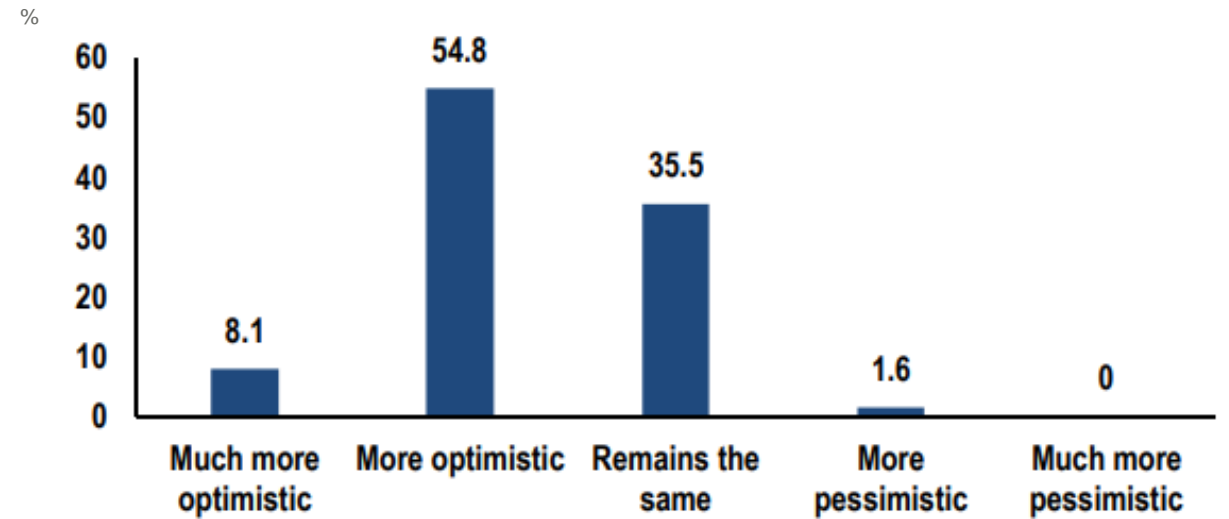
We continue to forecast China will match the size of the US economy around 2030

China's catch-up with the US



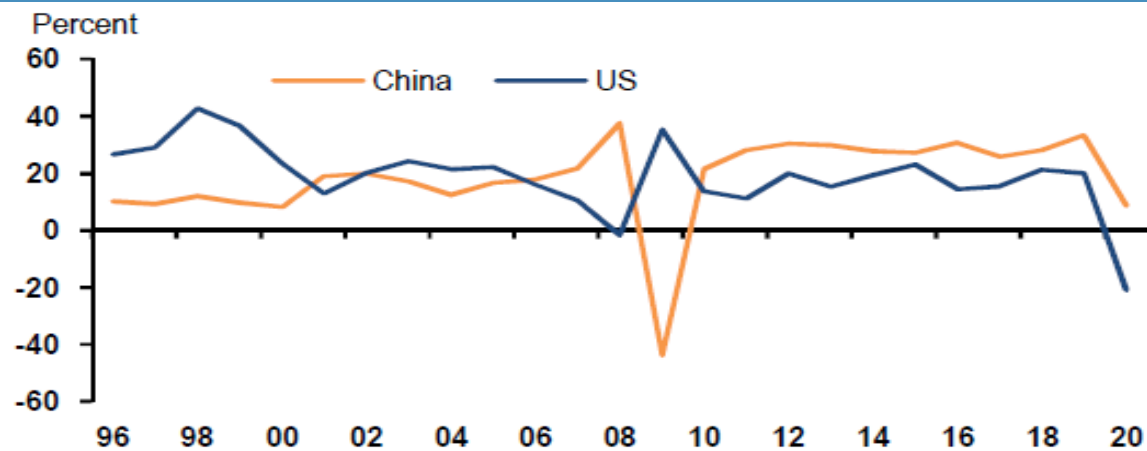
Source: J.P. Morgan

How have the US election results affected your thinking about doing business in China?



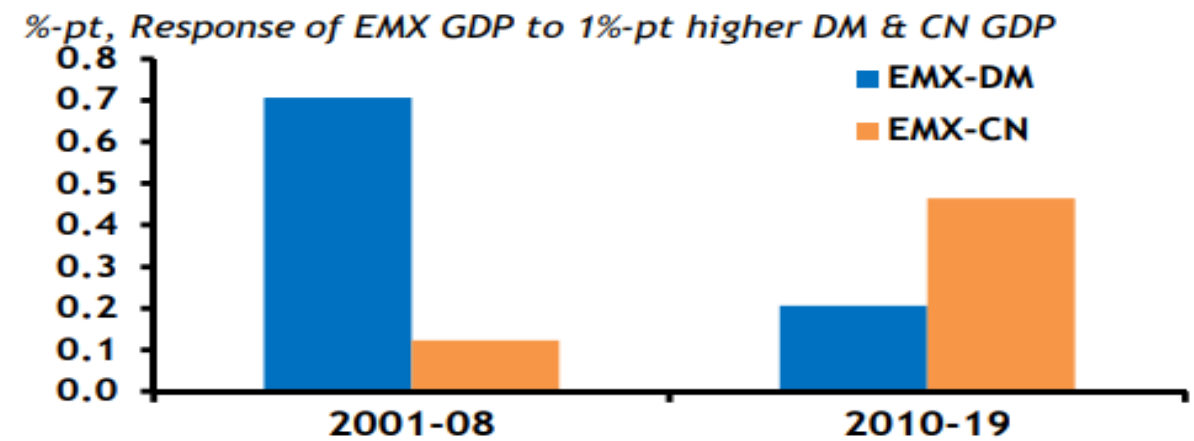
Source: Amcham Shanghai Survey on Nov 11-15; J.P. Morgan

Contribution to global GDP growth



Source: World Bank, J.P. Morgan

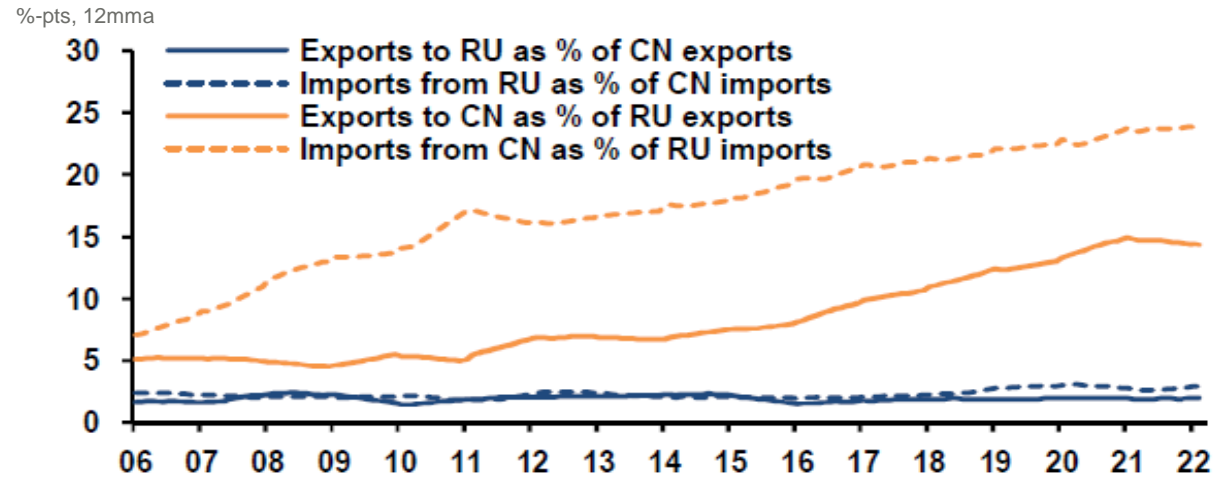
EMX GDP sensitivity to China has increased



Source: J.P. Morgan estimates

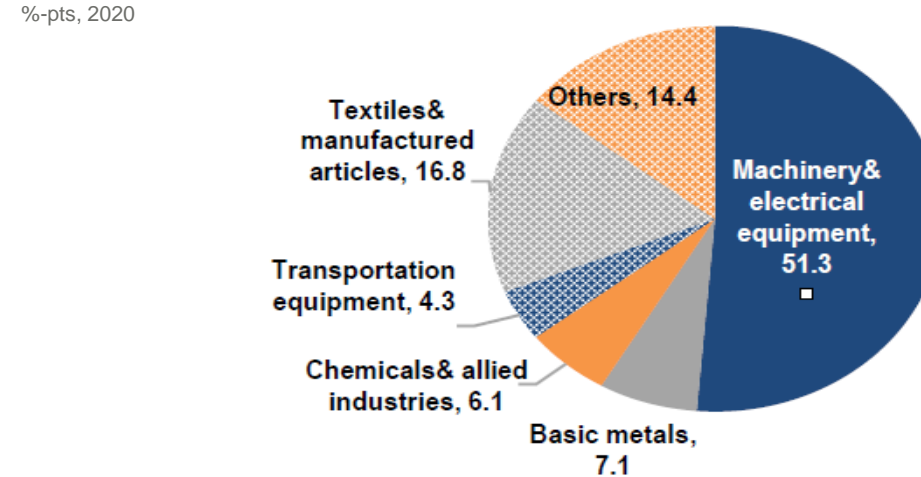
China became Russia's largest supplier in 2008, and imports from China constitute ~24% of Russia's imports but only ~2% of China's total exports

China and Russia bilateral trade dependence



Source: PBOC, J.P. Morgan

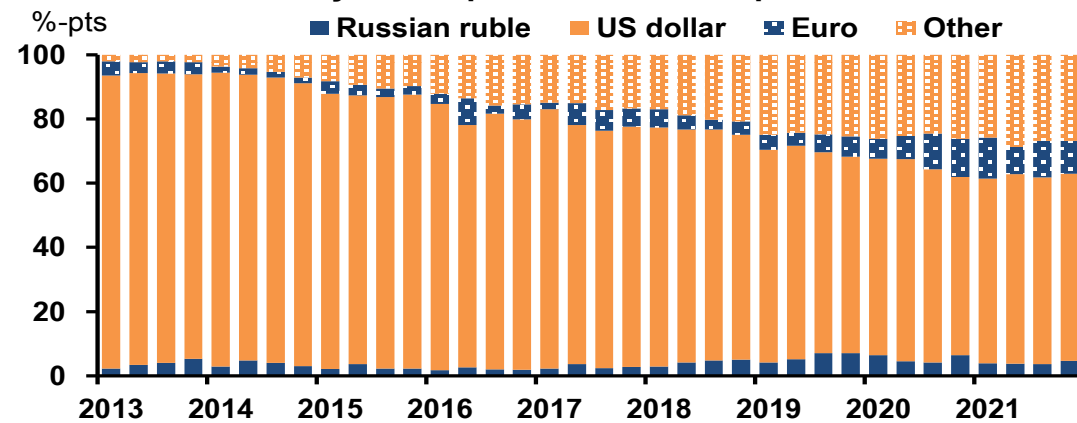
Russia's imports from China by product



Source: TradeMap, J.P. Morgan

Currency decomposition of RU-China trade imports

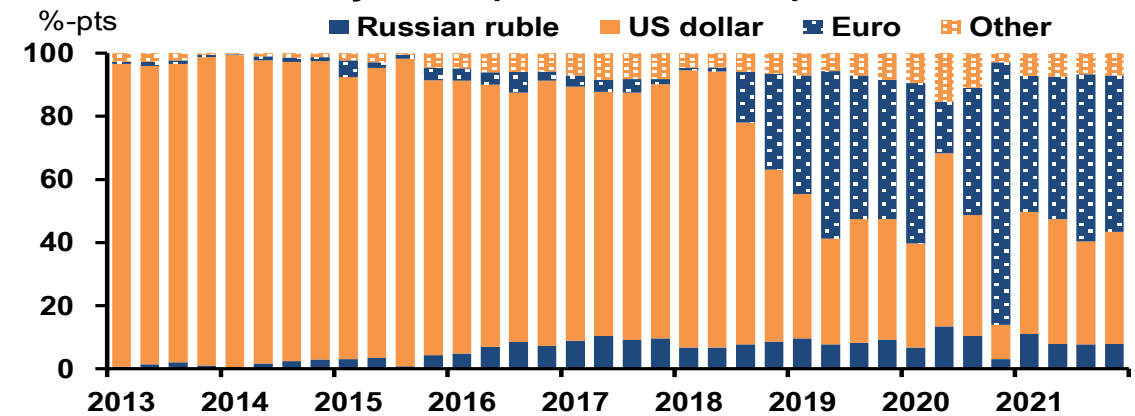
Settlement currency decomposition for RU imports from CN



Source: Bank of Russia, J.P. Morgan

Currency decomposition of RU-China trade exports

Settlement currency decomposition for RU exports to CN



Source: Bank of Russia, J.P. Morgan

Implications of the Russia Ukraine war on US-China relations

Financial sanctions on Russia

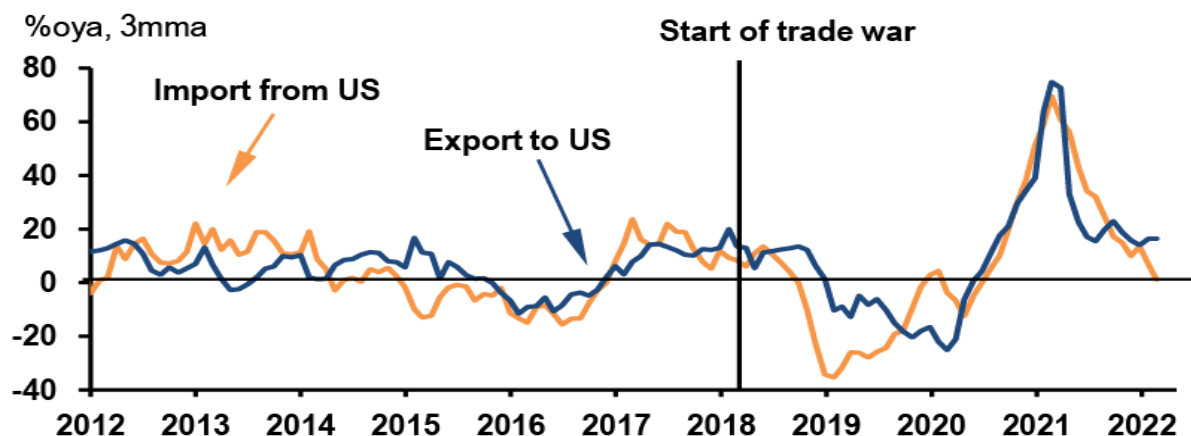
Table 1: Currency composition of Russia's international reserves

	EUR	USD	Gold	GBP	CNY	Other
Jun-21	32.3	16.4	21.7	6.5	13.1	10.0
Jun-20	29.5	22.2	22.9	5.9	12.2	7.3
Jun-13	36.9	41.1	7.5	8.2	-	6.3

Source: CBR, J.P. Morgan

US-China trade

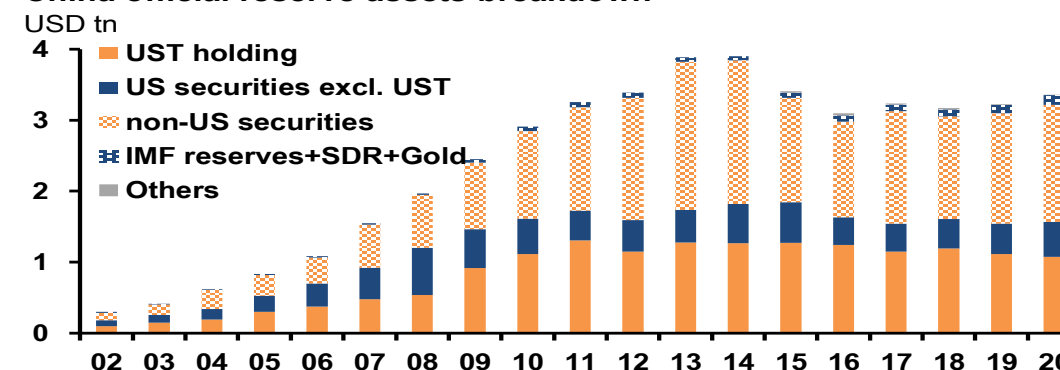
Bilateral trade with the US



Source: China Customs, J.P. Morgan

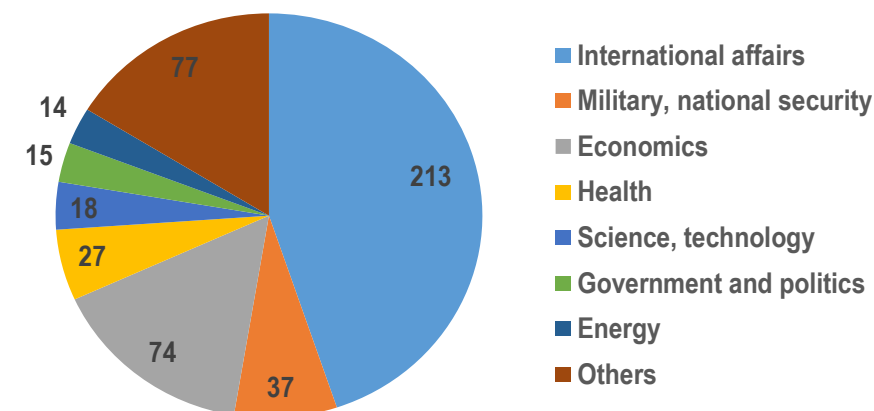
Big question for China's FX reserve management

China official reserve assets breakdown



Source: SAFE, U.S. Department of the Treasury, J.P. Morgan

Introduced China-bills in 117th US Congress (2021-2022)



Source: US Congress, J.P. Morgan

Growth and inflation outlook and forecasts

	Real GDP			Real GDP						Consumer prices			
	% over a year ago			% over previous period, year						% over a year ago			
	2021	2022	2023	4Q21	1Q22	2Q22	3Q22	4Q22	1Q23	4Q21	2Q22	4Q22	2Q23
United States	5.7	2.7	1.8	6.9	-1.5	3.3	2.8	2.0	1.8	6.7	8.2↑	6.8↑	3.6↑
Canada	4.5↓	3.8↓	2.4	6.6↓	3.1↓	4.5↑	2.6↑	2.3↑	2.3	4.7	7.0	6.1	2.5
Latin America	6.6	2.1↑	1.3	3.5↑	3.2	0.5↑	-0.1↓	0.2↓	1.5	8.3	10.0	8.0	4.9
Argentina	10.3	2.8	1.8	6.3	3.8	-4.0	-1.5	0.5	3.0	51.4	59.5	68.9	60.1
Brazil	4.6	1.2↑	0.6	2.7↑	4.0↓	1.5↑	-2.0↓	-1.6↓	1.2	10.5	12.0	8.9	5.7
Chile	11.7	1.6	0.6	7.0	-3.0	-5.0	-3.0	0.0	2.0	6.6	11.3	8.3	4.6
Colombia	10.7	6.5	2.5	10.5	4.0	3.0	1.5	2.0	2.5	5.2	9.3	8.7	5.4
Ecuador	4.2	3.1	2.5	2.9	3.5	2.5	2.0	3.0	2.7	1.8	3.1	2.9	1.7
Mexico	4.8	1.8	1.5	1.0	4.1	1.6	1.9	1.4	1.0	7.0	7.6	7.0	4.0
Peru	13.5	2.6	2.5	3.1	-1.7	-1.0	6.0	2.0	1.0	6.0	8.0↑	5.8↑	3.9↑
Uruguay	4.4	4.4	2.8	8.3	1.0	1.5	1.0	3.0	1.0	7.9	9.7	8.3	5.6
Asia/Pacific	6.3↑	3.6↓	4.1↓	7.7↑	4.8	-0.9↓	5.6↓	5.3↓	4.1↓	2.1	3.2	3.6↑	2.6↑
Japan	1.7	1.5	1.8	3.8	-1.0	4.0	3.5	2.5	1.0	0.5	2.1	2.2	1.7
Australia	4.8↑	3.6↑	2.5↓	15.3↑	3.1↑	2.1↓	1.9↓	2.8↓	2.4	3.5	5.2	4.6	2.8
New Zealand	5.6	2.3	2.4	12.6	2.1	1.2	3.3	2.2	2.2	5.9	6.9	4.4	2.3
EM Asia	7.4↑	4.1↓	4.8↓	8.0↑	6.2↓	-2.2↓	6.3↓	6.0↓	4.9↓	2.4	3.3	3.8↑	2.8↑
China	8.1	3.7	5.3	7.5	6.8	-5.4	7.5	7.3	5.5	1.8	2.3	3.0	2.4
India	8.7↑	6.6↓	4.3↓	8.2↑	7.9↓	4.5↓	4.5↓	4.0↓	4.0↓	5.0	7.0	6.6	5.3
Ex China/India	4.5	3.9↓	3.5↓	9.3	3.6	3.6↑	3.6↓	3.5↓	3.5	2.9	4.4↑	4.7↑	2.7↑
Hong Kong	6.3	0.4↑	4.1↑	0.0	-11.1↑	13.0↑	6.5↓	6.0↓	2.4	2.0	1.4↓	1.6↓	1.6↑
Indonesia	3.7	4.9	4.9	14.0	3.5	5.2	4.9	4.8	5.0	1.8	3.7	4.7	3.1
Korea	4.0	2.7↓	2.2↓	5.0	3.0	1.0↓	3.0↓	2.5↓	2.0	3.5	5.3↑	5.8↑	3.3↑
Malaysia	3.1	7.2	5.1	19.7	16.4	4.0	3.0	3.0	6.5	3.2	2.9	3.3	2.3
Philippines	5.7	8.5	6.1	14.7	7.6	7.0	6.0	6.0	6.0	3.6	5.2	5.0	2.7
Singapore	7.6	4.3	2.8	9.5	2.8	7.5	-0.8	1.3	3.5	3.7	6.5	6.2	2.6
Taiwan	6.6	3.5↓	2.7	10.1	4.3	0.3	2.7	2.9	2.9	2.7	3.2	2.9	2.0
Thailand	1.5	3.0	3.3	7.4	4.7	1.2	3.9	3.2	3.3	2.4	6.1	5.8	2.3
Western Europe	5.7	3.2	2.5	2.0	1.2	2.0	2.6	2.4	2.7	4.6	8.0↑	7.4↑	2.9↑
Euro area	5.4	3.1	2.8	1.2	1.1	2.3	3.0	2.8	3.0	4.6	7.9↑	7.2↑	2.5↑
Germany	2.9	3.0	3.5	-1.4	0.9	5.0	4.5	3.0	3.5	5.4	8.4↑	7.2↑	1.9↑
France	6.8↓	2.5↓	2.8	1.8↓	-0.8↓	1.0	2.0	2.5	3.5	3.3	5.8	5.7↑	2.4↑
Italy	6.6	3.4↑	2.4↑	2.8↑	0.5↑	2.0↑	2.0	2.5	2.5	3.7	7.2↑	7.2↑	2.9↑
Spain	5.1	4.4	3.2	9.2	1.3	1.0	3.0	3.5	3.5	5.8	8.5	7.0	2.5
Norway	4.2	3.8	2.7	5.6	-2.4	5.5	4.0	3.0	2.3	3.4	5.5	3.7	1.8
Sweden	4.9↑	1.9↓	1.6	4.7↑	-3.2↓	1.8	2.0	1.8	1.5	3.3	6.6	6.7	3.2
United Kingdom	7.4	3.8	1.2	5.2	3.0	0.5	0.9	0.8	1.8	4.9	9.0	8.8	4.6
EMEA EM	6.4	1.2↑	1.6↓	6.2	3.8↑	-7.2↑	-3.5↓	1.5↓	3.4↓	10.3	23.6↓	21.1↓	8.6↓
Czech Republic	3.3	3.2↑	2.4↓	3.2	3.7↑	0.5↓	1.8↓	2.3↓	2.5↓	6.1	15.2	14.3	5.8
Hungary	7.1	5.8	2.7	9.1	8.7	3.0	1.0	2.0	3.0	7.1	9.7	10.8	6.9
Israel	7.9	5.5	4.0	15.6	-1.6	3.6	3.4	3.4	4.1	2.5	4.3↑	4.9↑	3.2↑
Poland	5.9	6.1↑	2.8↓	7.4	10.0	0.0	1.5↓	2.5↓	3.3	7.7	13.8	13.4	10.3
Romania	6.0	6.0	5.0	4.1	22.5	2.4	3.0	2.4	6.6	8.0	14.4	14.3	9.6
Russia	4.7	-5.0↑	-1.5↓	3.9	-1.4	-22.0↑	-13.0↓	0.5↓	3.0↓	8.3	17.4↓	15.7↓	5.8↓
South Africa	4.9	1.9	1.8	4.7	3.7	1.5	1.8	2.2	1.9	5.4	6.3↓	6.7↓	5.2↓
Turkey	11.0	3.7↑	3.6↓	6.2	4.9↑	-1.2↓	0.4↓	0.8↓	4.1	25.8	72.3	61.5	18.4
Global	6.0↑	3.1	2.8↓	5.9	2.1	0.7↑	3.3↓	3.2↓	2.9↓	4.7	7.1	6.5↑	3.4↑
Developed markets	5.2	2.8	2.1	5.1↑	-0.2↓	2.9	2.8	2.2	2.1	5.1	7.3↑	6.4↑	3.1↑
Emerging markets	7.1	3.5	3.9↓	7.2↑	5.5	-2.5↑	4.1↓	4.7↓	4.3↓	4.1	6.9	6.7	3.8
Emerging ex China	6.2	3.2	2.6↓	6.9↑	4.3↑	0.2↑	1.0↓	2.3↓	3.1↓	6.4	11.3	10.2	5.2↑
Global — PPP weighted	6.3	3.5	3.2↓	6.2↑	3.1↓	-0.2↑	3.0↓	3.4↓	3.2↓	4.9	8.1	7.4↑	3.8↑

EM Fiscal Balance and Current Account Forecasts

	Fiscal Balance (% of GDP)			CA Balance (% of GDP)		
	2021	2022	2023	2021	2022	2023
Emerging markets	-4.0	-4.2	-3.7	1.6	1.3	1.1
EM ex. China	-4.9	-4.8	-4.1	1.4	1.2	1.0
Latin America	-4.3	-4.5	-4.2	-1.6	-0.7	-1.3
Argentina	-3.8	-4.6	-3.5	1.1	0.8	0.6
Brazil	-4.4	-6.2	-5.5	-1.7	0.2	-0.6
Chile	-7.6	-2.0	-2.7	-6.4	-3.3	-2.8
Colombia	-7.1	-6.2	-4.9	-5.7	-4.8	-4.7
Ecuador	-3.5	-2.2	-2.0	2.8	2.9	2.6
Mexico	-3.3	-3.3	-3.4	-0.4	-1.1	-2.0
Peru	-2.5	-2.4	-3.1	-2.8	-1.5	-1.2
Emerging Asia	-4.3	-4.4	-3.8	2.0	1.5	1.5
China	-3.1	-3.6	-3.2	1.8	1.3	1.1
Hong Kong	0.7	-1.8	1.3	7.2	4.0	0.2
India	-11.5	-10.5	-9.5	-1.7	-3.1	-2.6
Indonesia	-5.3	-4.5	-2.9	0.4	3.2	2.3
Korea	-3.7	-3.2	-3.0	4.9	3.8	4.5
Malaysia	-6.5	-6.2	-4.5	3.6	5.2	2.8
Philippines	-9.0	-7.5	-5.6	-1.1	-4.0	-3.1
Singapore	-2.2	-0.5	2.0	11.8	13.1	15.6
Taiwan	-1.5	-1.2	-0.9	12.6	11.5	11.4
Thailand	-4.7	-4.8	-3.7	-2.1	-1.0	2.6
EMEA EM	-2.5	-3.2	-2.9	2.2	1.8	1.0
Czech Republic	-5.9	-3.8	-2.4	-0.3	-2.5	-2.5
Hungary	-6.8	-5.8	-4.0	-3.0	-4.0	-3.7
Israel	-4.5	-3.5	-3.1	4.6	3.9	3.8
Poland	-1.9	-4.4	-4.0	-0.8	-1.9	-1.7
Romania	-8.1	-6.8	-5.6	-7.1	-7.4	-7.1
Russia	0.4	-0.8	-1.1	6.9	8.3	5.1
South Africa	-5.2	-5.4	-5.0	3.7	2.0	1.0
Turkey	-2.7	-3.7	-3.3	-1.8	-3.8	-1.7
Other EMEA EM						
Angola	2.8	3.1	2.0	12.5	14.1	5.4
Ghana	-12.4	-8.6	-7.1	-3.3	-2.8	-2.4
Kazakhstan	-3.0	-1.8	-2.4	-3.0	2.3	1.9
Kenya	-8.3	-8.5	-7.0	-5.3	-5.6	-5.6
Nigeria	-7.0	-5.8	-5.1	0.9	2.4	0.8
Serbia	-4.1	-3.5	-2.0	-4.4	-5.5	-5.0
Ukraine	-4.0	-9.3	-9.4	-1.3	-5.7	-5.6
Egypt	-7.2	-6.8	-6.4	-4.6	-4.0	-3.6
GCC	-1.0	8.2	5.8	7.8	14.6	11.3
Saudi Arabia	-2.3	8.0	5.9	5.3	13.9	11.0
UAE	0.3	6.7	4.2	8.6	11.4	7.6

Source: J.P. Morgan

Disclosures

Analyst Certification: The Research Analyst(s) denoted by an “AC” on the cover of this report certifies (or, where multiple Research Analysts are primarily responsible for this report, the Research Analyst denoted by an “AC” on the cover or within the document individually certifies, with respect to each security or issuer that the Research Analyst covers in this research) that: (1) all of the views expressed in this report accurately reflect the Research Analyst’s personal views about any and all of the subject securities or issuers; and (2) no part of any of the Research Analyst’s compensation was, is, or will be directly or indirectly related to the specific recommendations or views expressed by the Research Analyst(s) in this report. For all Korea-based Research Analysts listed on the front cover, if applicable, they also certify, as per KOFIA requirements, that the Research Analyst’s analysis was made in good faith and that the views reflect the Research Analyst’s own opinion, without undue influence or intervention.

All authors named within this report are Research Analysts who produce independent research unless otherwise specified. In Europe, Sector Specialists (Sales and Trading) may be shown on this report as contacts but are not authors of the report or part of the Research Department.

Other Disclosure: A contributor to this report has a household member who is a senior portfolio manager of and investor in certain emerging markets mutual funds, which may invest in instruments discussed in this report.

MSCI: The MSCI sourced information is the exclusive property of Morgan Stanley Capital International Inc. (MSCI). Without prior written permission of MSCI, this information and any other MSCI intellectual property may not be reproduced, disseminated or used to create any financial products, including any indices. This information is provided on an 'as is' basis. The user assumes the entire risk of any use made of this information. MSCI, its affiliates and any third party involved in, or related to, computing or compiling the information hereby expressly disclaim all warranties of originality, accuracy, completeness, merchantability or fitness for a particular purpose with respect to any of this information. Without limiting any of the foregoing, in no event shall MSCI, any of its affiliates or any third party involved in, or related to, computing or compiling the information have any liability for any damages of any kind. MSCI, Morgan Stanley Capital International and the MSCI indexes are services marks of MSCI and its affiliates.

Company-Specific Disclosures: Important disclosures, including price charts and credit opinion history tables, are available for compendium reports and all J.P. Morgan–covered companies, and certain non-covered companies, by visiting <https://www.jpmm.com/research/disclosures>, calling 1-800-477-0406, or e-mailing research.disclosure.inquiries@jpmorgan.com with your request.

A history of J.P. Morgan investment recommendations disseminated during the preceding 12 months can be accessed on the Research & Commentary page of <http://www.jpmorganmarkets.com> where you can also search by analyst name, sector or financial instrument.

Analysts' Compensation: The research analysts responsible for the preparation of this report receive compensation based upon various factors, including the quality and accuracy of research, client feedback, competitive factors, and overall firm revenues.

Other Disclosures

J.P. Morgan is a marketing name for investment banking businesses of JPMorgan Chase & Co. and its subsidiaries and affiliates worldwide.

UK MIFID FICC research unbundling exemption: UK clients should refer to [UK MIFID Research Unbundling exemption](#) for details of JPMorgan’s implementation of the FICC research exemption and guidance on relevant FICC research categorisation.

Any long form nomenclature for references to China; Hong Kong; Taiwan; and Macau within this research material are Mainland China; Hong Kong SAR (China); Taiwan (China); and Macau SAR (China).

J.P. Morgan Research may, from time to time, write on issuers or securities targeted by economic or financial sanctions imposed or administered by the governmental authorities of the U.S., EU, UK or other relevant jurisdictions (Sanctioned Securities). Nothing in this report is intended to be read or construed as encouraging, facilitating, promoting or otherwise approving investment or dealing in such Sanctioned Securities. Clients should be aware of their own legal and compliance obligations when making investment decisions.

Disclosures

Any digital or crypto assets discussed in this research report are subject to a rapidly changing regulatory landscape. For relevant regulatory advisories on crypto assets, including bitcoin and ether, please see <https://www.jpmorgan.com/disclosures/cryptoasset-disclosure>.

Exchange-Traded Funds (ETFs): J.P. Morgan Securities LLC (“JPMS”) acts as authorized participant for substantially all U.S.-listed ETFs. To the extent that any ETFs are mentioned in this report, JPMS may earn commissions and transaction-based compensation in connection with the distribution of those ETF shares and may earn fees for performing other trade-related services, such as securities lending to short sellers of the ETF shares. JPMS may also perform services for the ETFs themselves, including acting as a broker or dealer to the ETFs. In addition, affiliates of JPMS may perform services for the ETFs, including trust, custodial, administration, lending, index calculation and/or maintenance and other services.

Options and Futures related research: If the information contained herein regards options- or futures-related research, such information is available only to persons who have received the proper options or futures risk disclosure documents. Please contact your J.P. Morgan Representative or visit <https://www.theocc.com/components/docs/riskstoc.pdf> for a copy of the Option Clearing Corporation's Characteristics and Risks of Standardized Options or http://www.finra.org/sites/default/files/Security_Futures_Risk_Disclosure_Statement_2018.pdf for a copy of the Security Futures Risk Disclosure Statement.

Changes to Interbank Offered Rates (IBORs) and other benchmark rates: Certain interest rate benchmarks are, or may in the future become, subject to ongoing international, national and other regulatory guidance, reform and proposals for reform. For more information, please consult: https://www.jpmorgan.com/global/disclosures/interbank_offered_rates

Private Bank Clients: Where you are receiving research as a client of the private banking businesses offered by JPMorgan Chase & Co. and its subsidiaries (“J.P. Morgan Private Bank”), research is provided to you by J.P. Morgan Private Bank and not by any other division of J.P. Morgan, including, but not limited to, the J.P. Morgan Corporate and Investment Bank and its Global Research division.

Legal entity responsible for the production and distribution of research: The legal entity identified below the name of the Reg AC Research Analyst who authored this material is the legal entity responsible for the production of this research. Where multiple Reg AC Research Analysts authored this material with different legal entities identified below their names, these legal entities are jointly responsible for the production of this research. Research Analysts from various J.P. Morgan affiliates may have contributed to the production of this material but may not be licensed to carry out regulated activities in your jurisdiction (and do not hold themselves out as being able to do so). Unless otherwise stated below, this material has been distributed by the legal entity responsible for production. If you have any queries, please contact the relevant Research Analyst in your jurisdiction or the entity in your jurisdiction that has distributed this research material.

Legal Entities Disclosures and Country-/Region-Specific Disclosures:

Argentina: JPMorgan Chase Bank N.A Sucursal Buenos Aires is regulated by Banco Central de la República Argentina (“BCRA”- Central Bank of Argentina) and Comisión Nacional de Valores (“CNV”- Argentinian Securities Commission” - ALYC y AN Integral N°51). **Australia:** J.P. Morgan Securities Australia Limited (“JPMSAL”) (ABN 61 003 245 234/AFS Licence No: 238066) is regulated by the Australian Securities and Investments Commission and is a Market, Clearing and Settlement Participant of ASX Limited and CHI-X. This material is issued and distributed in Australia by or on behalf of JPMSAL only to "wholesale clients" (as defined in section 761G of the Corporations Act 2001). A list of all financial products covered can be found by visiting <https://www.jpmm.com/research/disclosures>. J.P. Morgan seeks to cover companies of relevance to the domestic and international investor base across all Global Industry Classification Standard (GICS) sectors, as well as across a range of market capitalisation sizes. If applicable, in the course of conducting public side due diligence on the subject company(ies), the Research Analyst team may at times perform such diligence through corporate engagements such as site visits, discussions with company representatives, management presentations, etc. Research issued by JPMSAL has been prepared in accordance with J.P. Morgan Australia’s Research Independence Policy which can be found at the following link: [J.P. Morgan Australia - Research Independence Policy](#). **Brazil:** Banco J.P. Morgan S.A. is regulated by the Comissao de Valores Mobiliarios (CVM) and by the Central Bank of Brazil. Ombudsman J.P. Morgan: 0800-7700847 / ouvidoria.jp.morgan@jpmorgan.com. **Canada:** J.P.

Disclosures

Morgan Securities Canada Inc. is a registered investment dealer, regulated by the Investment Industry Regulatory Organization of Canada and the Ontario Securities Commission and is the participating member on Canadian exchanges. This material is distributed in Canada by or on behalf of J.P.Morgan Securities Canada Inc. **Chile:** Inversiones J.P. Morgan Limitada is an unregulated entity incorporated in Chile. **China:** J.P. Morgan Securities (China) Company Limited has been approved by CSRC to conduct the securities investment consultancy business. **Dubai International Financial Centre (DIFC):** JPMorgan Chase Bank, N.A., Dubai Branch is regulated by the Dubai Financial Services Authority (DFSA) and its registered address is Dubai International Financial Centre - The Gate, West Wing, Level 3 and 9 PO Box 506551, Dubai, UAE. This material has been distributed by JP Morgan Chase Bank, N.A., Dubai Branch to persons regarded as professional clients or market counterparties as defined under the DFSA rules. **European Economic Area (EEA):** Unless specified to the contrary, research is distributed in the EEA by J.P. Morgan SE (“JPM SE”), which is subject to prudential supervision by the European Central Bank (“ECB”) in cooperation with BaFin and Deutsche Bundesbank in Germany. JPM SE is a company headquartered in Frankfurt with registered address at TaunusTurm, Taunustor 1, Frankfurt am Main, 60310, Germany. The material has been distributed in the EEA to persons regarded as professional investors (or equivalent) pursuant to Art. 4 para. 1 no. 10 and Annex II of MiFID II and its respective implementation in their home jurisdictions (“EEA professional investors”). This material must not be acted on or relied on by persons who are not EEA professional investors. Any investment or investment activity to which this material relates is only available to EEA relevant persons and will be engaged in only with EEA relevant persons. **Hong Kong:** J.P. Morgan Securities (Asia Pacific) Limited (CE number AAJ321) is regulated by the Hong Kong Monetary Authority and the Securities and Futures Commission in Hong Kong, and J.P. Morgan Broking (Hong Kong) Limited (CE number AAB027) is regulated by the Securities and Futures Commission in Hong Kong. JP Morgan Chase Bank, N.A., Hong Kong (CE Number AAL996) is regulated by the Hong Kong Monetary Authority and the Securities and Futures Commission, is organized under the laws of the United States with limited liability. **India:** J.P. Morgan India Private Limited (Corporate Identity Number - U67120MH1992FTC068724), having its registered office at J.P. Morgan Tower, Off. C.S.T. Road, Kalina, Santacruz - East, Mumbai – 400098, is registered with the Securities and Exchange Board of India (SEBI) as a ‘Research Analyst’ having registration number INH000001873. J.P. Morgan India Private Limited is also registered with SEBI as a member of the National Stock Exchange of India Limited and the Bombay Stock Exchange Limited (SEBI Registration Number – INZ000239730) and as a Merchant Banker (SEBI Registration Number - MB/INM000002970). Telephone: 91-22-6157 3000, Facsimile: 91-22-6157 3990 and Website: <http://www.jpmpil.com>. JPMorgan Chase Bank, N.A. - Mumbai Branch is licensed by the Reserve Bank of India (RBI) (Licence No. 53/ Licence No. BY.4/94; SEBI - IN/CUS/014/ CDSL : IN-DP-CDSL-444-2008/ IN-DP-NSDL-285-2008/ INBI00000984/ INE231311239) as a Scheduled Commercial Bank in India, which is its primary license allowing it to carry on Banking business in India and other activities, which a Bank branch in India are permitted to undertake. For non-local research material, this material is not distributed in India by J.P. Morgan India Private Limited. **Indonesia:** PT J.P. Morgan Sekuritas Indonesia is a member of the Indonesia Stock Exchange and is registered and supervised by the Otoritas Jasa Keuangan (OJK). **Korea:** J.P. Morgan Securities (Far East) Limited, Seoul Branch, is a member of the Korea Exchange (KRX). JPMorgan Chase Bank, N.A., Seoul Branch, is licensed as a branch office of foreign bank (JPMorgan Chase Bank, N.A.) in Korea. Both entities are regulated by the Financial Services Commission (FSC) and the Financial Supervisory Service (FSS). For non-macro research material, the material is distributed in Korea by or through J.P. Morgan Securities (Far East) Limited, Seoul Branch. **Japan:** JPMorgan Securities Japan Co., Ltd. and JPMorgan Chase Bank, N.A., Tokyo Branch are regulated by the Financial Services Agency in Japan. **Malaysia:** This material is issued and distributed in Malaysia by JPMorgan Securities (Malaysia) Sdn Bhd (18146-X), which is a Participating Organization of Bursa Malaysia Berhad and holds a Capital Markets Services License issued by the Securities Commission in Malaysia. **Mexico:** J.P. Morgan Casa de Bolsa, S.A. de C.V. and J.P. Morgan Grupo Financiero are members of the Mexican Stock Exchange and are authorized to act as a broker dealer by the National Banking and Securities Exchange Commission. **New Zealand:** This material is issued and distributed by JPMSAL in New Zealand only to “wholesale clients” (as defined in the Financial Markets Conduct Act 2013). JPMSAL is registered as a Financial Service Provider under the Financial Service providers (Registration and Dispute Resolution) Act of 2008. **Pakistan:** J. P. Morgan Pakistan Broking (Pvt.) Ltd is a member of the Karachi Stock Exchange and regulated by the Securities and Exchange Commission of Pakistan. **Philippines:** J.P. Morgan Securities Philippines Inc. is a Trading Participant of the Philippine Stock Exchange and a member of the Securities Clearing Corporation of the Philippines and the Securities Investor Protection Fund. It is regulated by the Securities and Exchange Commission. **Russia:** CB J.P. Morgan Bank International LLC is regulated by the Central Bank of Russia. **Singapore:** This material is issued and distributed in Singapore by or through J.P. Morgan Securities Singapore Private Limited (JPMSS) [MCI (P) 093/09/2021 and Co. Reg. No.: 199405335R], which is a member of the Singapore Exchange Securities Trading Limited, and/or JPMorgan Chase Bank, N.A., Singapore branch (JPMCB Singapore), both of which are regulated by the Monetary Authority of Singapore. This material is issued and distributed in Singapore only to accredited investors, expert investors and institutional investors, as defined in Section 4A of the Securities and Futures Act, Cap. 289 (SFA). This material is not intended to be issued or distributed to any retail investors or any other investors that do not fall into the classes of “accredited investors,” “expert investors” or “institutional investors,” as defined under Section 4A of the SFA. Recipients of this material in Singapore are to contact JPMSS or JPMCB Singapore in respect of any matters arising from, or in connection with, the material. As at the date of this material, JPMSS is a designated market maker for certain structured warrants listed on the Singapore Exchange where the

Disclosures

underlying securities may be the securities discussed in this material. Arising from its role as a designated market maker for such structured warrants, JPMSS may conduct hedging activities in respect of such underlying securities and hold or have an interest in such underlying securities as a result. The updated list of structured warrants for which JPMSS acts as designated market maker may be found on the website of the Singapore Exchange Limited: <http://www.sgx.com>. **South Africa:** J.P. Morgan Equities South Africa Proprietary Limited and JPMorgan Chase Bank, N.A., Johannesburg Branch are members of the Johannesburg Securities Exchange and are regulated by the Financial Services Board. **Taiwan:** J.P. Morgan Securities (Taiwan) Limited is a participant of the Taiwan Stock Exchange (company-type) and regulated by the Taiwan Securities and Futures Bureau. Material relating to equity securities is issued and distributed in Taiwan by J.P. Morgan Securities (Taiwan) Limited, subject to the license scope and the applicable laws and the regulations in Taiwan. According to Paragraph 2, Article 7-1 of Operational Regulations Governing Securities Firms Recommending Trades in Securities to Customers (as amended or supplemented) and/or other applicable laws or regulations, please note that the recipient of this material is not permitted to engage in any activities in connection with the material that may give rise to conflicts of interests, unless otherwise disclosed in the "Important Disclosures" in this material. **Thailand:** This material is issued and distributed in Thailand by JPMorgan Securities (Thailand) Ltd., which is a member of the Stock Exchange of Thailand and is regulated by the Ministry of Finance and the Securities and Exchange Commission, and its registered address is 3rd Floor, 20 North Sathorn Road, Silom, Bangrak, Bangkok 10500. **UK:** Unless specified to the contrary, research is distributed in the UK by J.P. Morgan Securities plc ("JPMS plc") which is a member of the London Stock Exchange and is authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority. JPMS plc is registered in England & Wales No. 2711006, Registered Office 25 Bank Street, London, E14 5JP. This material is directed in the UK only to: (a) persons having professional experience in matters relating to investments falling within article 19(5) of the Financial Services and Markets Act 2000 (Financial Promotion) (Order) 2005 ("the FPO"); (b) persons outlined in article 49 of the FPO (high net worth companies, unincorporated associations or partnerships, the trustees of high value trusts, etc.); or (c) any persons to whom this communication may otherwise lawfully be made; all such persons being referred to as "UK relevant persons". This material must not be acted on or relied on by persons who are not UK relevant persons. Any investment or investment activity to which this material relates is only available to UK relevant persons and will be engaged in only with UK relevant persons. Research issued by JPMS plc has been prepared in accordance with JPMS plc's policy for prevention and avoidance of conflicts of interest related to the production of Research which can be found at the following link: [J.P. Morgan EMEA - Research Independence Policy](#). **U.S.:** J.P. Morgan Securities LLC ("JPMS") is a member of the NYSE, FINRA, SIPC, and the NFA. JPMorgan Chase Bank, N.A. is a member of the FDIC. Material published by non-U.S. affiliates is distributed in the U.S. by JPMS who accepts responsibility for its content.

General: Additional information is available upon request. The information in this material has been obtained from sources believed to be reliable. While all reasonable care has been taken to ensure that the facts stated in this material are accurate and that the forecasts, opinions and expectations contained herein are fair and reasonable, JPMorgan Chase & Co. or its affiliates and/or subsidiaries (collectively J.P. Morgan) make no representations or warranties whatsoever to the completeness or accuracy of the material provided, except with respect to any disclosures relative to J.P. Morgan and the Research Analyst's involvement with the issuer that is the subject of the material. Accordingly, no reliance should be placed on the accuracy, fairness or completeness of the information contained in this material. Any data discrepancies in this material could be the result of different calculations and/or adjustments. J.P. Morgan accepts no liability whatsoever for any loss arising from any use of this material or its contents, and neither J.P. Morgan nor any of its respective directors, officers or employees, shall be in any way responsible for the contents hereof, apart from the liabilities and responsibilities that may be imposed on them by the relevant regulatory authority in the jurisdiction in question, or the regulatory regime thereunder. Opinions, forecasts or projections contained in this material represent J.P. Morgan's current opinions or judgment as of the date of the material only and are therefore subject to change without notice. Periodic updates may be provided on companies/industries based on company-specific developments or announcements, market conditions or any other publicly available information. There can be no assurance that future results or events will be consistent with any such opinions, forecasts or projections, which represent only one possible outcome. Furthermore, such opinions, forecasts or projections are subject to certain risks, uncertainties and assumptions that have not been verified, and future actual results or events could differ materially. The value of, or income from, any investments referred to in this material may fluctuate and/or be affected by changes in exchange rates. All pricing is indicative as of the close of market for the securities discussed, unless otherwise stated. Past performance is not indicative of future results. Accordingly, investors may receive back less than originally invested. This material is not intended as an offer or solicitation for the purchase or sale of any financial instrument. The opinions and recommendations herein do not take into account individual client circumstances, objectives, or needs and are not intended as recommendations of particular securities, financial instruments or strategies to particular clients. The recipients of this material must make their own independent decisions regarding any securities or financial instruments mentioned herein and should seek advice from such independent financial, legal, tax or other adviser as they deem necessary. J.P. Morgan may trade as a principal on the basis of the Research Analysts' views and research, and it may also engage in transactions for its own account or for its clients' accounts in a manner inconsistent with the views taken in this material, and J.P. Morgan is under no obligation to ensure that such

Disclosures

other communication is brought to the attention of any recipient of this material. Others within J.P. Morgan, including Strategists, Sales staff and other Research Analysts, may take views that are inconsistent with those taken in this material. Employees of J.P. Morgan not involved in the preparation of this material may have investments in the securities (or derivatives of such securities) mentioned in this material and may trade them in ways different from those discussed in this material. This material is not an advertisement for or marketing of any issuer, its products or services, or its securities in any jurisdiction.

"Other Disclosures" last revised May 28, 2022.

Copyright 2022 JPMorgan Chase & Co. All rights reserved. This material or any portion hereof may not be reprinted, sold or redistributed without the written consent of J.P. Morgan.