



Guide to the Markets

Asia | 4Q 2022 | As of September 30, 2022
















Global Market Insights Strategy Team











Americas

- **Dr. David Kelly, CFA**
New York
- **David Lebovitz**
New York
- **Meera Pandit, CFA**
New York
- **Jordan Jackson**
New York
- **Olivia Schubert**
New York
- **Gabriela Santos**
New York
- **Jack Manley**
New York
- **Stephanie Aliaga**
New York
- **Nimish Vyas**
New York

Europe

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London
- **Michael Bell, CFA**
London
- **Hugh Gimber, CFA**
London
- **Max McKechnie**
London
- **Natasha May**
London
- **Zara Nokes**
London
- **Vincent Juvyns**
Luxembourg
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Frankfurt
- **Maria Paola Toschi**
Milan
- **Elena Domecq**
Madrid
- **Lucia Gutierrez Mellado**
Madrid

Asia

- **Tai Hui**
Hong Kong
- **Marcella Chow**
Hong Kong
- **Ian Hui**
Hong Kong
- **Adrian Tong**
Hong Kong
- **Sahil Gauba**
Mumbai
- **Clara Cheong**
Singapore
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Shanghai
- **Shogo Maekawa**
Tokyo
- **Agnes Lin**
Taipei
- **Kerry Craig, CFA**
Melbourne



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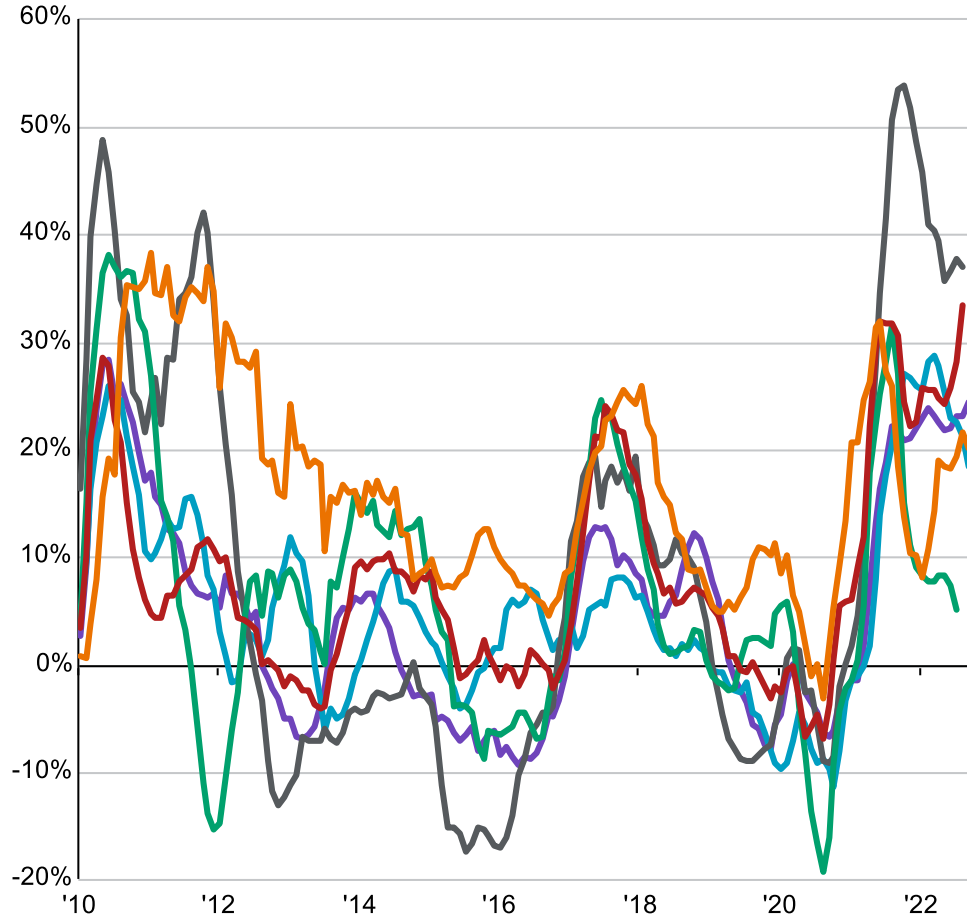


ASEAN: Exports and mobility

Regional economy

Exports

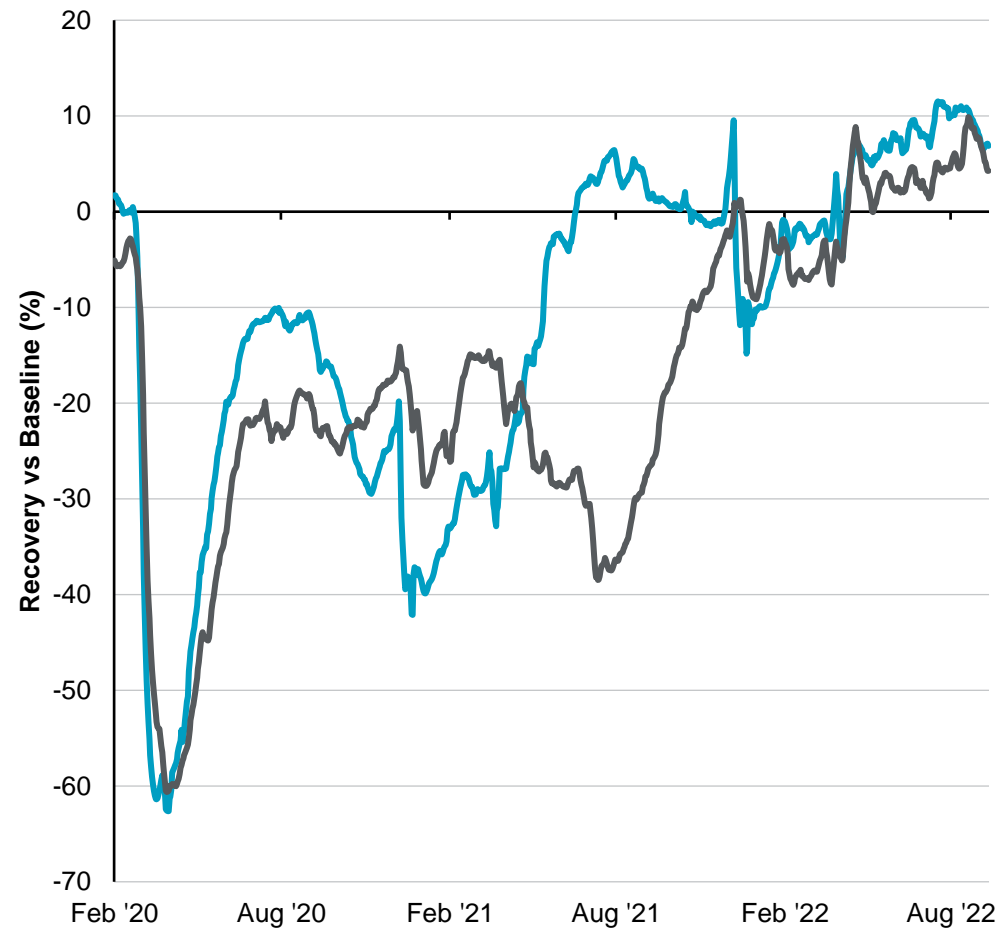
Year-over-year change, 6-month moving average



● Indonesia
 ● Malaysia
 ● Philippines
 ● Singapore
 ● Thailand
 ● Vietnam

Retail and recreation activity

% of pre-COVID-19 activity baseline*



● ASEAN**
 ● Global ex-ASEAN

Source: J.P. Morgan Asset Management; (Left) FactSet, National Statistics Agencies; (Right) Google. *Baseline refers to the pre-pandemic period of 03/01/20 – 06/02/20. Mobility data is based on anonymized geolocation data from Google. **Association of Southeast Asian Nations (ASEAN) include Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam. Other ASEAN economies are excluded due to data availability. Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.

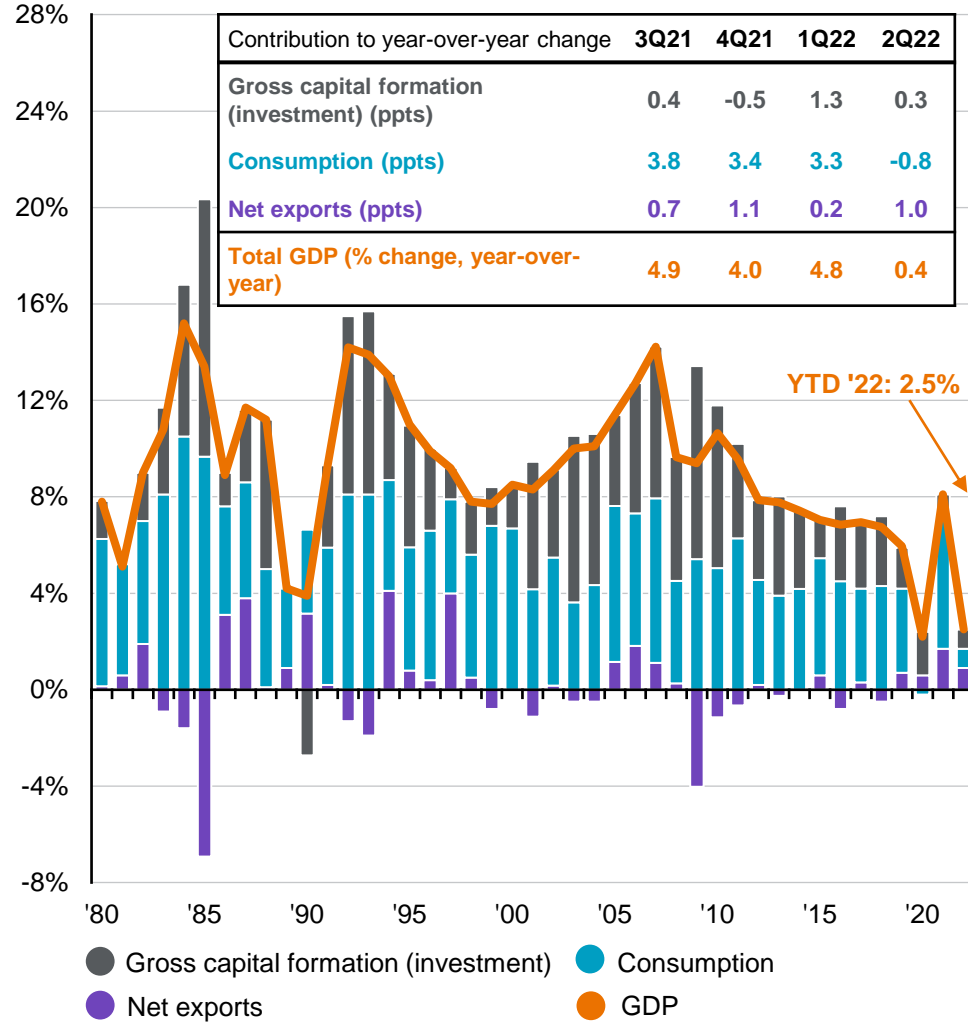


China: Economic snapshot

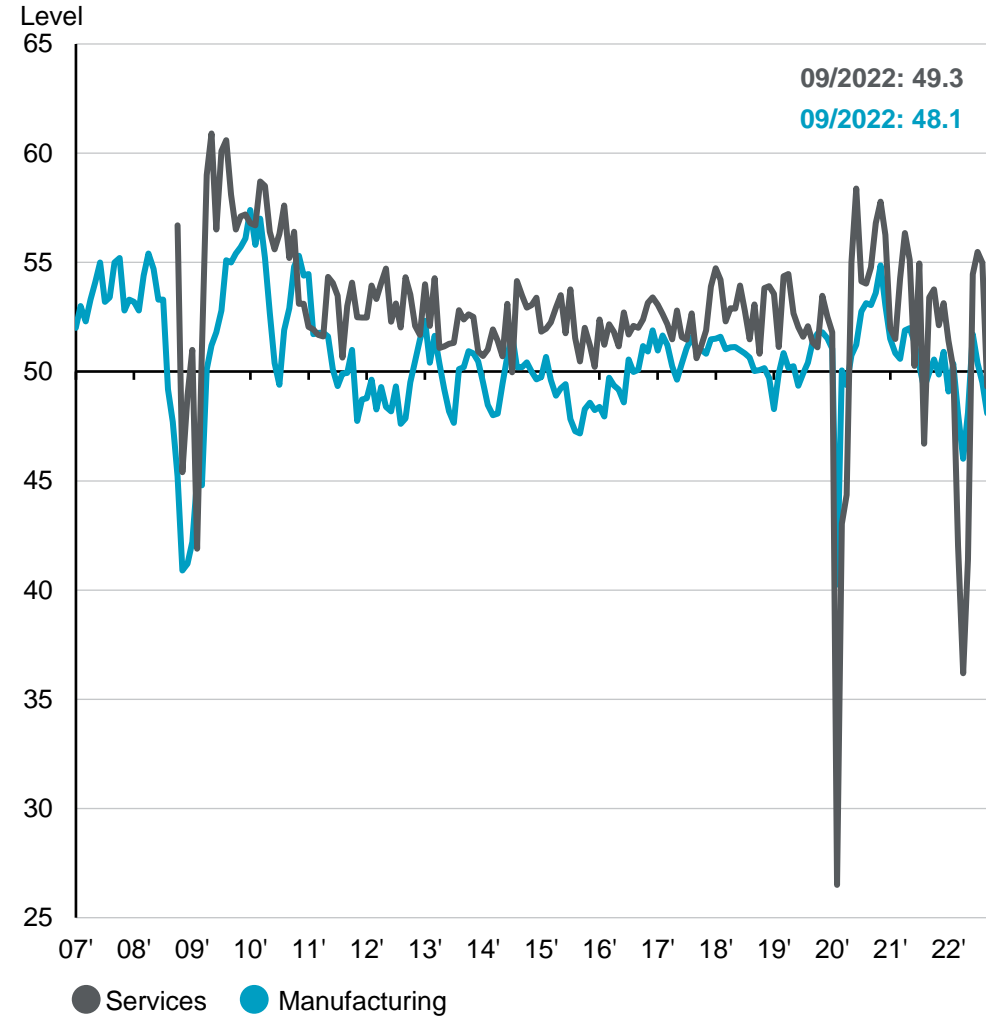
Regional economy

Contribution to real GDP growth

Year-over-year change



Caixin/Markit Purchasing Managers' Indices



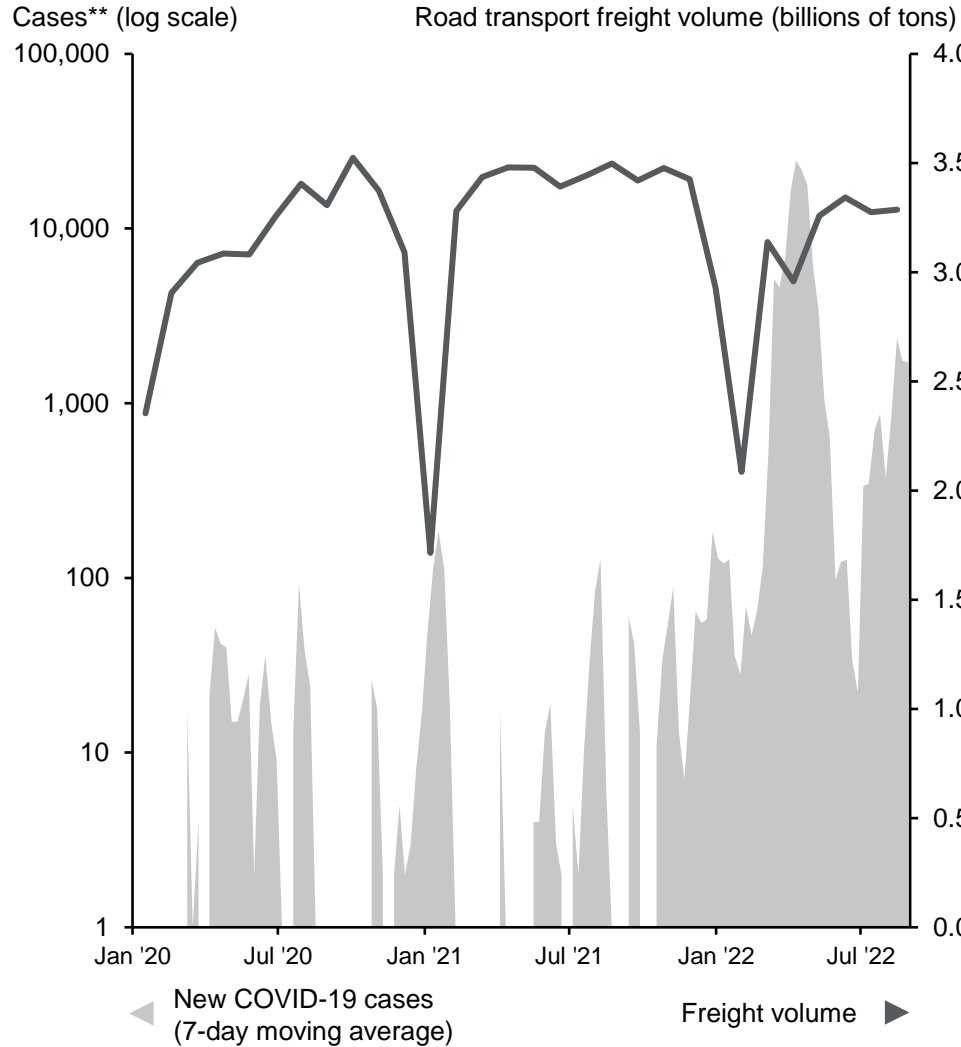
Source: J.P. Morgan Asset Management; (Left) CEIC, National Bureau of Statistics of China; (Right) Caixin/Markit, J.P. Morgan Economic Research. Total gross domestic product (GDP) figures may not sum due to rounding. Purchasing Managers' Index (PMI) is relative to 50, which indicates deceleration (below 50) or acceleration (above 50) of economic activities in the sector. Data for the Caixin/Markit Purchasing Managers' Services index begins from 31/10/08. Guide to the Markets – Asia. Data reflect most recently available as of 08/10/22.



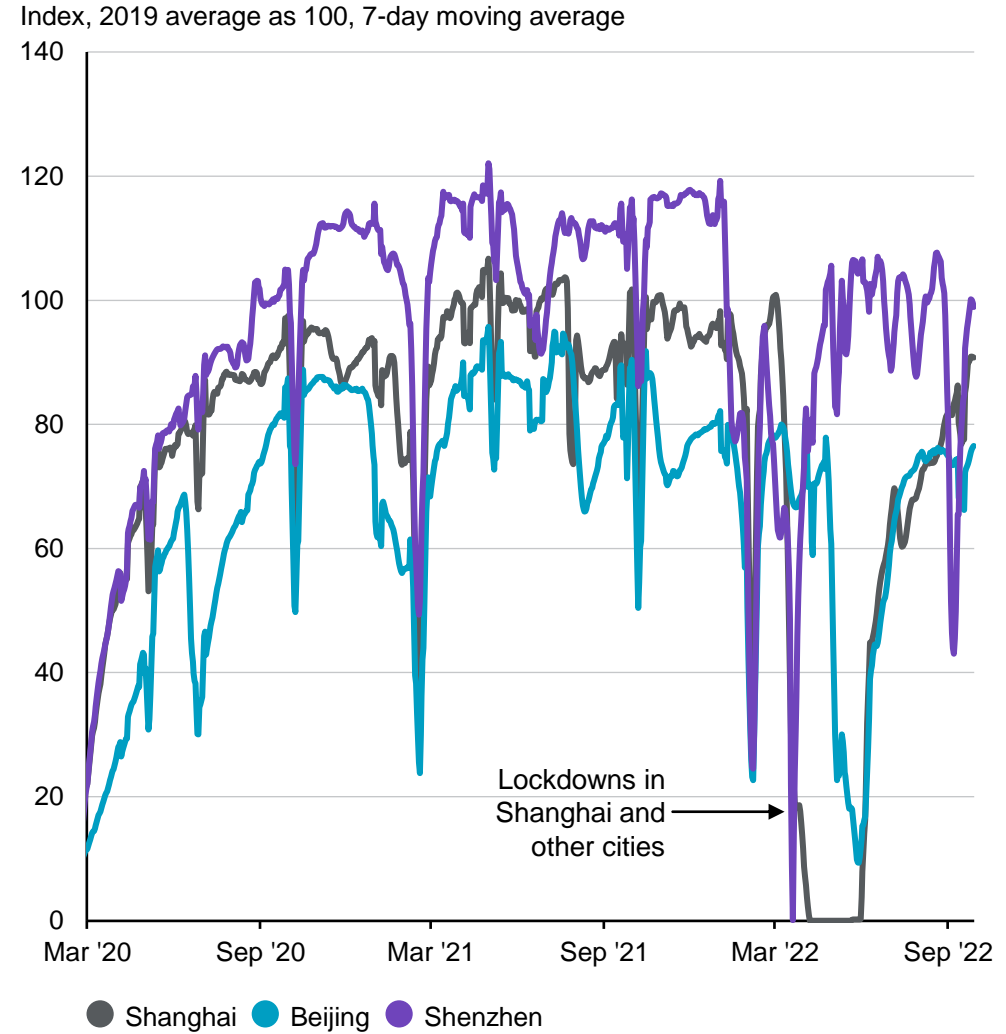
China: Mobility activity

Regional economy

New COVID-19 cases* and road transport freight volume



China major cities subway passenger flow



Source: Wind, J.P. Morgan Asset Management. *COVID-19 cases incorporate both domestic confirmed and asymptomatic cases. Confirmed cases are infections with imagological changes to the patient's lungs. Asymptomatic cases are patients with positive PCR testing results and/or mild symptoms, while without imagological changes in lungs. **Secondary axis on left chart uses a logarithmic scale. Cases peaked at 29,317 on 13/04/22. Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.

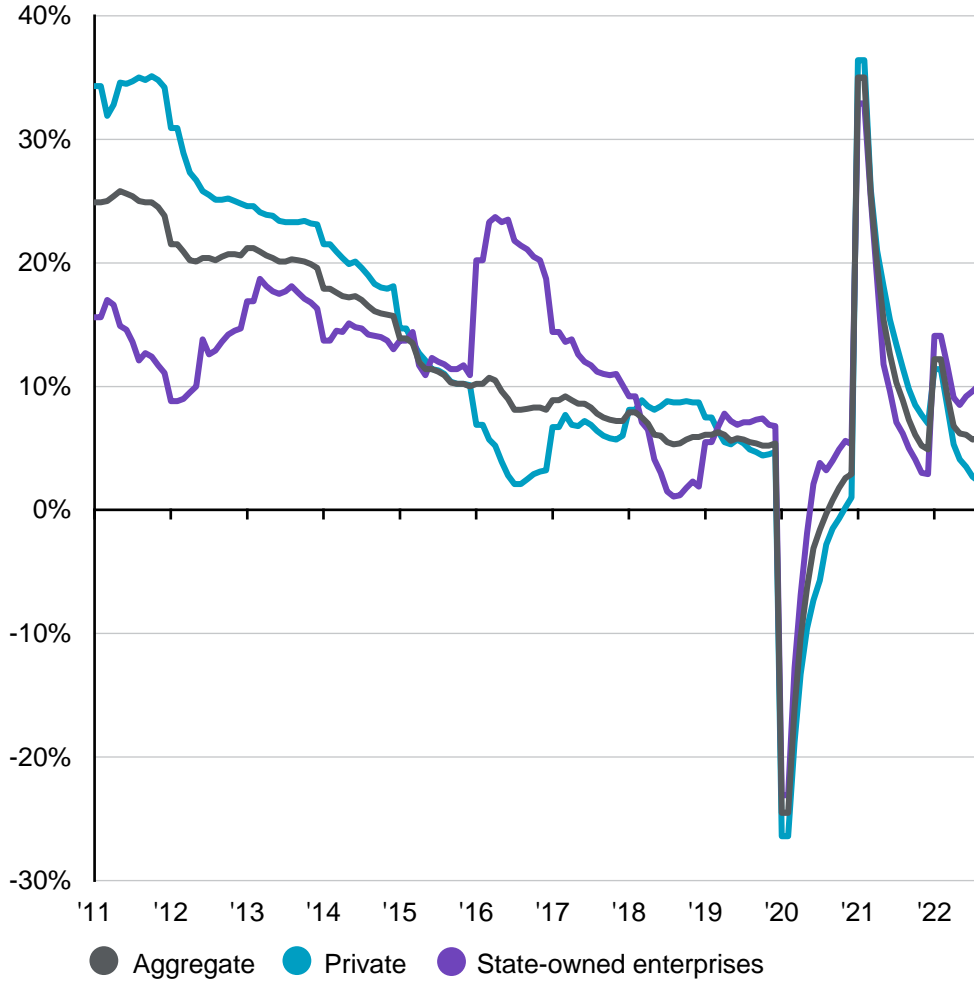


China: Cyclical indicators

Regional economy

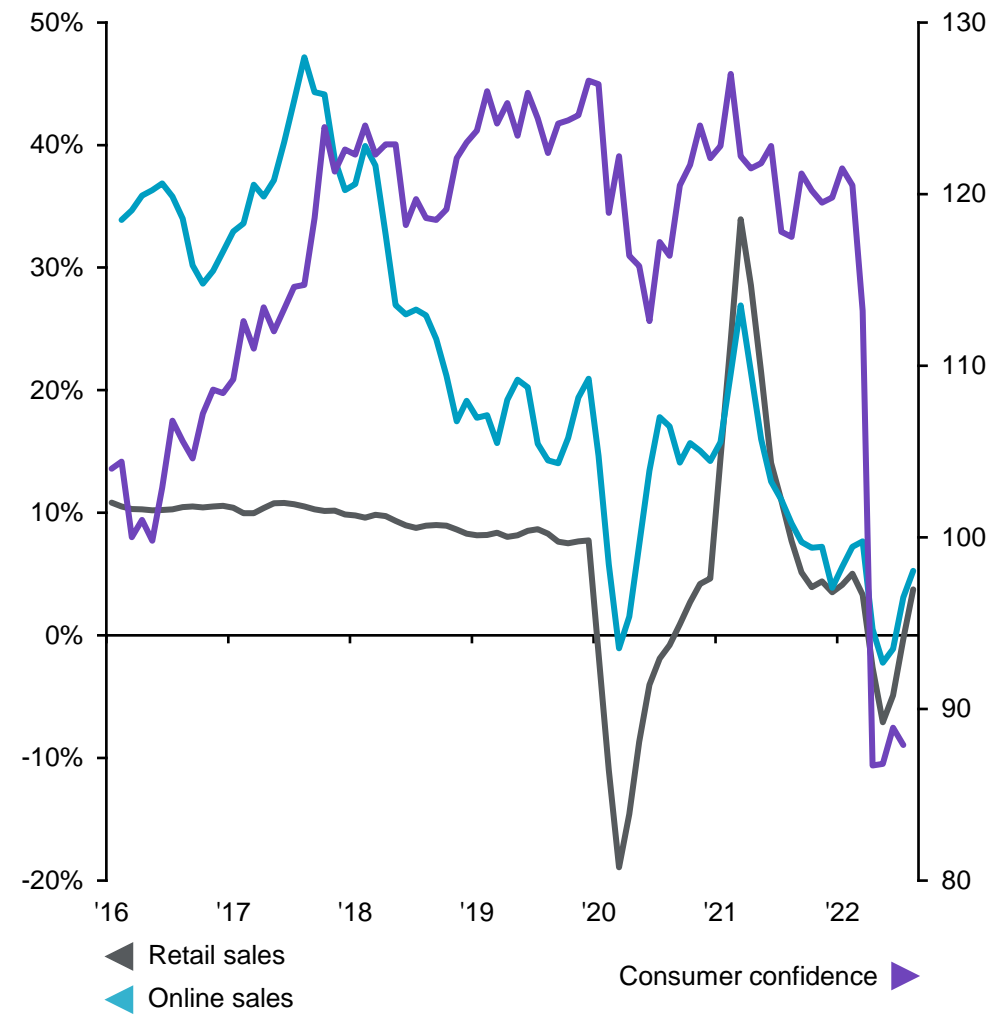
Fixed asset investment

Year-to-date, year-over-year change



Consumption

Year-over-year change, 3-month moving average



Source: CEIC, National Bureau of Statistics of China, J.P. Morgan Asset Management. Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.

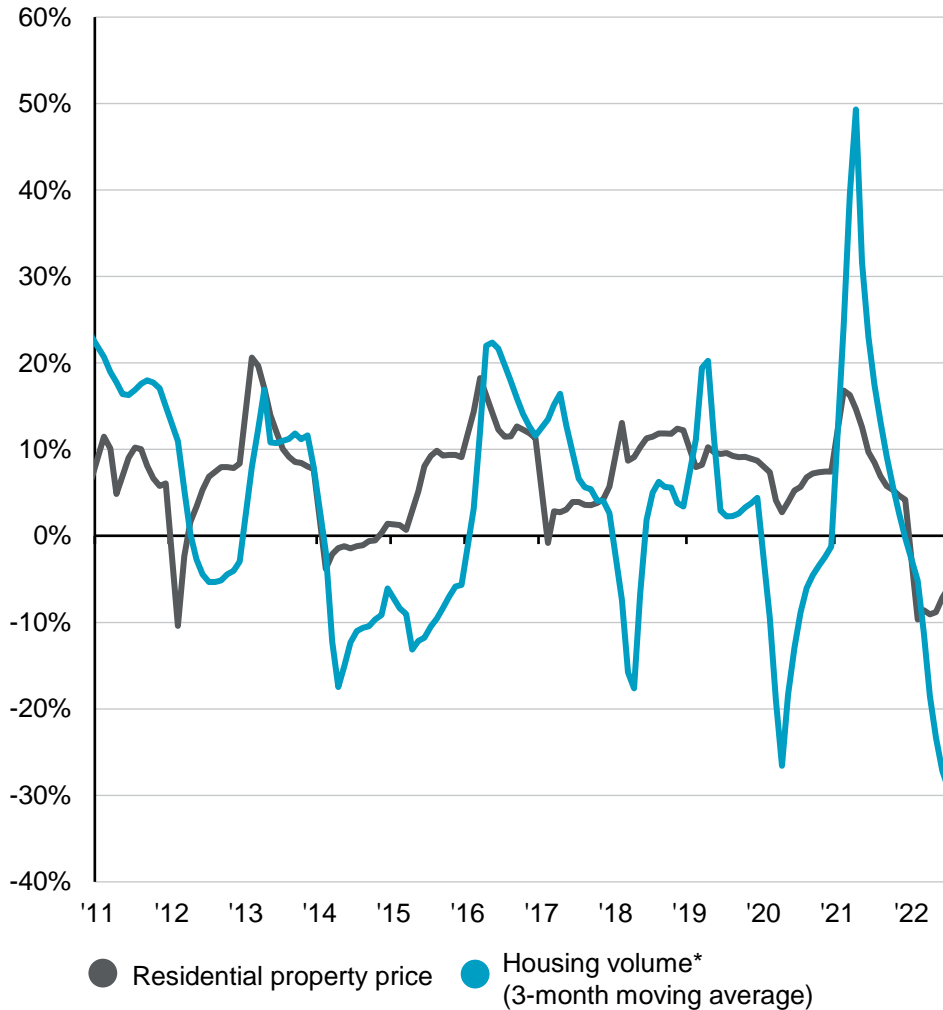


China: Property sector

Regional economy

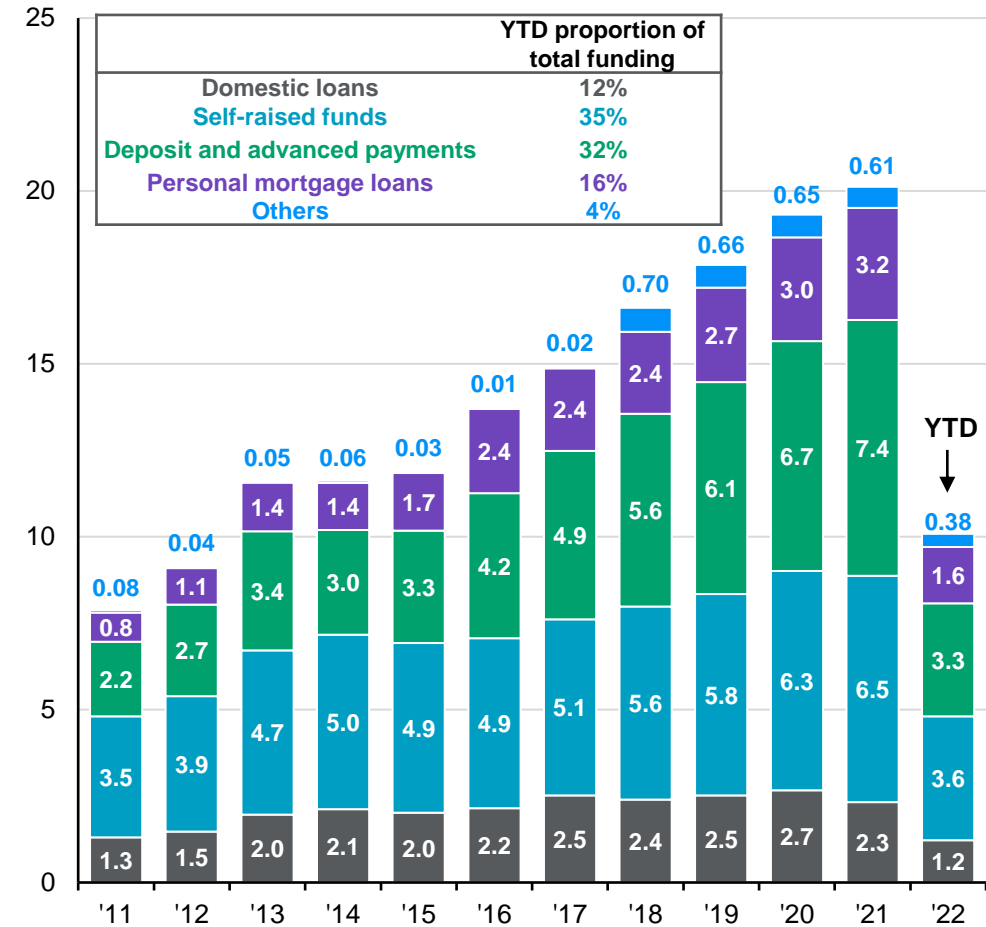
China residential property price and volume

Year-over-year change



Source of fundings for property developers

Trillion RMB



Source: National Bureau of Statistics of China, J.P. Morgan Asset Management; (Left) CEIC; (Right) Wind.

*Housing volume is the sum of the floor space of residential buildings sold, residential buildings newly started, residential buildings completed and land area purchased. Domestic loans refers to loans borrowed from banks. Self-raised funds include developers' internal funds, funds raised from bond issuance, equity issuance and accounts payable to construction contractors and other relevant parties. Personal mortgage loans are mortgage loans that home buyers borrow from banks and public housing funds. Proportion of total funding percentages may not sum to 100% due to rounding.

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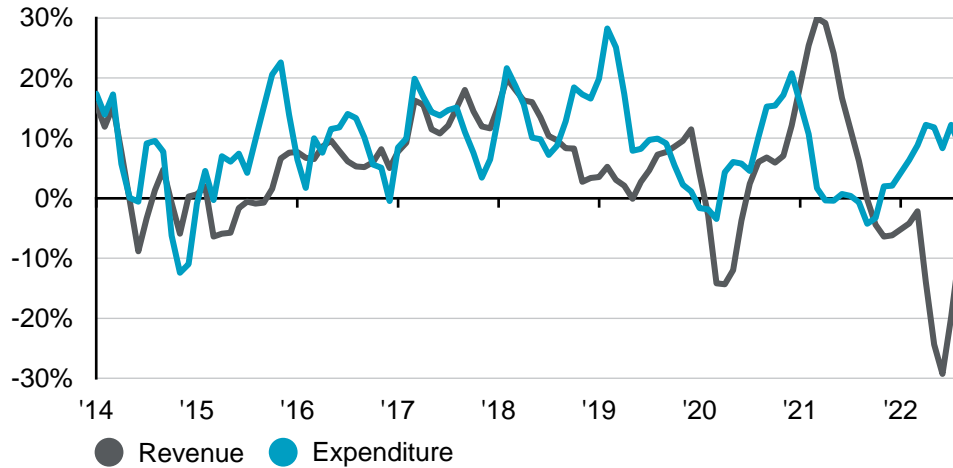


China: Fiscal policy

Regional economy

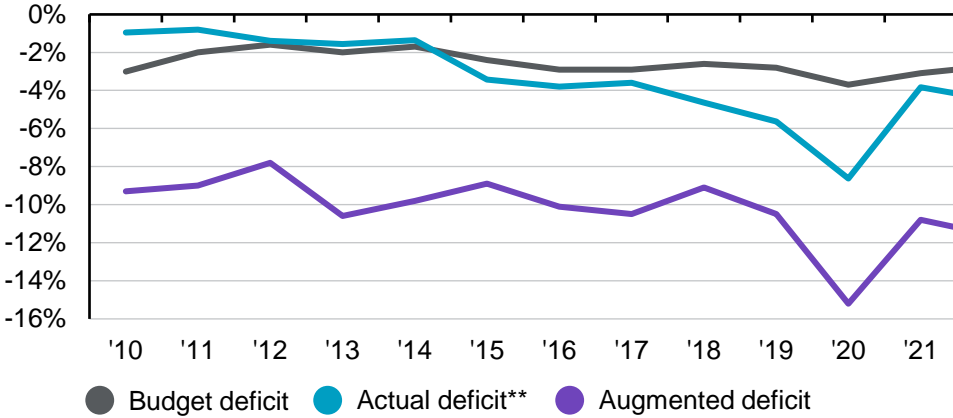
Fiscal revenue and expenditure*

Year-over-year change, 3-month moving average



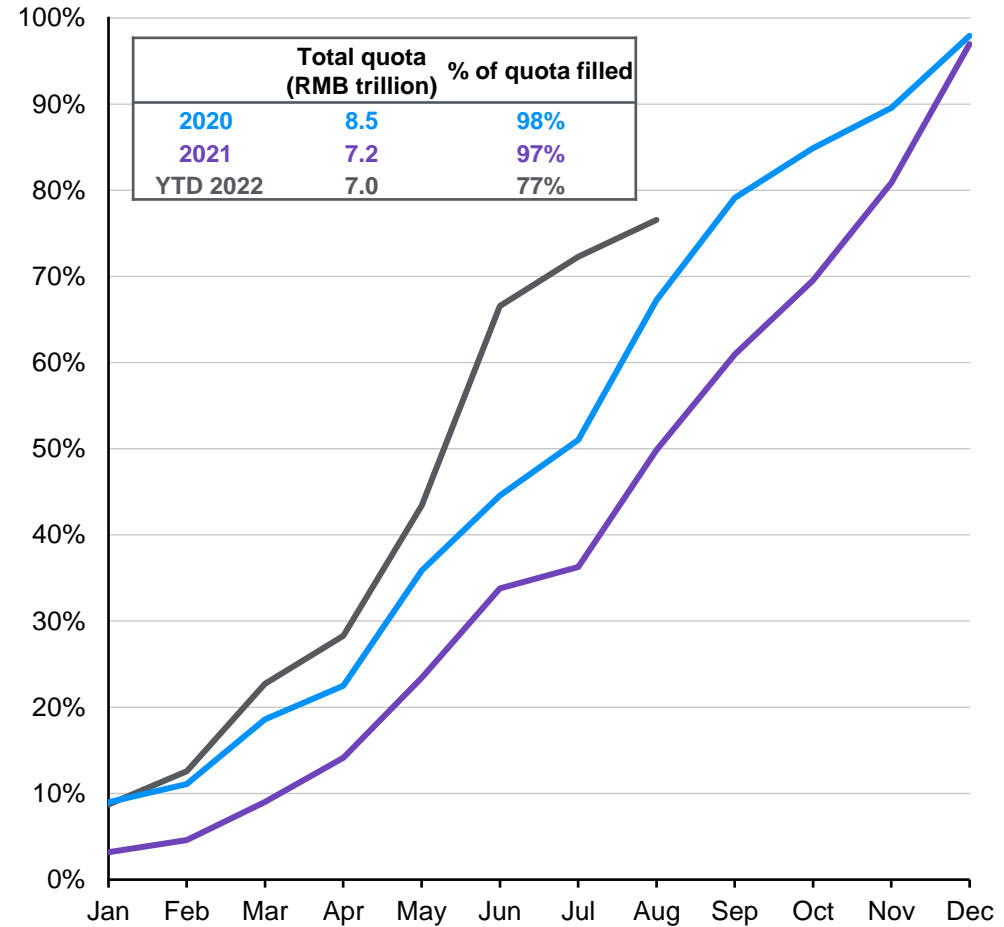
Fiscal balance

% of nominal GDP



Pace of central and local government bond issuance

Year-to-date issuance as % of full-year quota



Source: CEIC, J.P. Morgan Asset Management; (Left) Ministry of Finance of China; (Right) Wind.

*Fiscal revenue includes taxes, government funds, which are mostly derived from local government land sales, and other government revenues. Fiscal expenditure includes government spending of funds raised from taxes, government funds and general bond issuance. **Actual deficit = fiscal revenues – fiscal expenditures. Budget deficit = actual deficit adjusted with the fiscal stability fund. Augmented deficit is an estimate of all the fiscal resources used by the government to support economic growth, i.e. fiscal balance plus investment via local government financing vehicles, policy banks and other channels.

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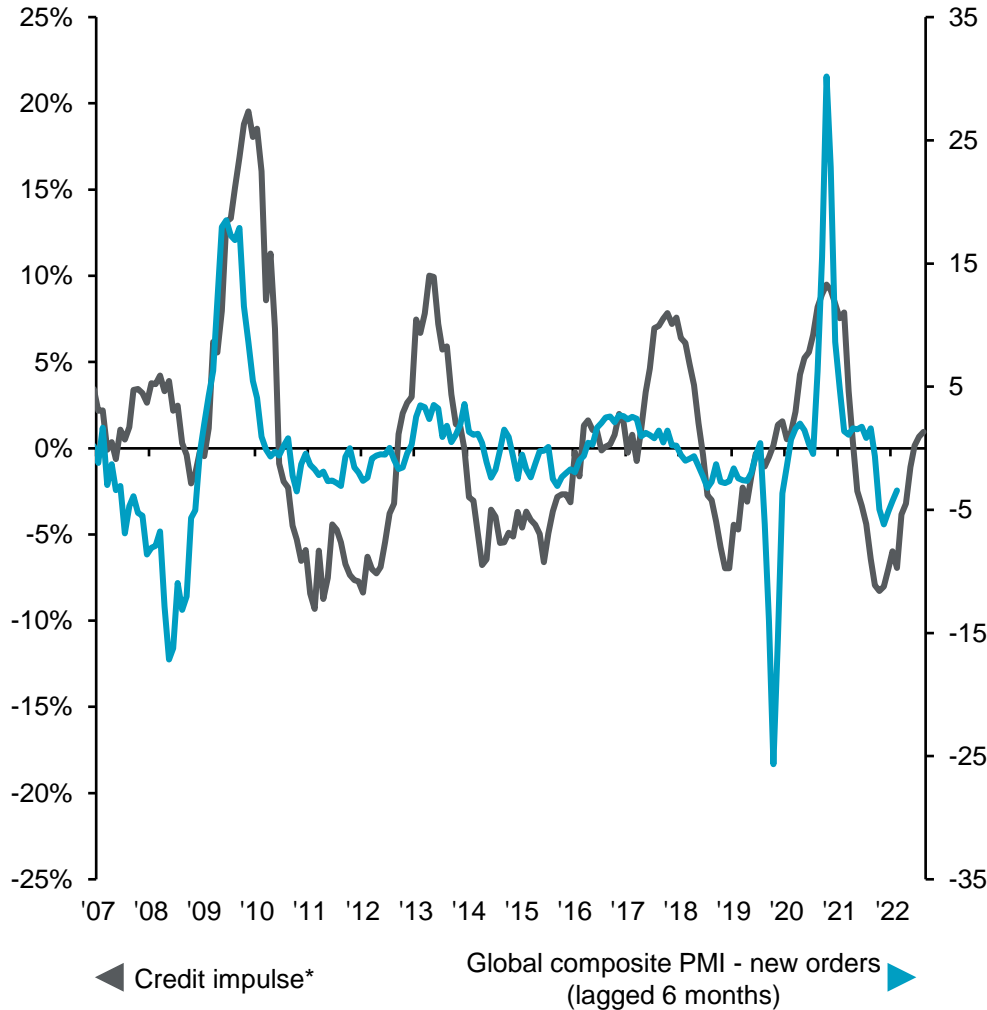


China: Monetary policy and credit growth

Regional economy

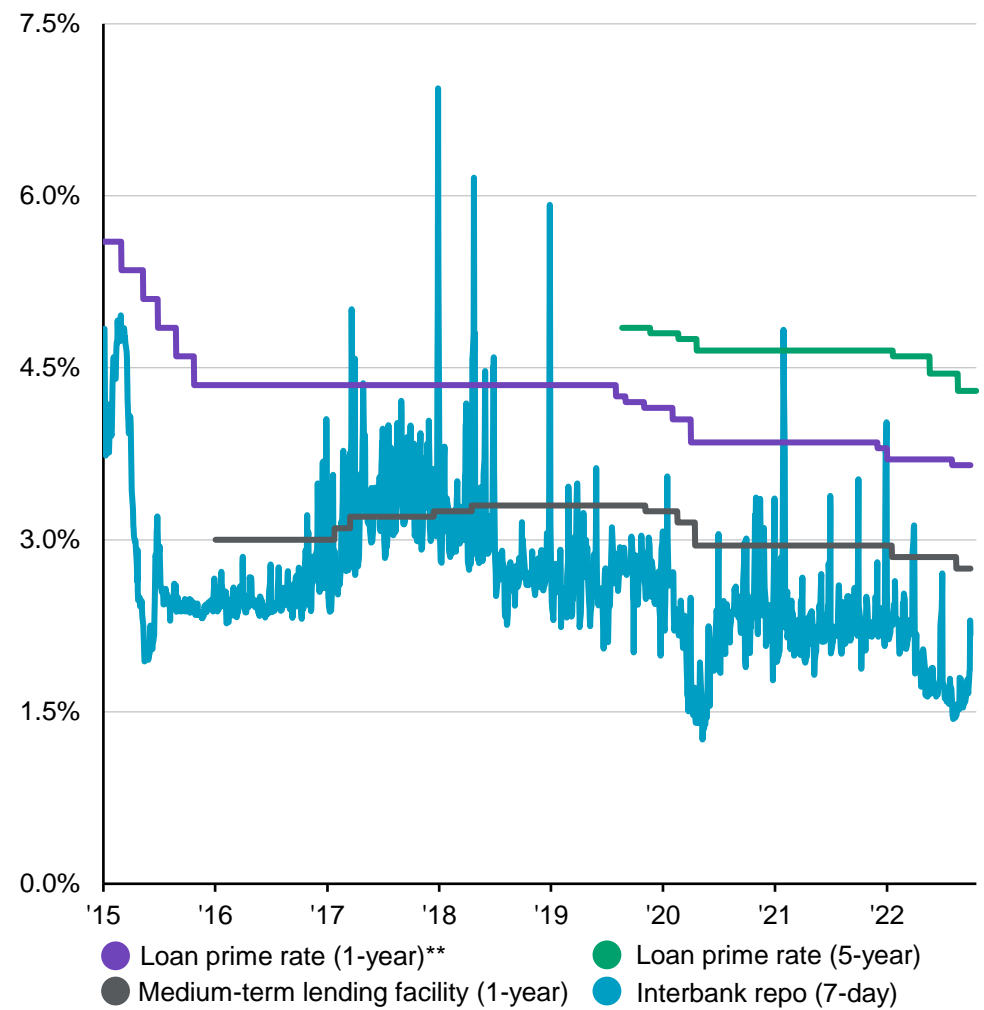
Chinese credit impulse and global new orders

% of nominal GDP, year-over-year change Difference from one year ago



Key interest rates

Per annum



Source: CEIC, People's Bank of China (PBoC), J.P. Morgan Asset Management; (Left) Ministry of Finance of China; (Right) National Interbank Funding Center.
 *Credit impulse measures the year-over-year change of credit flow (net aggregate social financing) as a percentage of nominal GDP. Rolling 12-month nominal GDP and credit stock are used in the calculation. **Previously, the 1-year lending rate was a key interest rate. In August 2019, the PBoC started to release 1-year and 5-year loan prime rates (LPR) on a monthly basis, which are based on quotes from 18 large banks. LPR has become the benchmark for commercial loans and floating rate loan contracts.

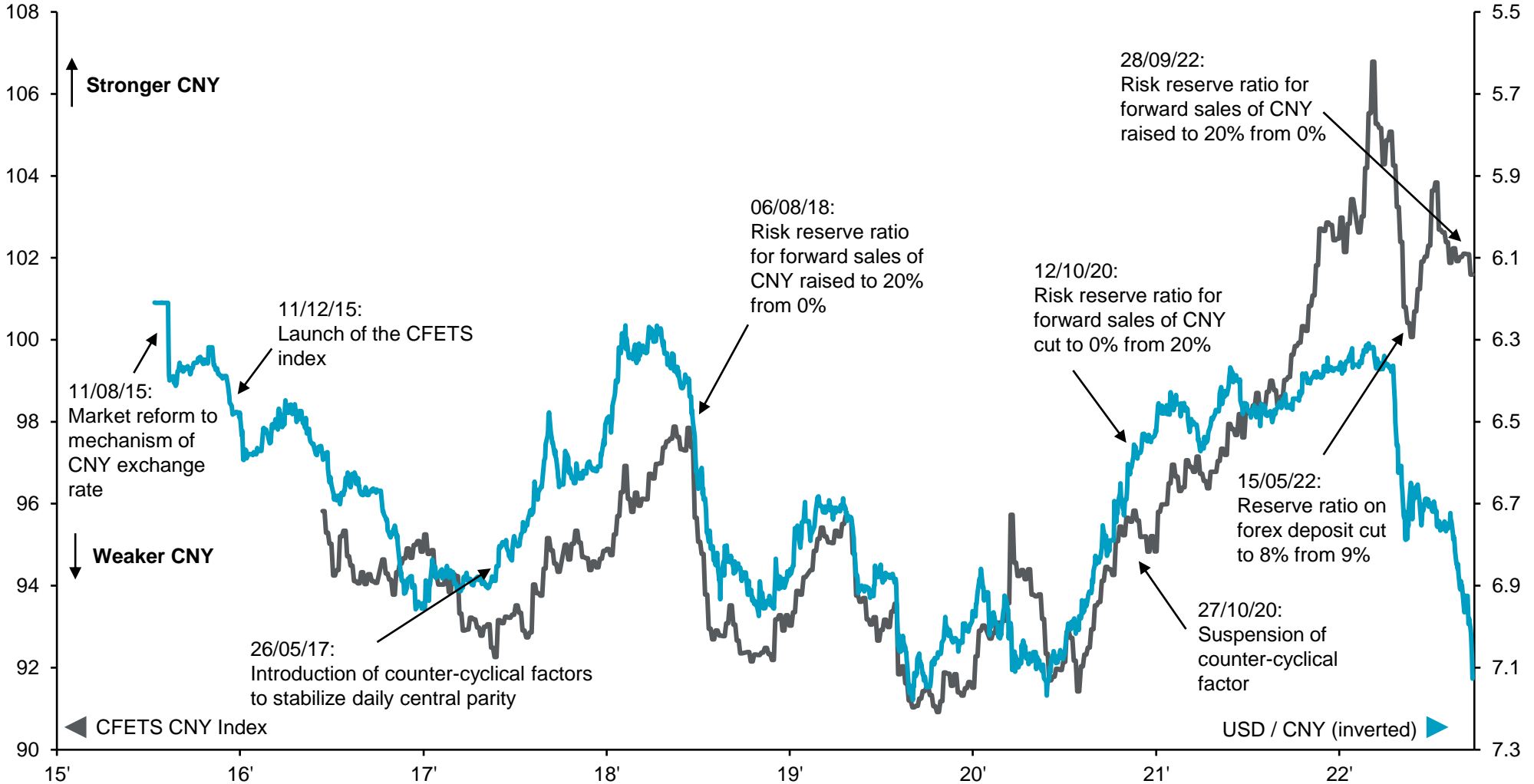
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China: Exchange rate

Chinese yuan exchange rate

CFETS Index*



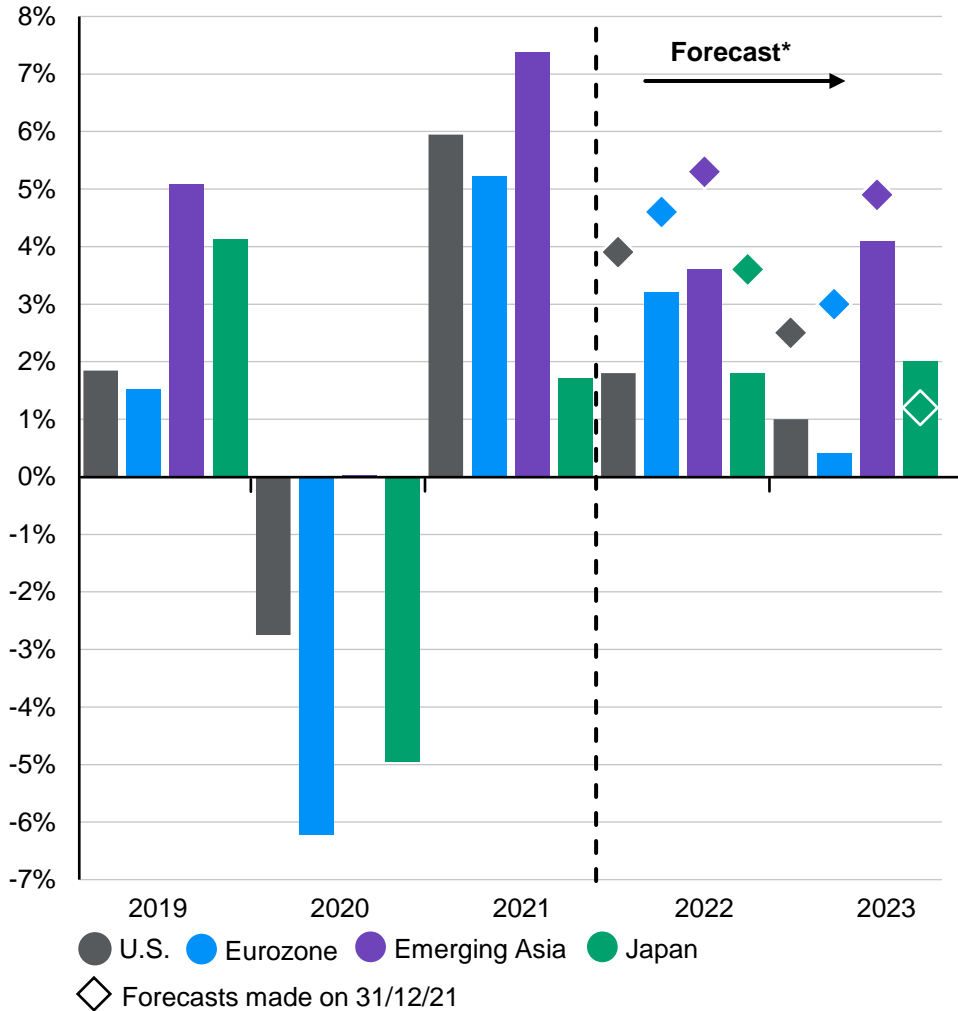
Source: China Foreign Exchange Trade Center, FactSet, J.P. Morgan Economic Research, J.P. Morgan Asset Management.
 *CFETS CNY Index is the China Foreign Exchange Trade System basket of 24 currencies traded against the Chinese renminbi, where the base value was set at 100 as of 31/12/14. Past performance is not a reliable indicator of current and future results.
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Global growth and inflation forecasts

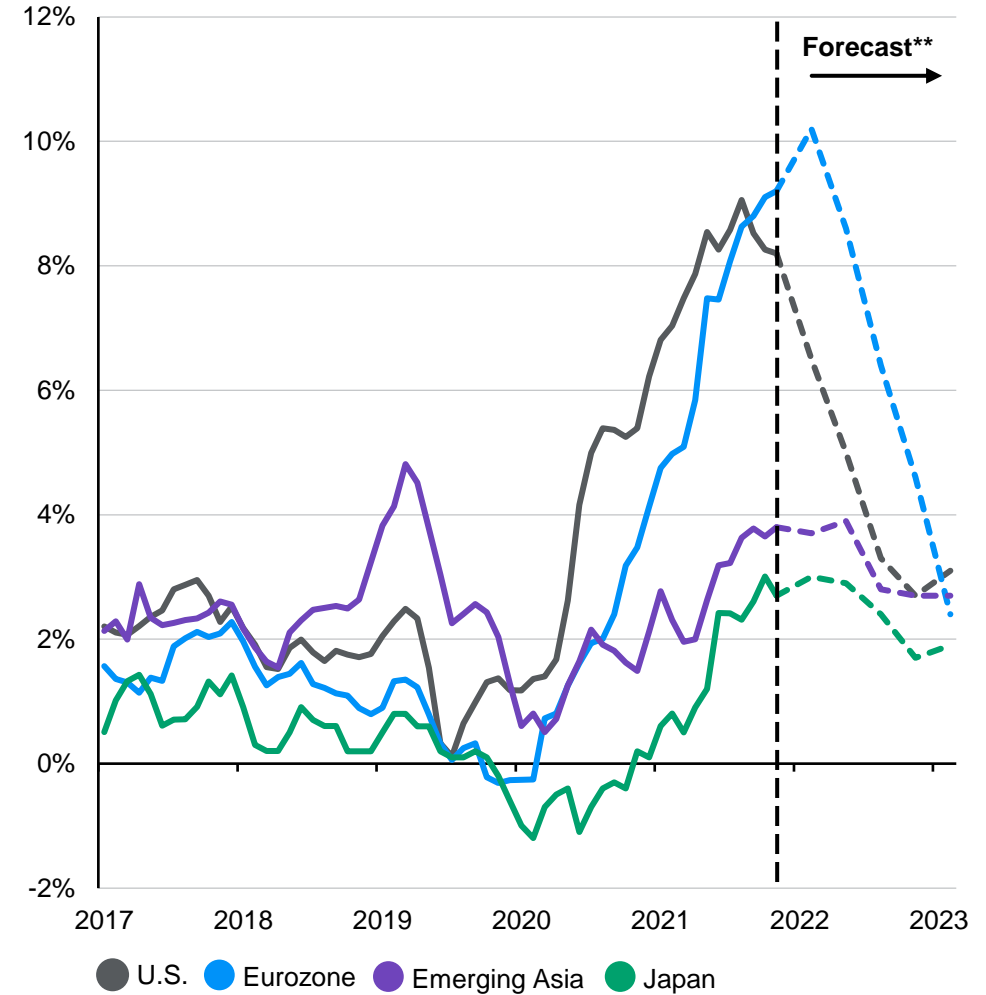
Global economy

Annual real GDP growth



Headline consumer price inflation

Year-over-year change



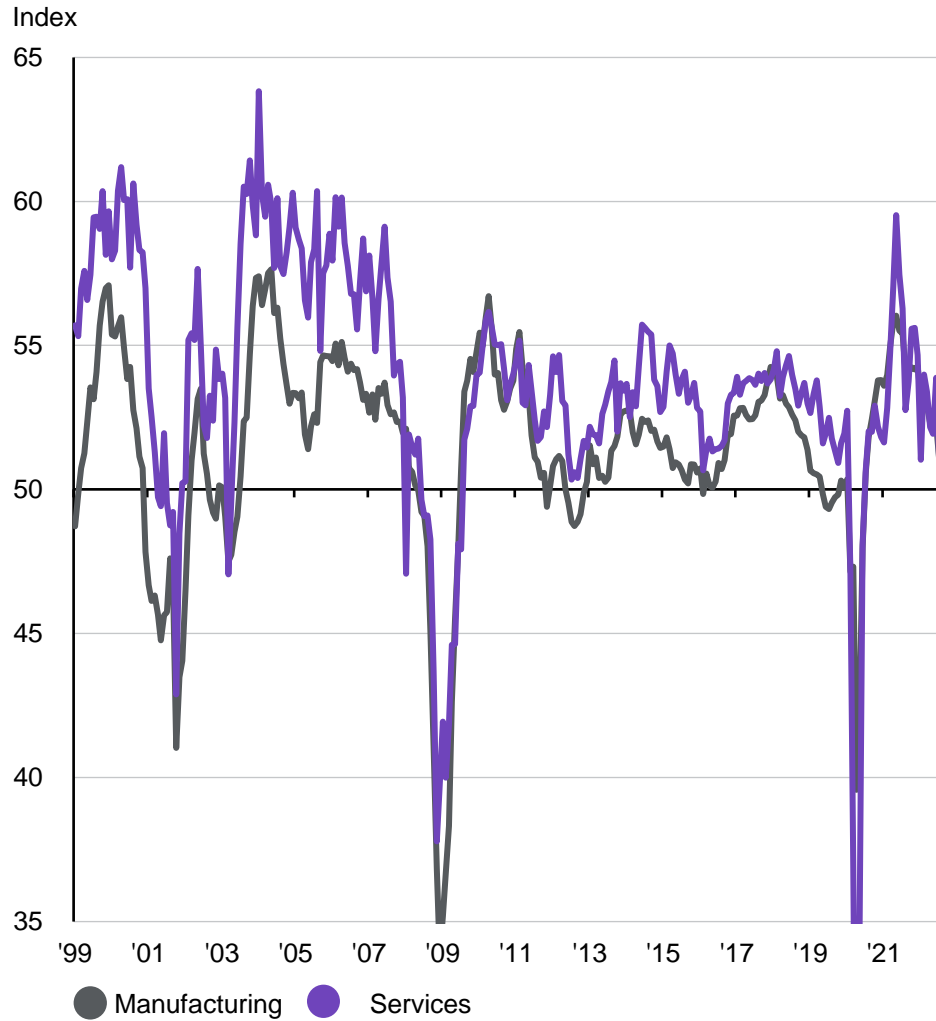
Source: FactSet, J.P. Morgan Economic Research, J.P. Morgan Asset Management. *Real GDP growth forecasts are based on growth forecasts estimated by J.P. Morgan Economic Research. **Inflation forecasts are based on consumer price inflation forecasts estimated by J.P. Morgan Economic Research. Diamonds in the left-hand-side chart represent the real GDP forecasts made on 31/12/21 published by J.P. Morgan Economic Research. Columns and dotted lines in the forecast area indicate the most recent forecasts published by J.P. Morgan Economic Research.
 Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.



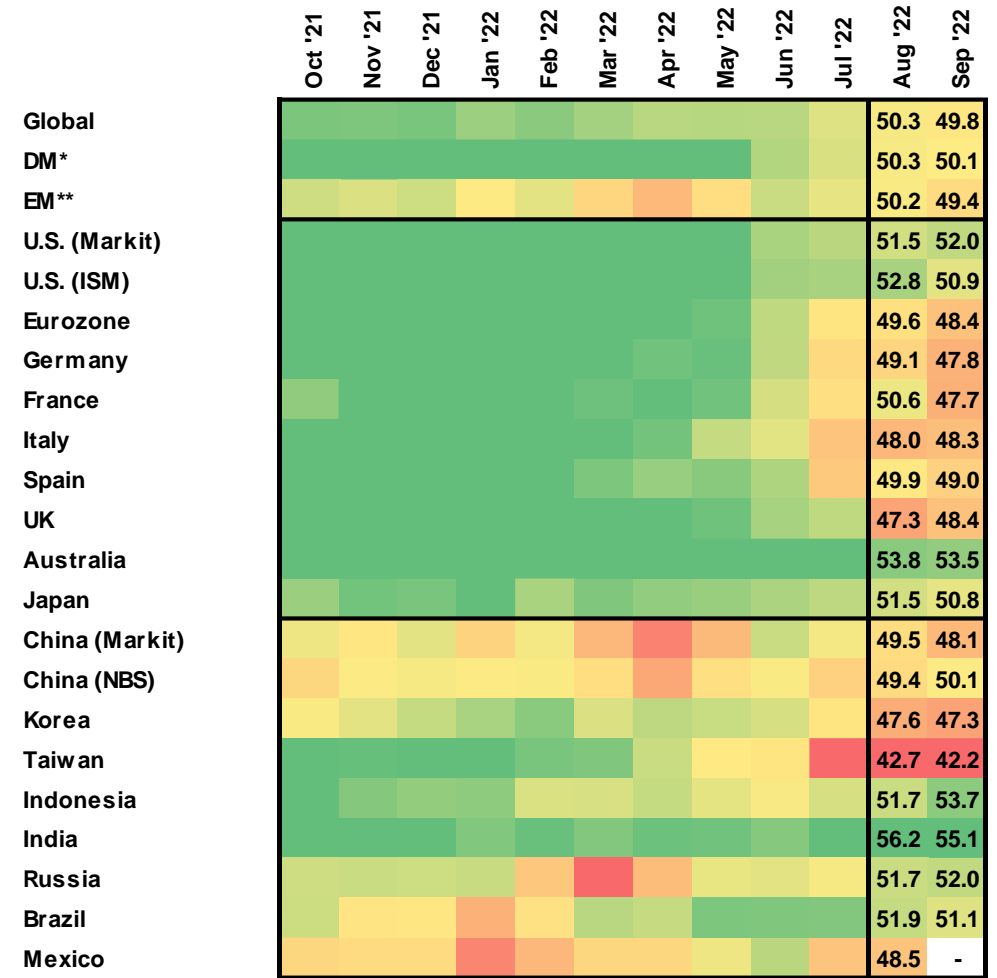
Global Purchasing Managers' Index (PMI)

Global economy

Global manufacturing and services PMI



Global manufacturing PMI breakdown



Source: Australian Industry Group, Institute for Supply Management, J.P. Morgan Economic Research, Markit, J.P. Morgan Asset Management. PMIs are relative to 50, which indicates deceleration (below 50) or acceleration (above 50) of the sector. Heatmap colors are based on PMI relative to the 50 level, with green (red) corresponding to acceleration (deceleration). *Developed market includes Australia, Canada, Denmark, eurozone, Japan, New Zealand, Norway, Sweden, Switzerland, UK and the U.S. **Emerging market includes Brazil, Chile, China, Colombia, Croatia, Czech Republic, Hong Kong SAR, Hungary, India, Indonesia, Israel, Korea, Malaysia, Mexico, Philippines, Poland, Romania, Russia, Saudi Arabia, Singapore, South Africa, Taiwan, Thailand, Turkey and Vietnam. Guide to the Markets – Asia. Data reflect most recently available as of 04/10/22.



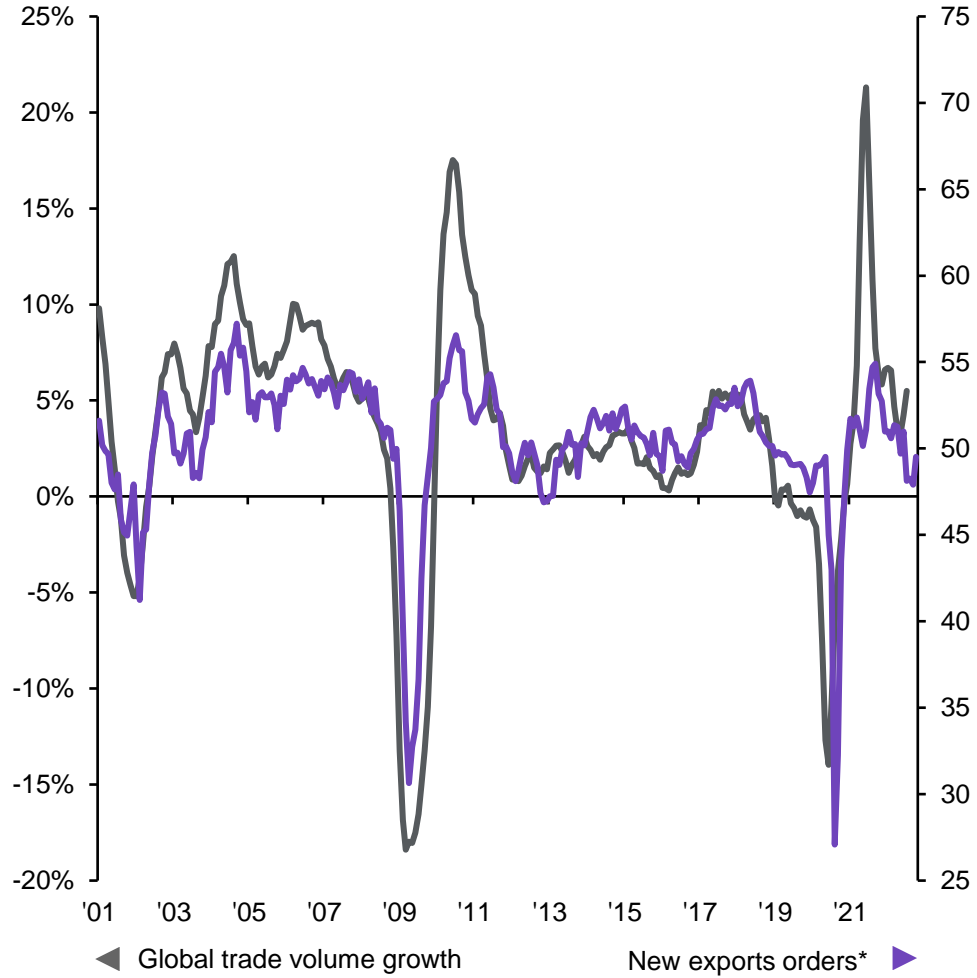
Global trade

Global economy

Global trade activity

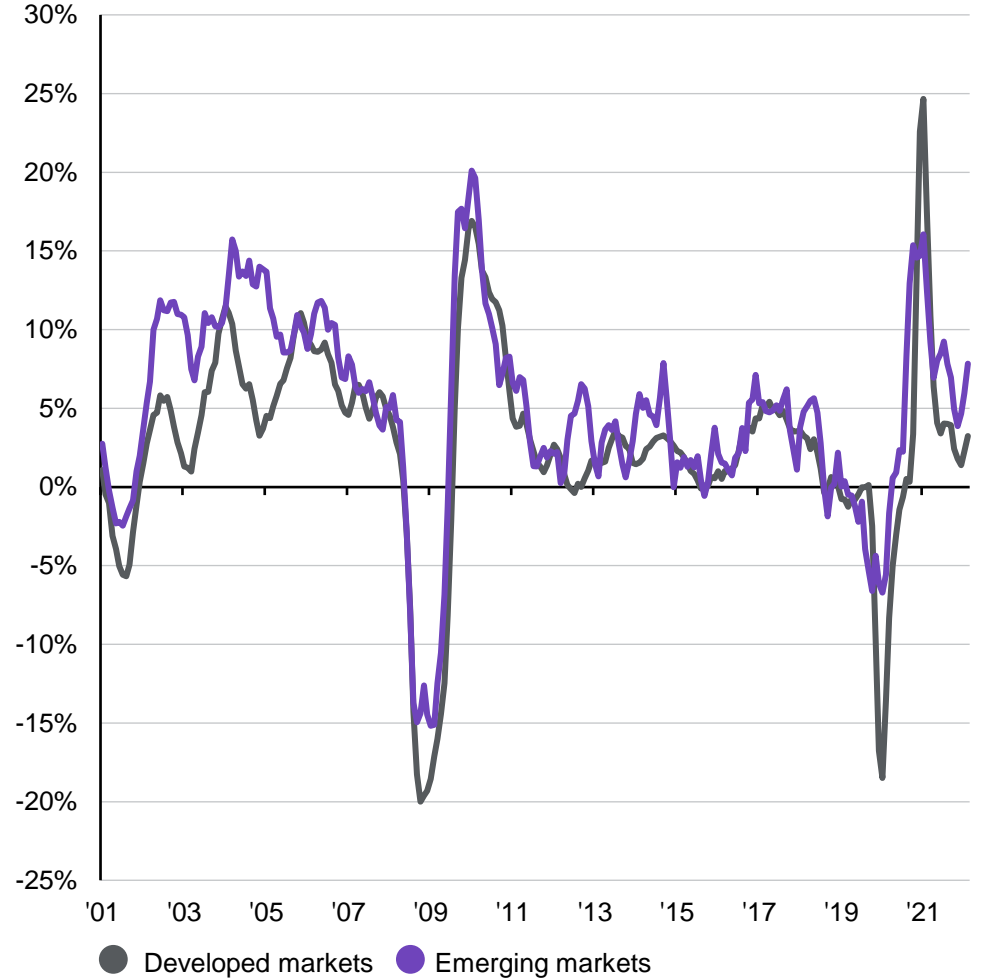
Year-over-year change, 3-month moving average

Index, 4-month lead



Exports growth

Year-over-year change, 3-month moving average

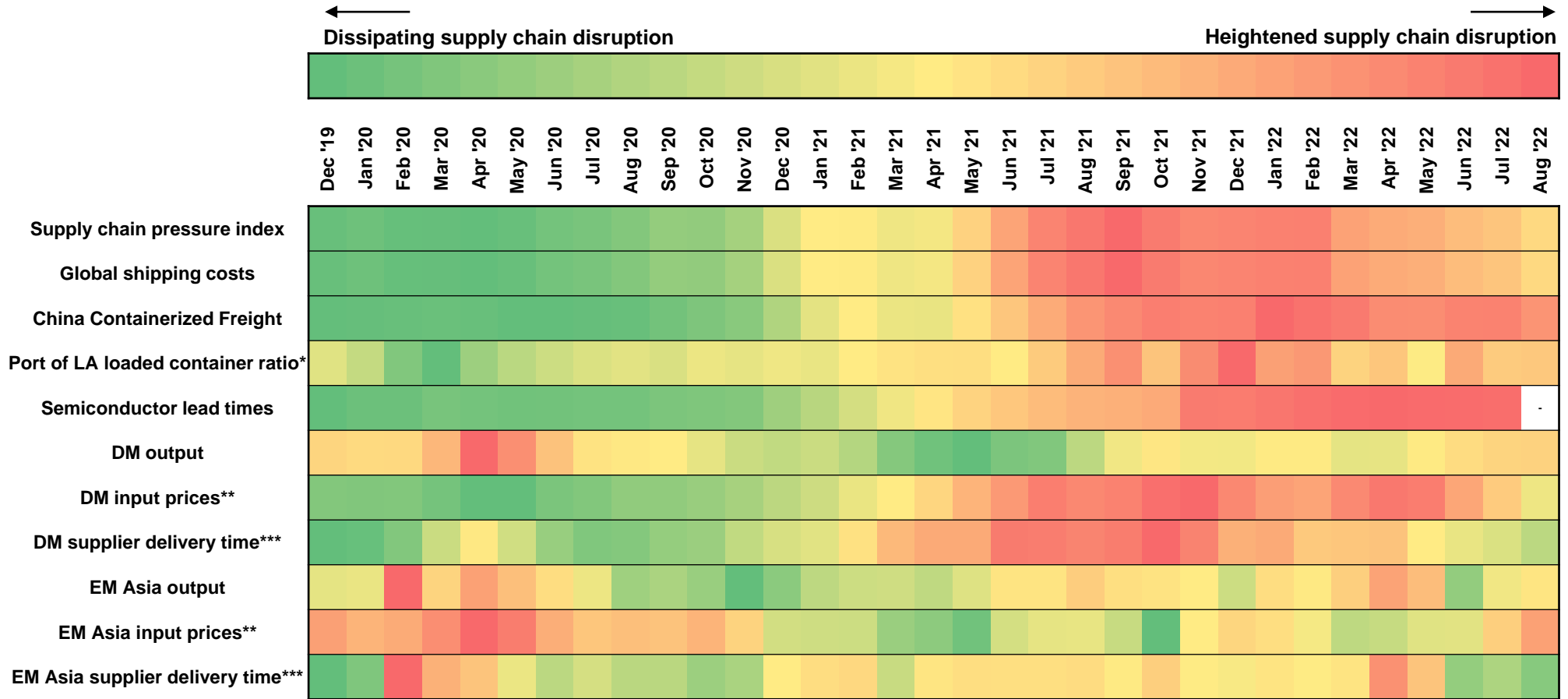


Source: FactSet, J.P. Morgan Economics Research, Markit, Netherlands Bureau for Economic Policy Analysis, J.P. Morgan Asset Management.
 *Series shown is the Global Manufacturing Purchasing Managers' Index Sub-Index for new export orders. Emerging markets and developed markets as defined by Netherlands Bureau for Economic Policy Analysis World Trade Monitor.
 Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.



Global supply chains

Supply chain issues



Source: Drewry, FactSet, IHS Markit, J.P. Morgan Economic Research, Port of Los Angeles, Shanghai Shipping Index, Susquehanna Financial Group, J.P. Morgan Asset Management. Supply chain pressure index: New York Fed Global Supply Chain Pressure Index. Global shipping costs: Drewry World Container Index. The Port of LA loaded container ratio is calculated by dividing the total number of loaded containers by the total number of empty containers. Semiconductor lead time is the time between ordering a chip and delivery and is only available until 31/07/22. The output, input prices and supplier delivery time of developed markets and EM Asia are measured using the corresponding manufacturing PMI sub-indices.

*Green signifies more loaded containers relative to empty containers at the Port of LA, which implies less supply chain disruptions.

**Green signifies lower input prices as the impact of input cost pressures has eased.

***Green signifies shorter supplier delivery time.

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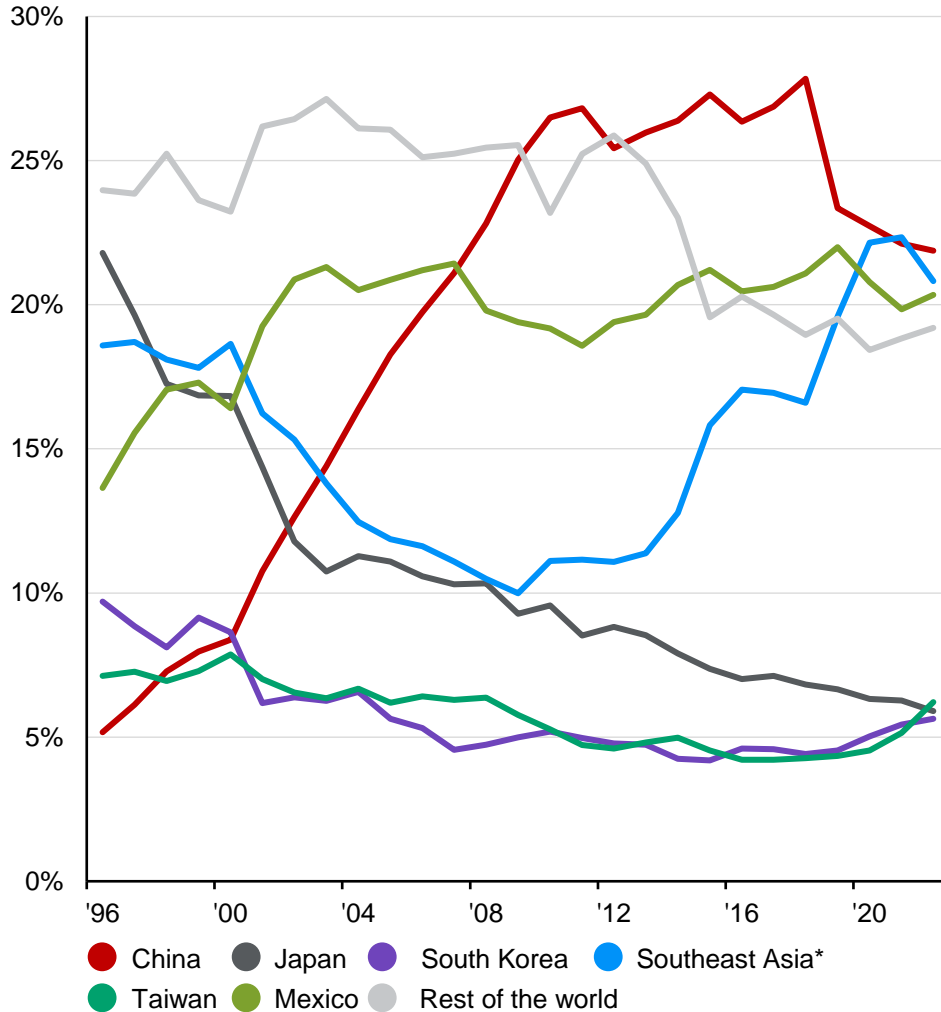


Regional supply chains

Global economy

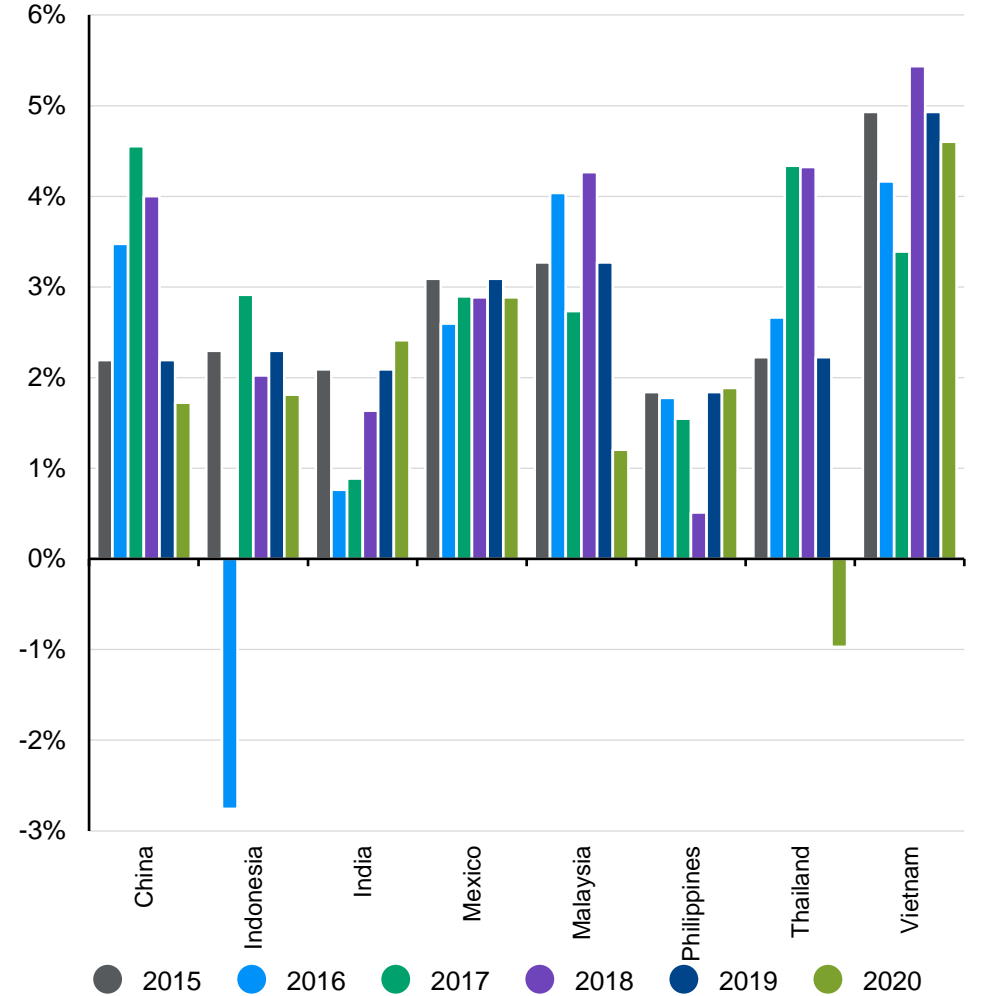
Electronic exports to the U.S.

Percentage of total electronic exports to the U.S.



Foreign direct investments

Net inflows as percentage of GDP



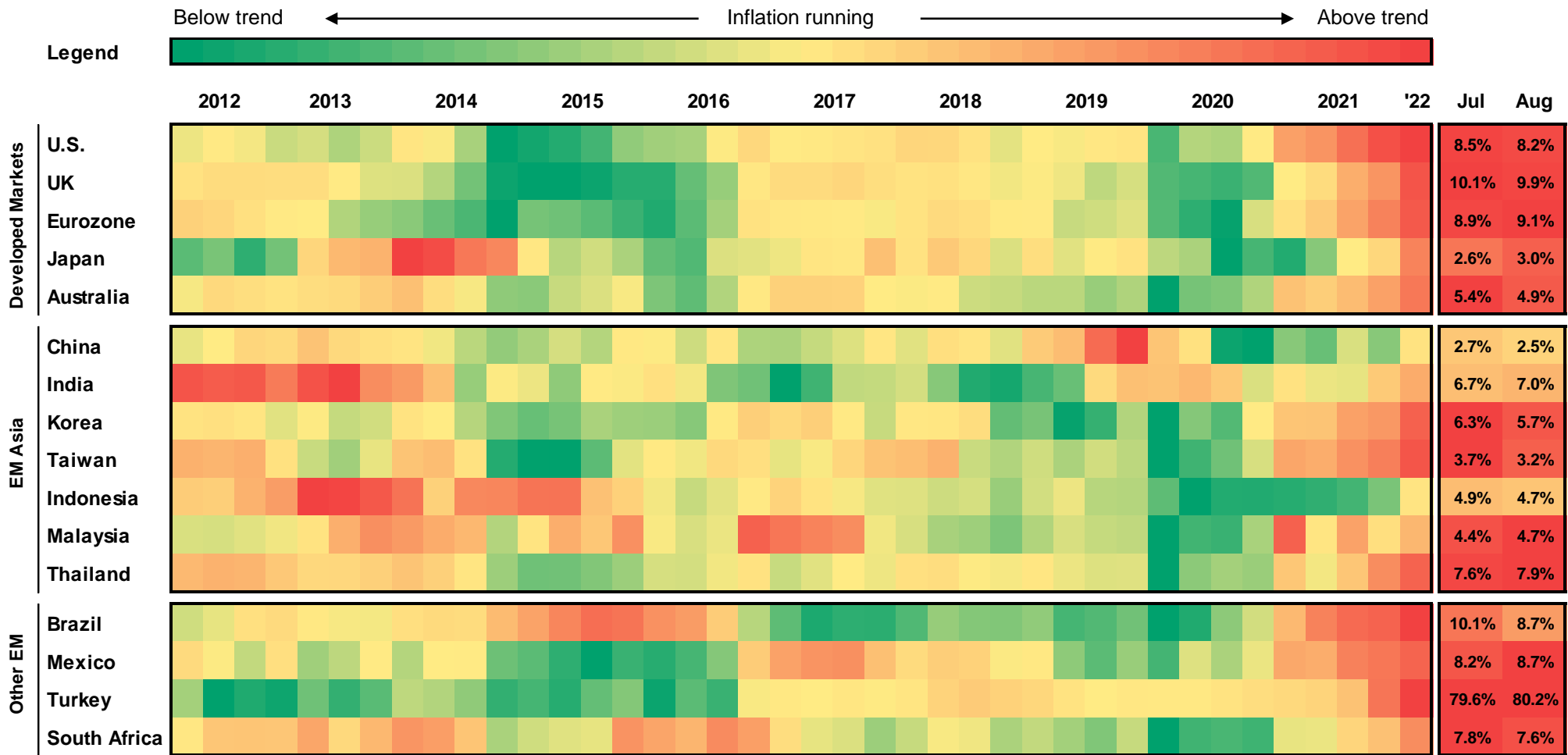
Source: J.P. Morgan Asset Management; (Left) U.S. Census Bureau; (Right) World Bank. *Southeast Asia is comprised of Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam. Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.



Global inflation

Headline consumer prices

Year-over-year change, quarterly



Source: Department of Statistics Malaysia, DGBAS, Eurostat, FactSet, IBGE, India Ministry of Statistics & Programme Implementation, INEGI, J.P. Morgan Economics Research, Korean National Statistical Office, Melbourne Institute, Ministry of Commerce Thailand, Ministry of Internal Affairs & Communications Japan, National Bureau of Statistics China, Office for National Statistics UK, Statistics Indonesia, Statistics Institute Turkey, Statistics South Africa, U.S. Department of Labor, J.P. Morgan Asset Management. Seasonally adjusted quarterly averages, with the exception of the two most recent figures, which are seasonally adjusted single month readings, are shown. Colors are based on z-score of year-over-year inflation rate relative to each market's own 10-year history where red (green) indicates inflation above (below) long-run trend. EM represents emerging markets.

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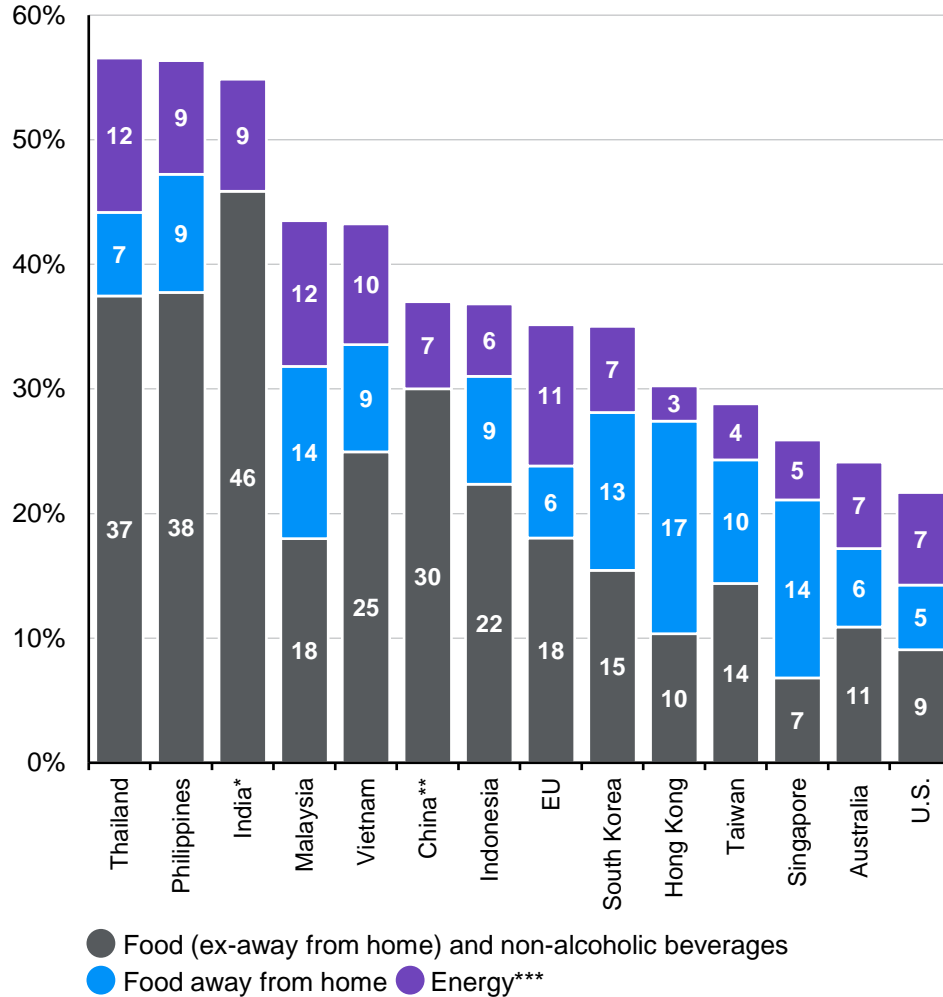


Global food and energy inflation

Global economy

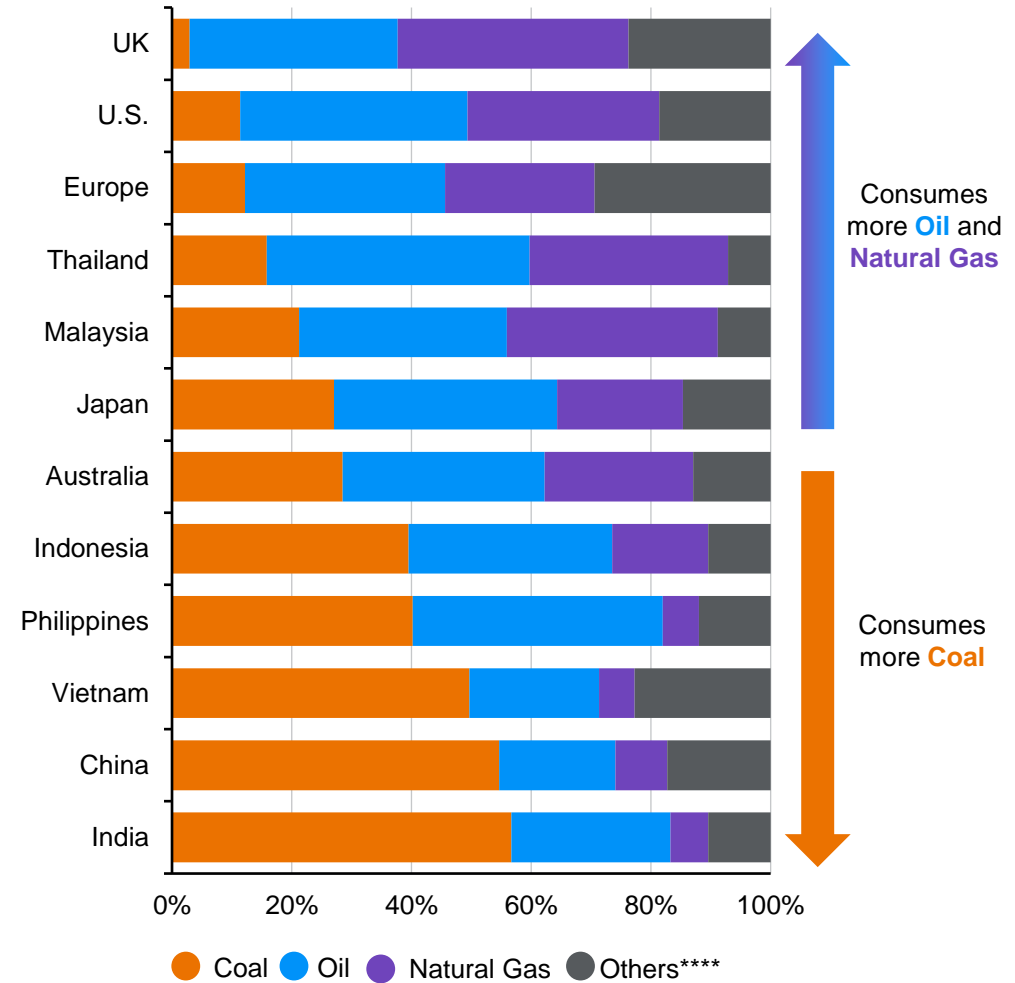
Food and energy weights within CPI baskets

Share of CPI basket



Energy consumption by fuel

Share of total energy consumption



Source: J.P. Morgan Asset Management; (Left) Australian Bureau of Statistics, CEIC, FactSet; (Right) BP Statistical Review of World Energy. *India's food away from home consumer price index (CPI) is zero. **China NBS does not provide detailed CPI weights. ***Energy includes energy used by households and transportation. ****Others include nuclear energy, hydroelectric and other renewables.
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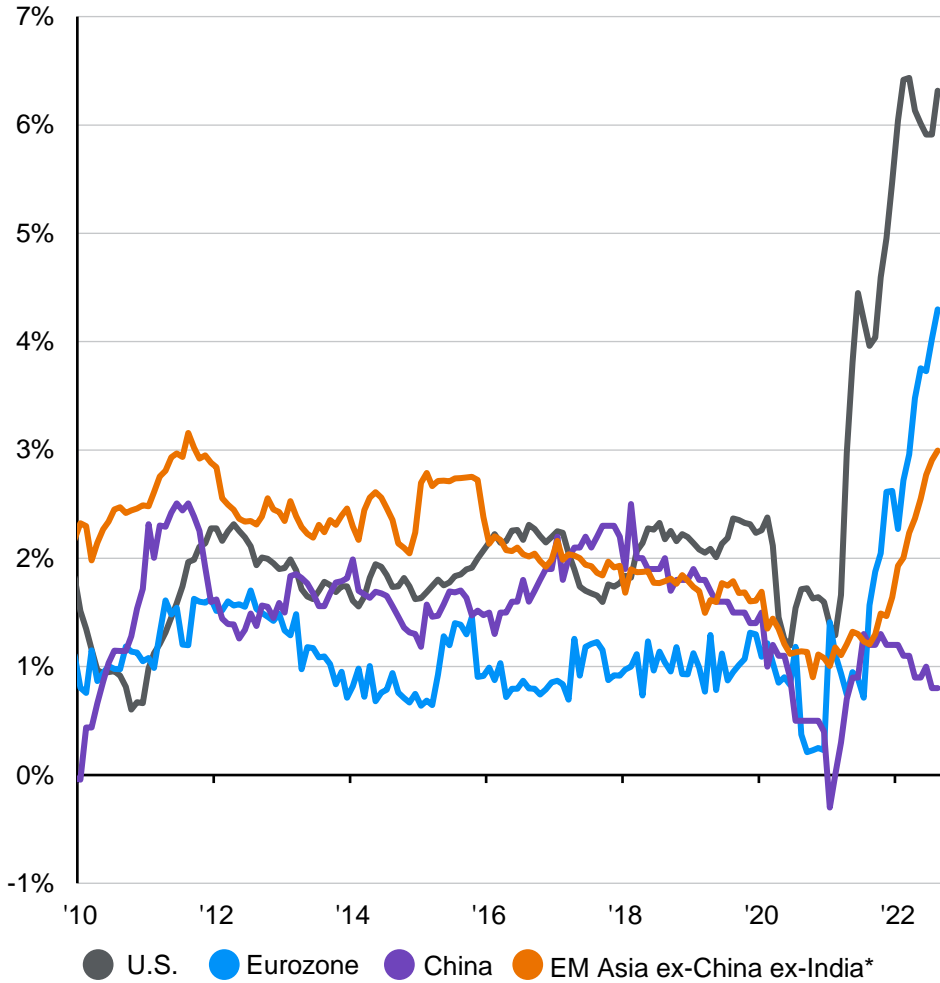


Global core inflation and wage growth

Global economy

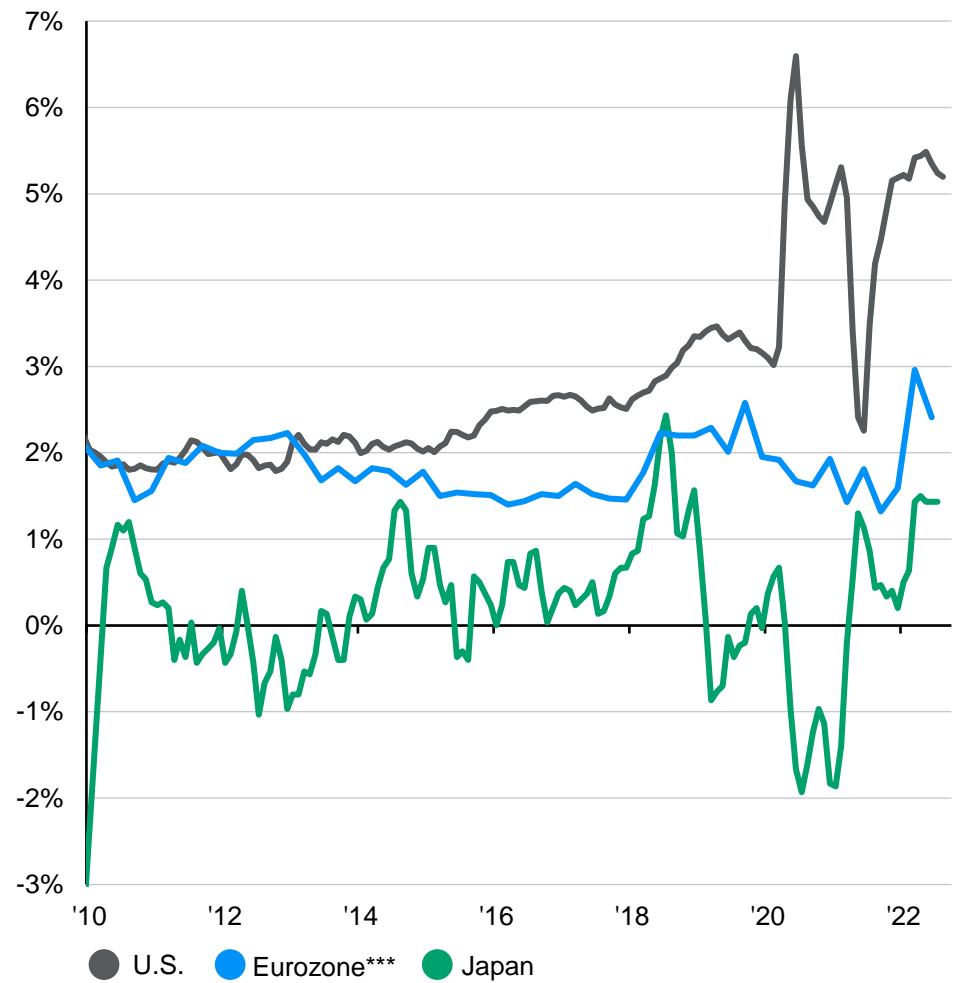
Core inflation across regions

Year-over-year change



Wage growth

Year-over-year change, 3-month moving average**



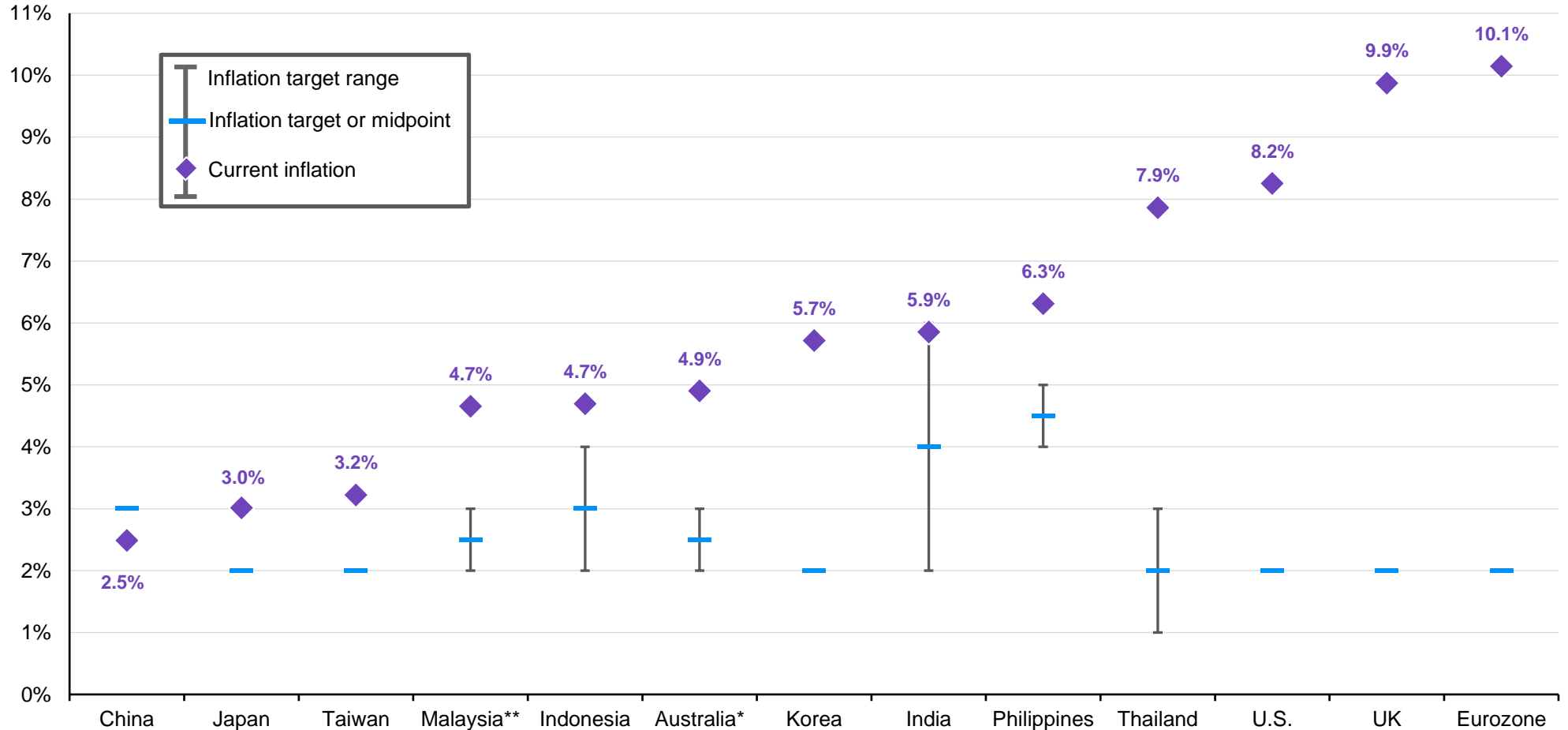
Source: FactSet, J.P. Morgan Asset Management; (Left) Bank of Korea, J.P. Morgan Economic Research, Ministry of Commerce Thailand, National Bureau of Statistics China, Statistics Indonesia, Statistics Philippines, Statistics Taiwan; (Right) Eurostat, Ministry of Health, Labor and Welfare Japan, U.S. Department of Labor. *EM Asia ex-China ex-India is constructed using a GDP weighted average of Indonesia, Malaysia, Philippines, South Korea, Taiwan and Thailand. **3-month moving average is applied to the U.S. and Japan only. ***Eurozone wage growth is calculated based on quarterly negotiated wage data. *Guide to the Markets – Asia*. Data reflect most recently available as of 30/09/22.



Central bank inflation targets

Inflation and central bank inflation targets

Year-over-year change



Source: FactSet, J.P. Morgan Asset Management. *The inflation figure used for Australia is based on trimmed-mean consumer price index (CPI) which is the preferred metric used by the Reserve Bank of Australia for its inflation target. **The inflation figure used for Malaysia is based on core CPI, which is the preferred metric used by the Bank Negara Malaysia (The Central Bank of Malaysia) for its inflation target. Inflation figures for other listed economies are based on headline CPI, in accordance with their preferred inflation target metric. Note that while the U.S. Federal Reserve officially targets 2% headline personal consumption expenditure (PCE) inflation, headline CPI is used for U.S. inflation in this chart due to the timelier release of data.
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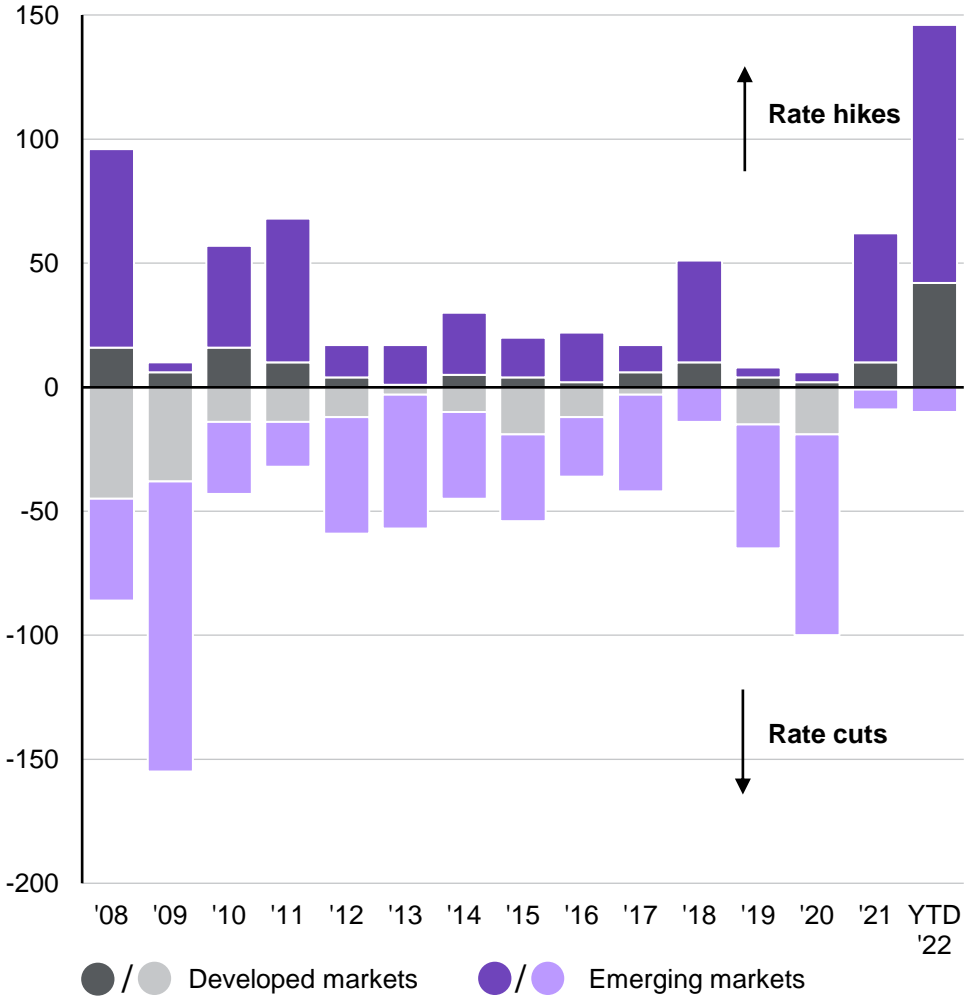


Global central bank policy rate changes

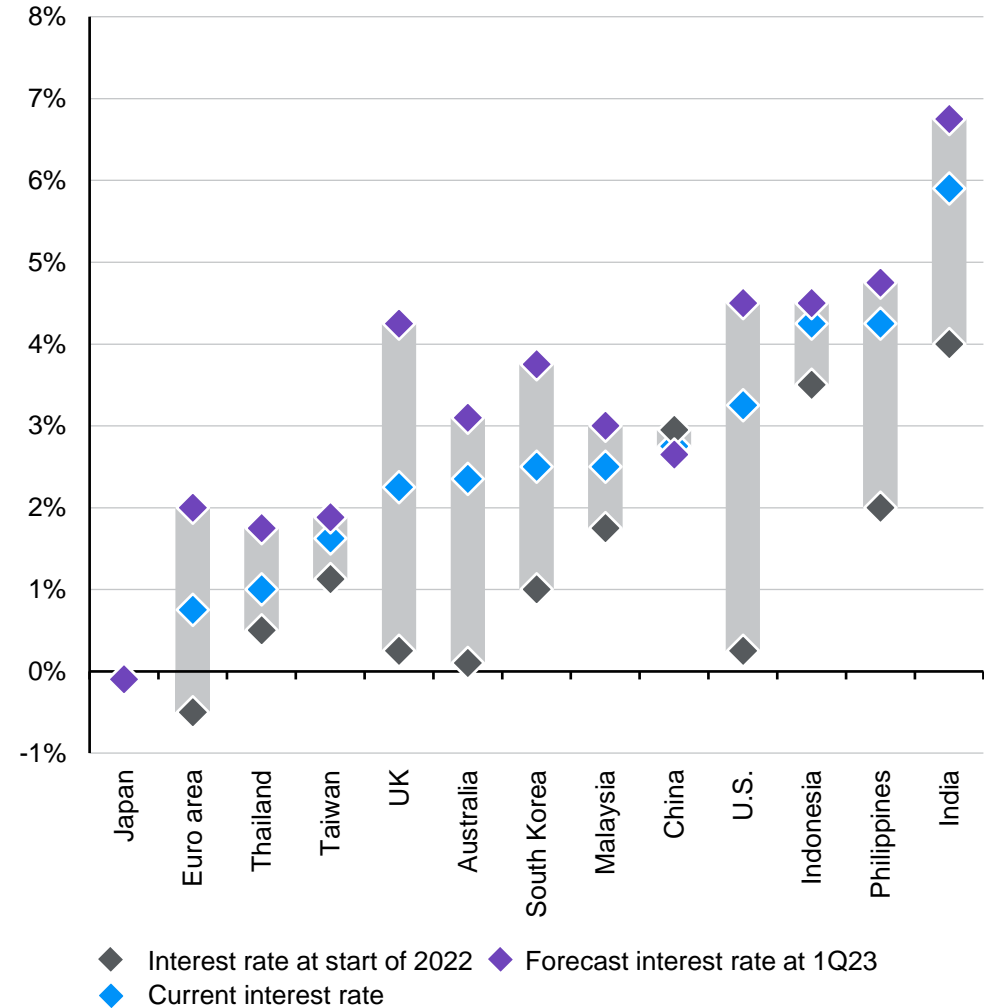
Global economy

Changes in central bank policy rates

Number of hikes or cuts*



Expected change in central bank policy rates



Source: Bank of International Settlements, J.P. Morgan Asset Management; (Right) CEIC, J.P. Morgan Economic Research.
 *Count covers the 38 central banks included in the Bank for International Settlements' central bank policy monitor except Argentina, Croatia and Hong Kong.
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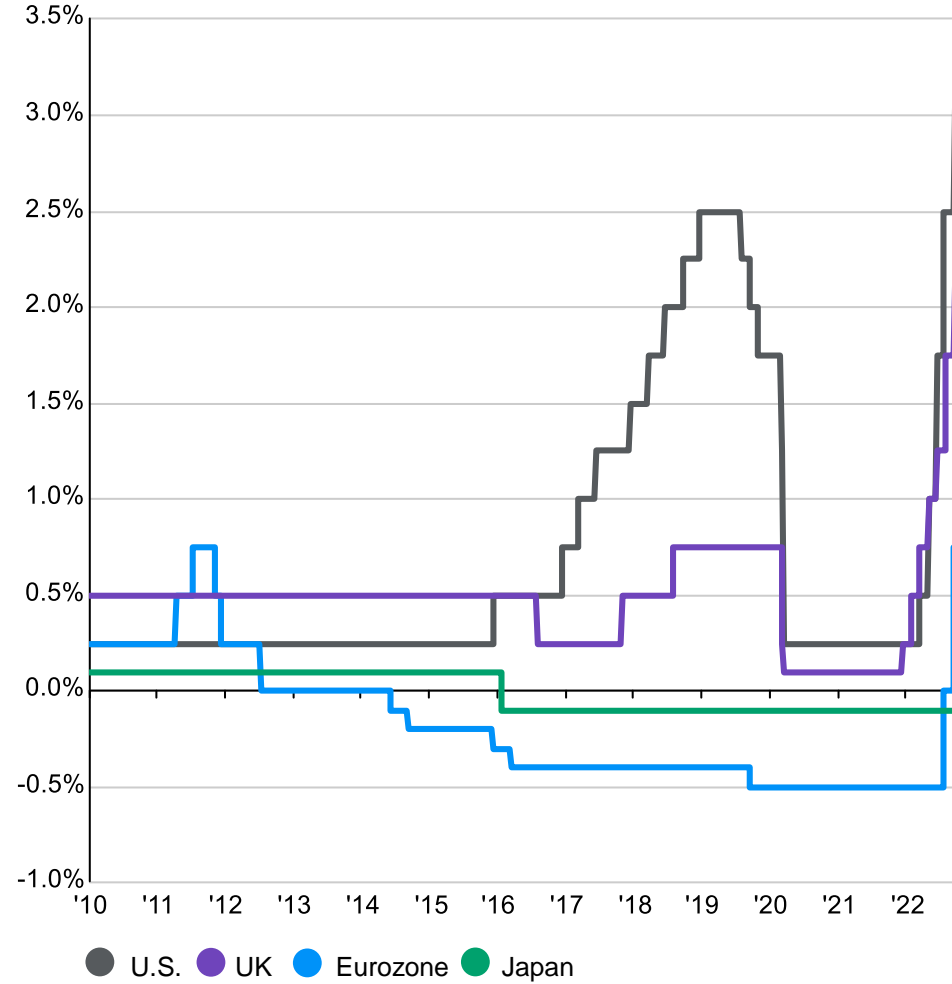


G4 central bank policy rates and market expectations

Global economy

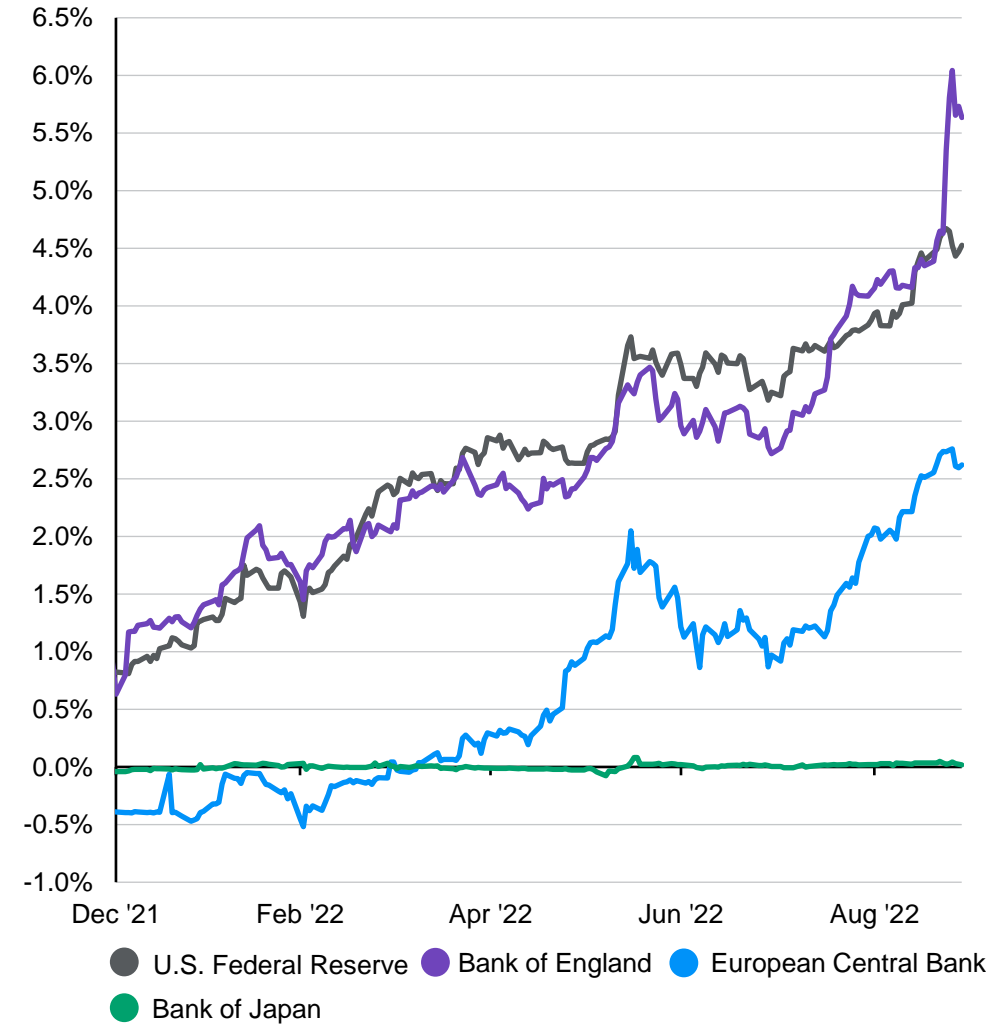
G4 central bank key policy rates

Per annum



Market expectations* for central bank policy rates

Expected rate by 31/03/23



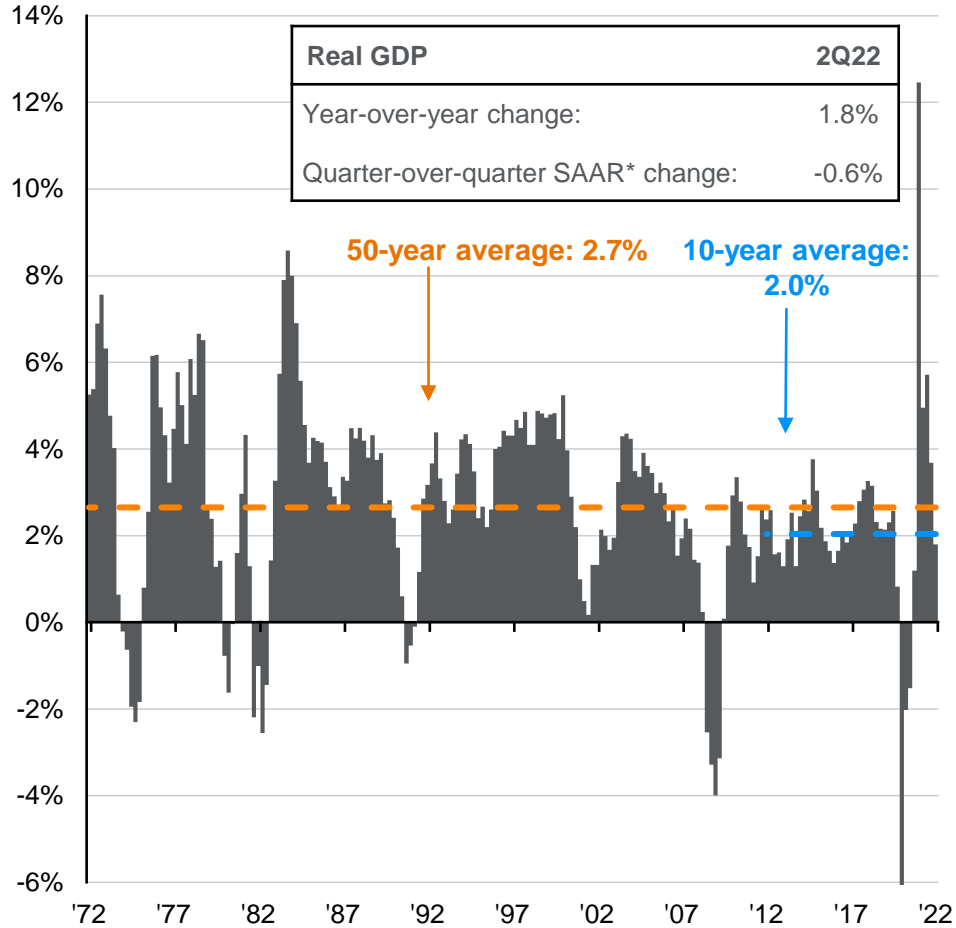
Source: J.P. Morgan Asset Management; (Left) FactSet; (Right) Bank of England, Bloomberg L.P., Federal Reserve. *Expectations are derived from the World Interest Rate Probability (WIRP) estimated forward rates. Past performance is not a reliable indicator of current and future results. Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.



United States: Economic growth and the composition of GDP

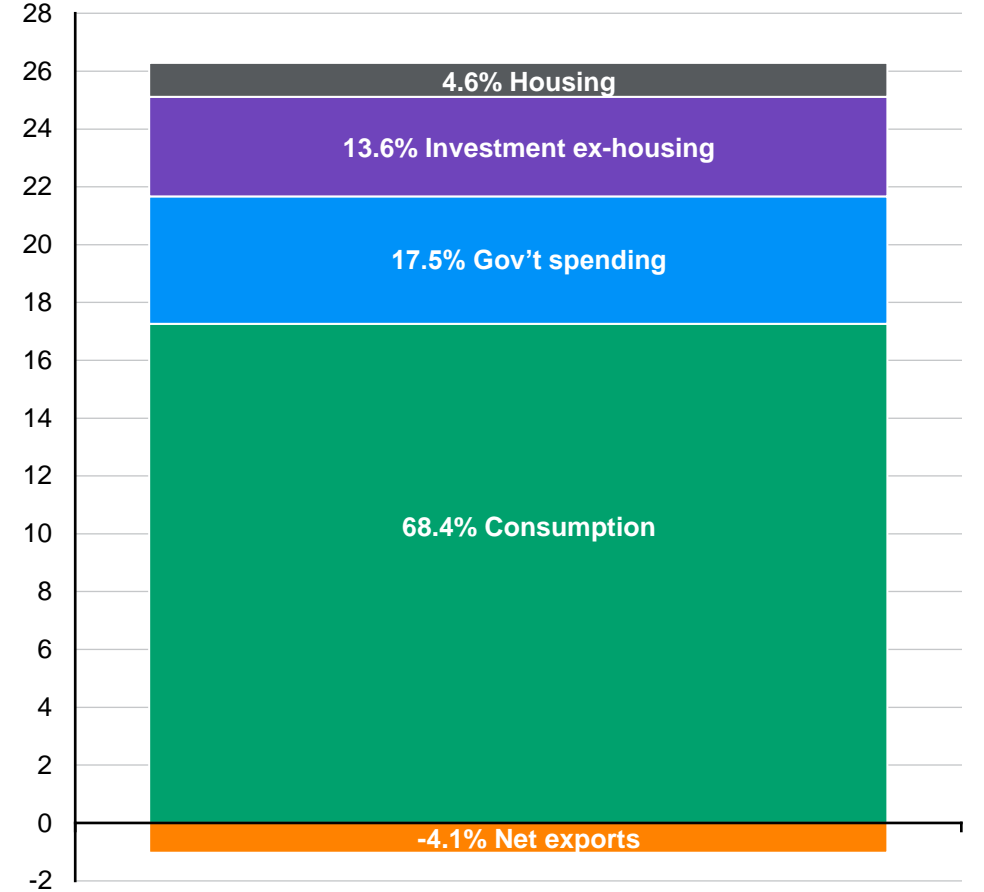
Real GDP

Year-over-year change



Components of GDP

2Q22 nominal GDP, USD trillions



Source: Bureau of Economic Analysis, FactSet, J.P. Morgan Asset Management.
 *SAAR stands for seasonally adjusted annualized rate.
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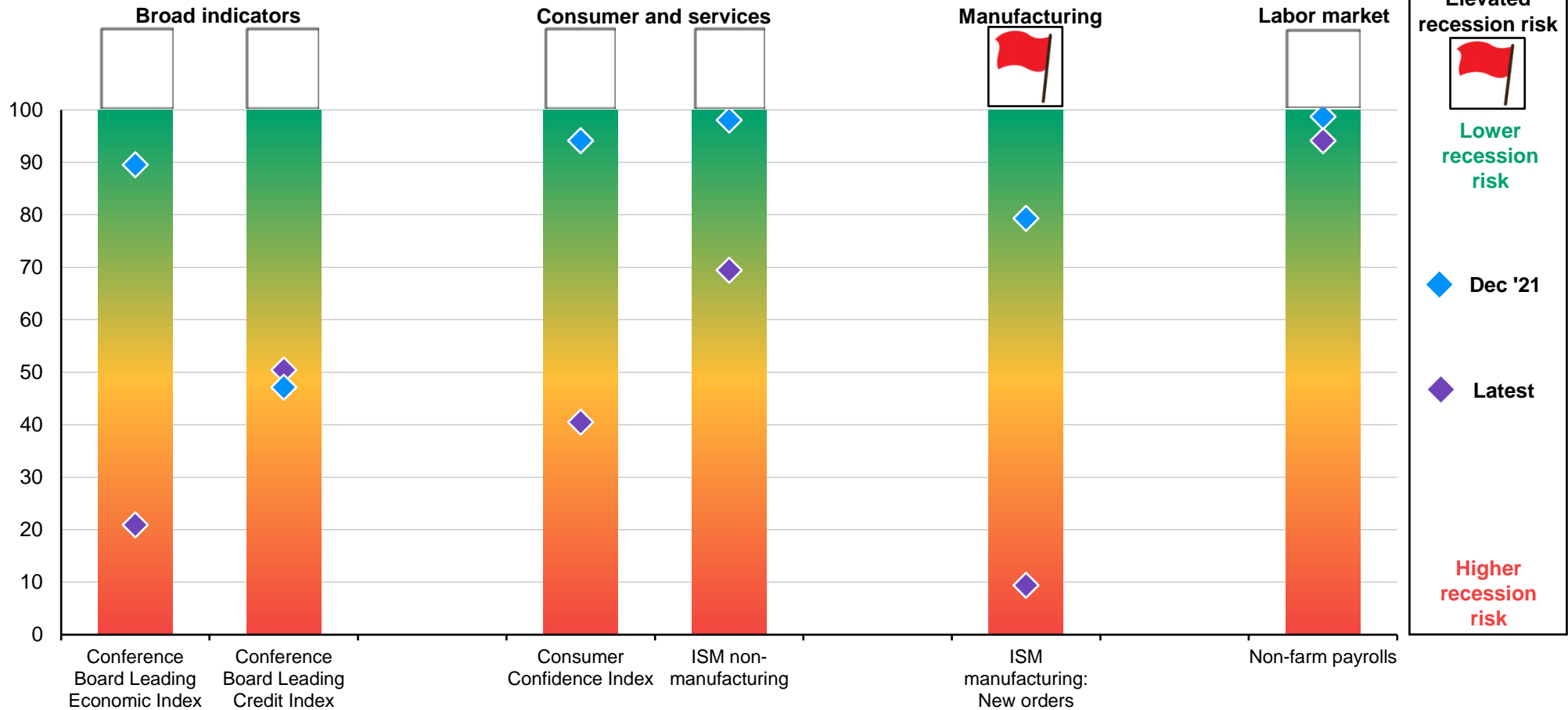


United States: Economic Monitor

Global economy

U.S. economic indicators

Percentile rank relative to historic data since 1990



Source: Conference Board U.S., FactSet, Institute for Supply Management, U.S. Department of Labor, J.P. Morgan Asset Management. Elevated recession risk flags are shown when the underlying indicator is at a level consistent with the onset of any of the three recessions prior to the COVID-19 recession. Transformations used for each of the indicators are % year-over-year change for the Leading Economic Index and Consumer Confidence Index, index level for Leading Credit Index, ISM non-manufacturing and ISM manufacturing new orders and three-month moving average of monthly absolute change for non-farm payrolls. Past performance is not a reliable indicator of current and future results.

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United States: Economic vulnerability monitor

U.S. economic vulnerability monitor

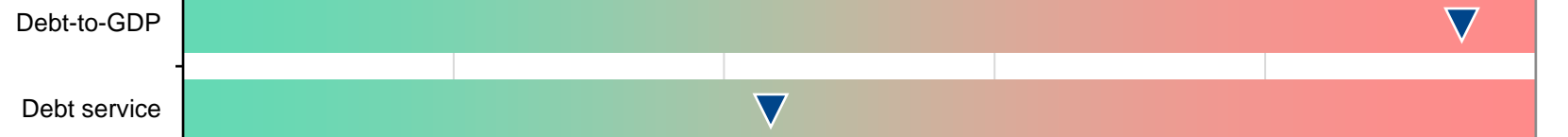
Percentile rank since 1990

Increasing levels of excess/overheating →

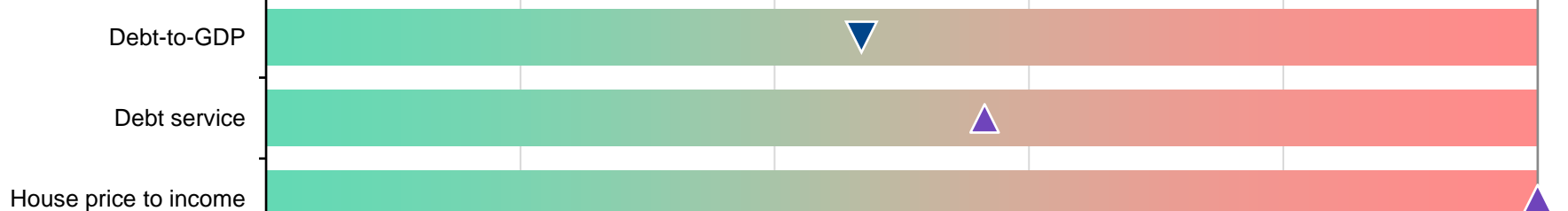
Banks



Corporates



Households



▲ Most recent percentile rank where ranking is greater than 6 months prior ▼ Most recent percentile rank where ranking is less than 6 months prior

Source: Bank of International Settlements, Bureau of Economic Analysis, Bureau of Labor Statistics, FactSet, Federal Reserve Bank of St. Louis, New York Fed, OECD, Refinitiv Datastream, U.S. Federal Reserve, J.P. Morgan Asset Management. Leverage ratio is tier 1 bank risk-based capital as a % of average total assets. All percentile rankings are calculated from first quarter 1990 or January 1990, except for Debt Service, which was calculated from first quarter 1999 due to data availability. *Guide to the Markets – Asia*. Data reflect most recently available as of 30/09/22.

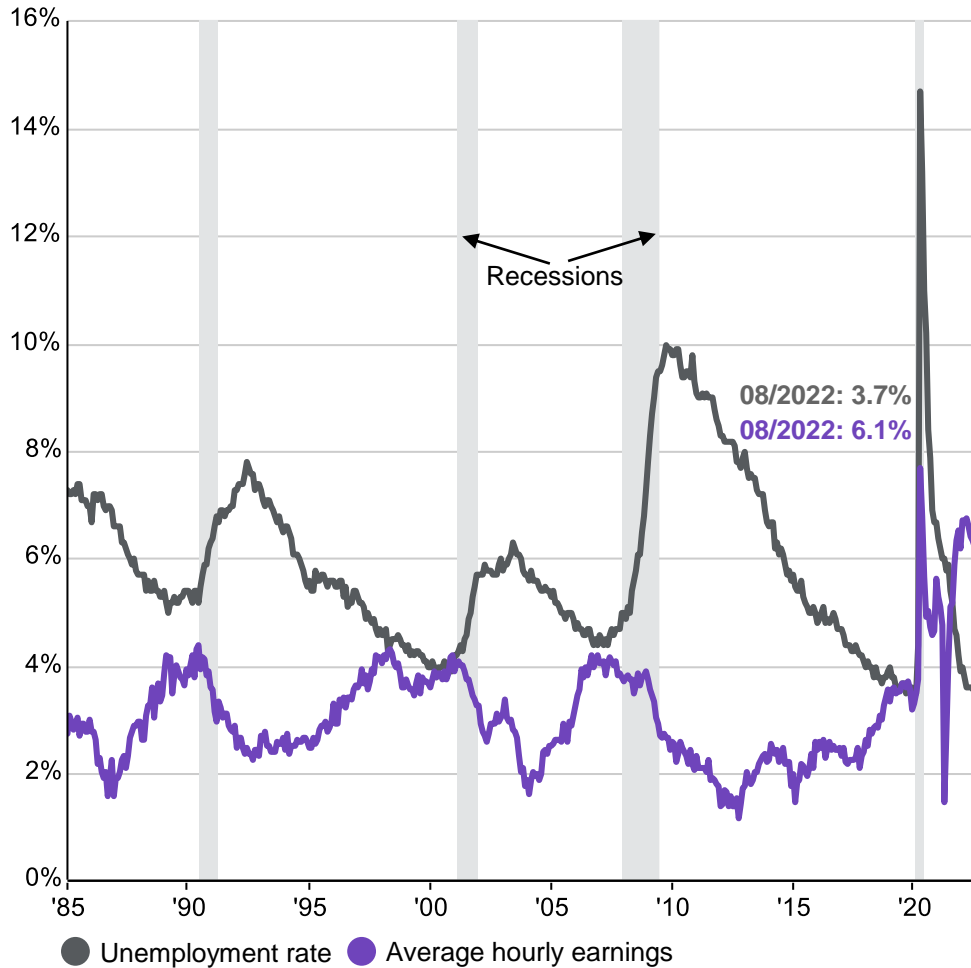


United States: Employment and wages

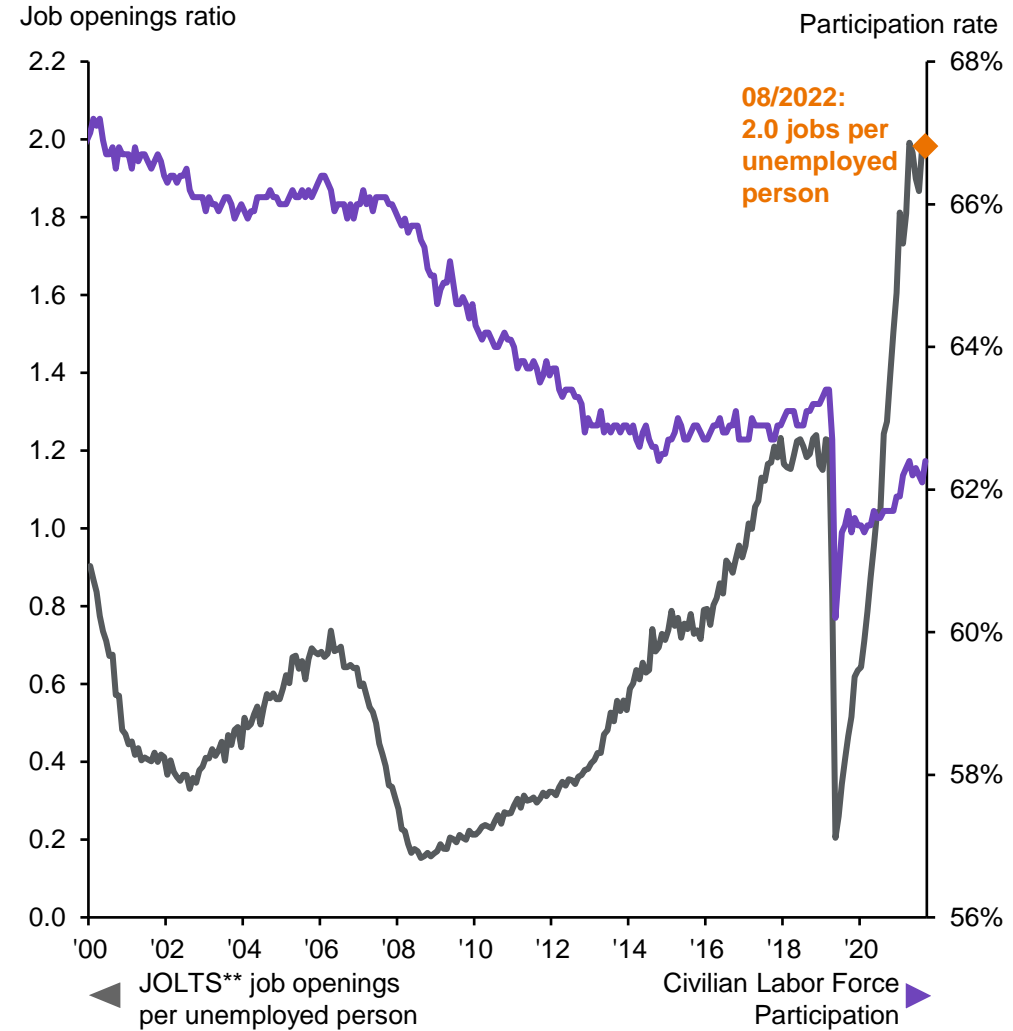
Global economy

Unemployment rate and average hourly earnings*

Percent of labor force, year-over-year change, seasonally adjusted



Labor market supply and demand



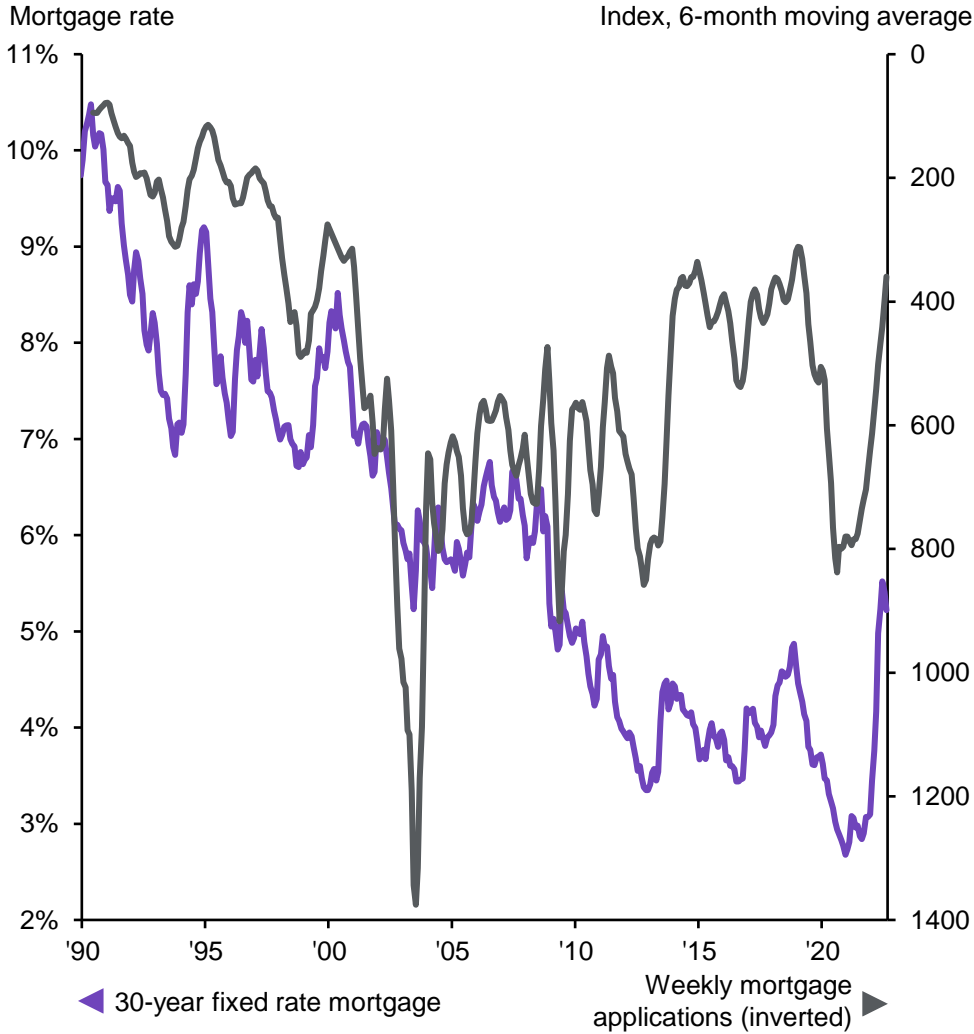
Source: J.P. Morgan Asset Management; (Left) FactSet, U.S. Bureau of Labor Statistics; (Right) Conference Board of U.S., U.S. Department of Labor.
 *Average hourly earnings are calculated from the wages of production and non-supervisory workers. **JOLTS stands for Job Openings and Labor Turnover Survey.
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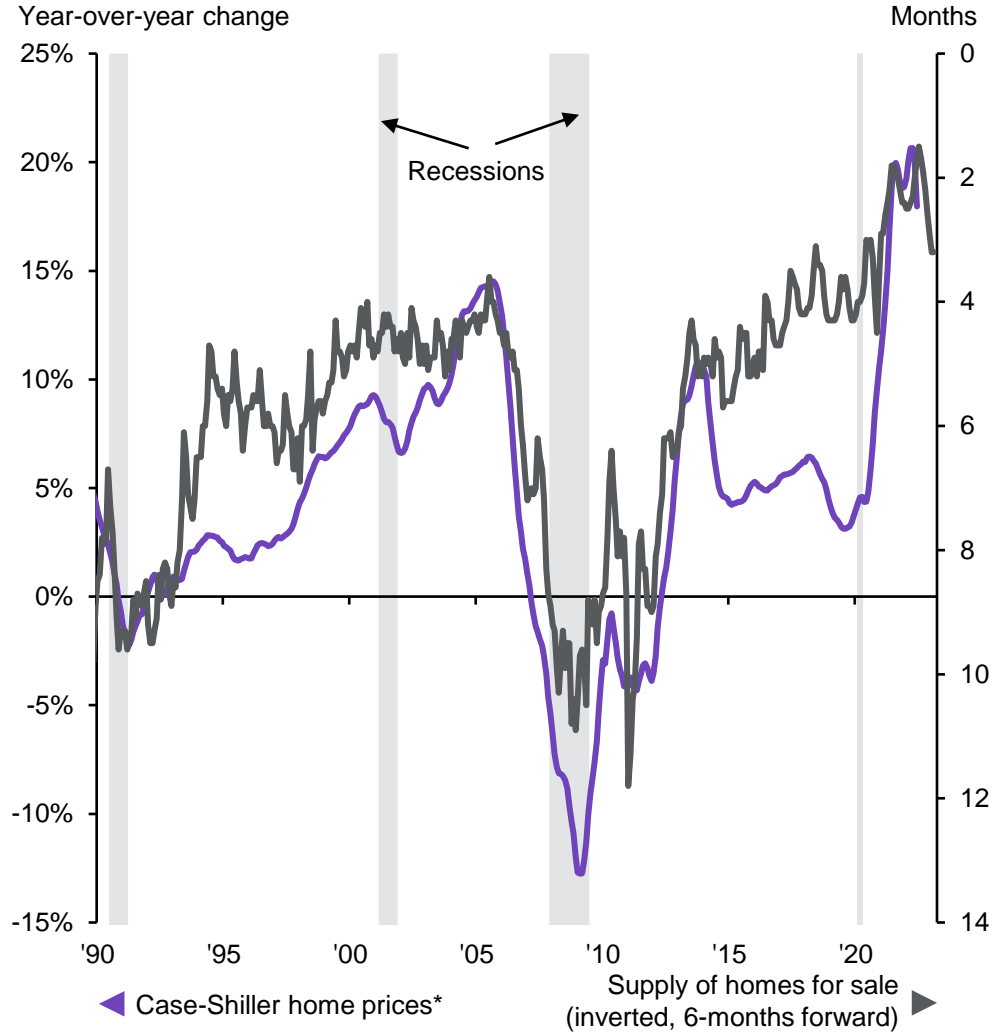
United States: Housing market

Global economy

Mortgage rate and applications



U.S. home prices and housing inventory



Source: FactSet, J.P. Morgan Asset Management; (Left) Freddie Mac, Mortgage Bankers Association; (Right) Dow Jones, National Bureau of Economic Research U.S., U.S. National Association of Realtors. *Home prices are based on the S&P Case Shiller U.S. Composite Home Price Index. Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.

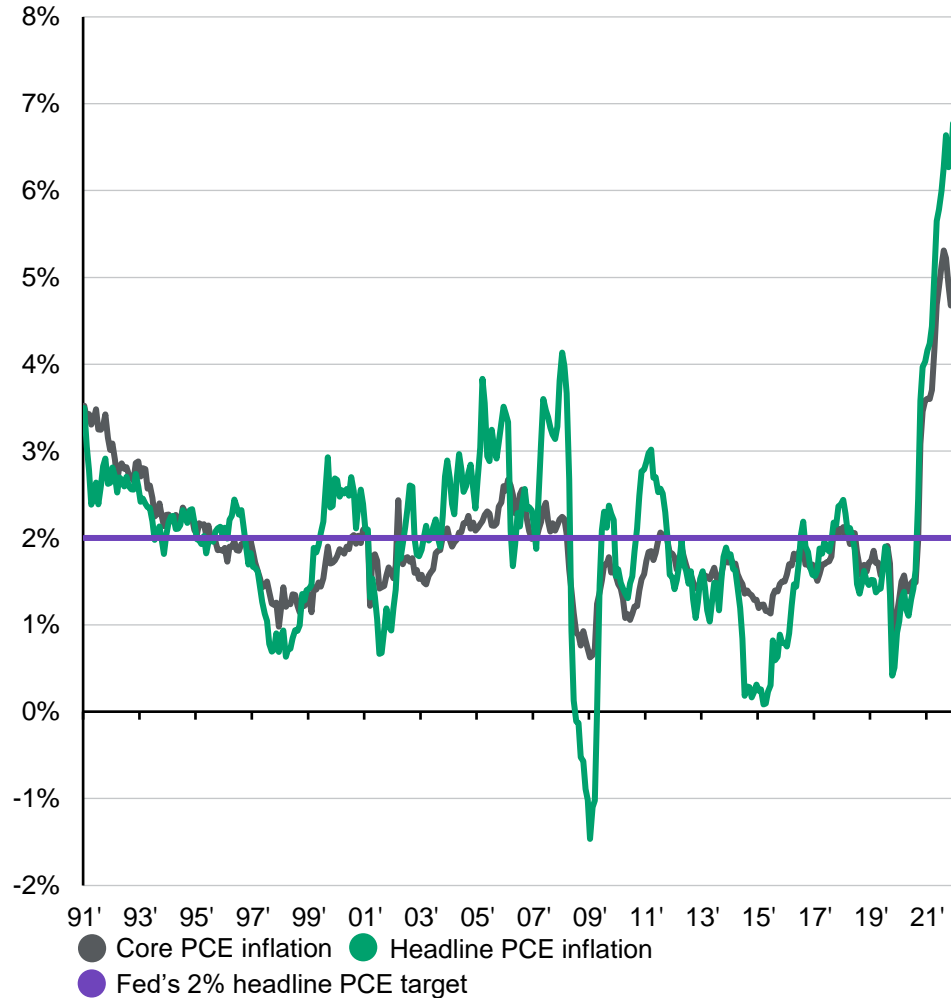


United States: Inflation

Global economy

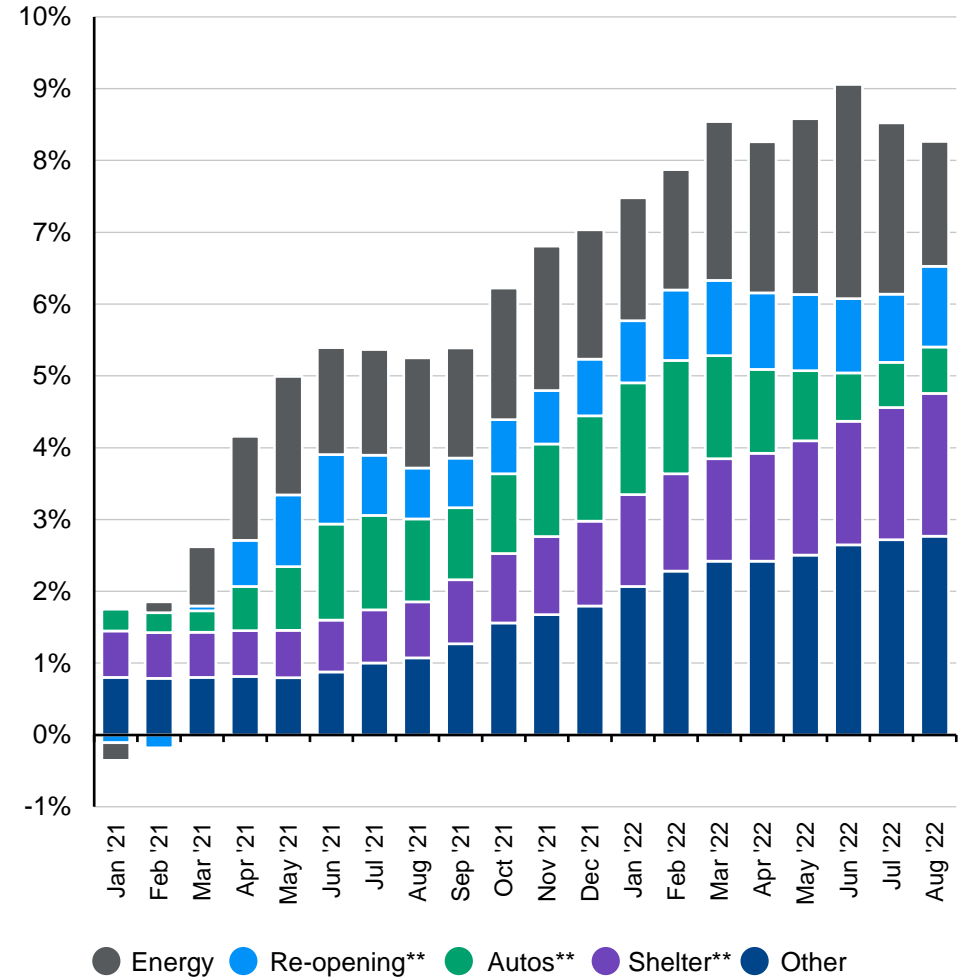
Headline and core PCE* inflation

Year-over-year change, seasonally adjusted



Consumer Price Index (CPI) components contribution

Year-over-year change, seasonally adjusted



Source: Bureau of Economic Analysis, Bureau of Labor Statistics, FactSet, Federal Reserve, J.P. Morgan Asset Management.

*The Federal Reserve (Fed) uses the Personal Consumption Expenditure (PCE) deflator to measure inflation. Core PCE is defined as PCE excluding food and energy prices. In August 2020, the Fed unveiled its Average Inflation Targeting policy, which seeks to achieve inflation that averages 2% over time.

**Re-opening defined as lodging away from home plus transportation services and food away from home, Autos defined as new vehicles plus used cars and trucks, Shelter defined as shelter minus lodging away from home.

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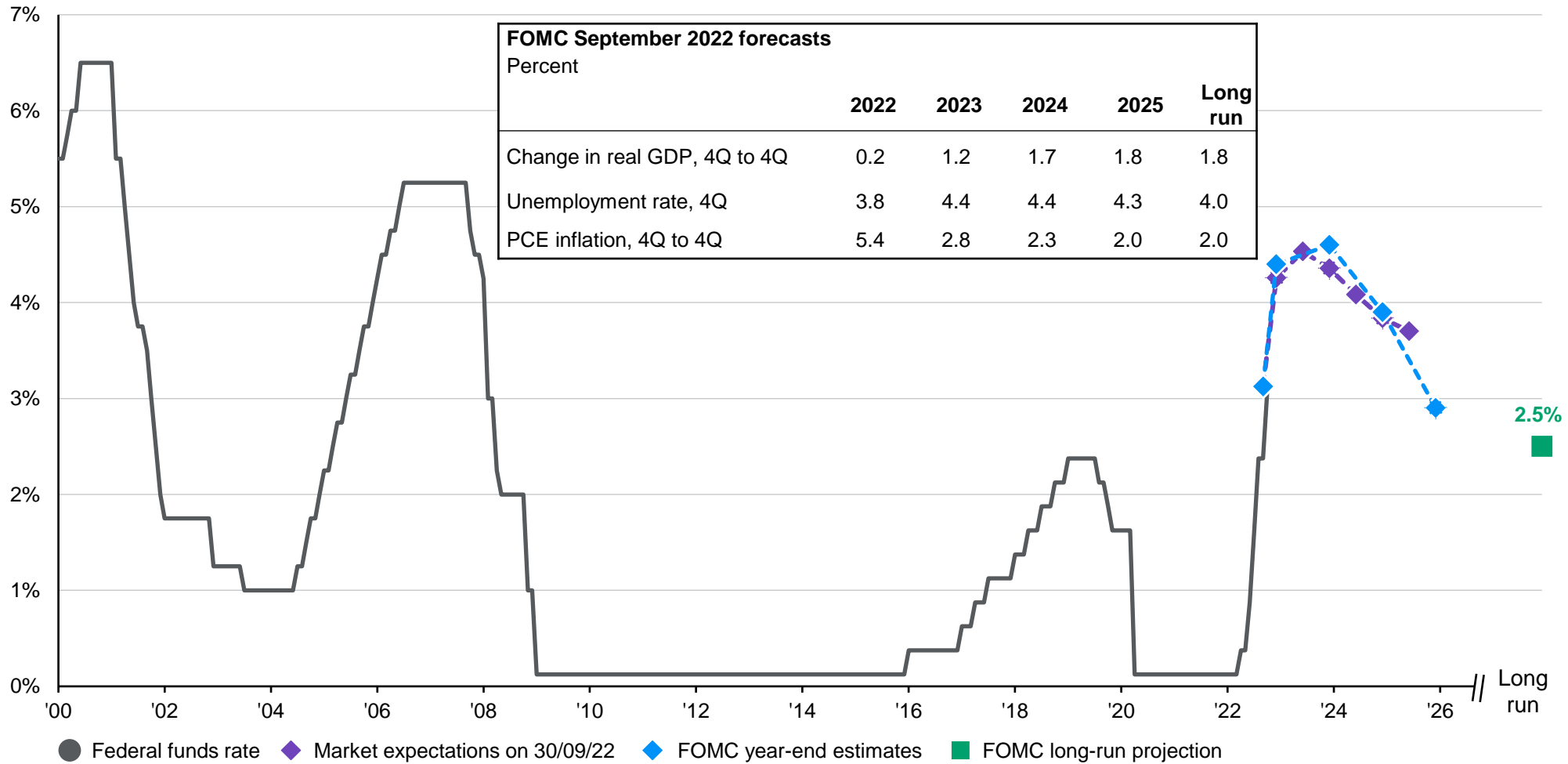


United States: Monetary policy

Global economy

Federal funds rate expectations

Market expectations for the fed funds rate



Source: Bloomberg Finance L.P., FactSet, U.S. Federal Reserve, J.P. Morgan Asset Management.
 Market expectations are derived from market implied policy rates as of 30/09/22. Federal Reserve projections shown are the median estimates of Federal Open Market Committee (FOMC) participants.
 Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.

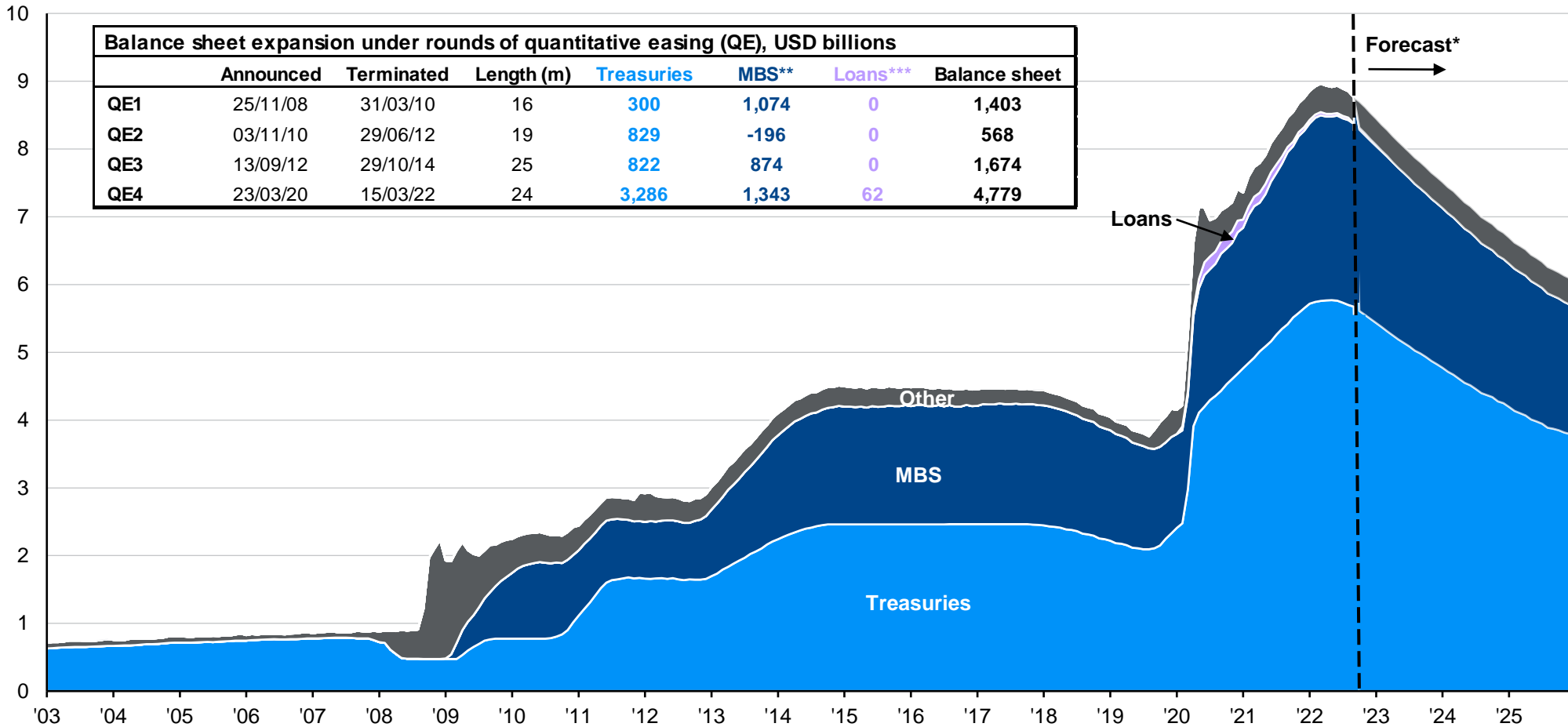


United States: Federal Reserve balance sheet

Global economy

The Federal Reserve balance sheet

USD trillions



Source: FactSet, Federal Reserve, J.P. Morgan Investment Bank, J.P. Morgan Asset Management.

At its peak, the balance sheet contained \$5.7tn in Treasuries and \$2.7tn in MBS. *The forecast assumes the Federal Reserve begins balance sheet runoff in mid-May and gradually increases the monthly cap on maturing Treasury and MBS securities per meeting until a max cap of \$100bn/month. The forecast does not include the active selling of securities from the committee. **MBS stands for mortgage-backed-securities. ***Loans include liquidity and credit extended through corporate credit facilities established in March 2020. Other includes primary, secondary and seasonal loans, repurchase agreements, foreign currency reserves and maiden lane securities. Forecasts are not a reliable indicator of future performance. Forecasts, projections and other forward-looking statements are based upon current beliefs and expectations. They are for illustrative purposes only and serve as an indication of what may occur. Given the inherent uncertainties and risks associated with forecasts, projections or other forward-looking statements, actual events, results or performance may differ materially from those reflected or contemplated.

Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.

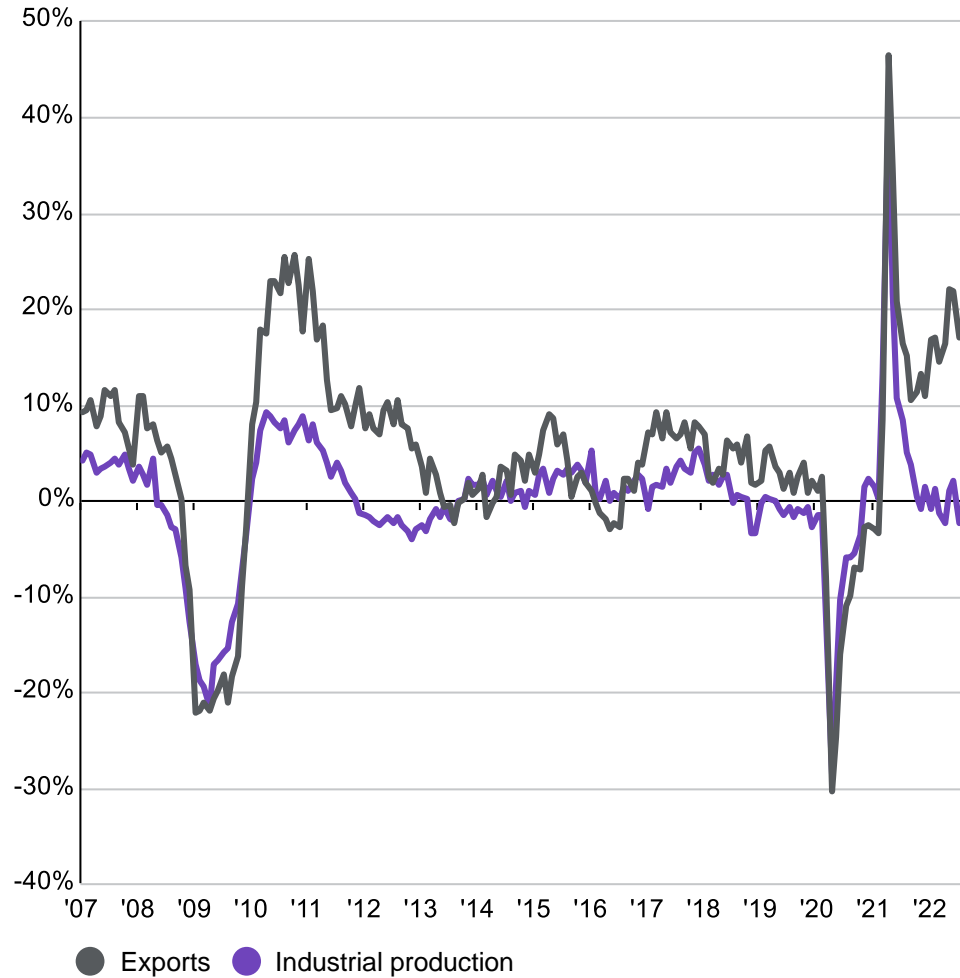


Eurozone: Economic snapshot

Global economy

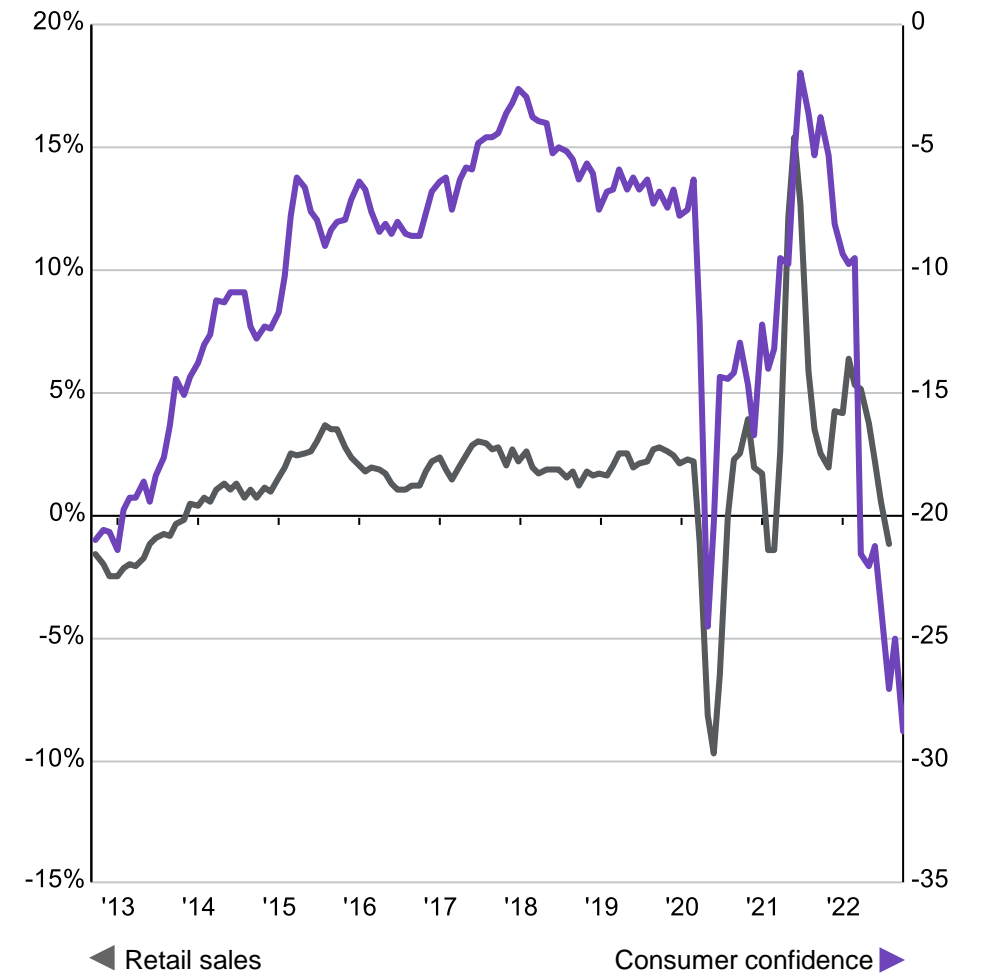
Eurozone activity

Year-over-year change



Consumer confidence* and retail sales

Year-over-year change, 3-month moving average



Source: Eurostat, FactSet, J.P. Morgan Asset Management; (Right) European Commission.

*Eurozone consumer confidence as reported by the European Commission, which measures the level of optimism that consumers have about the economy in relation to prior months and is typically below zero.

Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.

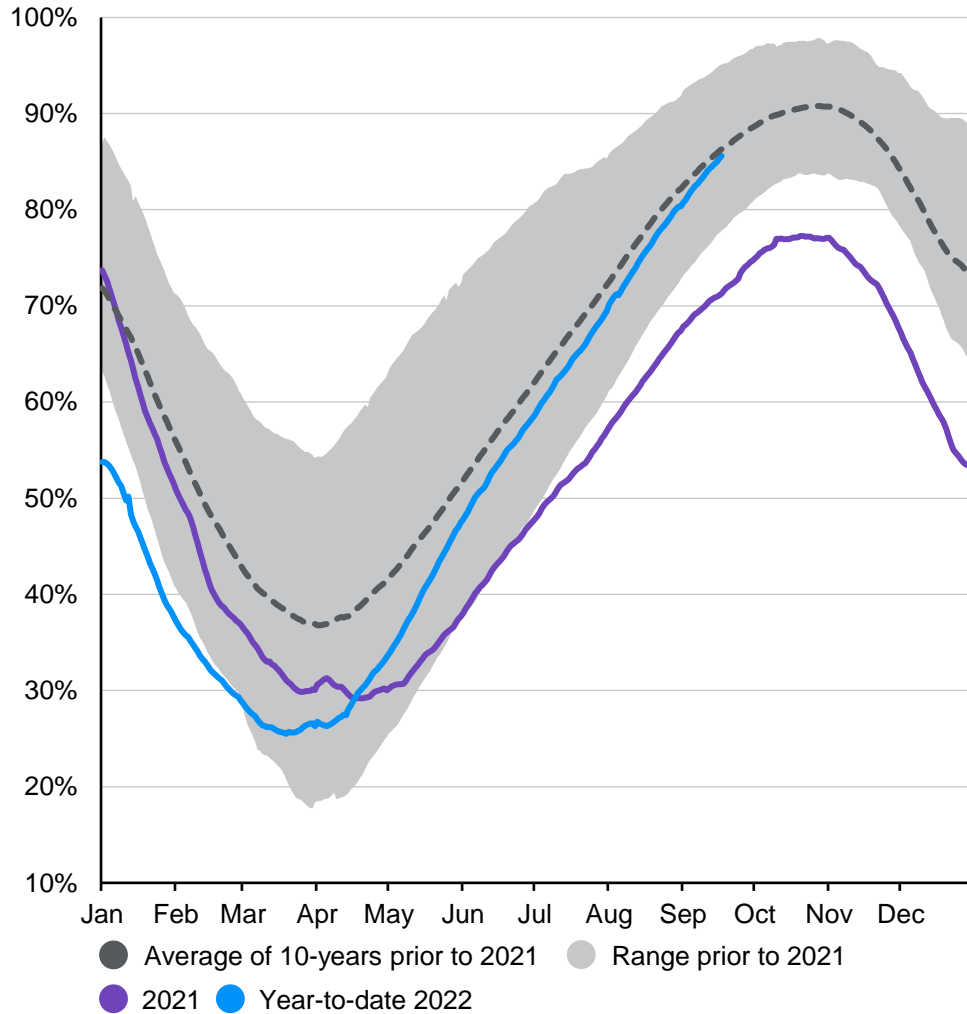


Eurozone: Energy supply and impact on consumers

Global economy

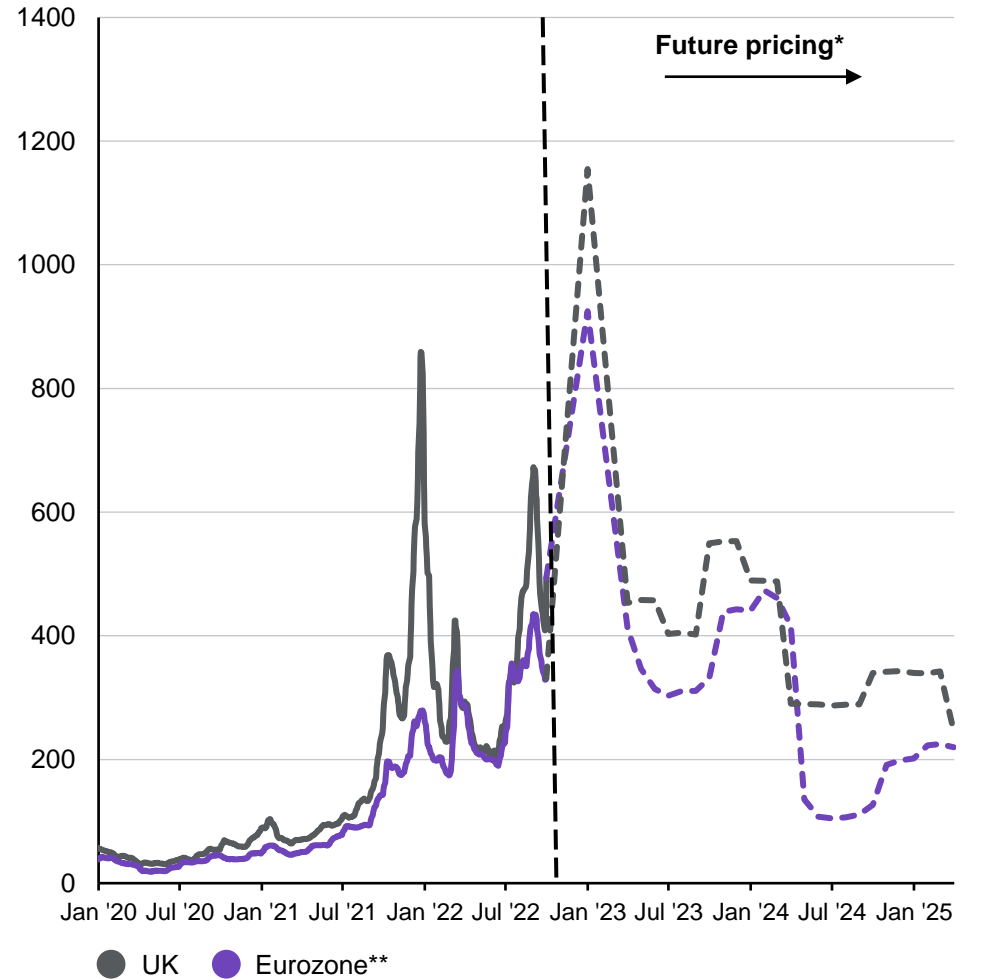
European Union gas inventories

Share of capacity



Electricity prices in Europe

Baseload electricity price, euro per Megawatt hour



Source: FactSet, InterContinental Exchange, J.P. Morgan Asset Management.

*Forecast prices are based on electricity price futures provided by the Intercontinental Exchange. **Eurozone figures calculated as the average of the German, French, Italian and Spanish period averages.

Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.



Global and Asia equity market returns

Equities

													10-yrs ('12 - '22)	
2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	3Q '22	YTD '22	Ann. Ret.	Ann. Vol.
U.S. 2.1%	India 26.0%	U.S. 32.4%	China A 52.1%	Japan 9.9%	Taiwan 19.6%	China 54.3%	U.S. -4.4%	Taiwan 37.7%	Korea 45.2%	U.S. 28.7%	India 6.8%	India -9.4%	U.S. 11.7%	China A 24.2%
ASEAN -6.1%	China 23.1%	Japan 27.3%	India 23.9%	China A 2.4%	U.S. 12.0%	Korea 47.8%	India -7.3%	China A 37.2%	Taiwan 42.0%	Taiwan 26.8%	ASEAN -1.7%	ASEAN -12.7%	Taiwan 9.5%	Korea 20.8%
Europe -10.5%	ASEAN 22.8%	Europe 26.0%	U.S. 13.7%	U.S. 1.4%	Korea 9.2%	India 38.8%	Taiwan -8.2%	U.S. 31.5%	China A 38.4%	India 26.7%	U.S. -4.9%	U.S. -23.9%	India 7.4%	India 20.3%
Korea -11.8%	APAC ex- JP 22.6%	Taiwan 9.8%	Taiwan 10.1%	Europe -2.3%	APAC ex- JP 7.1%	APAC ex- JP 37.3%	ASEAN -8.4%	Europe 24.6%	China 29.7%	Europe 17.0%	Japan -7.5%	Japan -26.1%	China A 6.2%	China 19.9%
Japan -14.2%	Korea 21.5%	Korea 4.2%	China 8.3%	India -6.1%	ASEAN 6.2%	China A 32.6%	Japan -12.6%	China 23.7%	APAC ex- JP 22.8%	Japan 2.0%	Europe -10.1%	APAC ex- JP -26.2%	Japan 5.2%	Taiwan 17.8%
APAC ex- JP -15.4%	Europe 19.9%	China 4.0%	ASEAN 6.4%	Korea -6.3%	Japan 2.7%	ASEAN 30.1%	APAC ex- JP -13.7%	Japan 20.1%	U.S. 18.4%	ASEAN 0.2%	APAC ex- JP -12.6%	Europe -28.4%	Europe 4.1%	Europe 15.6%
China -18.2%	Taiwan 17.7%	APAC ex- JP 3.7%	APAC ex- JP 3.1%	China -7.6%	China 1.1%	Taiwan 28.5%	Europe -14.3%	APAC ex- JP 19.5%	India 15.9%	China A -1.0%	Taiwan -14.0%	China A -29.4%	APAC ex- JP 3.3%	APAC ex- JP 15.4%
Taiwan -20.2%	U.S. 16.0%	China A -2.6%	Japan -3.7%	APAC ex- JP -9.1%	Europe 0.2%	Europe 26.2%	China -18.7%	Korea 13.1%	Japan 14.9%	APAC ex- JP -2.7%	Korea -16.3%	China -31.1%	China 2.6%	ASEAN 15.3%
China A -20.5%	China A 10.9%	India -3.8%	Europe -5.7%	Taiwan -11.0%	India -1.4%	Japan 24.4%	Korea -20.5%	ASEAN 8.8%	Europe 5.9%	Korea -7.9%	China A -19.1%	Taiwan -35.4%	Korea 0.6%	U.S. 14.3%
India -37.2%	Japan 8.4%	ASEAN -4.5%	Korea -10.7%	ASEAN -18.4%	China A -15.2%	U.S. 21.8%	China A -27.6%	India 7.6%	ASEAN -6.2%	China -21.6%	China -22.4%	Korea -40.0%	ASEAN -0.3%	Japan 13.8%

Source: FactSet, MSCI, Standard & Poor's, J.P. Morgan Asset Management.

Returns are total returns in U.S. dollars based on MSCI indices, except the U.S., which is the S&P 500, and China A, which is the CSI 300 index in U.S. dollar terms. China return is based on the MSCI China index. 10-yr total (gross) return data is used to calculate annualized returns (Ann. Ret.) and annualized volatility (Ann. Vol.) and reflect the period 30/09/12 – 30/09/22. Past performance is not a reliable indicator of current and future results.

Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.

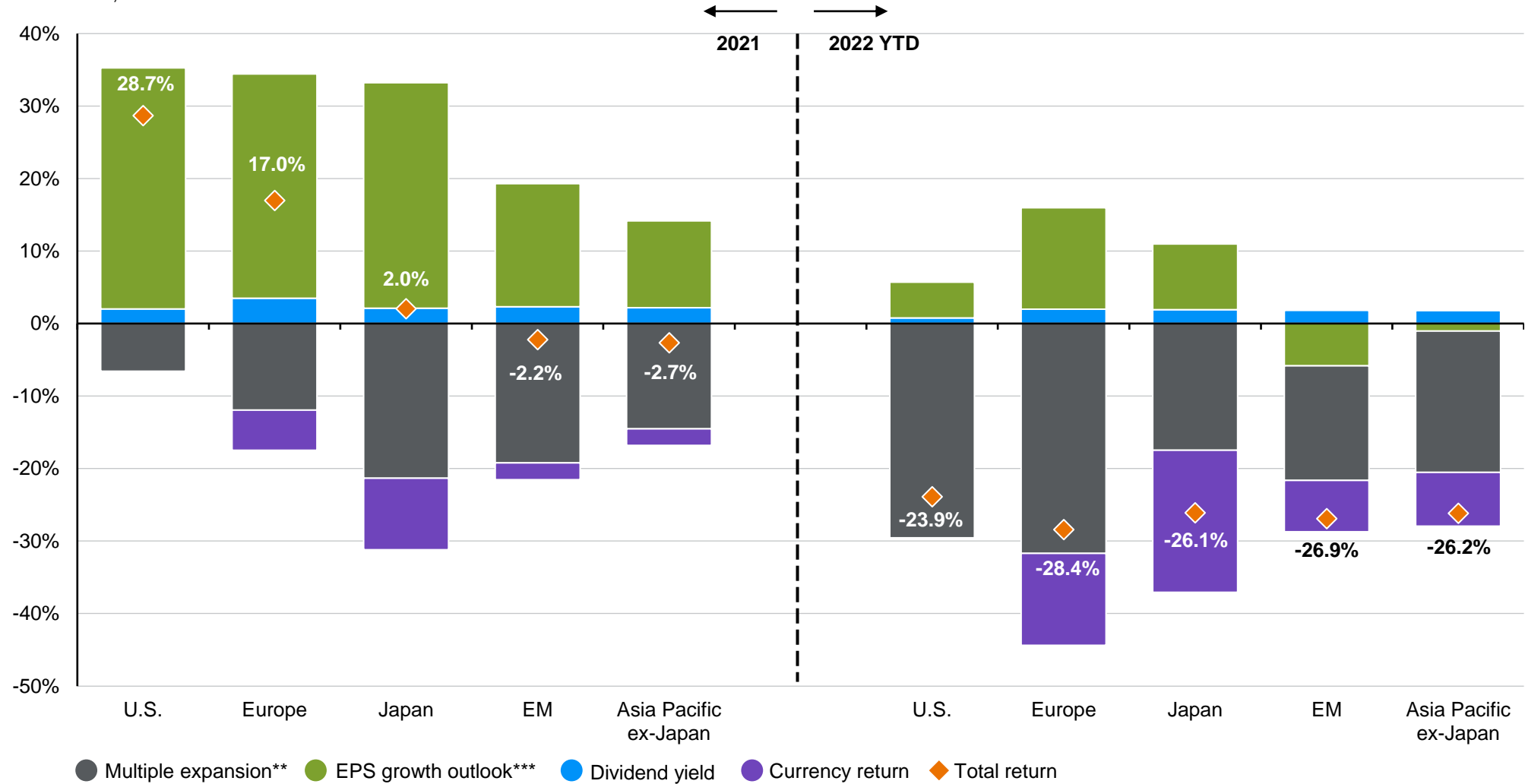


Global equities: Return composition

Equities

Sources of global equity returns*

Total return, USD



Source: FactSet, MSCI, Standard & Poor's, J.P. Morgan Asset Management. *All return values are MSCI Gross Index (official) data, except the U.S., which is the S&P 500.

Multiple expansion is based on the forward price-to-earnings ratio. *Earnings per share (EPS) growth outlook is based on next 12-month aggregate (NTMA) earnings estimates.

Diversification does not guarantee positive returns or eliminate risk of loss. Past performance is not a reliable indicator of current and future results.

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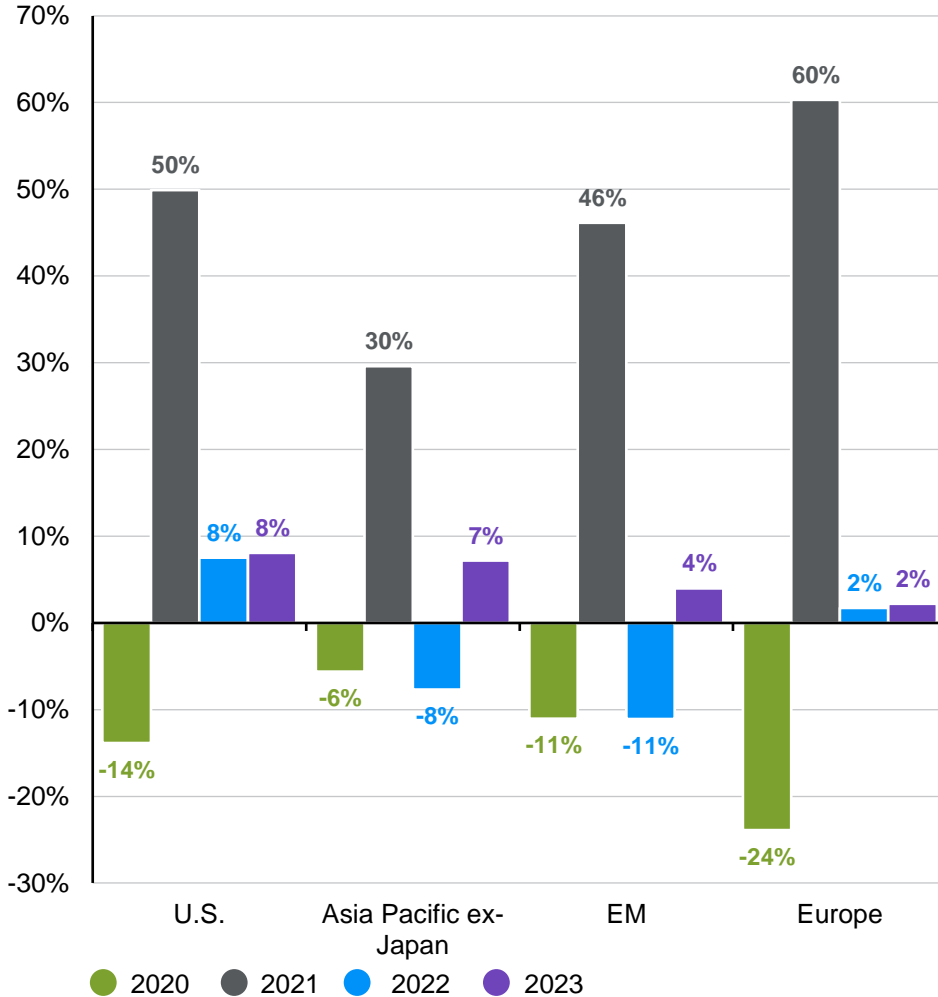


Global equities: Earnings expectations

Equities

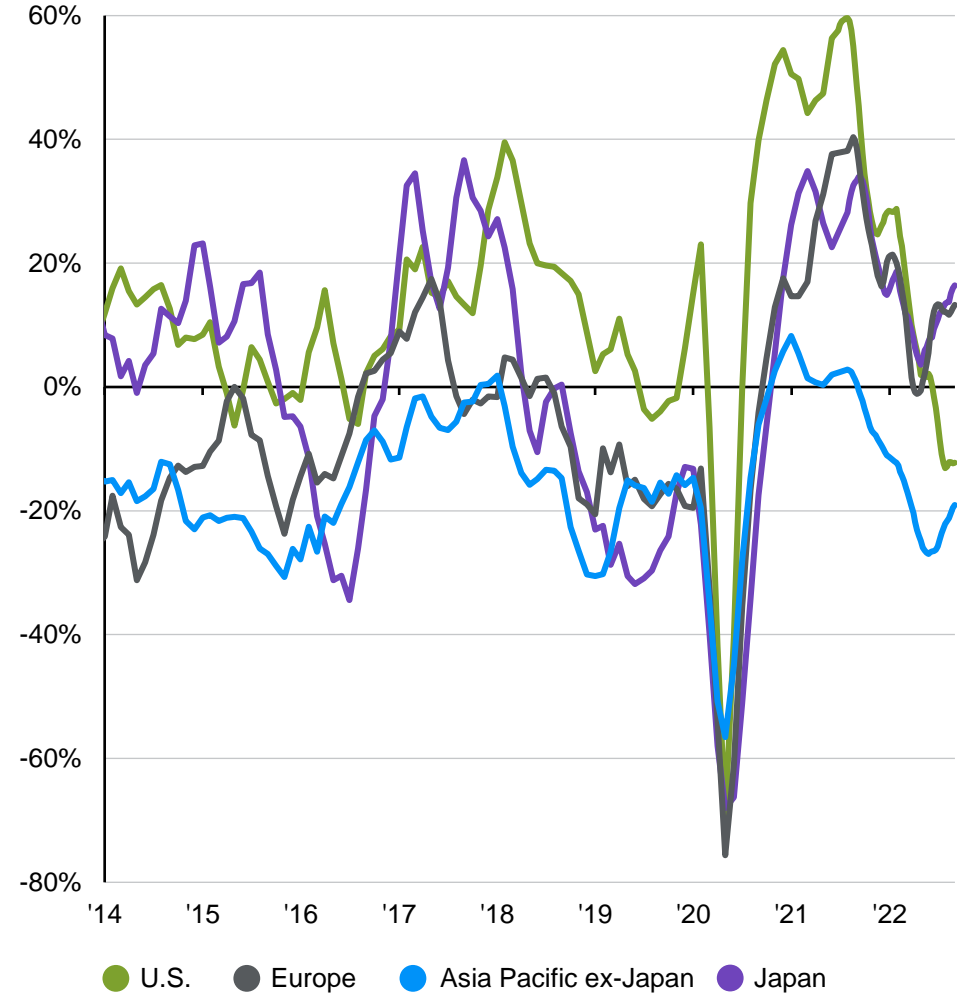
Earnings growth

Earnings per share, year-over-year change, consensus estimates



Earnings revisions ratios

Net earnings revisions to consensus estimates, 12-week moving average

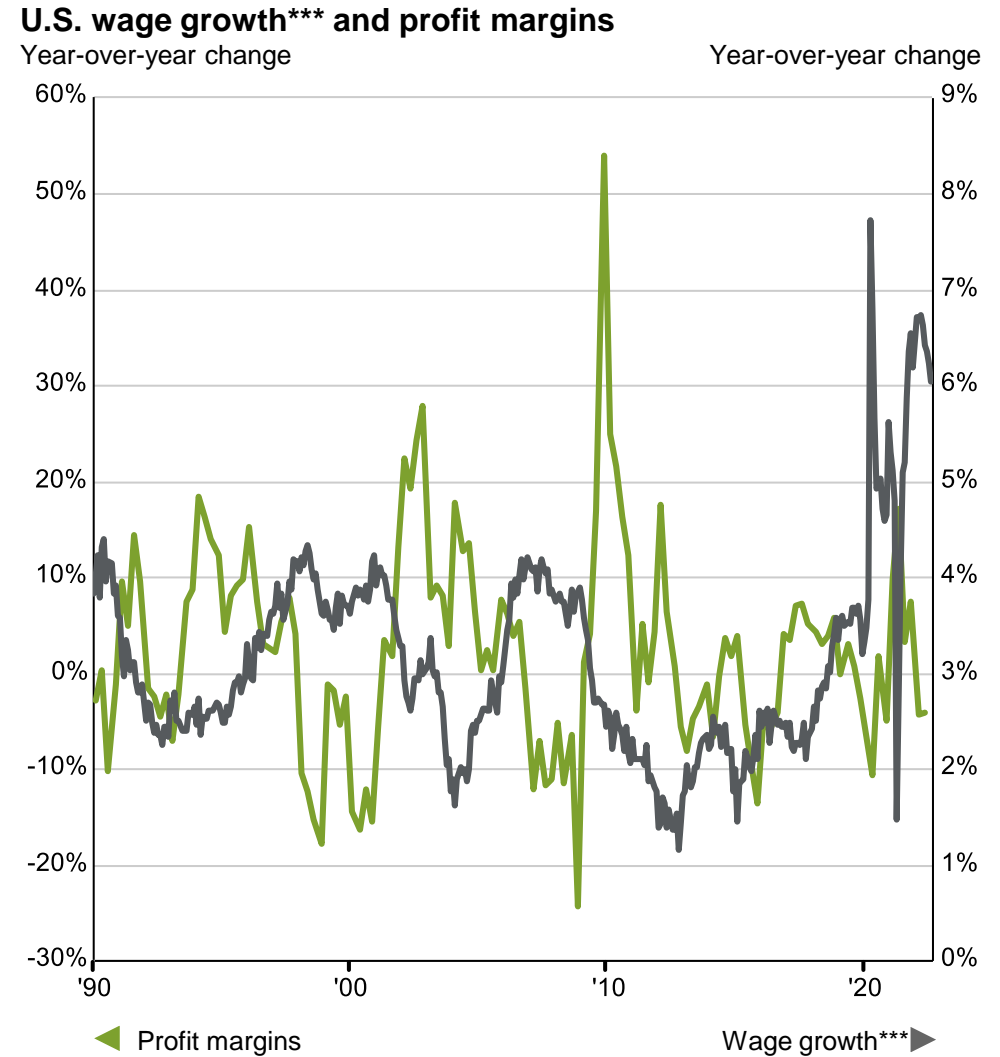


Source: FactSet, MSCI, Standard & Poor's, J.P. Morgan Asset Management. Asia Pacific ex-Japan, emerging markets (EM), Europe and U.S. equity indices used are the MSCI Asia Pacific ex-Japan, MSCI Emerging Markets, MSCI Europe and S&P 500, respectively. Consensus estimates used are calendar year estimates from FactSet. Revisions are based on the current unreported year. Net earnings revisions is (number of companies with upward earnings revisions – number of companies with downward earnings revisions) / number of total companies. Past performance is not a reliable indicator of current and future results. *Guide to the Markets – Asia*. Data reflect most recently available as of 30/09/22.



Global equities: Inflation and profitability

Equities



Source: FactSet, J.P. Morgan Asset Management; (Left) Federal Reserve Bank of Dallas, MSCI; (Right) U.S. Bureau of Economic Analysis, U.S. Department of Labor.
 *EPS is next 12-months earnings per share. **PPI is producer price index, world excluding U.S. ***Wage growth is the year-over-year change in the average hourly earnings of production and non-supervisory workers.
 Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.

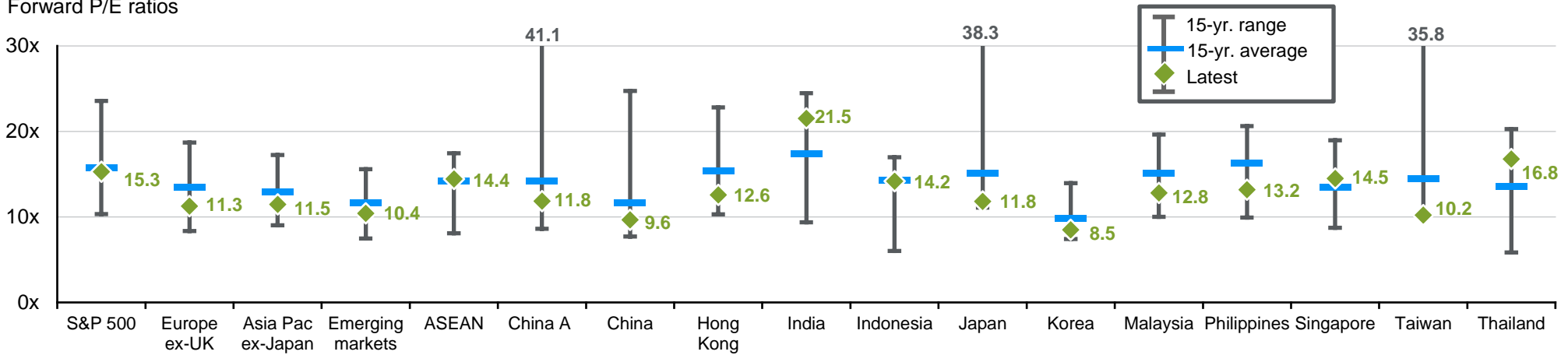


Global equities: Valuations

Equities

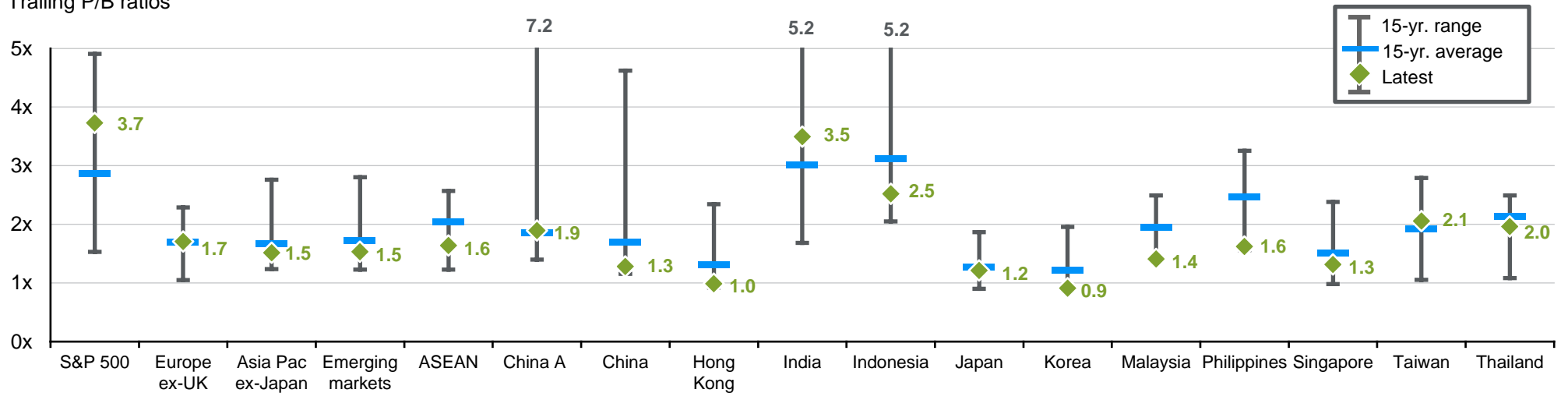
Equity market valuations – Price-to-earnings

Forward P/E ratios



Equity market valuations – Price-to-book

Trailing P/B ratios



Source: Bloomberg Finance L.P., China Securities Index, FactSet, MSCI, Standard & Poor's, J.P. Morgan Asset Management. Emerging markets is represented by the MSCI Emerging Markets Index. Price-to-earnings (P/E) and price-to-book (P/B) ratios are in local currency terms. 15-year range for P/E and P/B ratios are cut off to maintain a more reasonable scale for some indices. Past performance is not a reliable indicator of current and future results. Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.

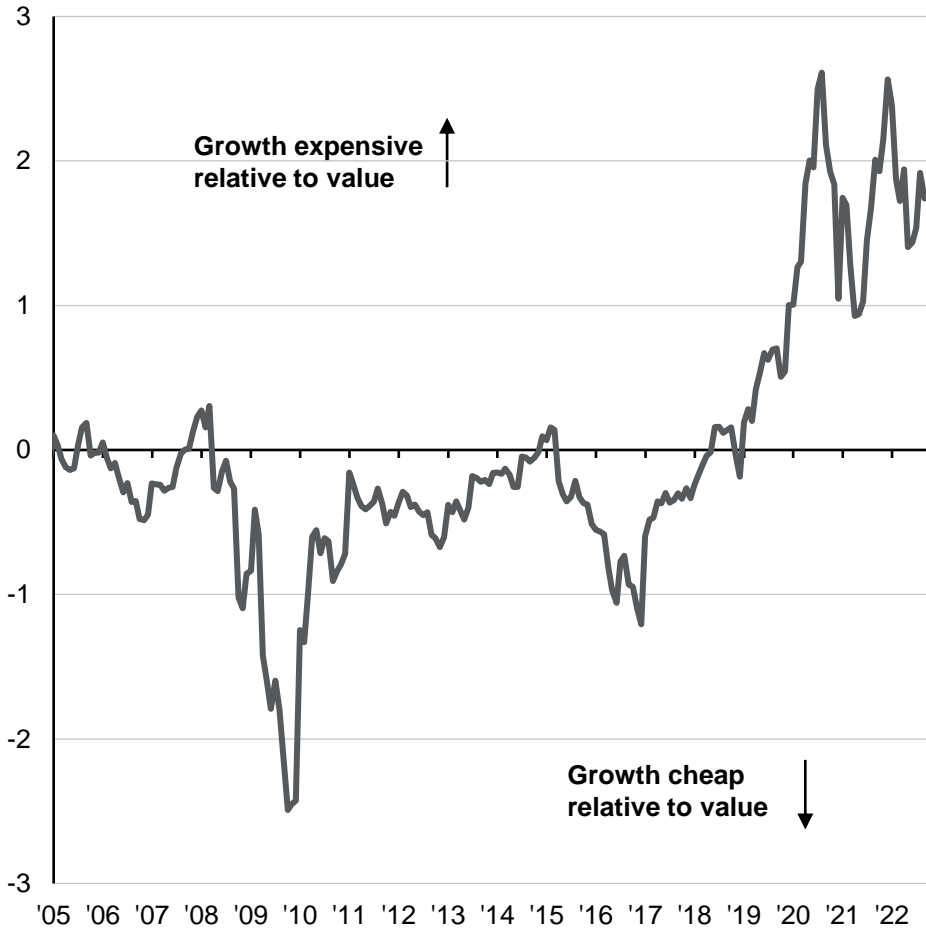


Global equities: Growth versus value

Equities

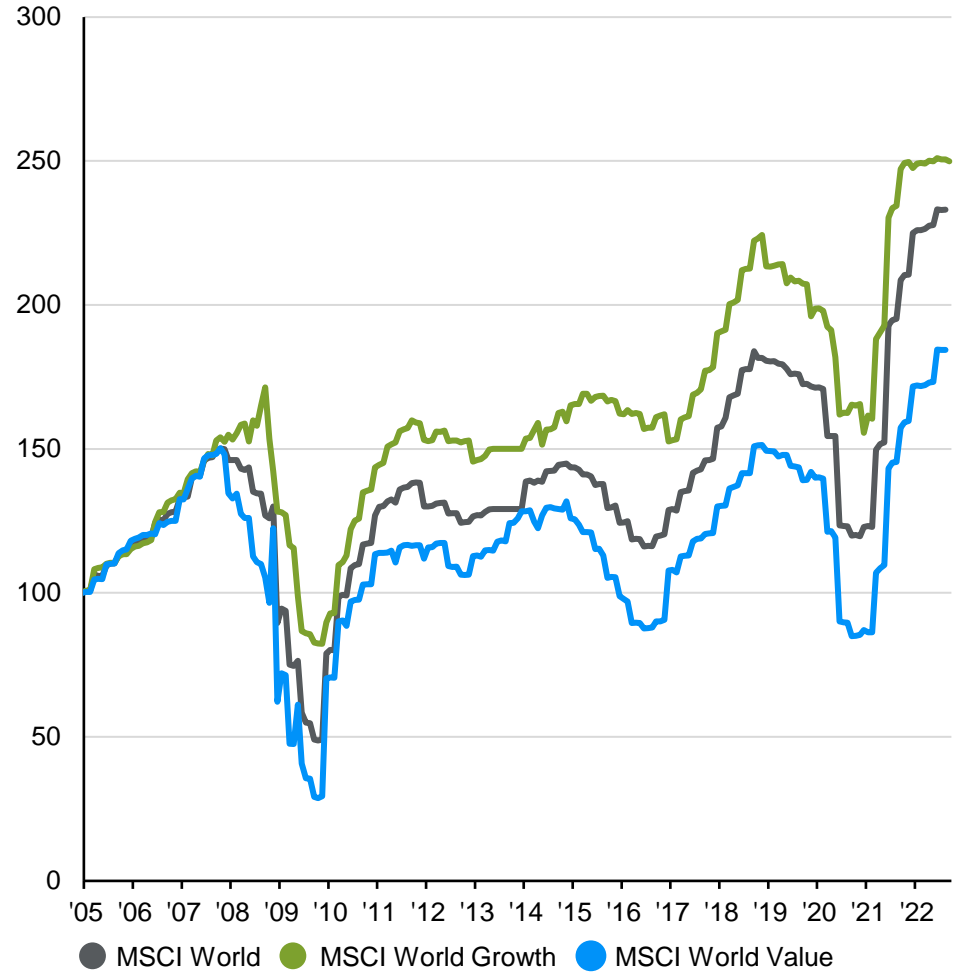
Growth vs. value valuations*

MSCI World growth / value fwd. P/E ratio, # of std. dev. over / under average



Trailing 12-months earnings per share

Indexed, 31/12/04 = 100



Source: J.P. Morgan Asset Management; (Left) FactSet, MSCI; (Right) Bloomberg L.P.
 *Growth is the MSCI World Growth index and value is the MSCI World Value index.
 Past performance is not a reliable indicator of current and future results.
 Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.

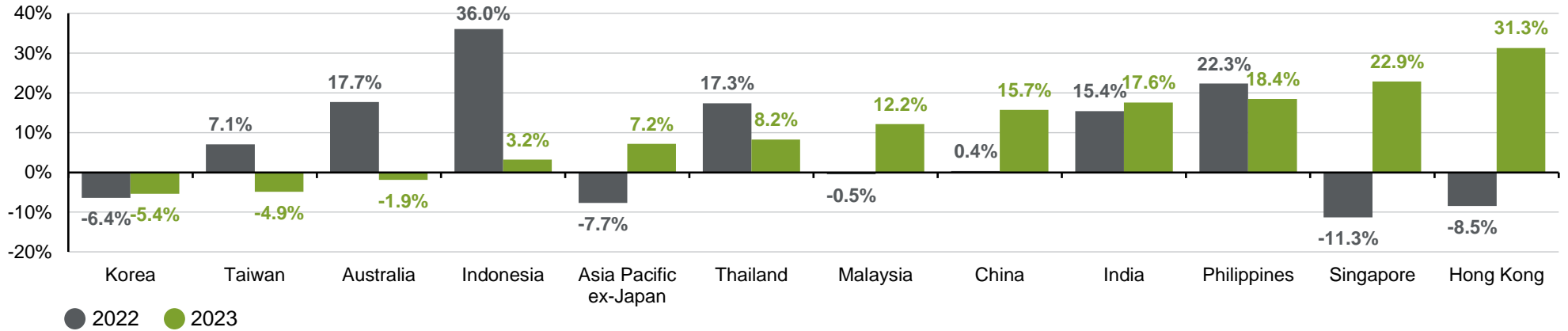


APAC ex-Japan equities: Earnings expectations by market and sector

Equities

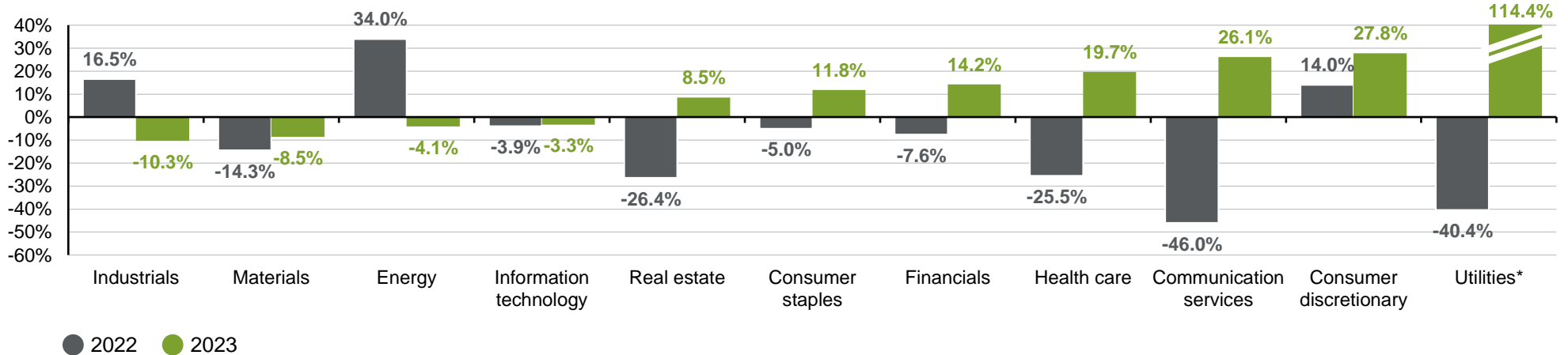
Earnings growth by market

Earnings per share, year-over-year change, consensus estimates



Earnings growth by sector

Earnings per share, year-over-year change, consensus estimates



Source: FactSet, MSCI, J.P. Morgan Asset Management. Consensus estimates used are calendar year estimates from FactSet. (Top) Equity indices used are the respective MSCI indices. (Bottom) Sector indices used are from the MSCI AC Asia Pacific ex-Japan Index. Past performance is not a reliable indicator of current and future results. *The utilities sector earnings is expected to increase by 114% in 2023. Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.

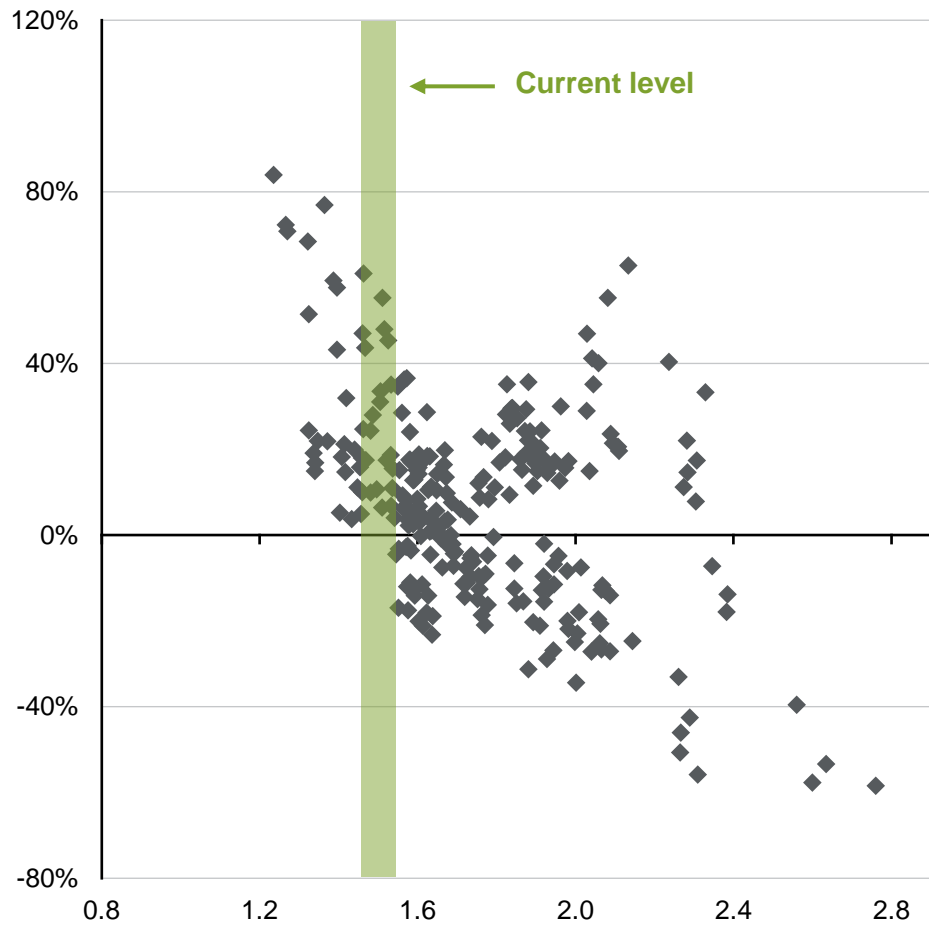


APAC ex-Japan equities: Performance drivers

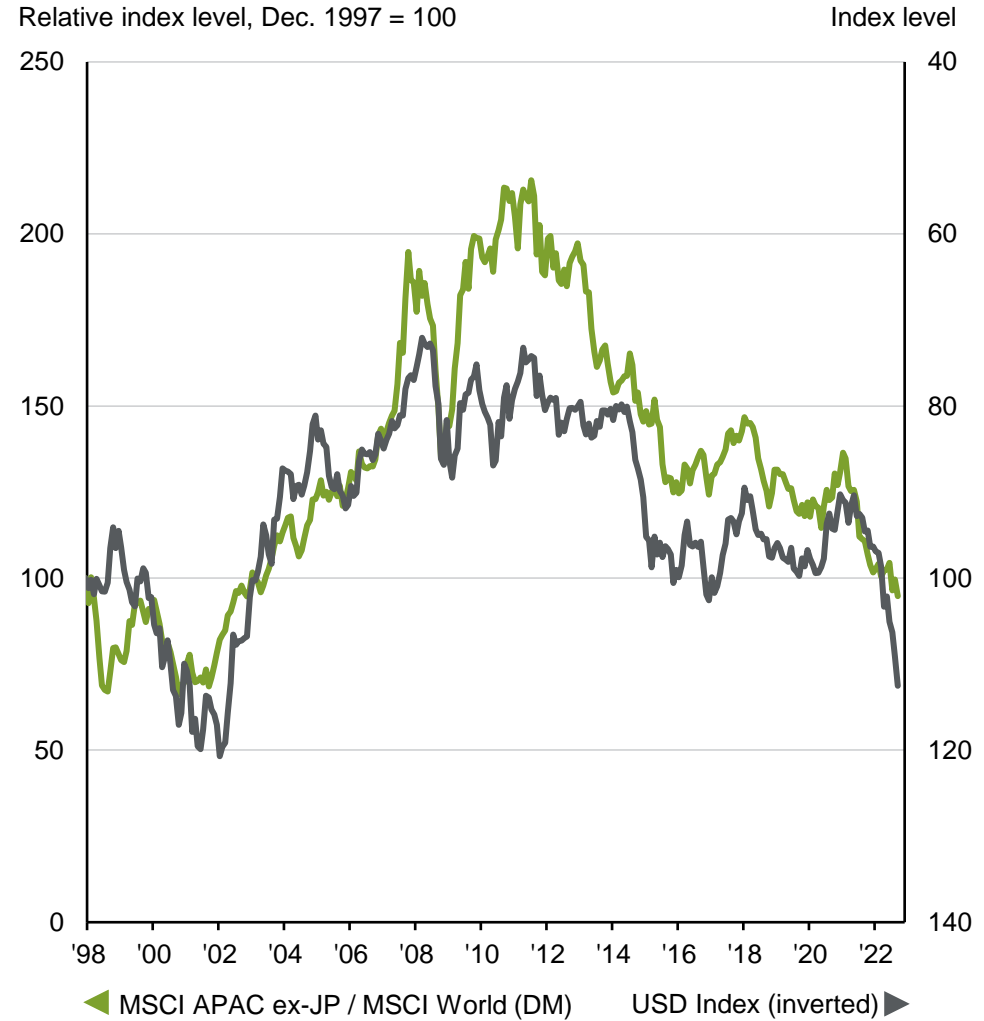
Equities

APAC ex-JP price-to-book* and subsequent returns

Next 12 months' price return in USD



APAC ex-JP / DM equity performance and USD index



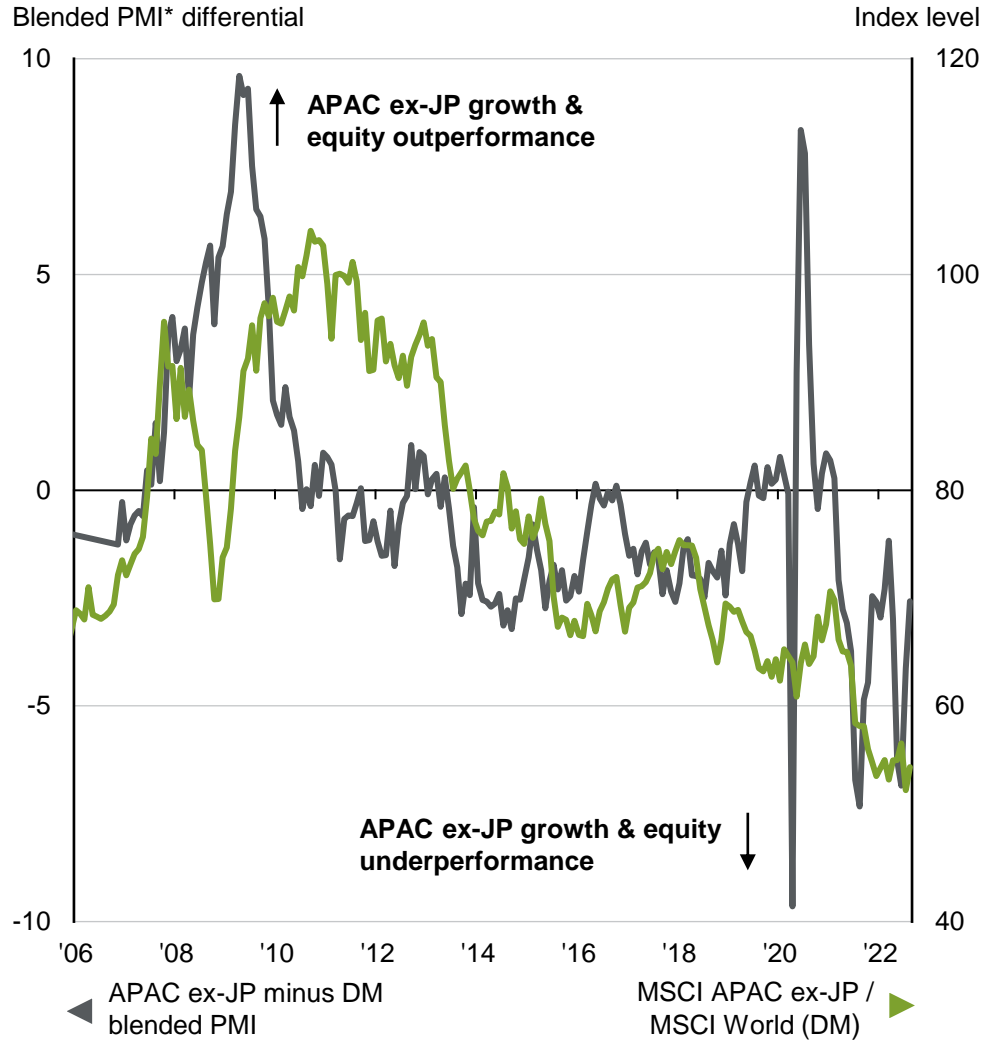
Source: FactSet, MSCI, J.P. Morgan Asset Management; (Left) J.P. Morgan Economic Research. *Price-to-book ratio used here is trailing 12-months price-to-book ratio. Dots represent monthly data points since 1996. DM = Developed markets. Past performance is not a reliable indicator of current and future results. *Guide to the Markets – Asia*. Data reflect most recently available as of 30/09/22.



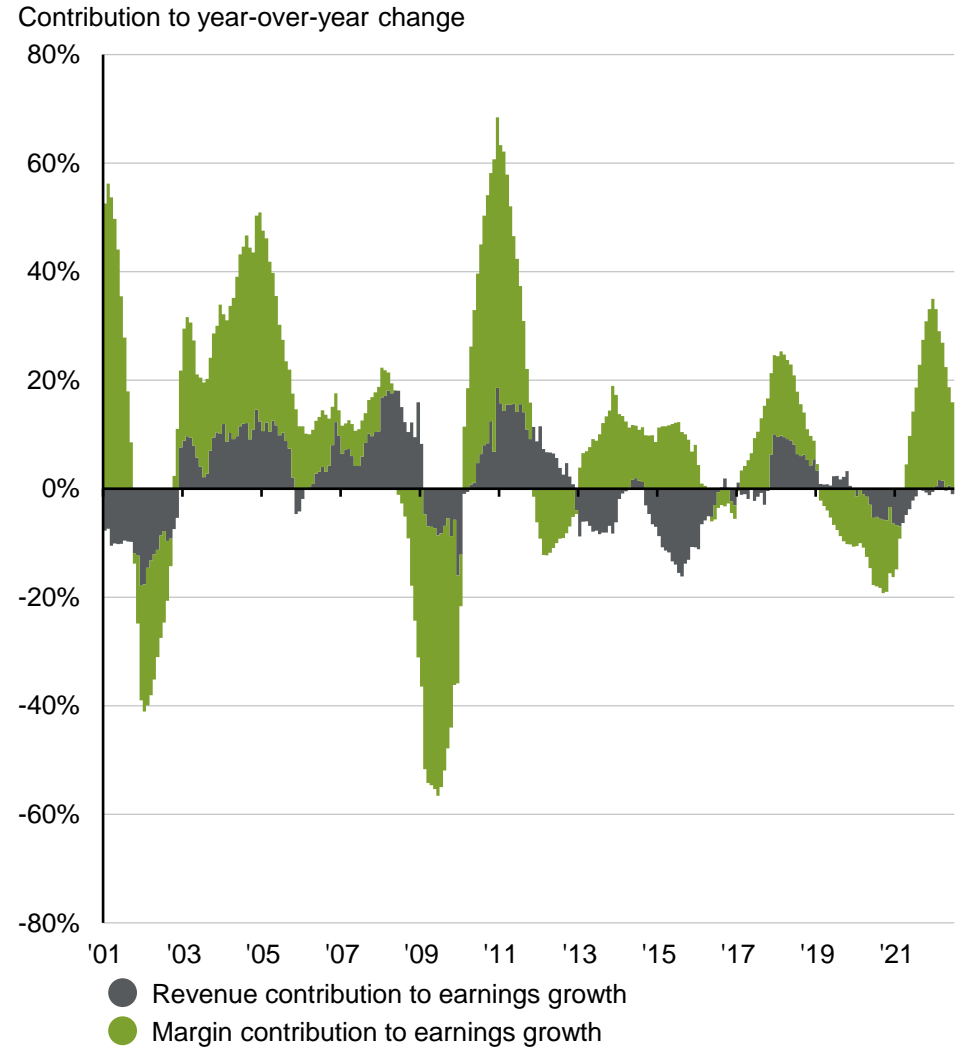
APAC ex-Japan equities: Performance and earnings

Equities

APAC ex-JP vs. DM PMI and equity performance



APAC ex-JP components of earnings growth



Source: J.P. Morgan Asset Management; (Left) FactSet, Haver, J.P. Morgan Economic Research; (Right) Bloomberg L.P.. MSCI DM = Developed markets. *Blended PMI is weighted average PMI based on the respective equity indices' geographical revenues. APAC ex-JP blended PMI weightings based on MSCI APAC ex-Japan Index geographical revenues. DM blended PMI weightings based on MSCI World Index geographical revenues. Past performance is not a reliable indicator of current and future results.

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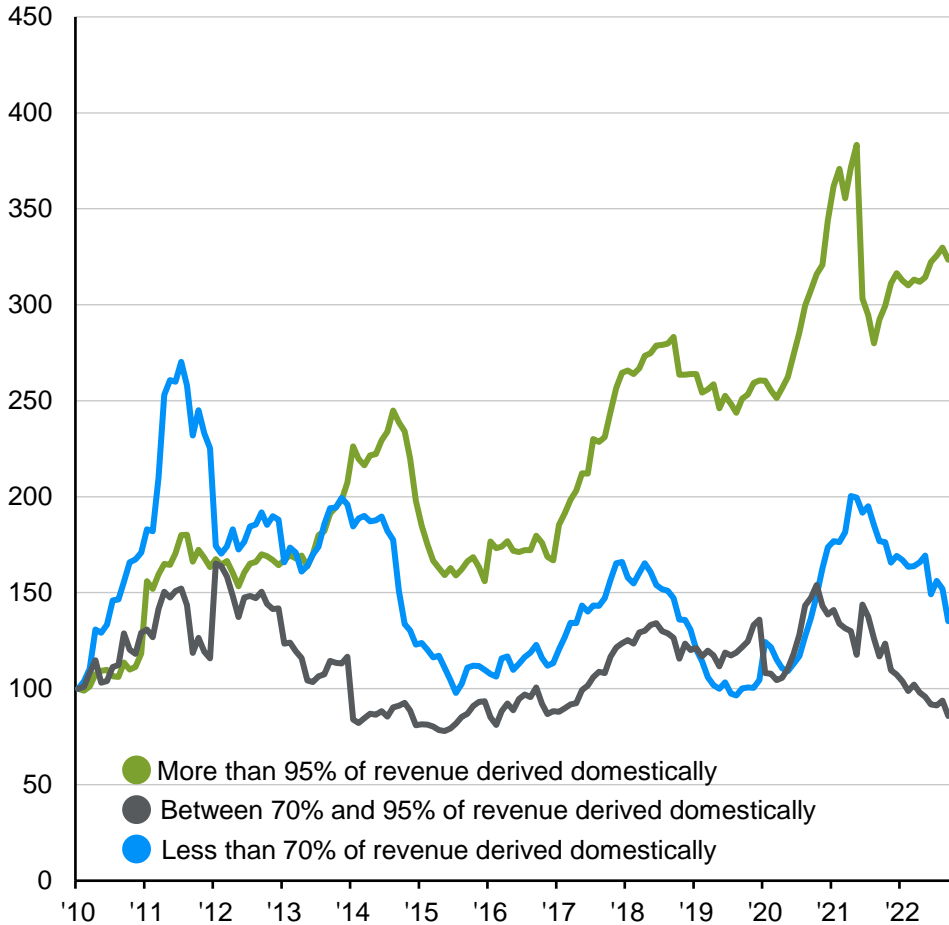


APAC ex-Japan equities: Earnings trend by revenue source and exports

Equities

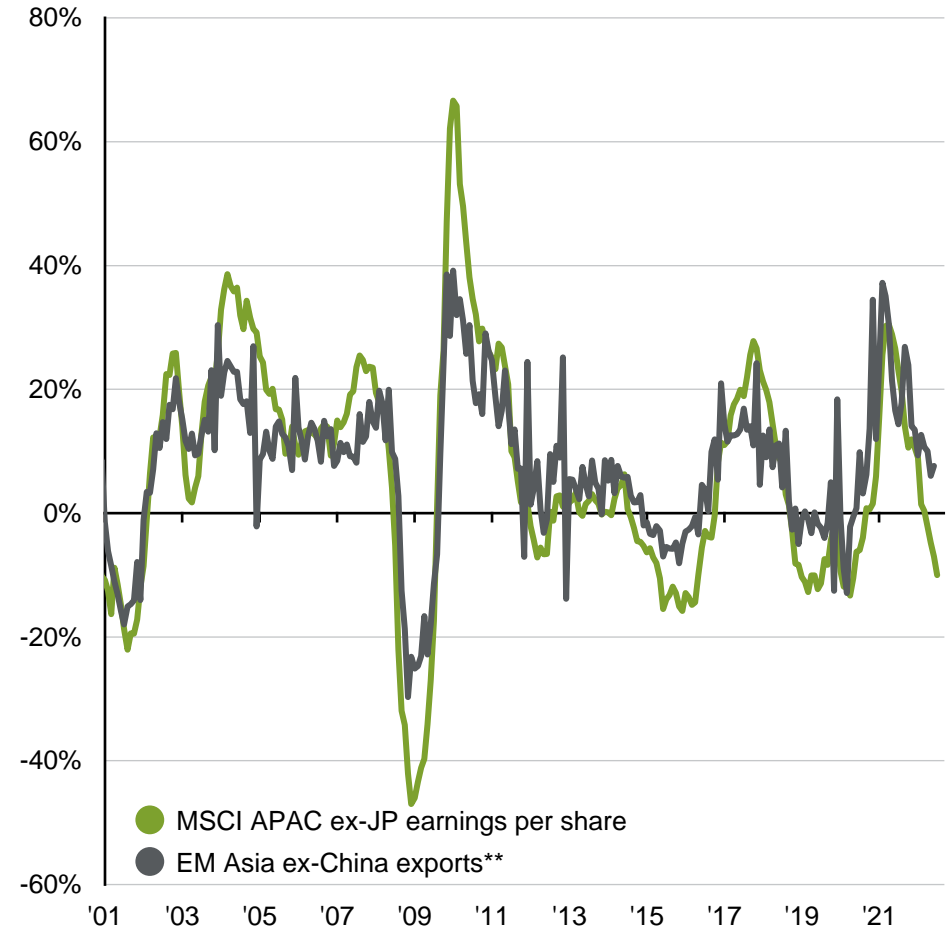
Domestic vs. export-oriented Asian companies*

MSCI AC Asia Pacific ex-Japan, earnings per share, Jan. 2010 = 100



Growth in nominal exports and earnings per share

USD, year-over-year change



Source: J.P. Morgan Asset Management; (Left) FactSet, MSCI; (Right) CEIC, national statistics agencies.

Earnings per share (EPS) used is next 12 months' aggregate estimate. *Universe of stocks within the MSCI AC Asia Pacific ex-Japan index are split into three buckets depending on their revenue exposure to their domestic market. Over the time period examined (29/01/10 – 30/09/22), monthly adjustments are made to the buckets to reflect changes in a company's operations over time. Subsequently, EPS for each bucket is calculated by summing the market value-weighted EPS for each company on a monthly basis over the examined period. Each EPS series is then indexed to 100 on 29/01/10. **EM Asia ex-China includes Hong Kong, Korea, Malaysia, Singapore, Taiwan, Thailand and Vietnam. Overall exports aggregate is gross domestic product (GDP)-weighted. Past performance is not a reliable indicator of current and future results. *Guide to the Markets – Asia*. Data reflect most recently available as of 30/09/22.

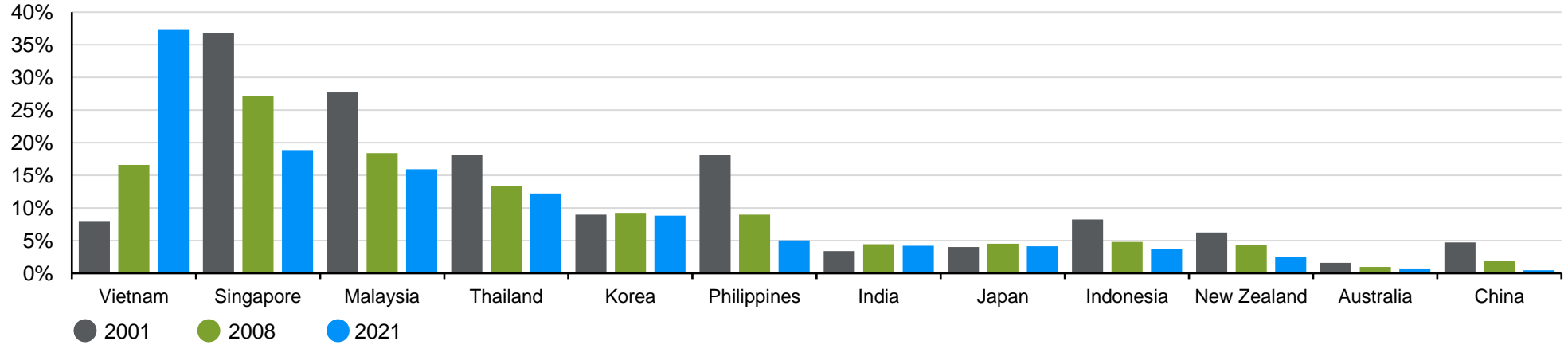


APAC ex-Japan equities: Exposure to the U.S. and Europe

Equities

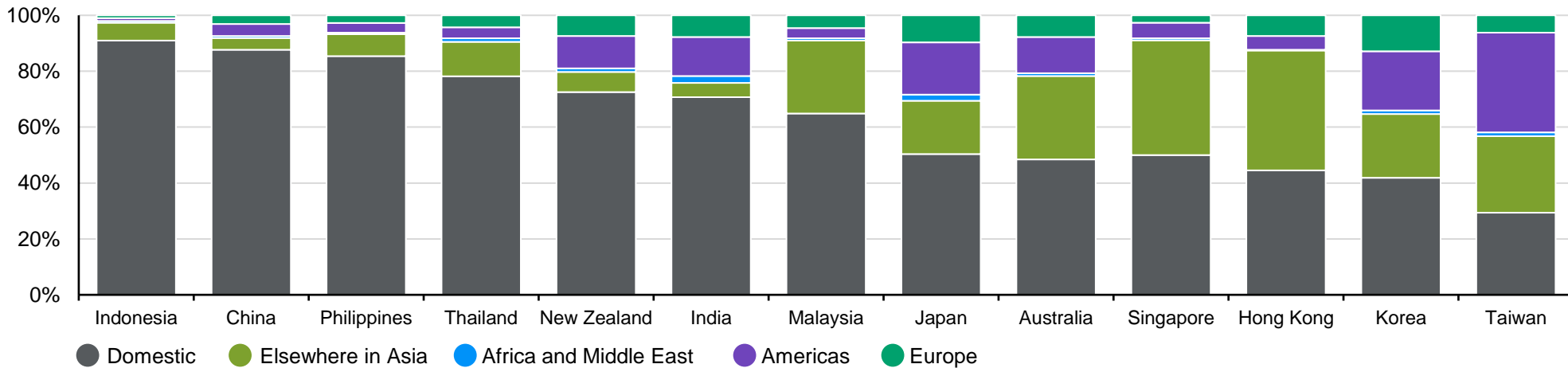
Asian economies' export exposure to U.S. and European Union

Value of exports to U.S. and European Union as a share of nominal GDP, USD



Geographic revenue exposure

Revenue exposure of MSCI indices



Source: FactSet, J.P. Morgan Asset Management; (Top) IMF Direction of Trade Statistics, Oxford Economics; (Bottom) MSCI. Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.

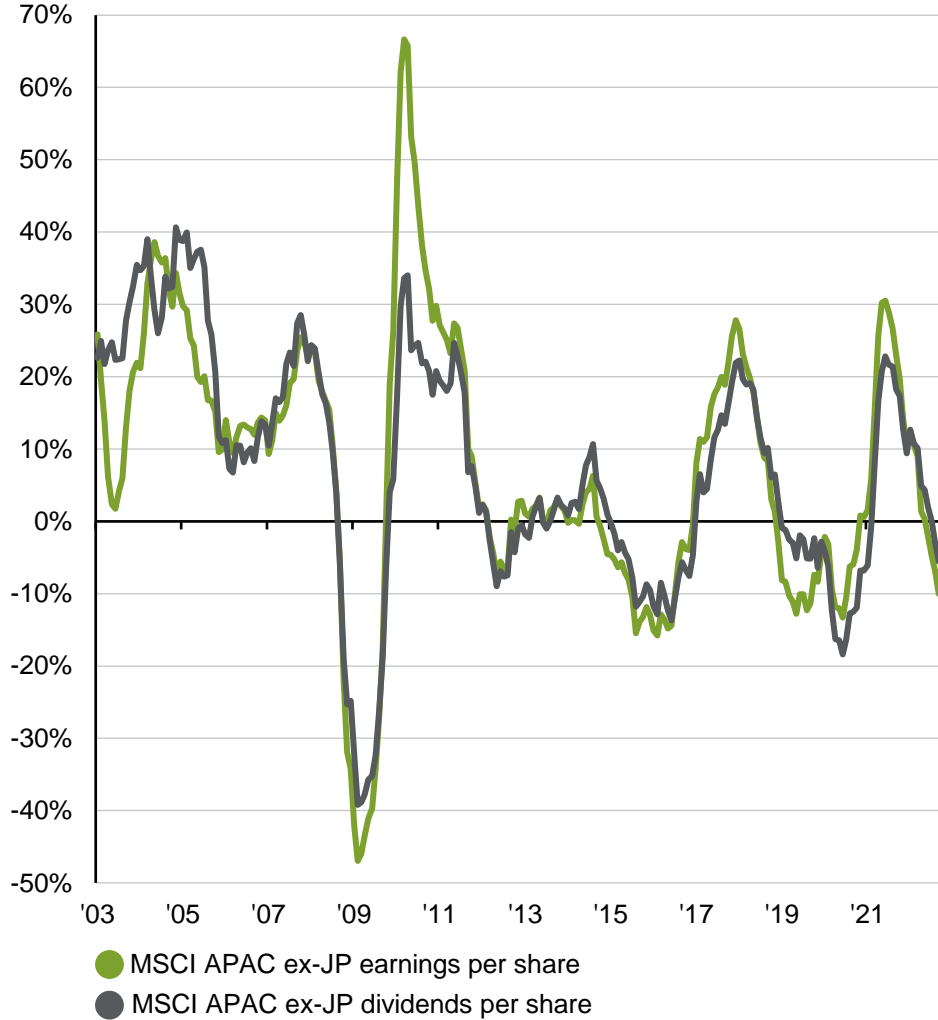


APAC ex-Japan equities: Dividends

Equities

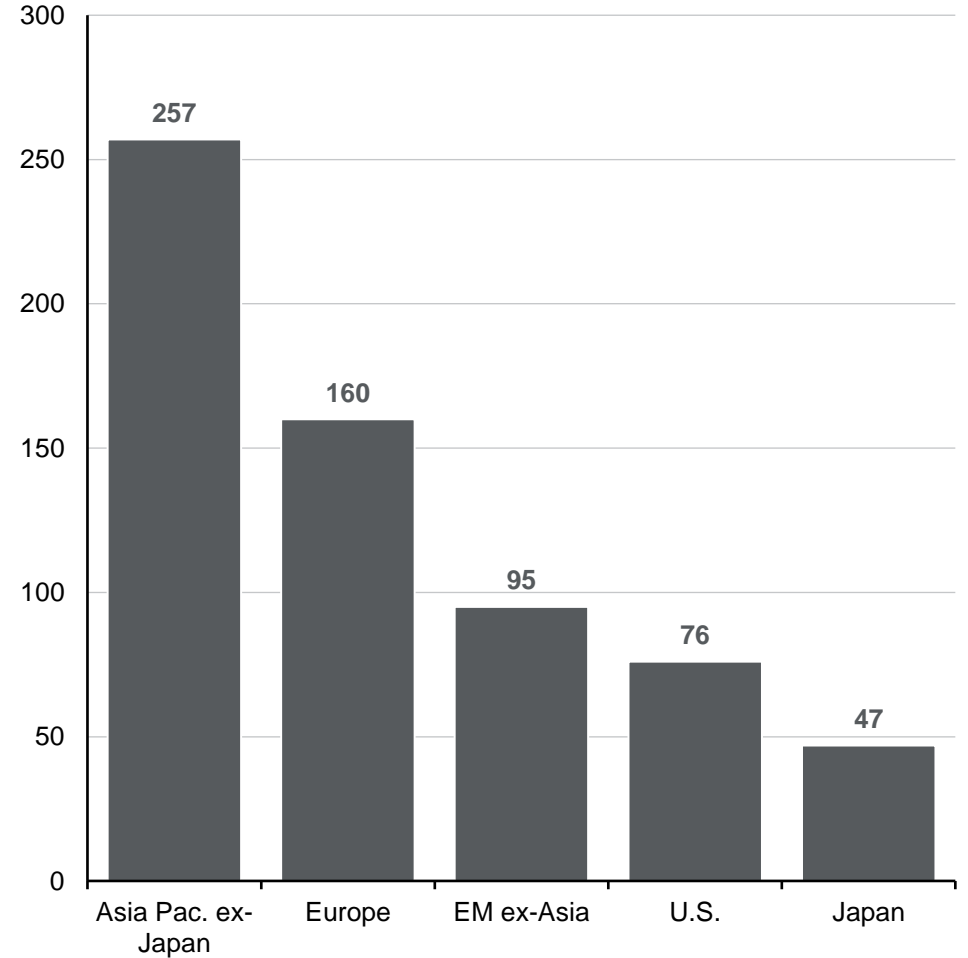
APAC ex-JP earnings and dividends growth estimates

Year-over-year change



Number of companies yielding greater than 4% by region

Constituents of MSCI AC World Index



Source: FactSet, MSCI, J.P. Morgan Asset Management. Past performance is not a reliable indicator of current and future results. Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.

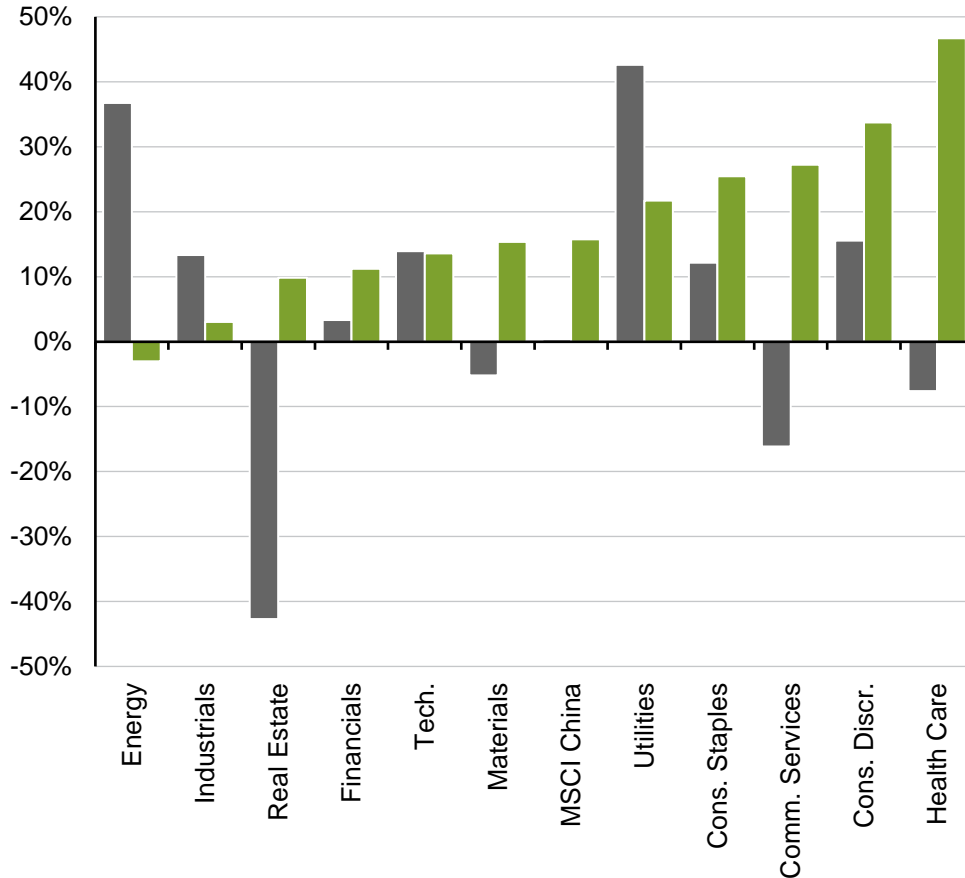


China: Sector earnings and valuations

Equities

Earnings growth of MSCI China*

Earnings per share, year-over-year change, consensus estimates

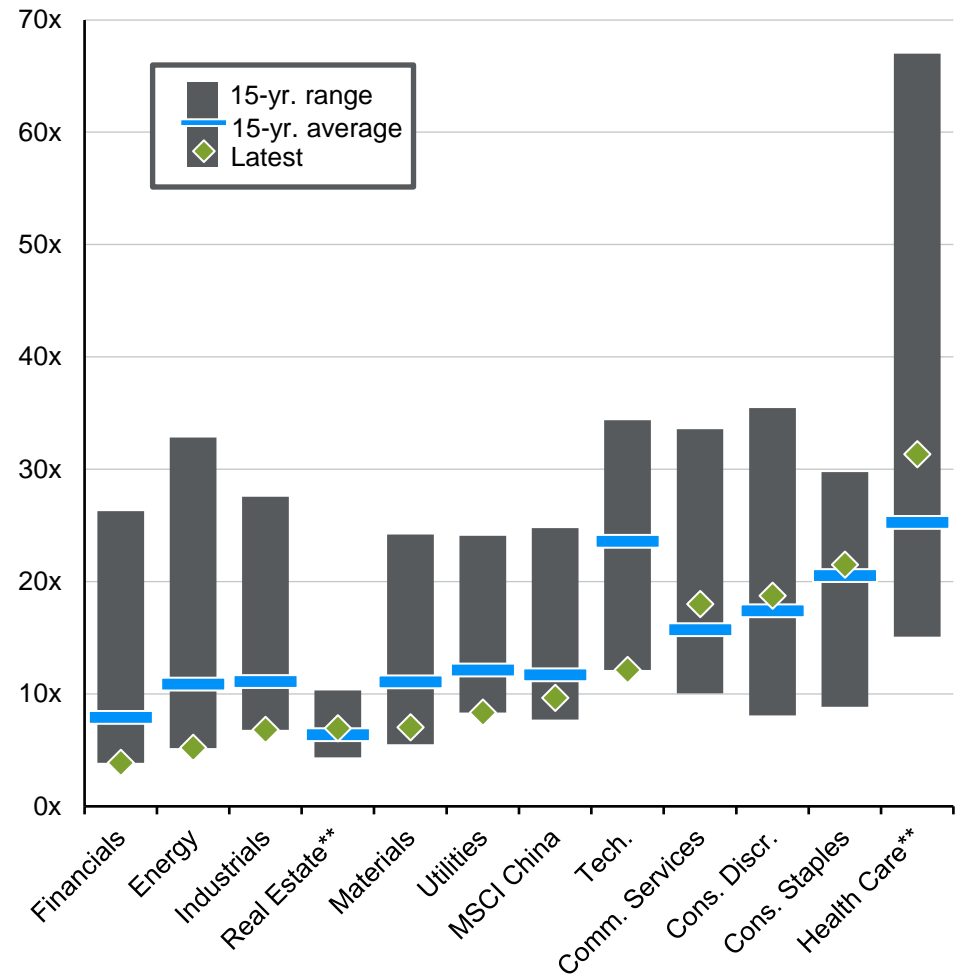


Sector	Weight (%)
Energy	2.9
Industrials	5.8
Real Estate	3.9
Financials	15.7
Tech.	5.3
Materials	3.7
MSCI China	100.0
Utilities	2.7
Cons. Staples	6.3
Comm. Services	17.5
Cons. Discr.	30.6
Health Care	5.7

● 2022 ● 2023

MSCI China price-to-earnings

Forward P/E ratios



Source: FactSet, MSCI, J.P. Morgan Asset Management. *Sector indices used are from the MSCI China Index. Consensus estimates used are calendar year estimates from FactSet. Past performance is not a reliable indicator of current and future results. **Data for the forward price-to-earnings ratio in the real estate and health care sectors begin from 30/09/16 and 30/06/09, respectively. Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.

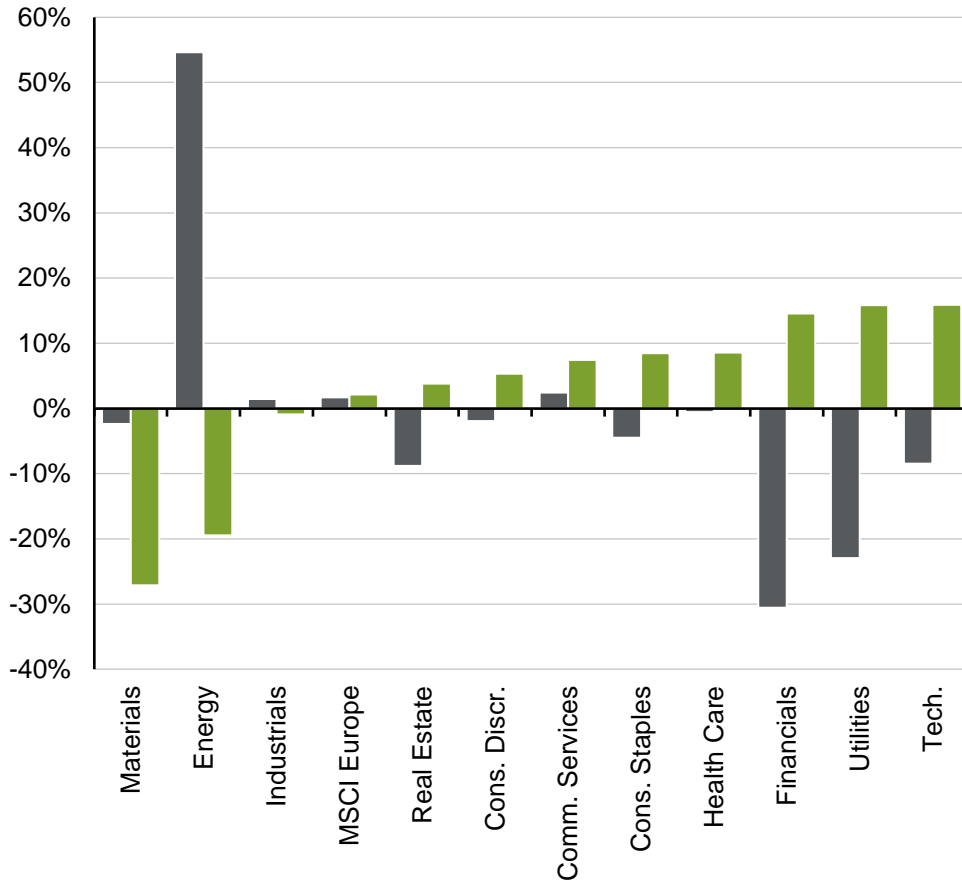


Europe: Sector earnings and valuations

Equities

MSCI Europe earnings growth estimates

Earnings per share, year-over-year change, consensus estimates

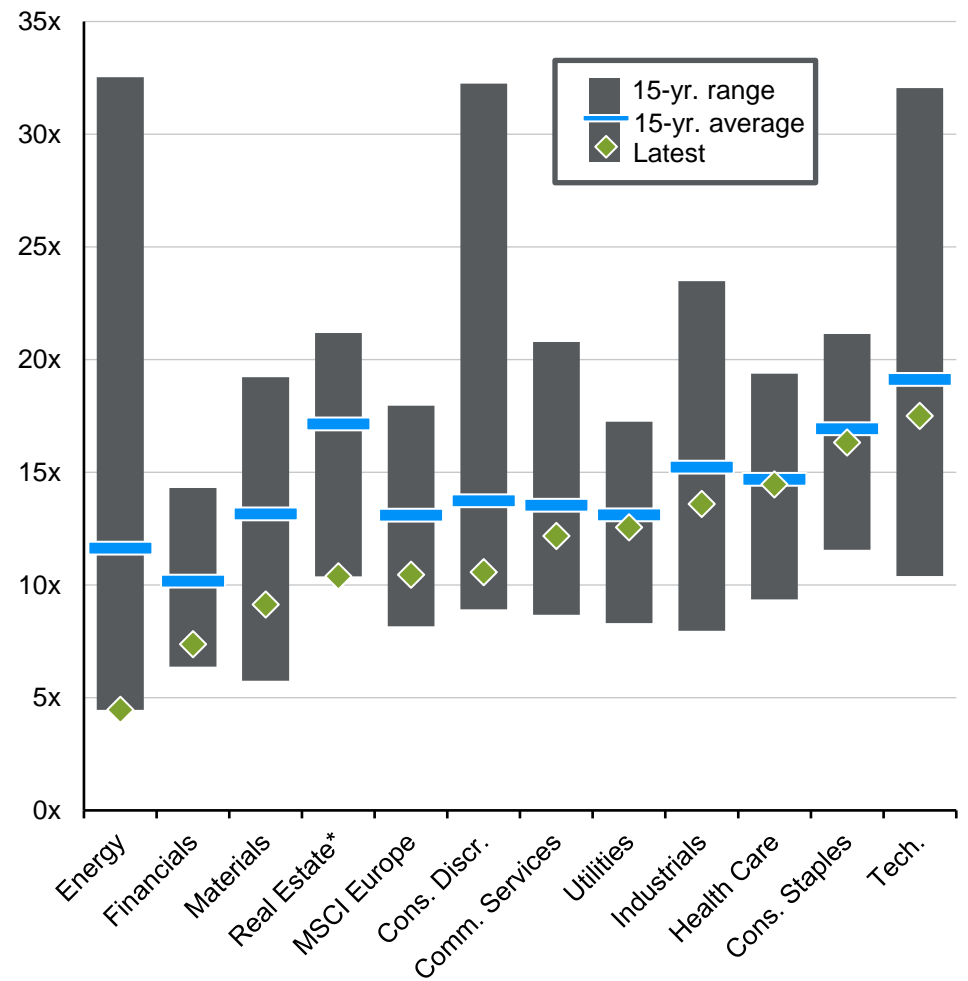


Sector	Weight (%)
Materials	7.3
Energy	6.6
Industrials	14.1
MSCI Europe	100.0
Real Estate	0.9
Cons. Discr.	10.2
Comm. Services	3.6
Cons. Staples	14.3
Health Care	15.9
Financials	15.9
Utilities	4.2
Tech.	7.0

● 2022 ● 2023

MSCI Europe price-to-earnings

Forward P/E ratios



Source: FactSet, Standard & Poor's, J.P. Morgan Asset Management.
 *Data for the forward price-to-earnings ratio in the real estate sector begins 30/09/16.
 Past performance is not a reliable indicator of current and future results.
 Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.

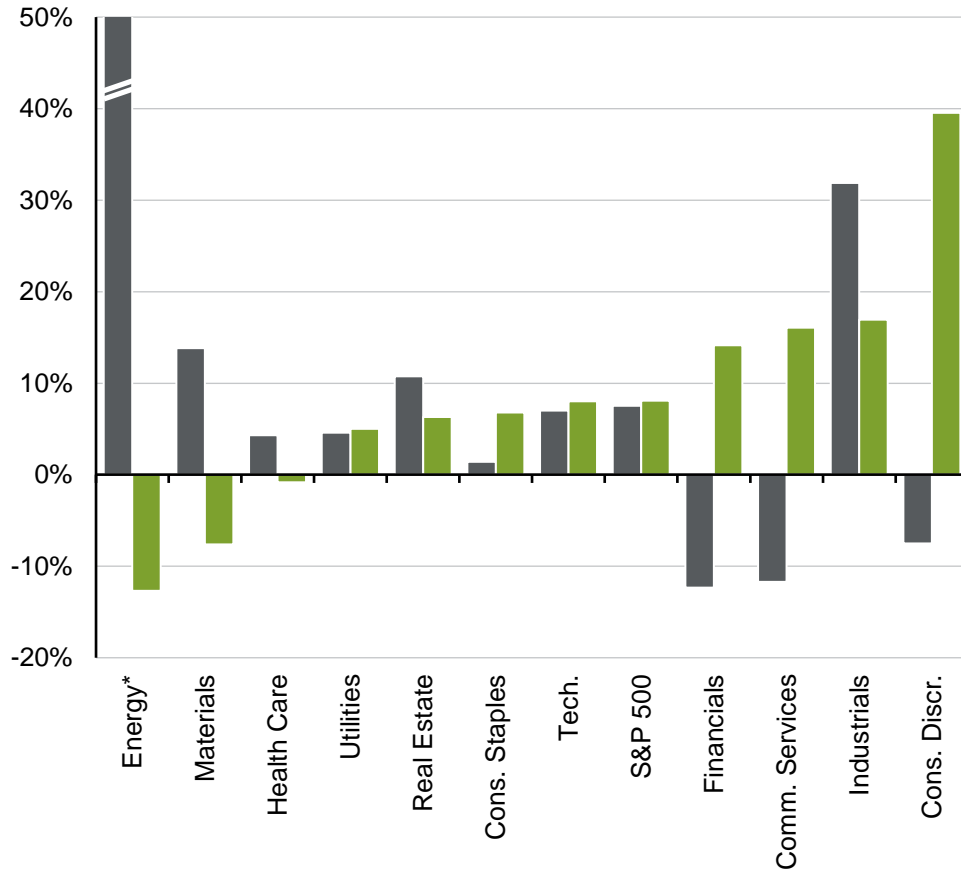


United States: Sector earnings and valuations

Equities

S&P 500 earnings growth estimates

Earnings per share, year-over-year change, consensus estimates

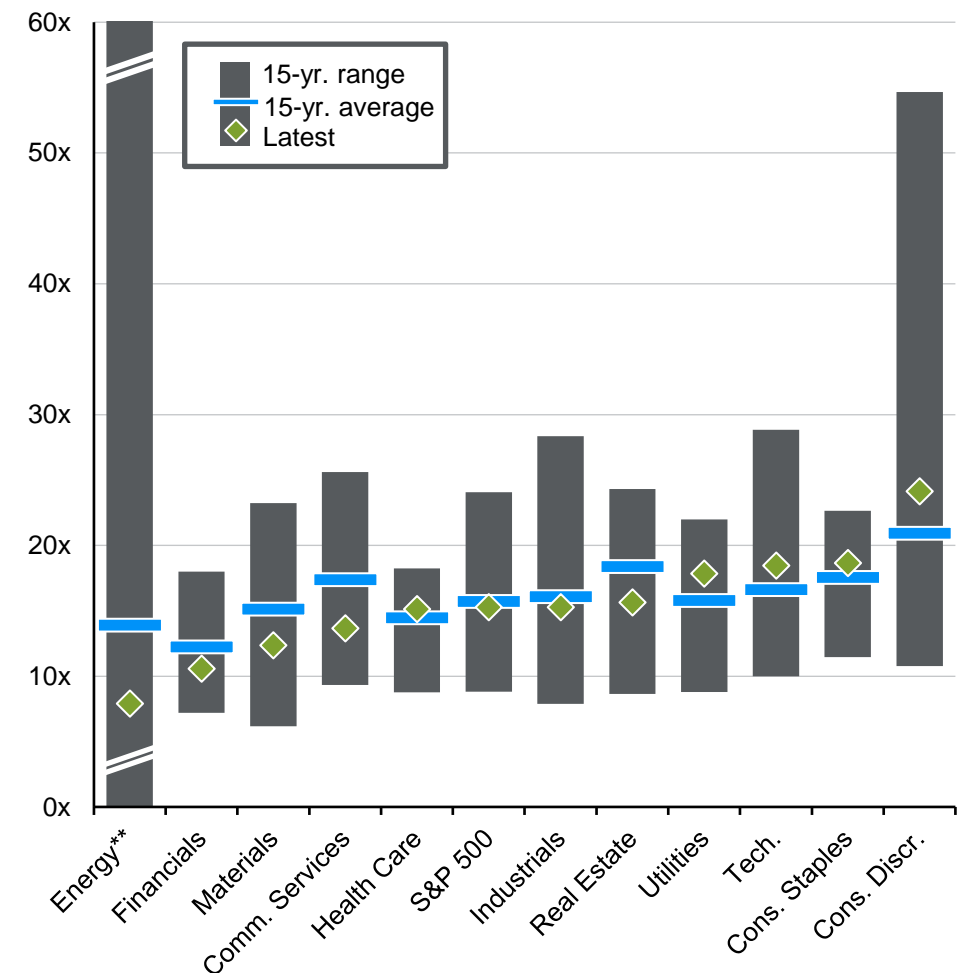


Sector Weight (%)	4.6	2.5	15.1	3.1	2.8	6.9	26.4	100.0	11.0	8.1	7.9	11.7

● 2022 ● 2023

S&P 500 price-to-earnings

Forward P/E ratios



Source: FactSet, Standard & Poor's, J.P. Morgan Asset Management.

*The energy sector earnings are expected to increase by 147% in 2022.

**The energy sector reached a historic maximum of 1,160x and a historic minimum of -491x.

Past performance is not a reliable indicator of current and future results.

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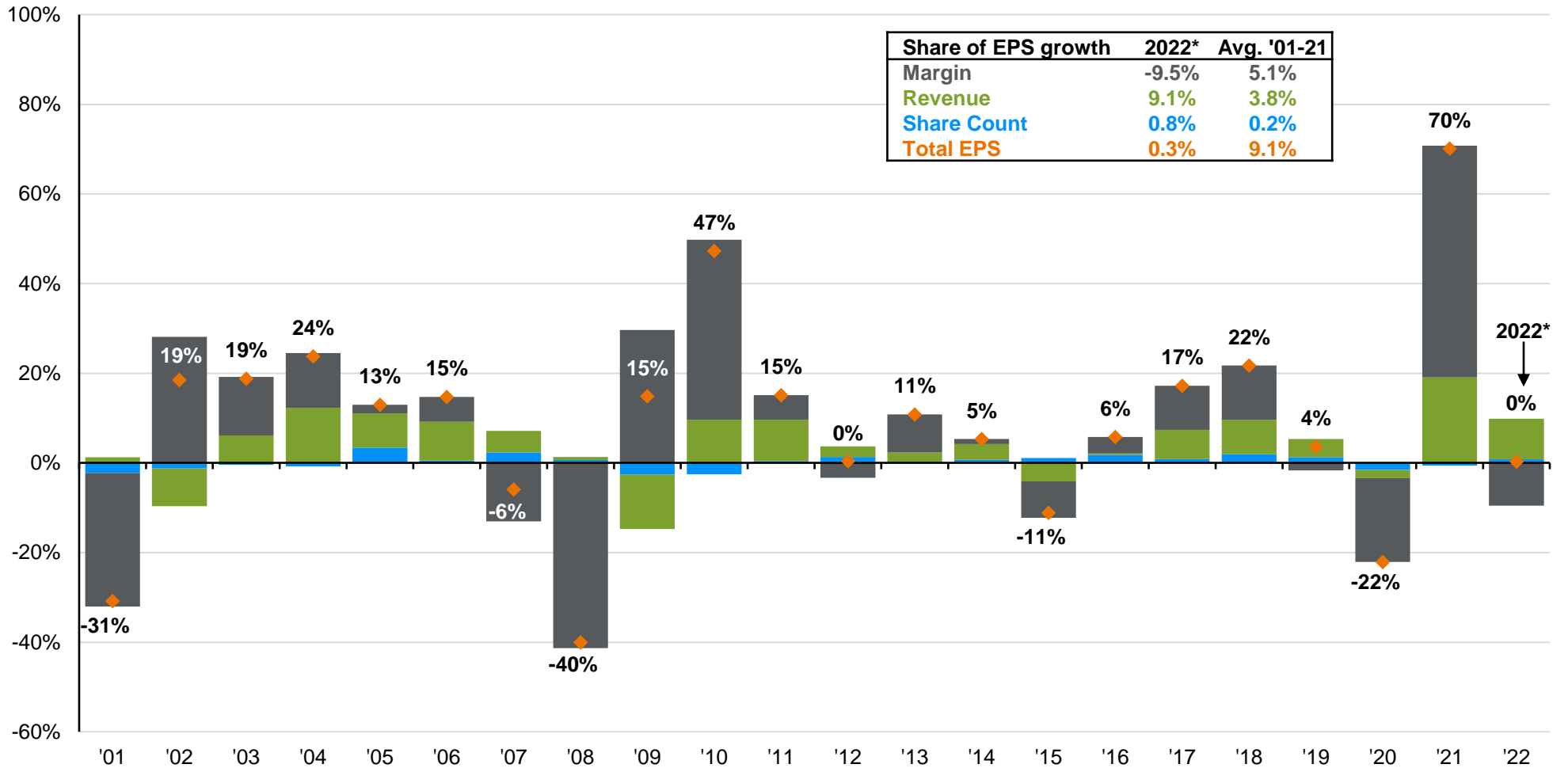


United States: Sources of earnings per share growth

Equities

S&P 500 year-over-year operating EPS growth

Annual growth broken into revenue, changes in profit margin & changes in share count



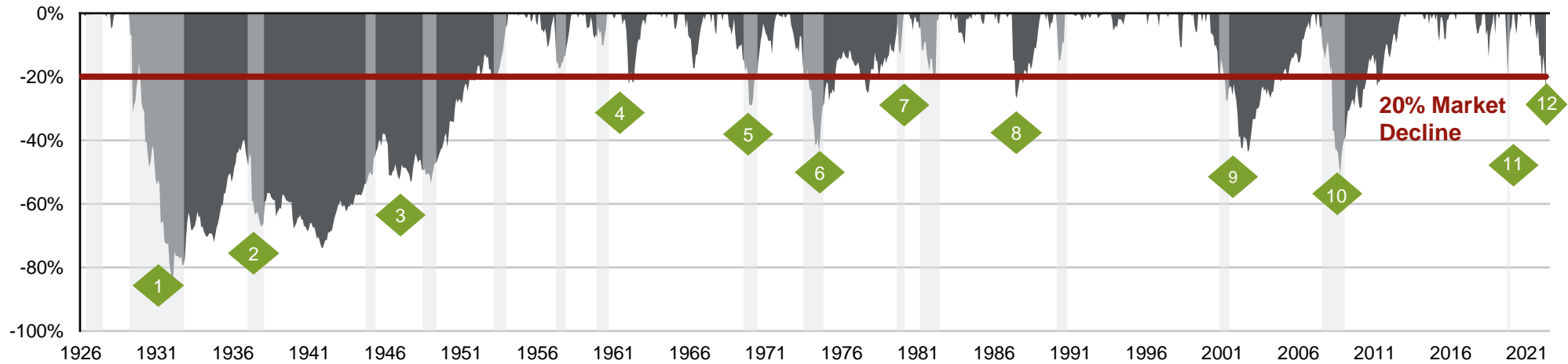
Source: Compustat, FactSet, Standard & Poor's, J.P. Morgan Asset Management.
 EPS levels are based on annual operating earnings per share. *2022 earnings figures are based on weekly operating earnings estimates from Standard & Poor's.
 Percentages may not sum due to rounding. Past performance is not indicative of future returns.
 Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.



United States: Bull and bear markets

Equities

S&P 500 Composite declines from all-time highs



Characteristics of bull and bear markets

Market corrections	Bear markets*				Macro environment				Bull markets			
	Mkt. Peak	Bear return (%)	Duration (mths)	P/E trough	Recession	Commodity spike	Aggressive Fed	Extreme valuations	Bull begin date	Bull return (%)	Duration (mths)	P/E Peak
1 Crash of 1929	09/1929	-86	32		◆			◆	07/1926	152	37	
2 1937 Fed tightening	03/1937	-60	61		◆		◆	◆	03/1935	129	23	
3 Post WWII crash	05/1946	-30	36		◆			◆	04/1942	158	49	
4 Flash crash of 1962. Cuban Missile Crisis	12/1961	-28	6					◆	10/1960	39	13	
5 Tech crash of 1970	11/1968	-36	17		◆	◆	◆	◆	10/1962	103	73	
6 Stagflation. OPEC oil embargo	01/1973	-48	20		◆	◆			05/1970	74	31	
7 Volcker tightening	11/1980	-27	20		◆	◆	◆		03/1978	62	32	
8 1987 crash	08/1987	-34	3	9.6x				◆	08/1982	229	60	15.2x
9 Tech bubble	03/2000	-49	30	13.8x	◆			◆	10/1990	417	113	24.7x
10 Global financial crisis	10/2007	-57	17	10.2x	◆	◆	◆		10/2002	101	60	15.1x
11 Coronavirus pandemic	02/2020	-34	1	13.3x	◆				03/2009	401	131	19.1x
12 Stagflation worries	01/2022	-25**	Ongoing	15.3x***		◆	◆		03/2020	114	21	24.1x
Averages****	-	-44	23						-	169	57	

Source: FactSet, NBER, Robert Shiller, Standard & Poor's, J.P. Morgan Asset Management. *A bear market represents a 20% or more decline from the previous market high using a monthly frequency. Periods of recession are defined using the NBER's business cycle dates. Commodity spike is defined by a significant upward movement in oil prices. Periods of extreme valuation are defined as periods where the forward P/E multiple on the S&P 500 were approximately two standard deviations above the long-run average. Aggressive Fed tightening is defined as Federal Reserve monetary tightening that was unexpected and/or significant in magnitude. Peak and trough price-to-earnings ratios quoted are next 12 months forward P/Es. **Most recently available bear return since the start of the Stagflation worries bear market. ***Most recently available P/E trough since the start of the Stagflation worries bear market. ****Averages do not include ongoing bull or bear markets. Past performance is not a reliable indicator of current and future results.

Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.



Global fixed income returns

GTM ASIA 50

Fixed income

												10-yrs ('12 - '22)	
2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	3Q '22	YTD '22	Ann. Ret.	Ann. Vol.
Europe HY 30.5%	Europe HY 14.9%	USD Asian 8.3%	Asia HY 5.2%	U.S. HY 17.1%	Europe HY 21.0%	Cash 1.8%	U.S. IG 14.5%	Europe HY 10.9%	U.S. HY 5.3%	Cash 0.5%	Cash 0.6%	U.S. HY 3.9%	Local EMD 11.6%
Asia HY 20.4%	U.S. HY 7.4%	U.S. IG 7.5%	USD Asian 2.8%	Local EMD 11.4%	Local EMD 15.4%	U.S. Treas 0.9%	USD EMD 14.4%	U.S. IG 9.9%	Cash 0.0%	U.S. HY -0.6%	Local EMD -13.0%	USD Asian 2.2%	Europe HY 11.1%
Local EMD 19.9%	Asia HY 2.0%	Asia HY 6.1%	USD EMD 1.2%	Asia HY 11.2%	USD EMD 9.3%	DM Gov't -0.7%	U.S. HY 14.3%	DM Gov't 9.7%	U.S. IG -1.0%	USD Asian -3.5%	U.S. Treas -13.1%	U.S. IG 1.7%	USD EMD 8.4%
USD EMD 18.5%	Cash 0.0%	USD EMD 5.5%	U.S. Treas 0.8%	USD EMD 10.2%	U.S. HY 7.5%	USD Asian -0.8%	Local EMD 13.1%	U.S. Treas 8.0%	USD EMD -1.5%	Local EMD -4.2%	USD Asian -13.9%	USD EMD 1.0%	Asia HY 7.7%
U.S. HY 15.8%	USD Asian -1.4%	U.S. Treas 5.1%	Cash 0.0%	U.S. IG 6.1%	Asia HY 6.9%	U.S. HY -2.1%	Asia HY 12.8%	U.S. HY 7.1%	U.S. Treas -2.3%	USD EMD -4.2%	U.S. HY -14.7%	Asia HY 0.9%	U.S. HY 7.3%
USD Asian 14.3%	U.S. IG -1.5%	U.S. HY 2.5%	U.S. IG -0.7%	USD Asian 5.8%	DM Gov't 6.8%	U.S. IG -2.5%	USD Asian 11.3%	USD Asian 6.3%	USD Asian -2.4%	U.S. Treas -4.3%	U.S. IG -18.7%	Europe HY 0.8%	U.S. IG 6.0%
U.S. IG 9.8%	U.S. Treas -2.7%	DM Gov't 0.7%	DM Gov't -2.6%	Europe HY 3.4%	U.S. IG 6.4%	Asia HY -3.2%	Europe HY 10.3%	USD EMD 5.9%	Local EMD -2.6%	U.S. IG -5.1%	DM Gov't -20.3%	Cash 0.6%	DM Gov't 5.7%
U.S. Treas 2.0%	DM Gov't -4.5%	Cash 0.0%	U.S. HY -4.5%	DM Gov't 1.6%	USD Asian 5.8%	USD EMD -4.6%	U.S. Treas 6.9%	Asia HY 4.9%	Europe HY -3.1%	Asia HY -6.0%	USD EMD -22.2%	U.S. Treas 0.5%	USD Asian 4.4%
DM Gov't 1.3%	Local EMD -5.5%	Europe HY -6.0%	Europe HY -7.6%	U.S. Treas 1.0%	U.S. Treas 2.3%	Local EMD -6.7%	DM Gov't 6.0%	Cash 0.5%	DM Gov't -6.5%	Europe HY -7.1%	Asia HY -23.7%	DM Gov't -1.5%	U.S. Treas 4.1%
Cash 0.1%	USD EMD -6.6%	Local EMD -6.1%	Local EMD -18.0%	Cash 0.3%	Cash 0.8%	Europe HY -8.2%	Cash 2.2%	Local EMD -1.2%	Asia HY -11.0%	DM Gov't -7.2%	Europe HY -26.9%	Local EMD -1.5%	Cash 0.2%

Source: Bloomberg Finance L.P., FactSet, J.P. Morgan Economic Research, J.P. Morgan Asset Management. Based on Bloomberg U.S. Aggregate Credit – Corporate High Yield Index (U.S. HY), Bloomberg U.S. Aggregate Credit – Corporate Investment Grade Index (U.S. IG), J.P. Morgan Government Bond Index – EM Global (GBI-EM) (Local EMD), J.P. Morgan Emerging Market Bond Index Global (EMBIG) (USD EMD), J.P. Morgan Asia Credit Index (JACI) (USD Asian Bond), Bloomberg Pan European High Yield (Europe HY), J.P. Morgan Government Bond Index – Global Traded (DM Government Bond), J.P. Morgan Asia Credit High Yield Index (Asia HY), Bloomberg Global U.S. Treasury – Bills (3-5 years) (U.S. Treasury) and Bloomberg U.S. Treasury – Bills (1-3 months) (Cash). 10-year data is used to calculate annualized returns (Ann. Ret.) and annualized volatility (Ann. Vol.). Returns are in U.S. dollars and reflect the period from 30/09/12 to 30/09/22. Past performance is not a reliable indicator of current and future results.

Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.

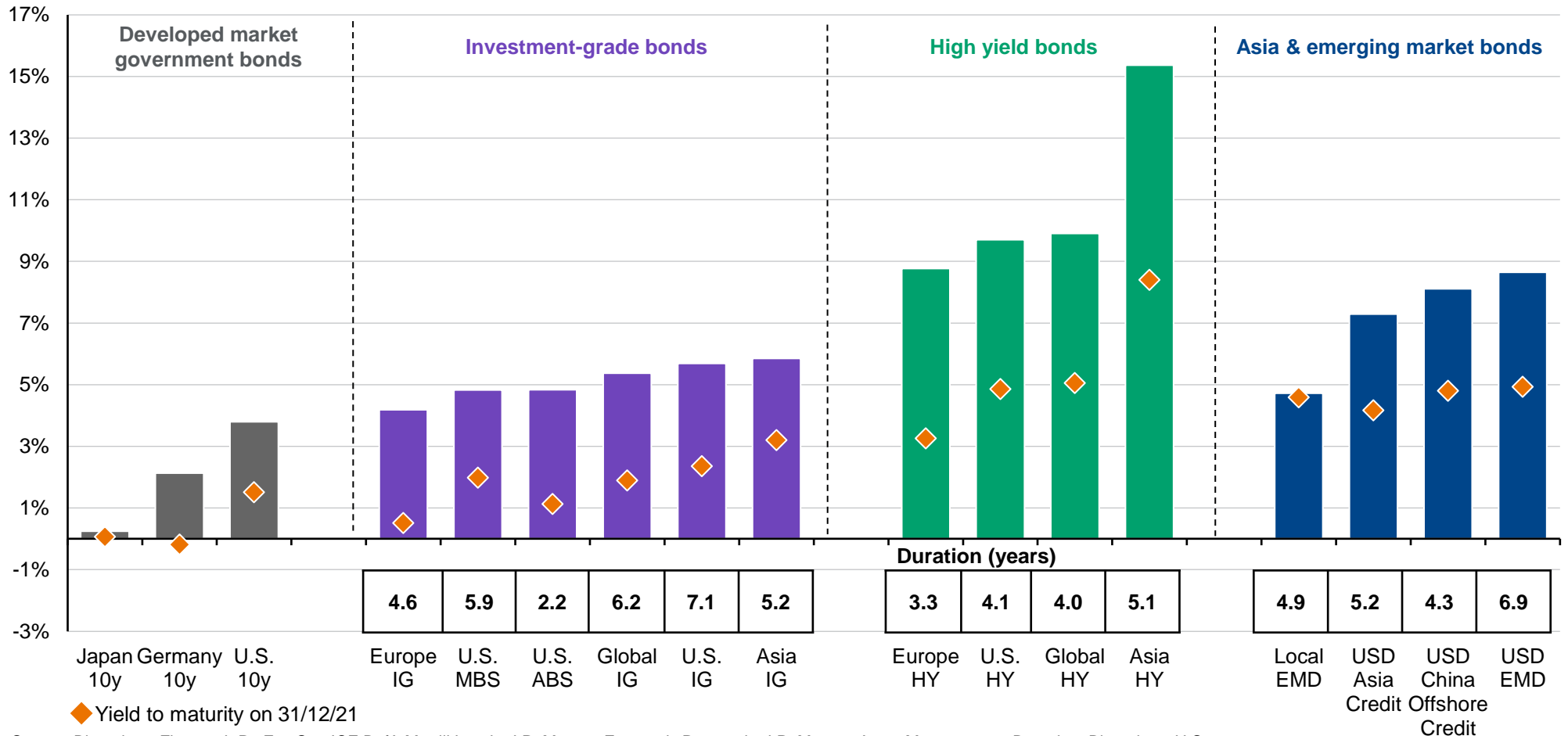


Global fixed income: Yields and duration

Fixed income

Fixed income yields

Yield to maturity



Source: Bloomberg Finance L.P., FactSet, ICE BofA Merrill Lynch, J.P. Morgan Economic Research, J.P. Morgan Asset Management. Based on Bloomberg U.S. Aggregate Credit – Corporate Investment Grade Index (U.S. IG), Bloomberg Euro Aggregate Credit – Corporate (Europe IG), J.P. Morgan Asia Credit Investment Grade Index (Asia IG), Bloomberg Global Aggregate – Corporate (Global IG), Bloomberg U.S. Aggregate Credit – Corporate High Yield Index (U.S. HY), Bloomberg U.S. Aggregate Securitized – Asset Backed Securities (U.S. ABS), Bloomberg U.S. Aggregate Securitized – Mortgage Backed Securities (U.S. MBS), Bloomberg Pan European High Yield (Europe HY), J.P. Morgan Asia Credit High Yield Index (Asia HY), ICE BofA Global High Yield (Global HY), J.P. Morgan GBI-EM (Local EMD), J.P. Morgan EMBI Global (USD EMD), J.P. Morgan Asia Credit Index (JACI) (USD Asia Credit), J.P. Morgan Asia Credit China Index (USD China Offshore Credit). Duration is a measure of the sensitivity of the price (the value of the principal) of a fixed income investment to a change in interest rates and is expressed as number of years. Rising interest rates mean falling bond prices, while declining interest rates mean rising bond prices. Yields are not guaranteed, positive yield does not imply positive return. Past performance is not a reliable indicator of current and future results.

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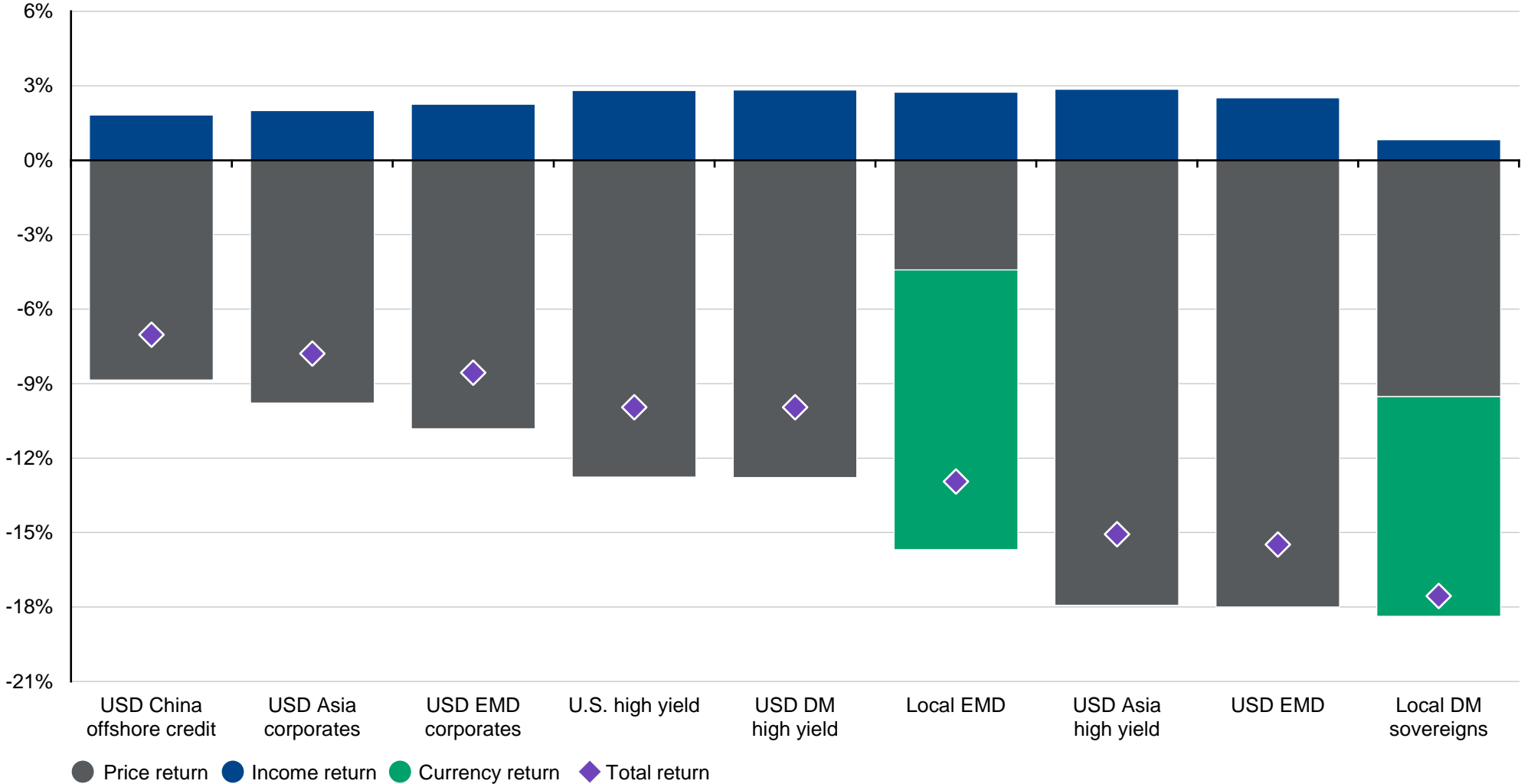


Global fixed income: Return composition

Fixed income

Debt return composition

Last 6 months



Source: J.P. Morgan Economics Research, J.P. Morgan Asset Management.
 Based on J.P. Morgan Asia Credit High Yield Index (USD Asia high yield), J.P. Morgan CEMBI (USD emerging market debt (EMD) corporates), J.P. Morgan EMBI Global (USD EMD), J.P. Morgan Asia Credit Corporates Index (USD Asia corporates), J.P. Morgan Asia Credit China Index (USD China offshore credit), J.P. Morgan Developed Market HY Index (USD DM high yield), J.P. Morgan Domestic High Yield Index (U.S. high yield), J.P. Morgan GBI-EM Global (Local EMD), J.P. Morgan GBI-DM (Local DM sovereigns). Past performance is not a reliable indicator of current and future results.
 Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.

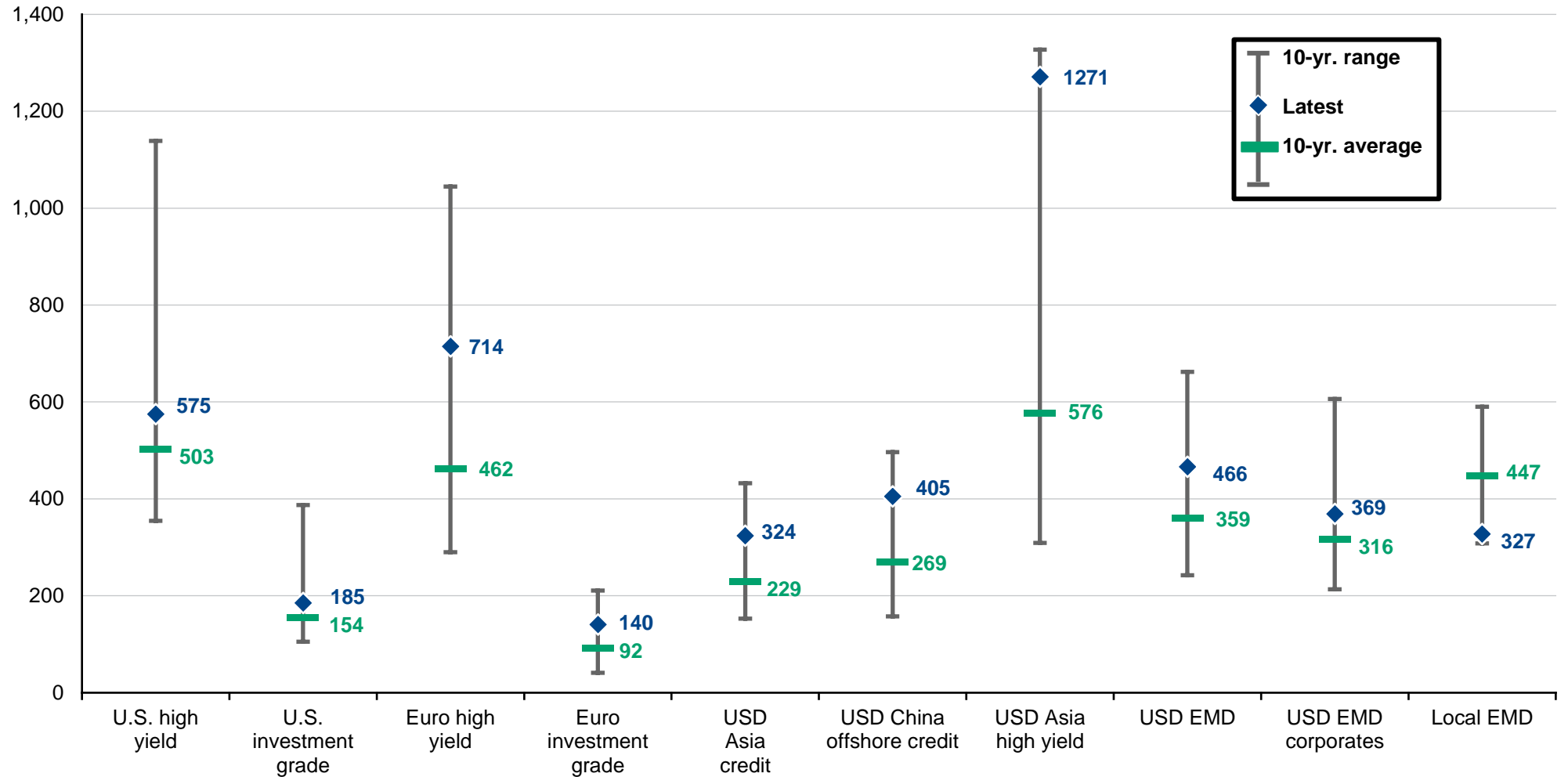


Global fixed income: Valuations

Fixed income

Spread to worst across fixed income sub-sectors

Basis points, last 10 years



Source: iBoxx, ICE BofA Merrill Lynch, J.P. Morgan Economics Research, J.P. Morgan Asset Management. Based on J.P. Morgan Domestic High Yield Index (U.S. high yield), J.P. Morgan U.S. Liquid Index (JULI) (U.S. investment grade), J.P. Morgan Euro High Yield Index (Euro high yield), iBoxx EUR corporates (Euro investment grade), J.P. Morgan Asia Credit Index (JACI) (USD Asia credit), J.P. Morgan Asia Credit China Index (USD China offshore credit), J.P. Morgan Asia Credit High Yield Index (USD Asia high yield), J.P. Morgan EMBI Global (USD EMD), J.P. Morgan Corporate Emerging Markets Bond Index – CEMBI (USD EMD corporates), J.P. Morgan GBI-EM Global (Local EMD). Positive yield does not imply positive return. Past performance is not a reliable indicator of current and future results.

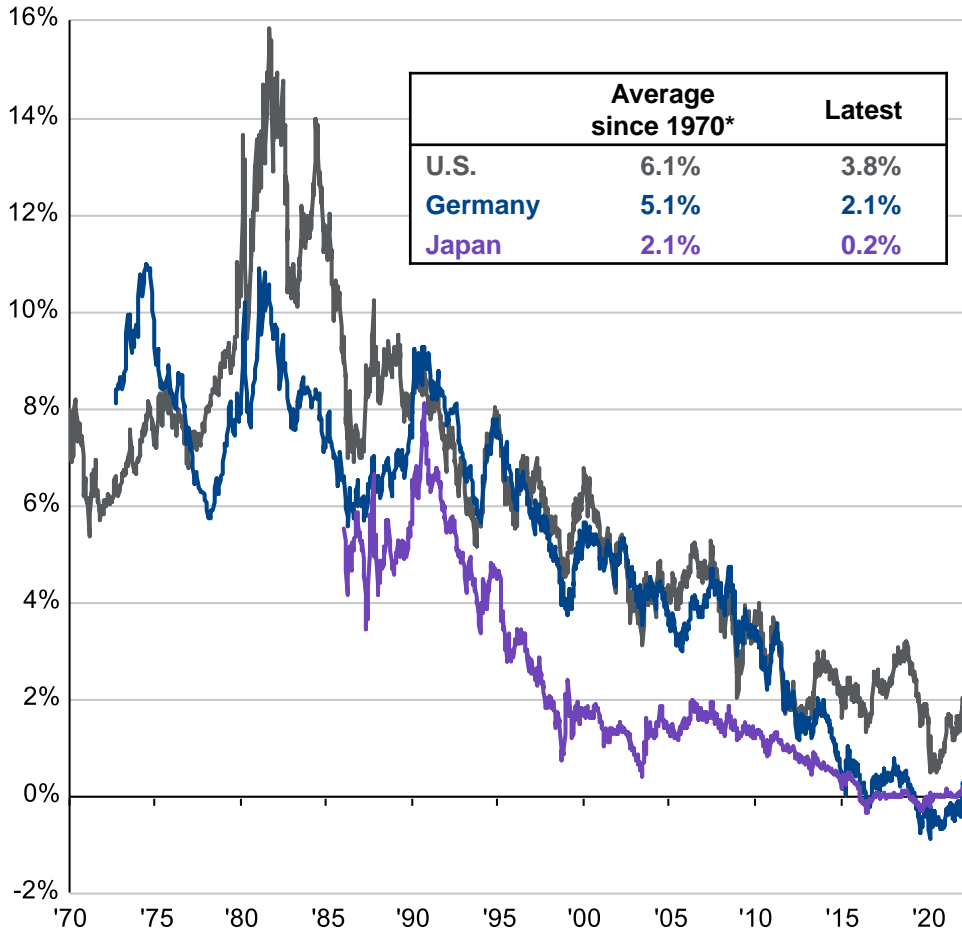
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Global fixed income: Government bond yields and expected inflation

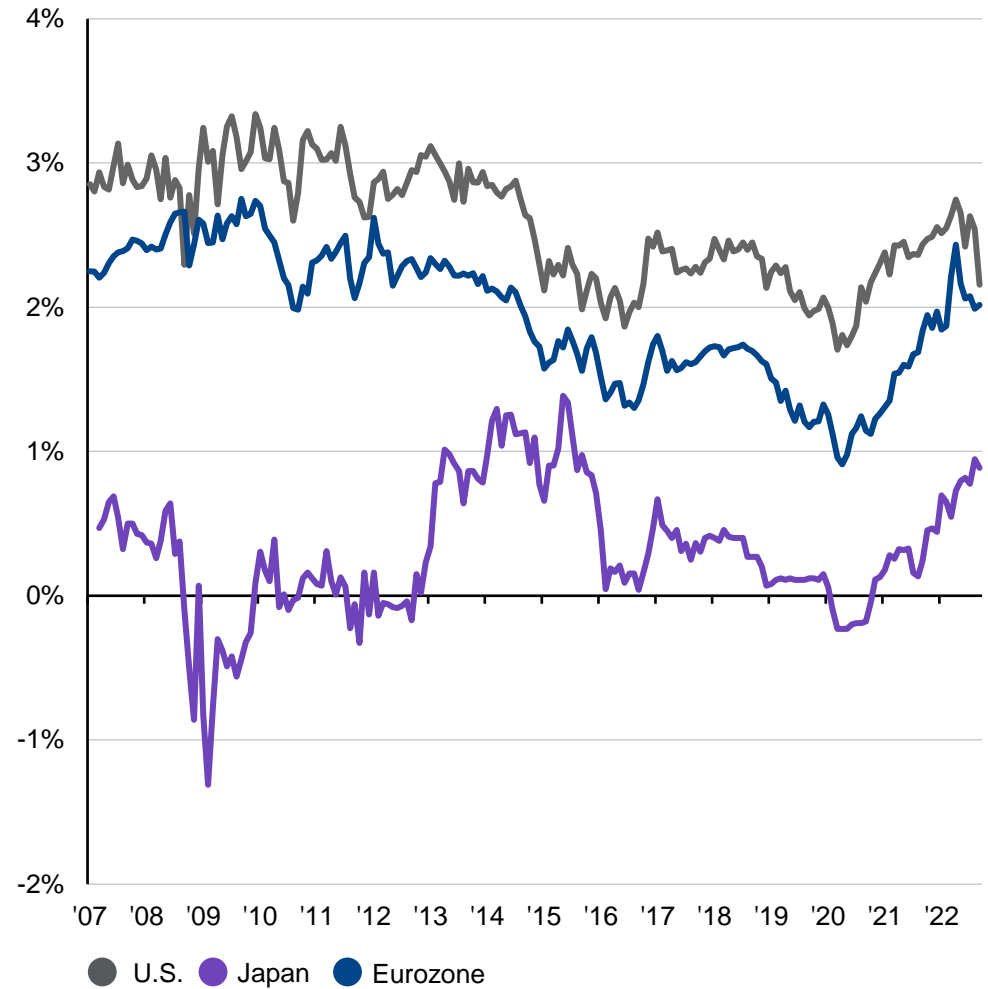
Fixed income

10-year government bond yields



Market-based inflation expectations

5-year 5-year inflation swap rate



Source: J.P. Morgan Asset Management; (Left) FactSet, Tullett Prebon; (Right) Bloomberg Finance L.P.
 *Data begins, and averages calculated from, 01/01/70 for U.S. Treasuries, 02/10/72 for German Bunds and 03/02/86 for Japanese Government Bonds.
 Past performance is not a reliable indicator of current and future results. Positive yield does not imply positive return.
 Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.

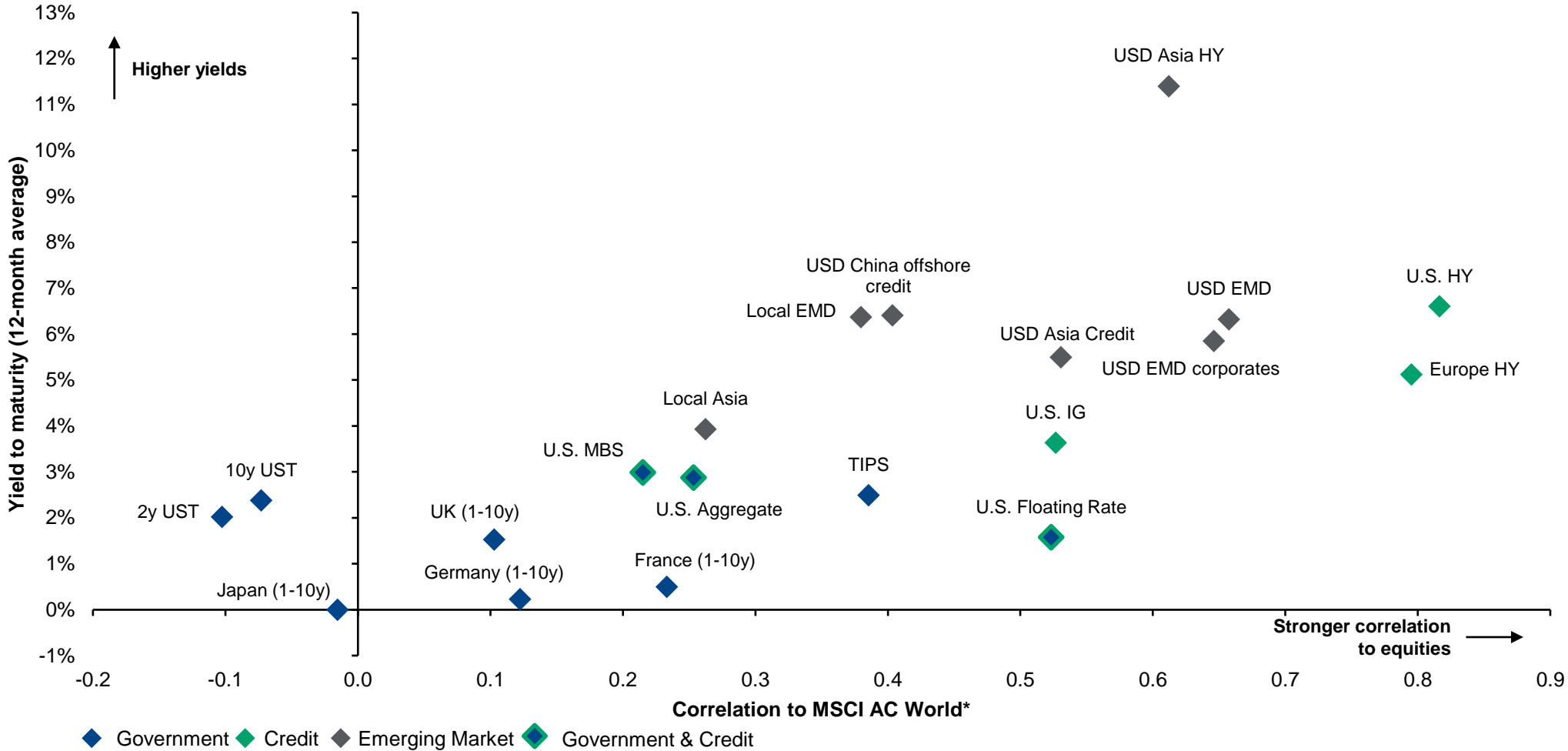


Global fixed income: Yields and risks

Fixed income

Yields and correlations of fixed income returns to equities

Yield, 10-year correlation between monthly total returns



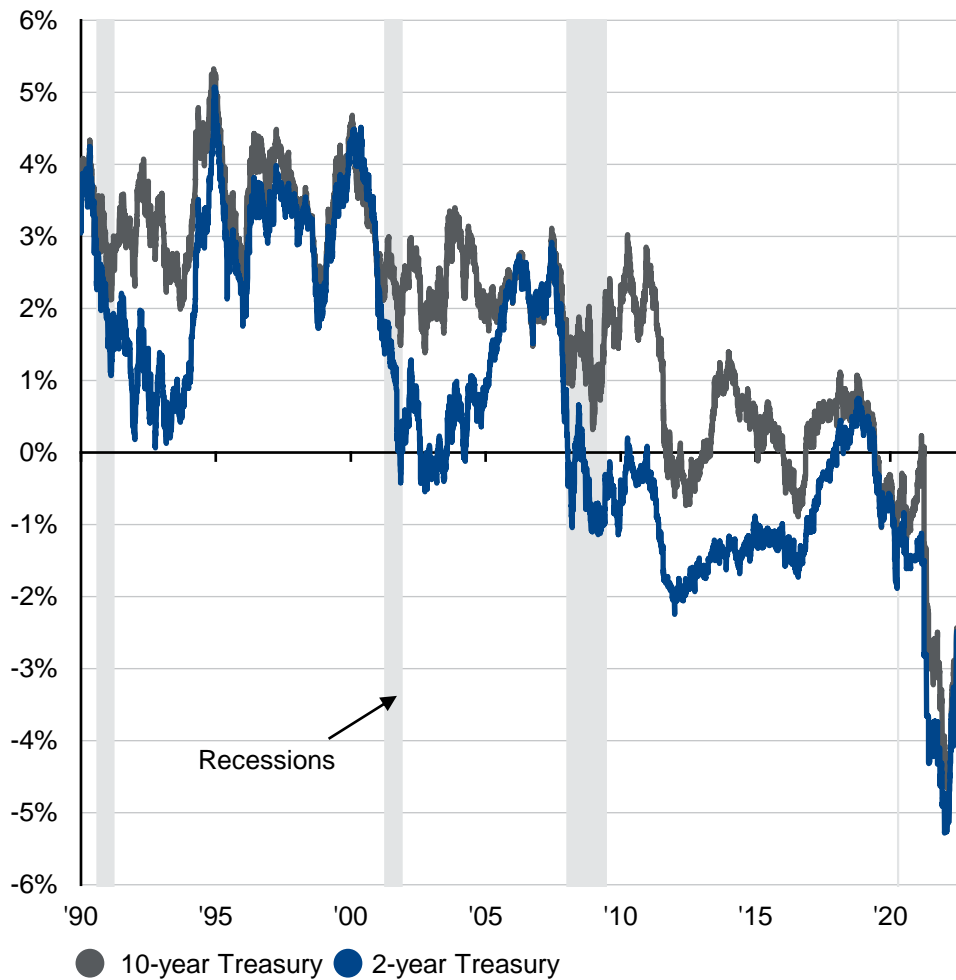
Source: Bloomberg Finance L.P., FactSet, ICE BofA Merrill Lynch, J.P. Morgan Economics Research, MSCI, J.P. Morgan Asset Management. Based on Bloomberg U.S. Treasury (UST) Bellwether 2y & 10y (2y & 10y UST), Bloomberg Treasury Inflation-Protected Securities (TIPS), ICE BofAML Country Government (1-10y) (France, Germany, Japan & UK (1-10y)), Bloomberg U.S. Aggregate, Credit – Investment Grade & High Yield (U.S. Aggregate, IG & HY), Bloomberg U.S. Floating Rate (U.S. Floating Rate), Bloomberg U.S. Aggregate Securitized – Mortgage-Backed Securities (U.S. MBS), Bloomberg Pan-European High Yield (Europe HY), J.P. Morgan GBI-EM Global (Local EMD), J.P. Morgan EMBI Global (USD EMD), J.P. Morgan Asia Credit (JACI) (USD Asia Credit), J.P. Morgan Asia Credit (JACI) – High Yield (USD Asia HY), J.P. Morgan Asia Credit China Index (USD China offshore credit), J.P. Morgan CEMBI (USD EMD corporates), J.P. Morgan Asia Diversified (JADE) (Local Asia). *Correlations are based on 10-years of monthly returns. Past performance is not a reliable indicator of current and future results. Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.



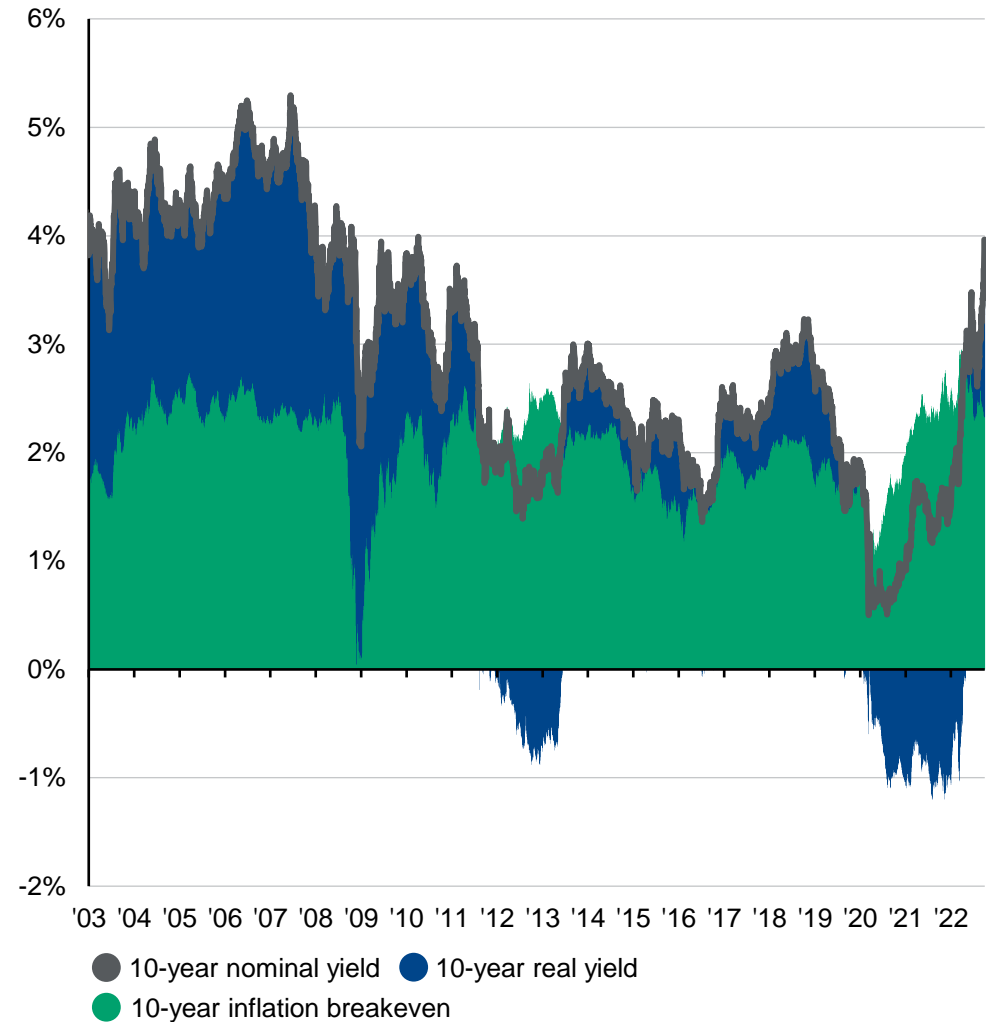
U.S. real yields

Fixed income

Real 10-year and 2-year U.S. Treasury yields*



U.S. 10-year Treasury yield breakdown**



Source: FactSet, Federal Reserve, J.P. Morgan Asset Management; (Right) Tullett Prebon.

*Real 10-year and 2-year Treasury yields are calculated as the daily Treasury yields less year-over-year core consumer price index inflation for that month except for September 2022, where real yields are calculated by subtracting August 2022 year-over-year core inflation. **Real yield calculated using 10-year breakeven, which represents the difference in yield between nominal and inflation-protected government bonds and is a market-based measure of average inflation expectations over the next 10 years. Yield is not guaranteed. Positive yield does not imply positive return. Past performance is not a reliable indicator of current and future results.

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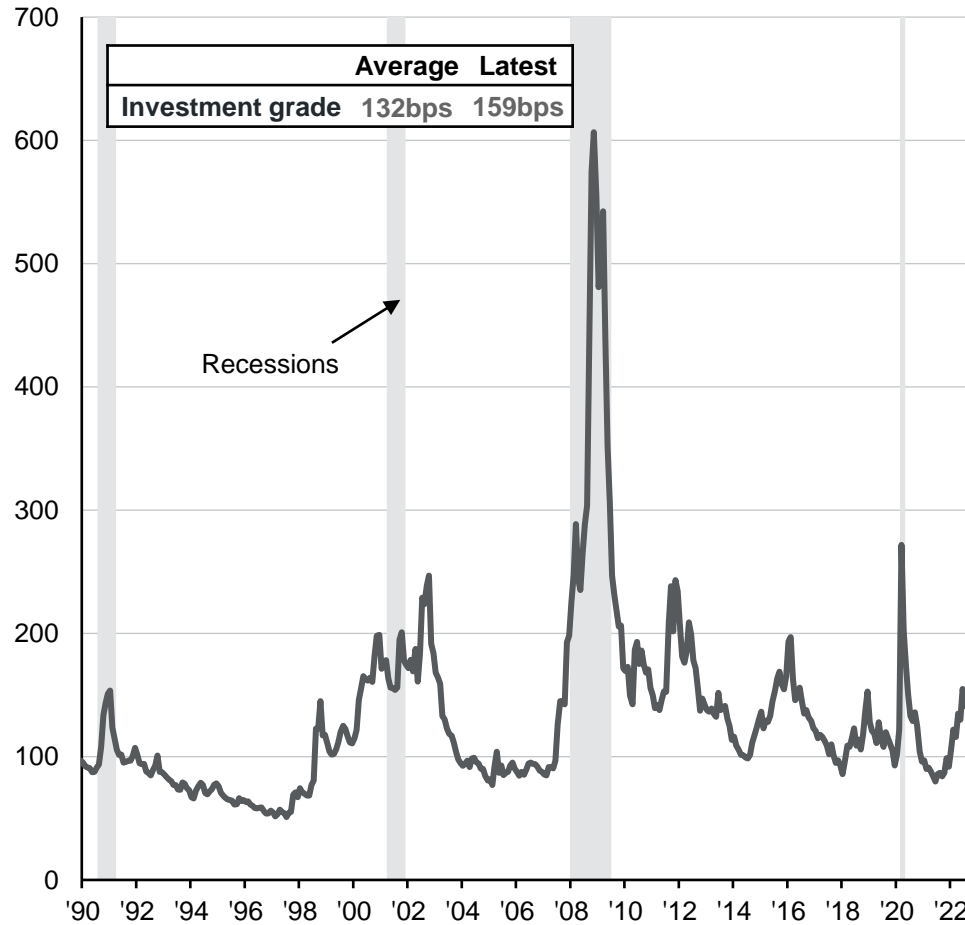


U.S. investment grade bonds

Fixed income

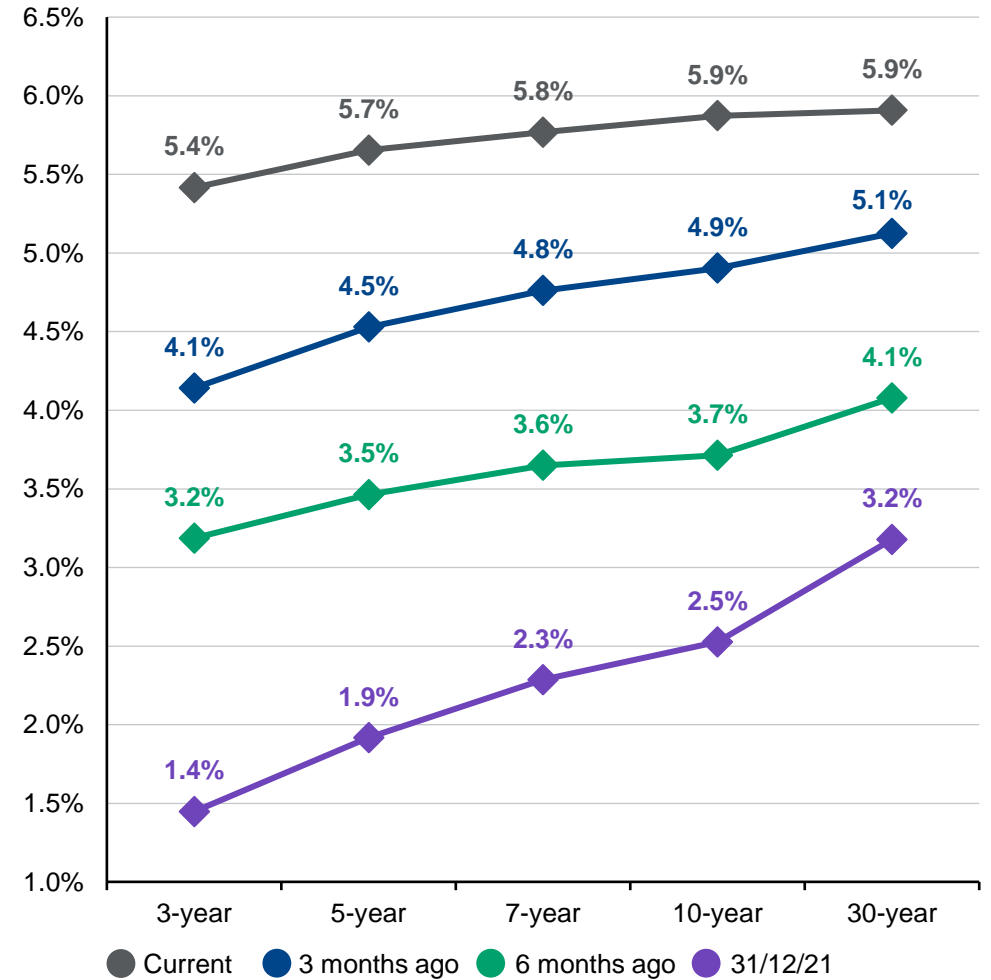
Corporate bond spread

Basis points, option-adjusted spread over U.S. Treasury*



U.S. investment grade** credit curve

Yield-to-maturity



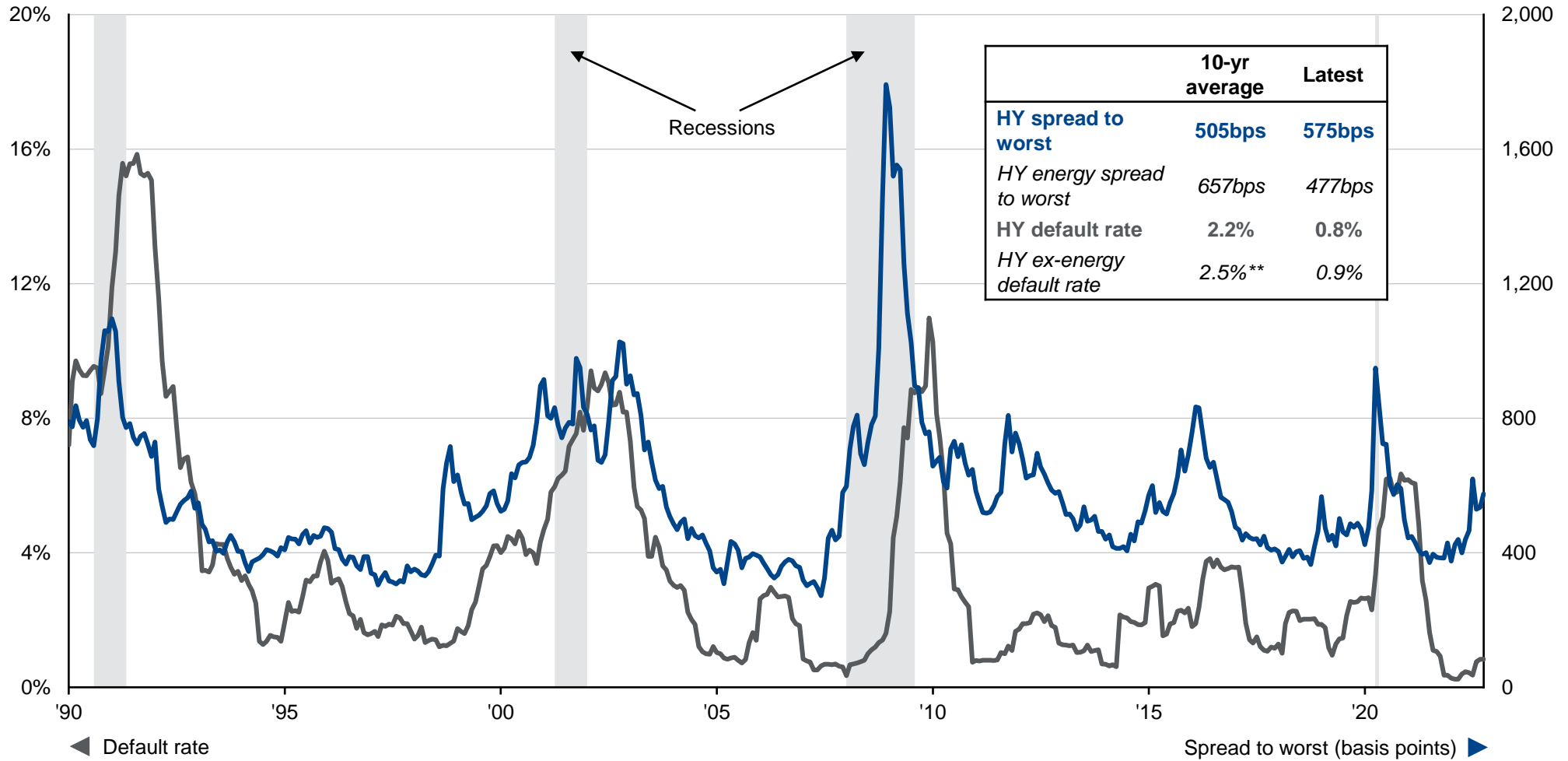
Source: Bloomberg Finance L.P., FactSet, J.P. Morgan Asset Management. *Investment grade is Bloomberg U.S. Aggregate Credit – Corporate Investment Grade Index.
 **U.S. investment grade is based on J.P. Morgan U.S. High Grade Index.
 Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.



U.S. high yield bond spreads

Fixed income

High yield spread and default rate*



Source: J.P. Morgan Economics Research, J.P. Morgan Asset Management.

*Default rate is defined as the percentage of the total market trading at or below 50% of par value and includes any Chapter 11 filing, pre-packaged filing or missed interest payments. Spreads indicated are benchmark yield-to-worst less comparable maturity Treasury yields. **Data reflects 20-year average and is as of 31/12/21. U.S. corporate high yield is represented by the J.P. Morgan Domestic High Yield Index.

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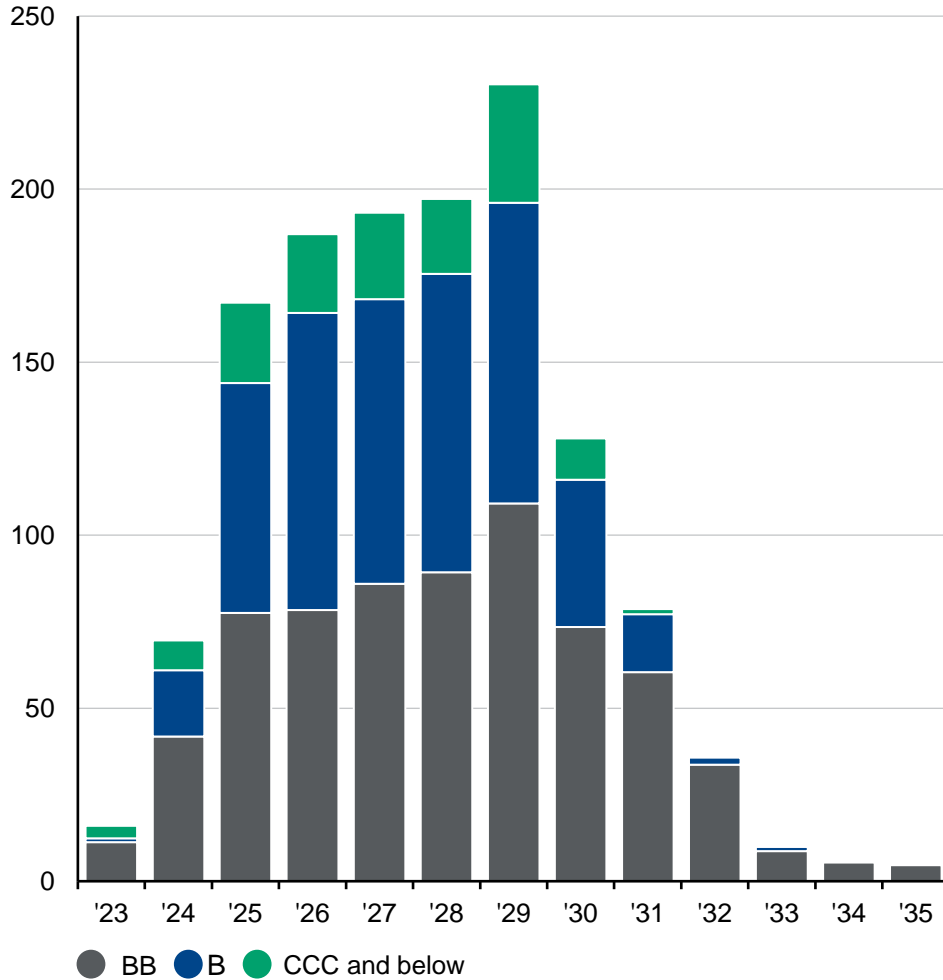


U.S. high yield bond fundamentals

Fixed income

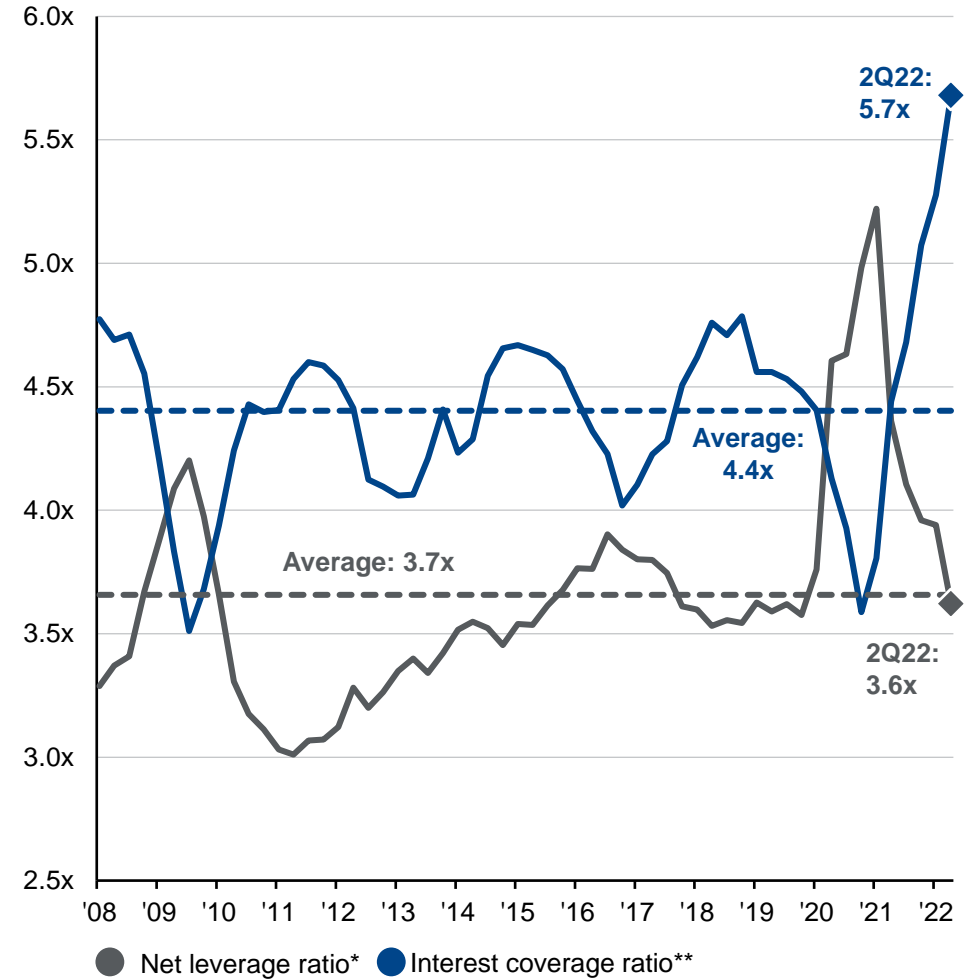
Maturity profile

USD billions



U.S. high yield leverage measures

Net leverage* and interest coverage ratio**



Source: J.P. Morgan Asset Management; (Left) Bloomberg L.P.; (Right) J.P. Morgan Economic Research. *Net leverage is net debt divided by adjusted earnings before interest, tax, depreciation and amortization (EBITDA). **Interest coverage ratio is EBITDA over interest expense. Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.

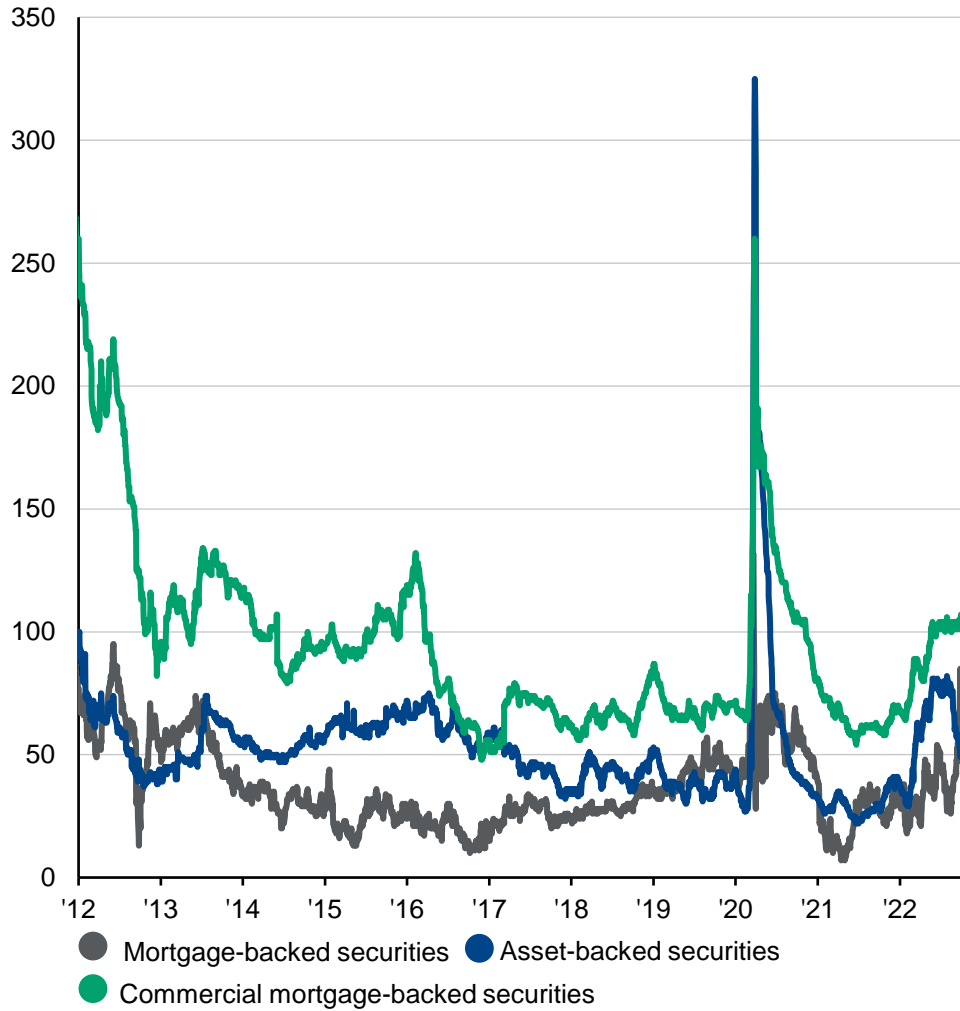


U.S. securitized assets

Fixed income

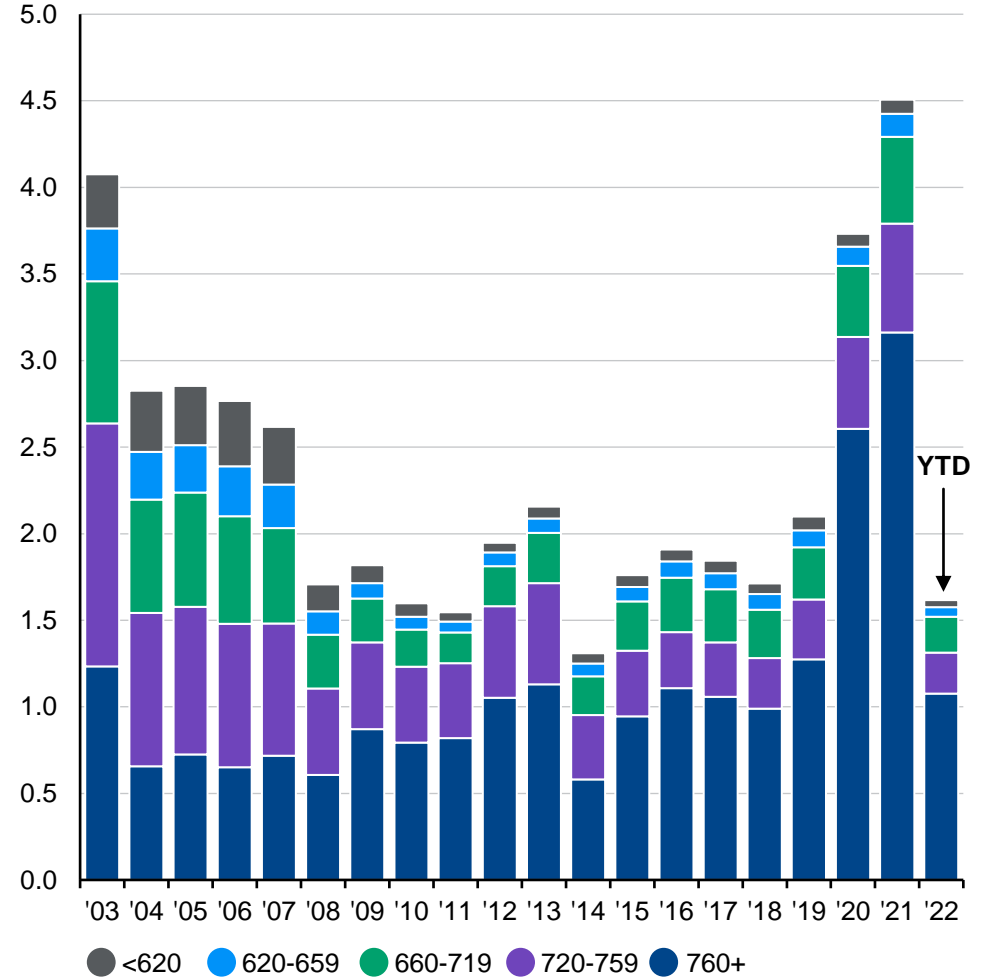
Spreads

Basis points, option-adjusted spreads



Mortgage originations by credit score*

USD trillions



Source: J.P. Morgan Asset Management; (Left) Bloomberg L.P.; (Right) Equifax, New York Fed Consumer Credit. *Credit score is Equifax Riskscore 3.0. Credit scores measure creditworthiness or likelihood of repayment of a borrower. The higher the score, the less risk of default. Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.

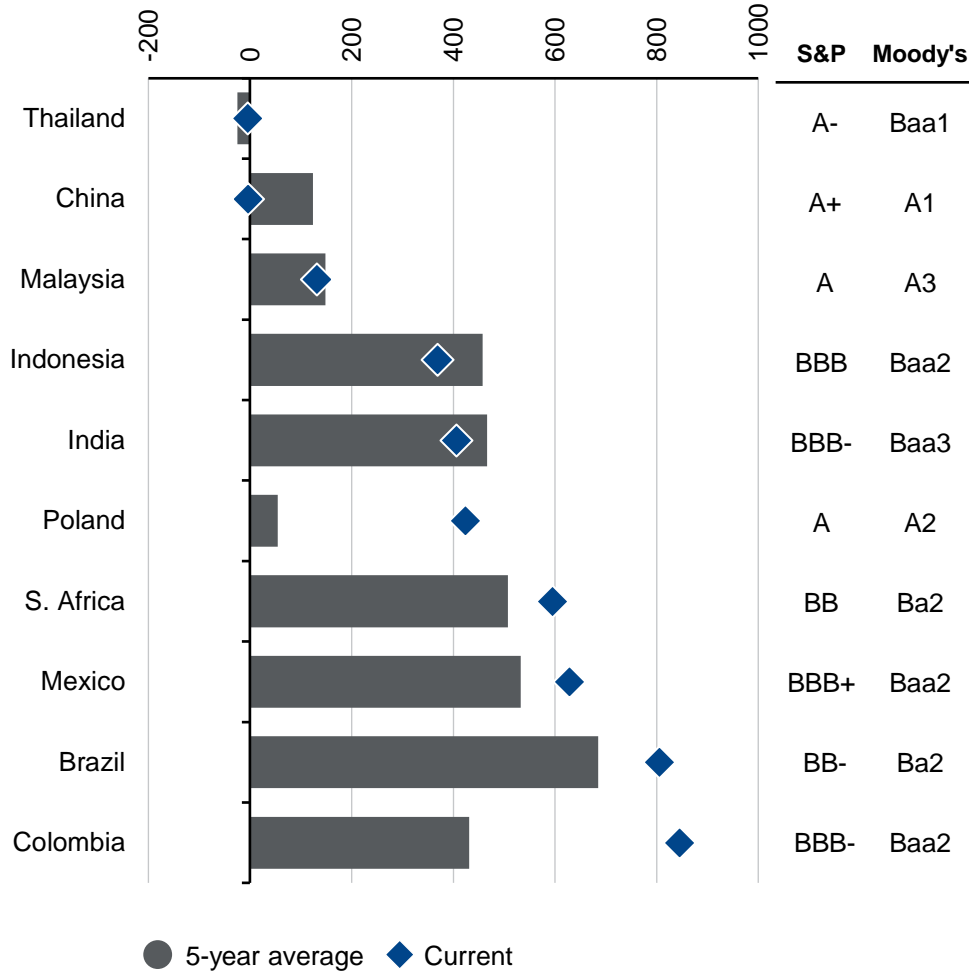


Emerging market debt

Fixed income

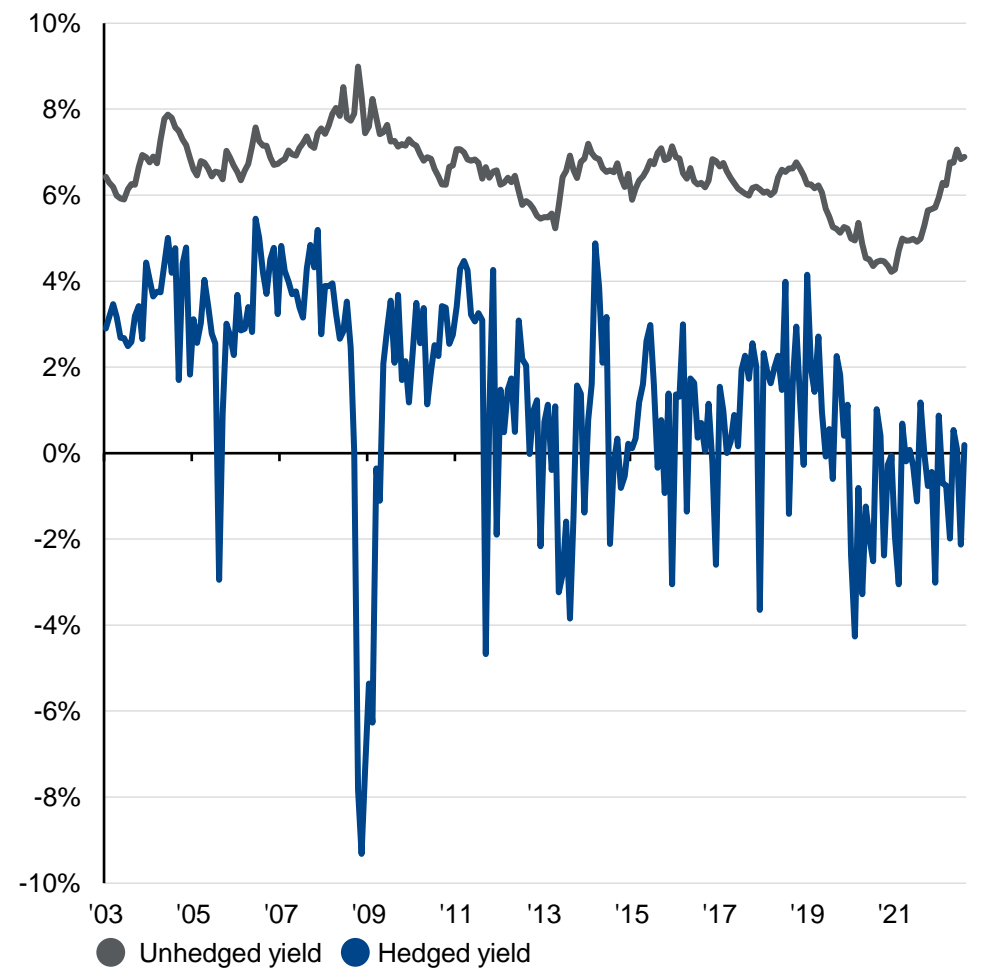
Spread between local rates and U.S. Treasuries

3-5 year local currency government bond index*, basis points



EM debt hedging cost comparison

Aggregate currency movement to be hedged against the U.S. dollar**



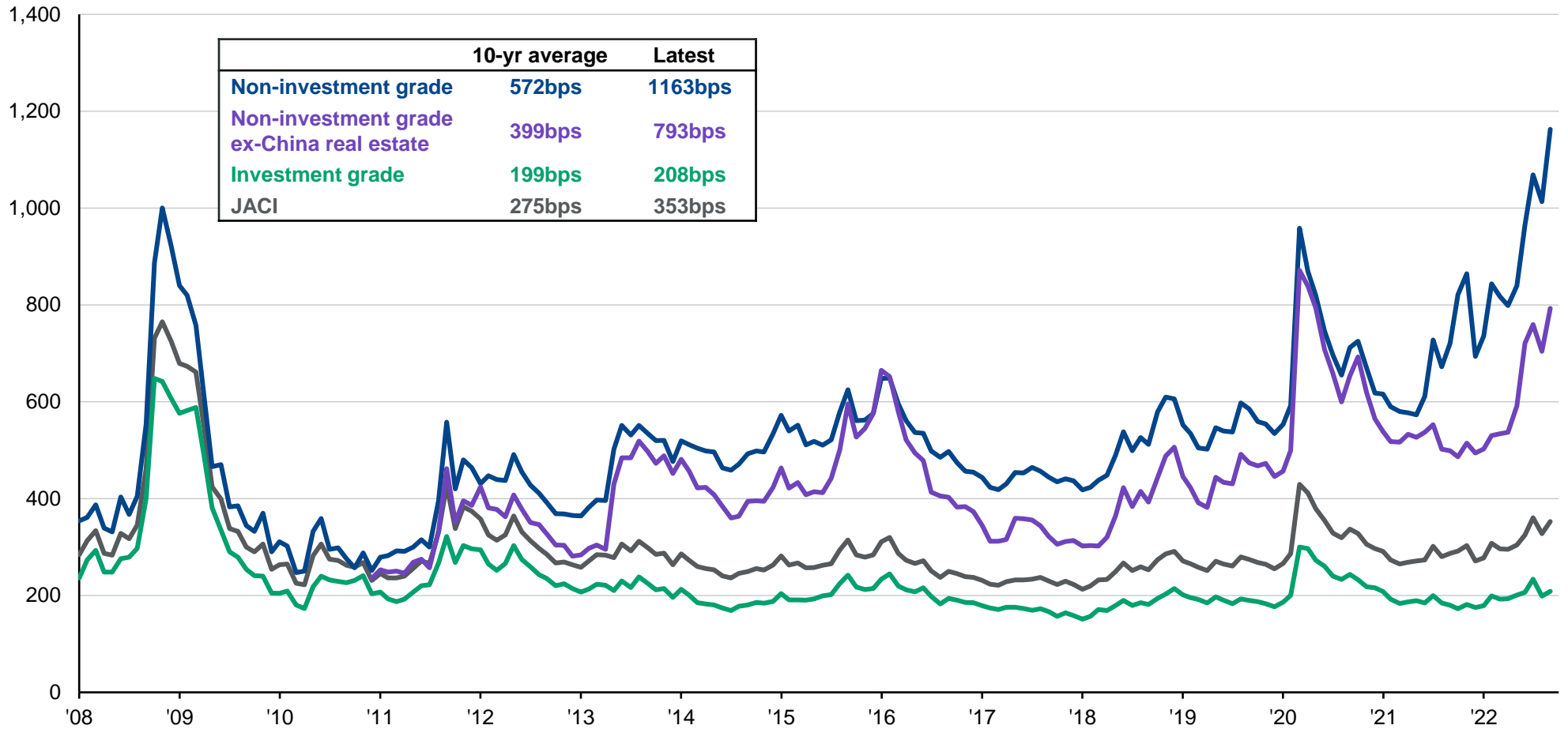
Source: Bloomberg Finance L.P., J.P. Morgan Asset Management; (Left) J.P. Morgan Economics Research.
 *J.P. Morgan GBI-EM Broad Diversified Index sub-component used for each market. Spread is the difference between the yield on each market's local 3-5 year government bond, except for South Africa, which uses 1-5 year, and the yield on the Bloomberg U.S. Aggregate Government - Treasury (3-5 Year). S&P and Moody's are respective market's local currency long-term debt ratings. **EM debt is represented by the J.P. Morgan GBI-EM Global Diversified Index. Hedging costs calculated using the weighted average of currency hedge costs for all constituent countries in the index.
 Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.



Asia fixed income

JACI spread

Basis points over U.S. Treasury



Fixed income

Source: J.P. Morgan Economics Research, J.P. Morgan Asset Management. The JACI is the J.P. Morgan Asia Credit Index. Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.

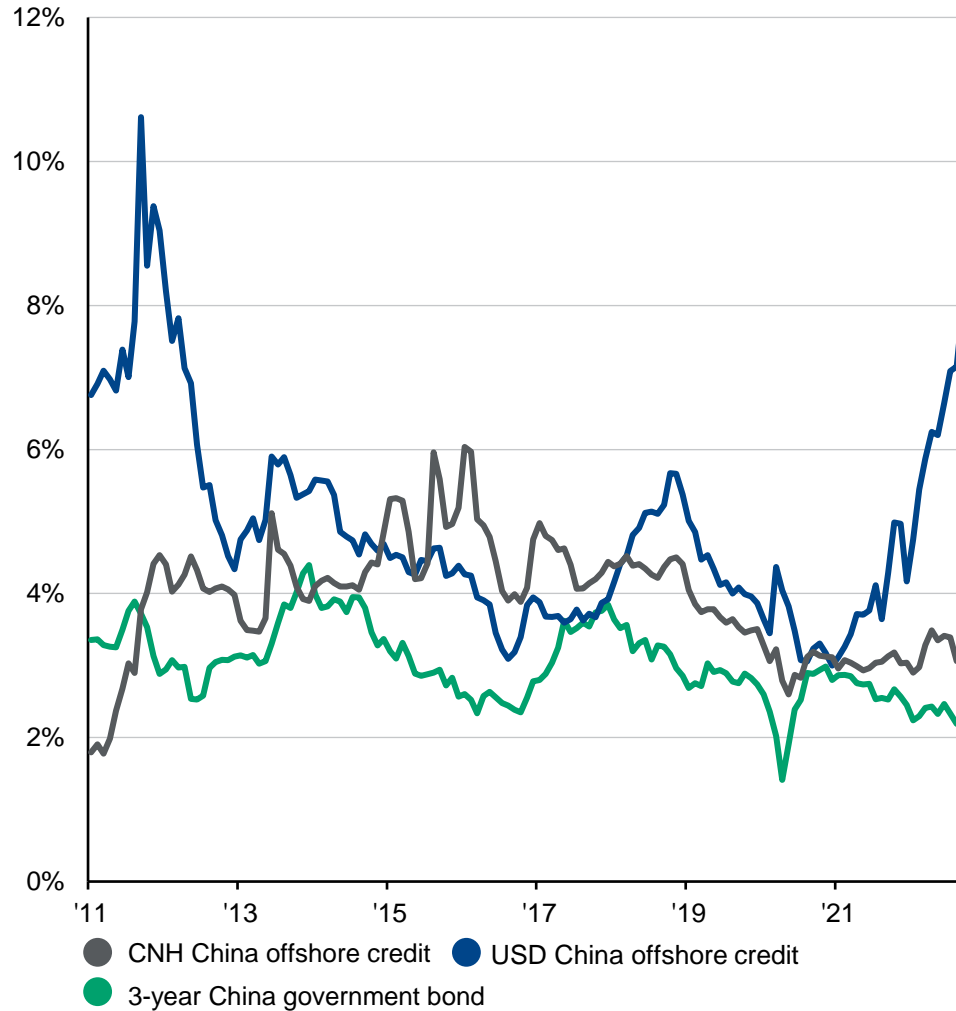


China bonds

Fixed income

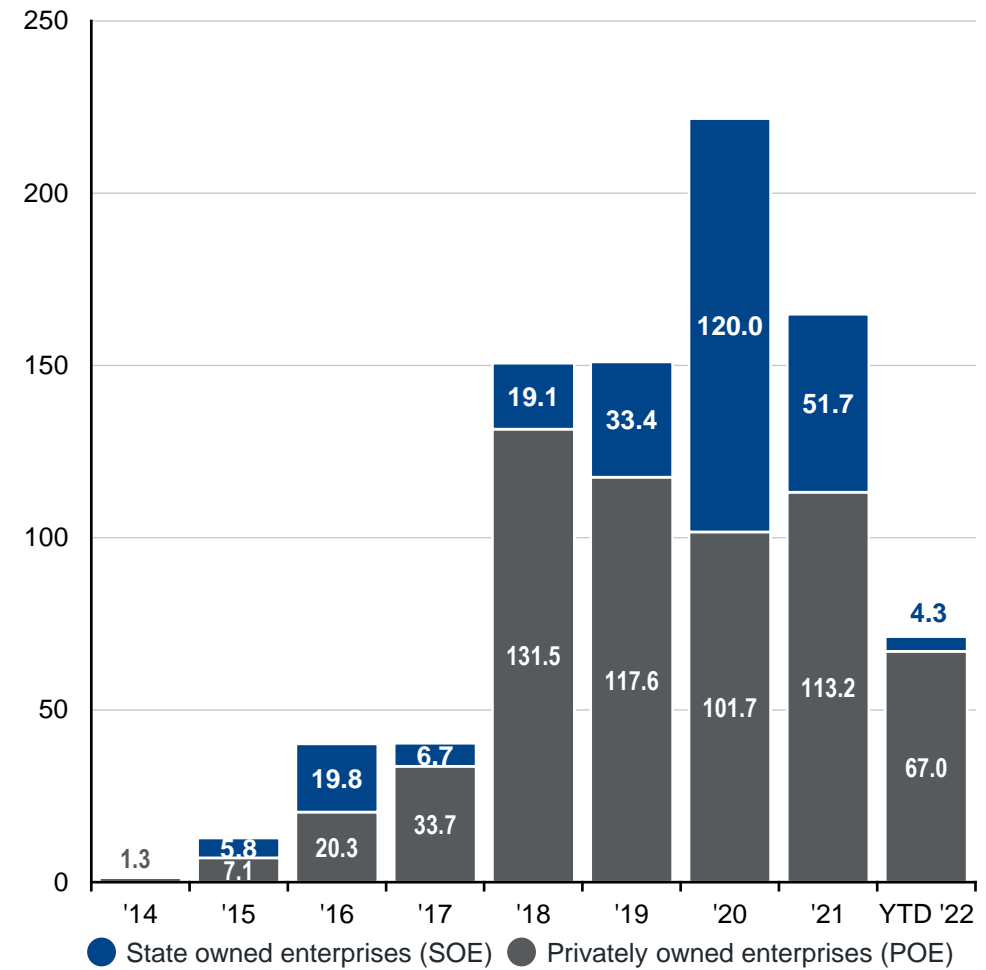
Bond yields*

Yield per annum



Value of defaults in onshore market

RMB billion



Source: J.P. Morgan Economics Research, J.P. Morgan Asset Management; (Left) FTSE Russell, National Interbank Funding Center; (Right) Wind.

*Credit indices shown are yield-to-worst, government bond index shown displays yield-to-maturity. FTSE Dim Sum Bond Index (CNH China offshore credit), J.P. Morgan Asia Credit China Index (USD China offshore credit).

Yields are not guaranteed, positive yield does not imply positive return.

Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.



Asset class returns

Other asset classes

												10-yrs ('12 - '22)	
2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	3Q '22	YTD '22	Ann. Ret.	Ann. Vol.
APAC ex-JP 22.6%	DM Equities 27.4%	Asian Bonds 8.3%	Asian Bonds 2.8%	EM ex-Asia 25.2%	APAC ex-JP 37.3%	Cash 1.8%	DM Equities 28.4%	APAC ex-JP 22.8%	DM Equities 22.3%	Cash 0.5%	Cash 0.6%	DM Equities 8.7%	EM ex-Asia 21.1%
Global Corp HY 18.9%	Global Corp HY 8.4%	U.S. IG 7.5%	EMD 1.2%	Global Corp HY 14.0%	EM ex-Asia 24.7%	Asian Bonds -0.8%	APAC ex-JP 19.5%	DM Equities 16.5%	EM ex-Asia 8.1%	EM ex-Asia -1.8%	Asian Bonds -13.9%	Diversified 3.5%	APAC ex-JP 15.4%
EMD 18.5%	Diversified 5.4%	EMD 5.5%	Cash 0.0%	EMD 10.2%	DM Equities 23.1%	Global Bonds -1.2%	EM ex-Asia 16.9%	Diversified 11.2%	Diversified 3.5%	Global Corp HY -2.4%	Global Corp HY -18.2%	APAC ex-JP 3.3%	DM Equities 14.1%
DM Equities 16.5%	APAC ex-JP 3.7%	DM Equities 5.5%	DM Equities -0.3%	DM Equities 8.2%	Diversified 17.2%	U.S. IG -2.5%	Diversified 16.4%	U.S. IG 9.9%	Global Corp HY 2.0%	Asian Bonds -3.5%	U.S. IG -18.7%	Global Corp HY 3.0%	Diversified 8.8%
Diversified 15.4%	Cash 0.0%	Diversified 3.3%	U.S. IG -0.7%	Diversified 8.1%	Global Corp HY 10.3%	Global Corp HY -3.5%	U.S. IG 14.5%	Global Bonds 9.2%	Cash 0.0%	EMD -4.2%	Global Bonds -19.9%	Asian Bonds 2.2%	EMD 8.4%
EM ex-Asia 14.8%	Asian Bonds -1.4%	APAC ex-JP 3.1%	Global Bonds -3.2%	APAC ex-JP 7.1%	EMD 9.3%	EMD -4.6%	EMD 14.4%	Global Corp HY 8.2%	U.S. IG -1.0%	U.S. IG -5.1%	Diversified -20.3%	U.S. IG 1.7%	Global Corp HY 7.8%
Asian Bonds 14.3%	U.S. IG -1.5%	Global Bonds 0.6%	Diversified -3.4%	U.S. IG 6.1%	Global Bonds 7.4%	Diversified -6.0%	Global Corp HY 13.4%	Asian Bonds 6.3%	EMD -1.5%	Diversified -5.9%	EM ex-Asia -20.6%	EMD 1.0%	U.S. IG 6.0%
U.S. IG 9.8%	Global Bonds -2.6%	Global Corp HY 0.2%	Global Corp HY -4.9%	Asian Bonds 5.8%	U.S. IG 6.4%	DM Equities -8.2%	Asian Bonds 11.3%	EMD 5.9%	Asian Bonds -2.4%	DM Equities -6.1%	EMD -22.2%	Cash 0.6%	Global Bonds 5.3%
Global Bonds 4.3%	EMD -6.6%	Cash 0.0%	APAC ex-JP -9.1%	Global Bonds 2.1%	Asian Bonds 5.8%	EM ex-Asia -11.5%	Global Bonds 6.8%	Cash 0.5%	APAC ex-JP -2.7%	Global Bonds -6.9%	DM Equities -25.1%	Global Bonds -0.9%	Asian Bonds 4.4%
Cash 0.1%	EM ex-Asia -9.3%	EM ex-Asia -13.3%	EM ex-Asia -25.1%	Cash 0.3%	Cash 0.8%	APAC ex-JP -13.7%	Cash 2.2%	EM ex-Asia -9.7%	Global Bonds -4.7%	APAC ex-JP -12.6%	APAC ex-JP -26.2%	EM ex-Asia -2.5%	Cash 0.2%

Source: Bloomberg Finance L.P., Dow Jones, FactSet, J.P. Morgan Economic Research, MSCI, J.P. Morgan Asset Management.

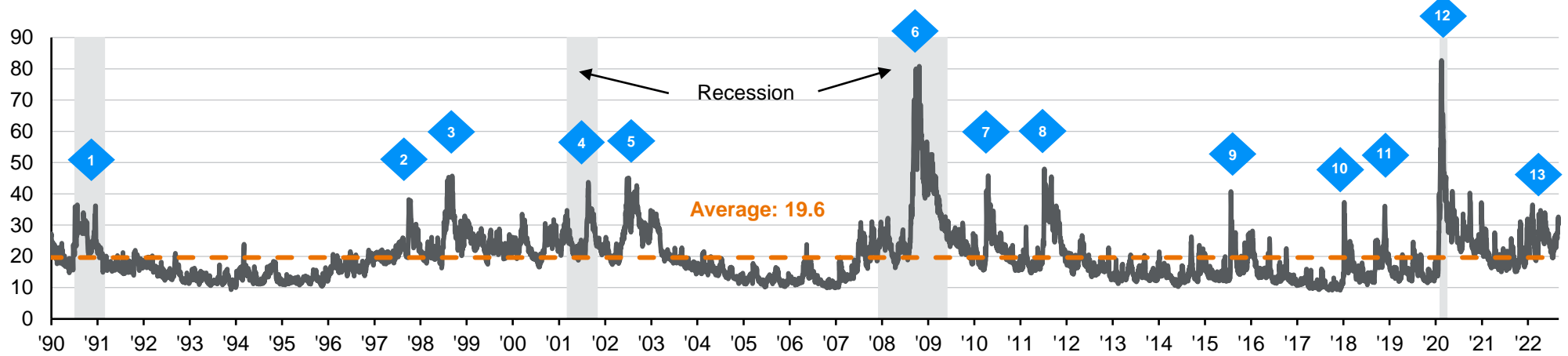
The "Diversified" portfolio assumes the following weights: 20% in the MSCI World Index (*DM Equities*), 20% in the MSCI AC Asia Pacific ex-Japan (*APAC ex-JP*), 5% in the MSCI EM ex-Asia (*EM ex-Asia*), 10% in the J.P. Morgan EMBIG Index (*EMD*), 10% in the Bloomberg Aggregate (*Global Bonds*), 10% in the Bloomberg Global Corporate High Yield Index (*Global Corporate High Yield*), 15% in J.P. Morgan Asia Credit Index (*Asian Bonds*), 5% in Bloomberg U.S. Aggregate Credit – Corporate Investment Grade Index (*U.S. IG*) and 5% in Bloomberg U.S. Treasury – Bills (1-3 months) (*Cash*). Diversified portfolio assumes annual rebalancing. All data represent total return in U.S. dollar terms for the stated period. 10-year total return data is used to calculate annualized returns (Ann. Ret.) and 10-year price return data is used to calculate annualized volatility (Ann. Vol.) and reflects the period 30/09/12 – 30/09/22. Please see disclosure page at end for index definitions. Past performance is not a reliable indicator of current and future results. Diversification does not guarantee investment returns and does not eliminate the risk of loss.

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Volatility

VIX index*



VIX breaks 35 in six months**	Related event	S&P 500 Performance				VIX returns to long-term average*** (days)	
		On the day	After 1 month	After 3 months	After 12 months		
1	06/08/90	Recession – oil price shock and rate hikes	-3.0%	-4.2%	-5.9%	16.8%	218
2	30/10/97	Asian crisis	-1.7%	7.5%	9.1%	21.6%	113
3	27/08/98	Long-Term Capital Management	-3.8%	0.6%	13.8%	29.3%	309
4	17/09/01	Recession – collapse of dot-com bubble	-4.9%	2.9%	9.2%	-15.9%	172
5	15/07/02	Enron accounting scandal	-0.4%	1.3%	-8.3%	9.0%	304
6	17/09/08	Recession – global financial crisis	-4.7%	-14.8%	-21.8%	-7.9%	476
7	07/05/10	Greece bailout package, austerity imposed	-1.5%	-5.0%	1.0%	21.2%	157
8	08/08/11	European debt crisis, U.S. credit downgrade	-6.7%	5.9%	12.7%	25.2%	165
9	24/08/15	Chinese yuan devaluation	-3.9%	2.1%	10.2%	15.5%	44
10	05/02/18	Bond market re-pricing growth and rate hikes	-4.1%	3.4%	0.9%	3.4%	9
11	24/12/18	Global growth and market liquidity fears	-2.7%	12.4%	19.0%	37.1%	18
12	27/02/20	Recession – Coronavirus pandemic	-4.4%	-13.2%	1.7%	27.9%	383
13	07/03/22	Russia-Ukraine conflict	-3.0%	7.1%	-1.9%	-	21
Median			-3.8%	1.7%	5.4%	19.0%	
Average			-3.5%	0.5%	3.0%	15.3%	

Source: FactSet, J.P. Morgan Asset Management.

*The VIX-CBOE Volatility Index measures market expectations of near-term volatility conveyed by S&P 500 Index (SPX) option prices. **First day when VIX breaks 35; subsequent spikes above 35 within the next six months are not included. ***Number of days for VIX to return to its long-term average after initial VIX spikes above 35. Past performance is not a reliable indicator of current and future results.

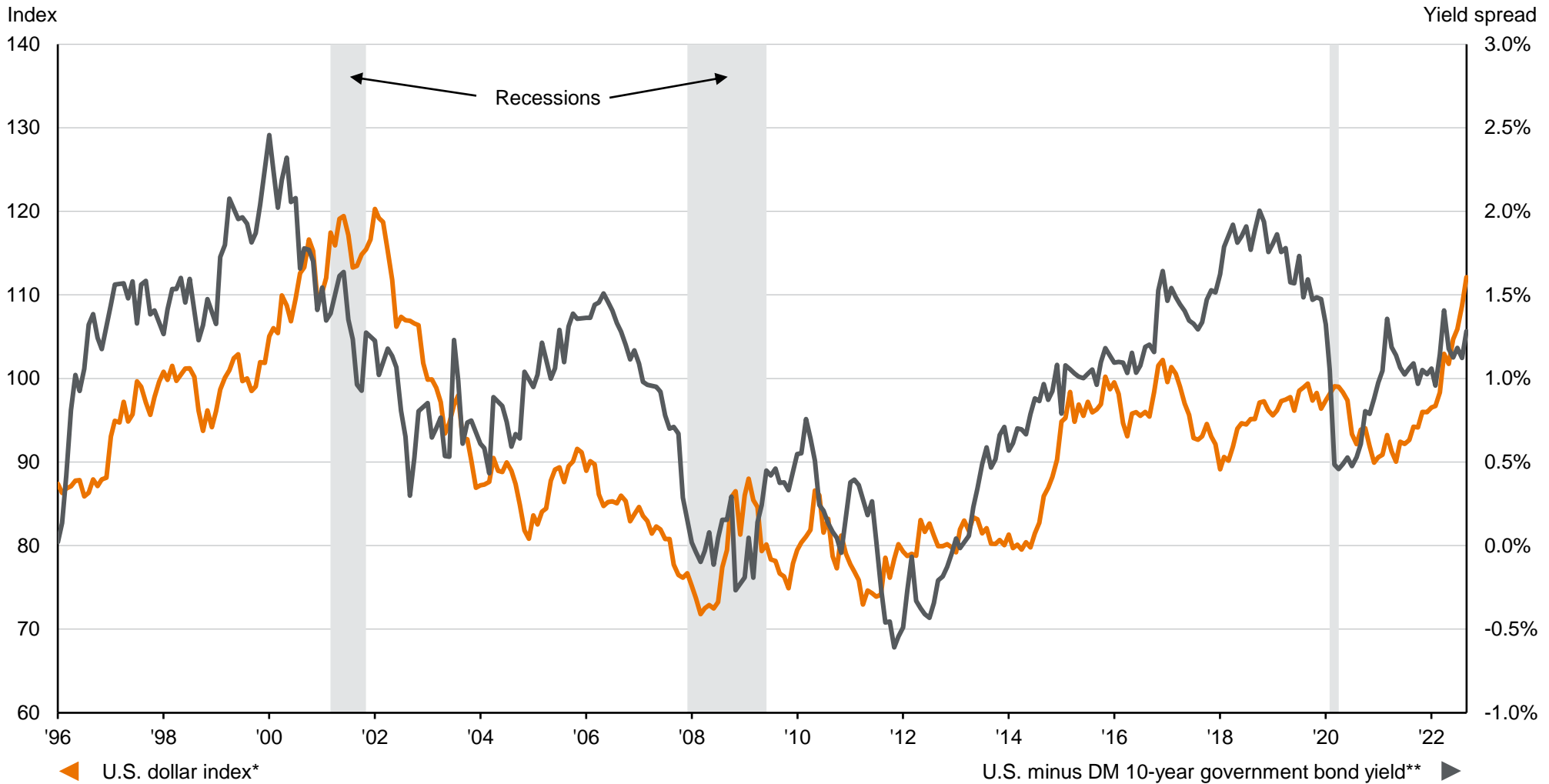
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U.S. dollar

Other asset classes

U.S. dollar and interest rate differential



Source: FactSet, OECD, Tullett Prebon, WM/Reuters, J.P. Morgan Asset Management. *The U.S. dollar index shown here is a nominal trade-weighted index of major trading partners' currencies. Major currencies are the British pound, Canadian dollar, euro, Japanese yen, Swedish kroner and Swiss franc.

**DM is developed markets and the yield is calculated as a GDP-weighted average of the 10-year government bond yields of Australia, Canada, France, Germany, Italy, Japan, Switzerland and the UK.

Past performance is not a reliable indicator of current and future results.

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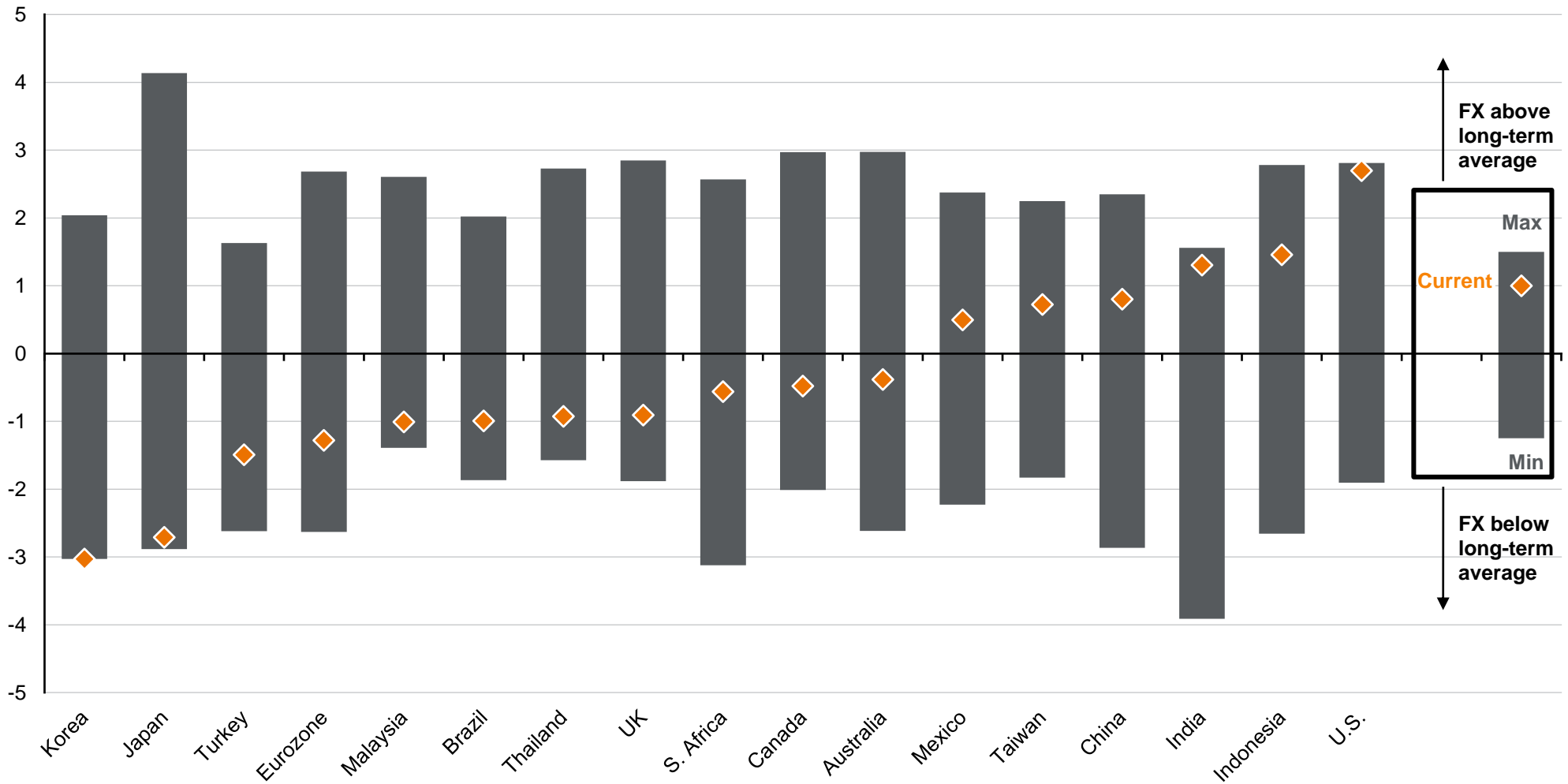


Currencies

Other asset classes

Currency deviation from 10-year average in real effective exchange rate* terms

Number of standard deviations away from average



Source: FactSet, J.P. Morgan Economic Research, J.P. Morgan Asset Management.

*The real trade-weighted exchange rate index is the weighted average of a market's currency relative to a basket of other major currencies adjusted for the effects of inflation. The weights are determined by comparing the relative trade balances, in terms of one market's currency, with other markets within the basket.

Past performance is not a reliable indicator of current and future results.

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Emerging market external positions

Other asset classes

Current account positions, currency movements and reserve adequacy



Source: FactSet, International Monetary Fund, J.P. Morgan Asset Management.

*Adequate reserves are stocks of a market's foreign exchange reserves that can cover 3 months of imports (the amount of times available reserves can cover 3 months' worth of imports) and cover short-term debt due in the next year (the amount of times available reserves can pay off debt maturing in the next 12 months and any payments on longer-term debt due in the next 12 months). The larger the bubble, the larger the amount of reserve coverage.

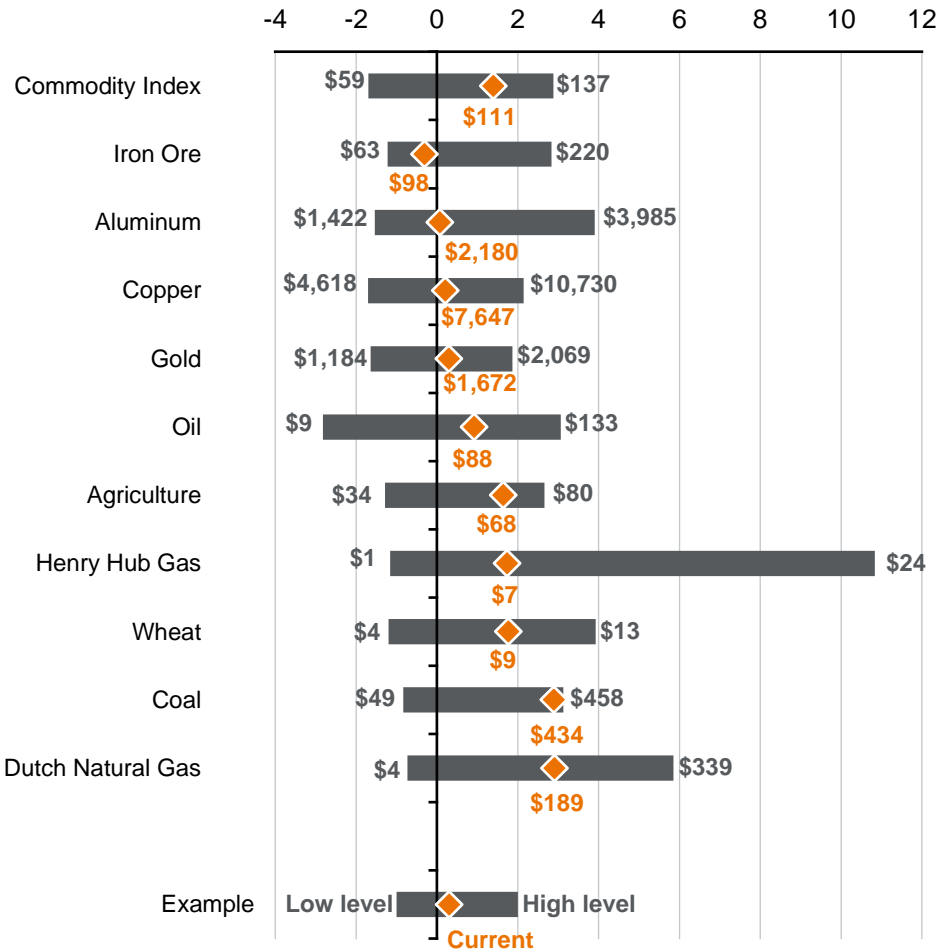
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Commodities

Commodity prices

Z-scores for the past five years, USD per unit



Returns

	2017	2018	2019	2020	2021	3Q '22	2017 - 2022	
							Ann. Ret.	Ann. Vol.
M&M (E)	37.5%	Euro M&M (FI)	Gold (E)	M&M (E)	Energy (E)	Energy (E)	Agri. (E)	Gold (E)
37.5%	-0.9%	51.1%	27.6%	44.3%	0.5%	9.2%	30.0%	
Agri. (E)	20.3%	US M&M (FI)	M&M (E)	Gold (E)	Comdty.	Agri. (E)	M&M (E)	Energy (E)
20.3%	-3.5%	17.1%	25.7%	27.1%	0.2%	7.7%	27.2%	
EM M&M (FI)	14.7%	Energy (FI)	EM M&M (FI)	Agri. (E)	Agri. (E)	US M&M (FI)	Comdty.	M&M (E)
14.7%	-3.7%	16.5%	19.5%	23.1%	-0.2%	7.0%	26.7%	
US M&M (FI)	9.9%	EM M&M (FI)	US M&M (FI)	EM M&M (FI)	M&M (E)	Euro M&M (FI)	Energy (E)	Agri. (E)
9.9%	-4.1%	14.0%	10.6%	23.0%	-0.9%	5.7%	15.6%	
Gold (E)	9.4%	Agri. (E)	Agri. (E)	US M&M (FI)	US M&M (FI)	EM M&M (FI)	US M&M (FI)	Comdty.
9.4%	-8.9%	13.8%	8.5%	6.6%	-3.8%	2.3%	14.2%	
Energy (E)	9.1%	Comdty.	Energy (FI)	Energy (FI)	EM M&M (FI)	Comdty.	Gold (E)	EM M&M (FI)
9.1%	-11.2%	13.4%	6.0%	2.0%	-4.1%	1.7%	12.8%	
Energy (FI)	9.0%	Energy (E)	Energy (E)	Euro M&M (FI)	Energy (FI)	M&M (E)	Energy (FI)	Energy (FI)
9.0%	-11.4%	9.5%	3.5%	-0.7%	-4.3%	-1.4%	10.3%	
Euro M&M (FI)	3.9%	Gold (E)	Comdty.	Comdty.	Euro M&M (FI)	Energy (FI)	Euro M&M (FI)	US M&M (FI)
3.9%	-13.0%	7.7%	-3.1%	-0.7%	-5.7%	-1.7%	7.2%	
Comdty.	1.7%	M&M (E)	Euro M&M (FI)	Energy (E)	Gold (E)	Gold (E)	EM M&M (FI)	Euro M&M (FI)
1.7%	-17.8%	5.2%	-28.5%	-7.7%	-13.9%	-2.8%	5.8%	

Source: Bloomberg Finance L.P., FactSet, J.P. Morgan Asset Management; (Left) CBOT, CME, CRB, LME; (Right) J.P. Morgan Economic Research, MSCI. Commodities represented by appropriate Bloomberg Commodity sub-index priced in U.S. dollars. Aluminum and copper is priced on LME. Coal is the Newcastle Coal Closing Price (USD/t). Crude oil is Brent crude. Dutch Natural Gas is Dutch TTF Gas Monthly Near Term (NDEX EUR/mwh). Henry Hub Gas is Natural Gas Henry Hub Spot Price (USD/Mmbtu). Iron Ore is iron ore 62% Fe -Cost and Freight China Port. Other commodity prices represented by futures contracts. Z-scores calculated using daily prices over past five years. Based on Bloomberg Commodity Index (Comdty.); MSCI ACWI Select – Energy Producers IMI, Metals & Mining Producers ex Gold & Silver IMI, Gold Miners IMI, Agriculture Producers IMI (Energy (E), M&M (E), Gold (E), Agri. (E)); Bloomberg Global Agg. Credit – Corporate Energy Index (Energy (FI)); Bloomberg U.S. Agg. Credit – Corporate High Yield Metals & Mining Index (U.S. M&M (FI)); Bloomberg Euro Agg. Credit – Corporate Metals & Mining Index (Euro M&M (FI)); J.P. Morgan Emerging Market Corporate Credit – Corporate Metals & Mining Index (EM M&M (FI)). 5-year total return data used to calculate annualized returns (Ann. Ret.) and 5-year price return data used to calculate annualized volatility (Ann. Vol.), reflects the period 30/09/17 – 30/09/22. Past performance is not a reliable indicator of current and future results. Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.

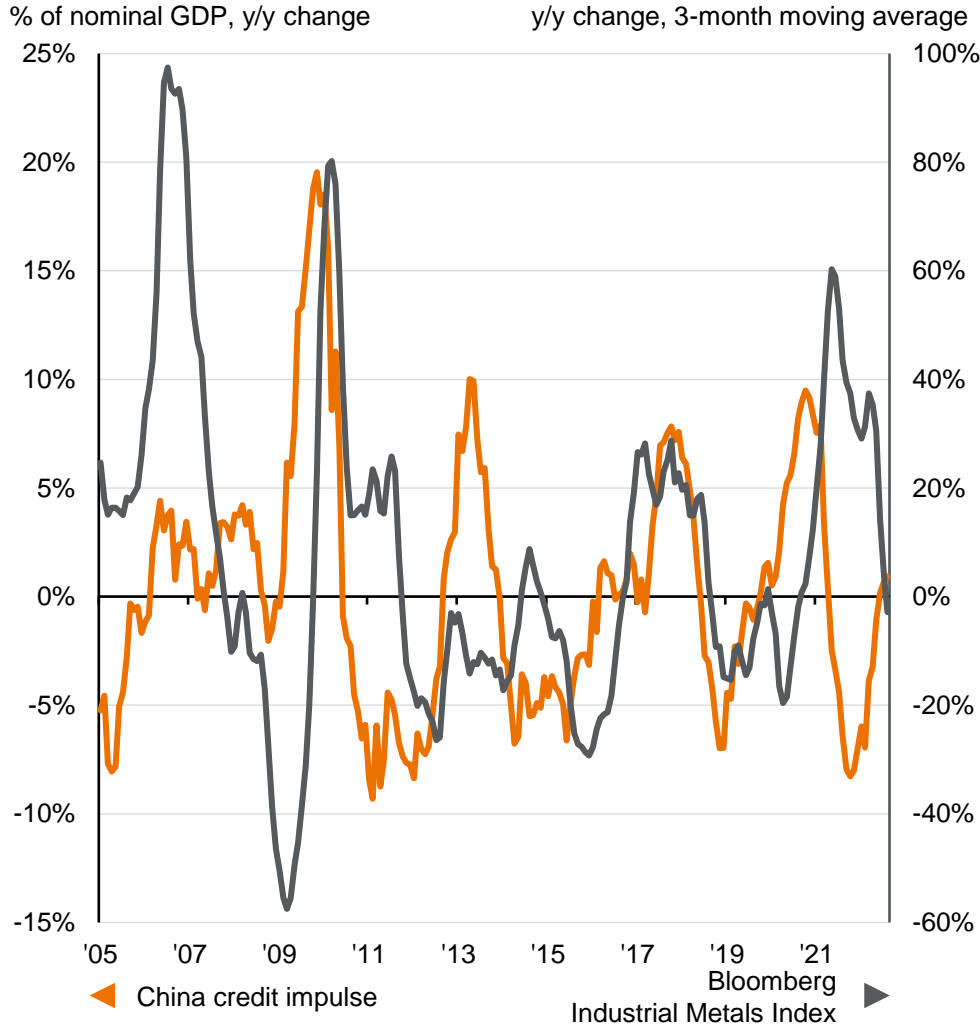
Other asset classes



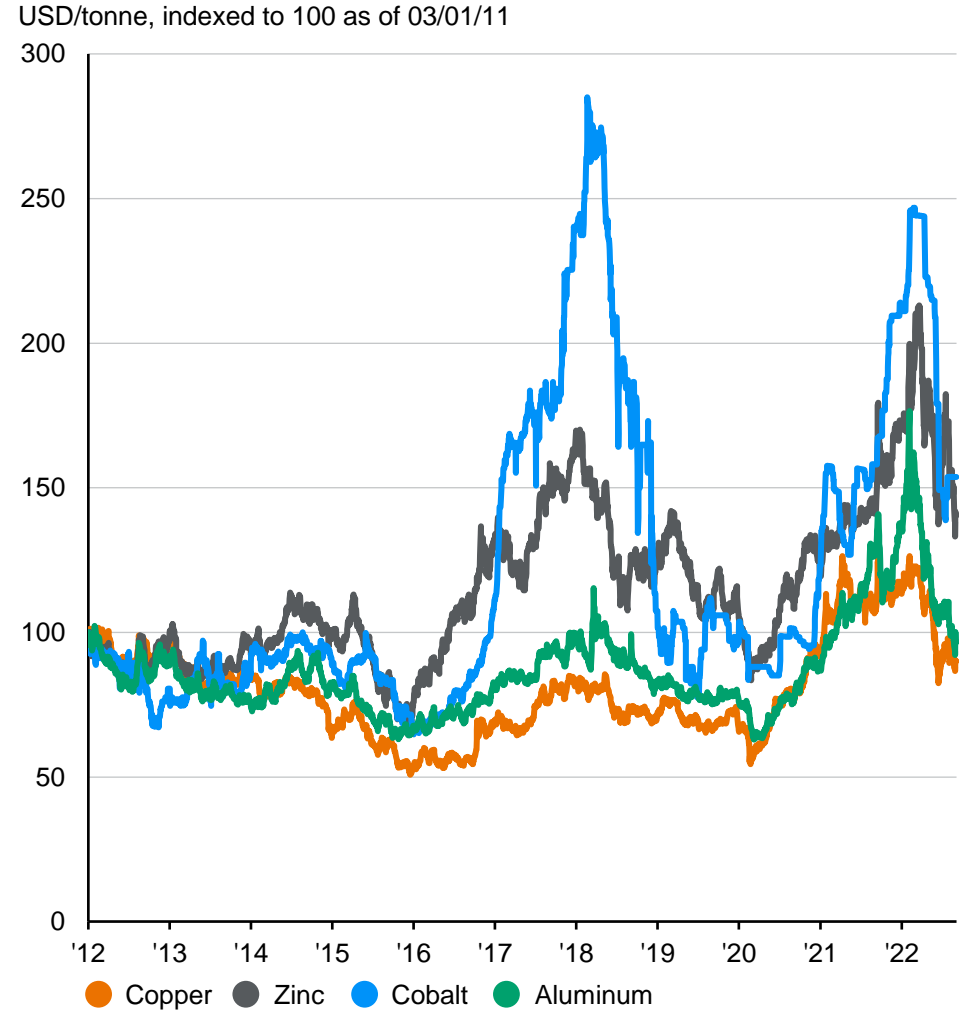
Industrial metals

Other asset classes

China credit impulse and industrial metals' prices



Industrial metal prices



Source: FactSet, J.P. Morgan Asset Management; (Left) Bloomberg, People's Bank of China. Credit impulse measures the year-over-year change in credit flow (net flow of total social financing) as a percentage of nominal GDP. Past performance is not a reliable indicator of current and future results. Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.

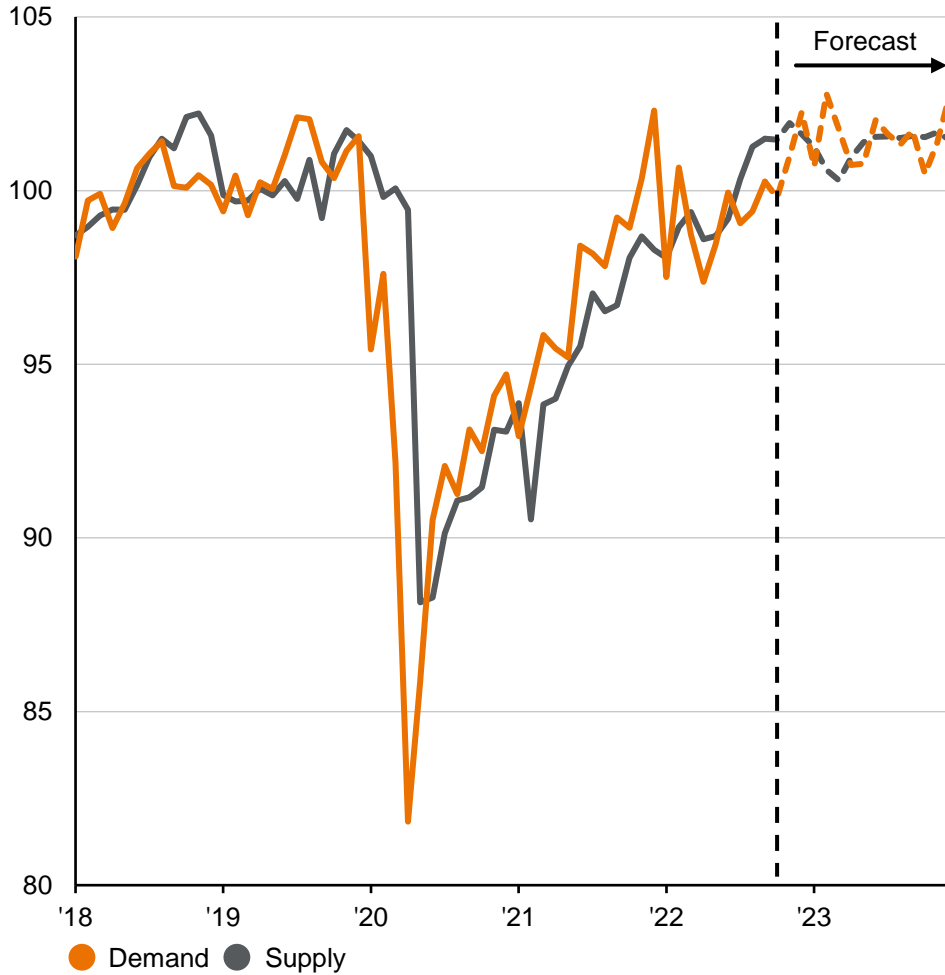


Oil: Short-term market dynamics

Other asset classes

Global oil supply and demand

Million barrels / day



Price of oil

Brent crude, USD / bbl



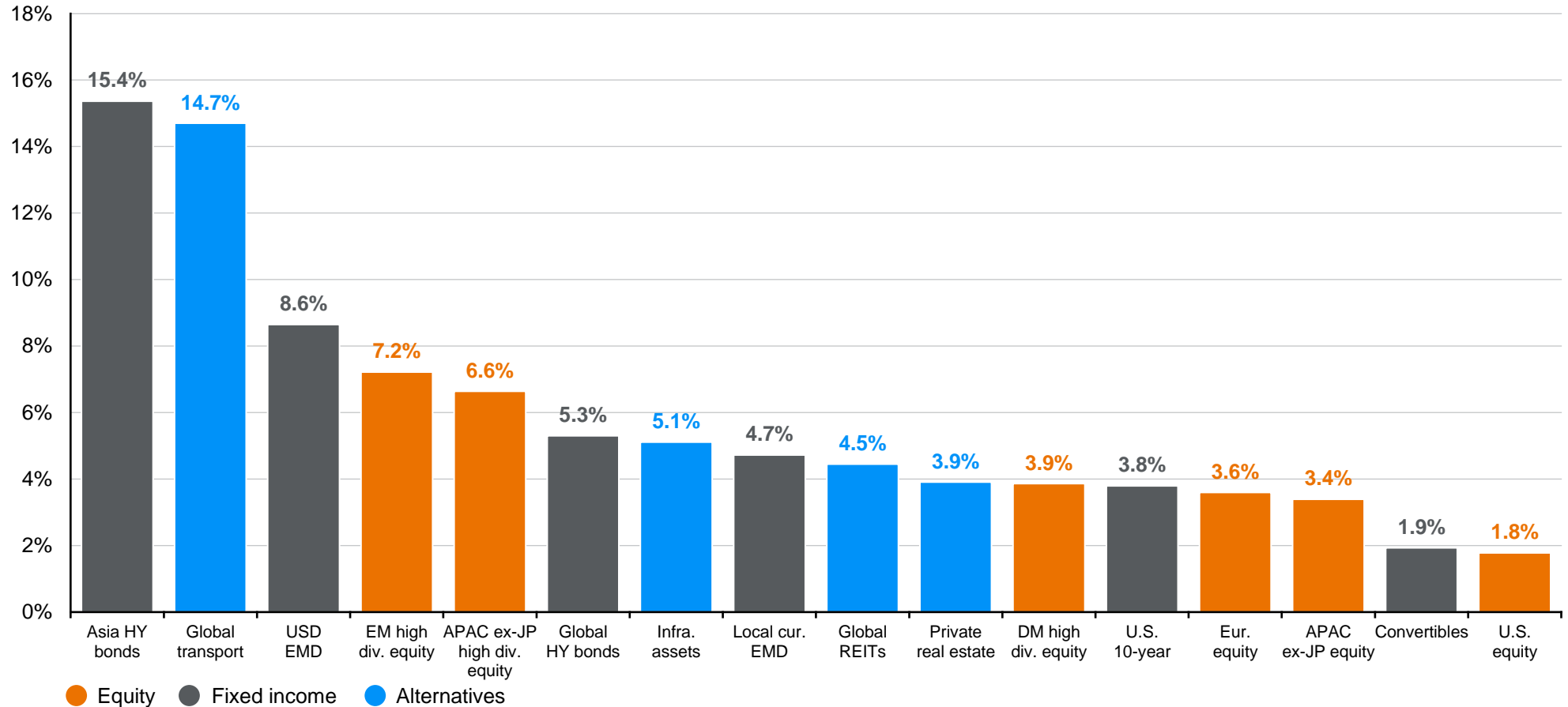
Source: FactSet, J.P. Morgan Asset Management; (Left) Global Trade Tracker, U.S. Energy Information Administration; (Right) Commodity Research Bureau. Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.



Alternative sources of income

Other asset classes

Asset class yields



Source: Alerian, Bank of America, Bloomberg Finance L.P., Clarkson, Drewry Maritime Consultants, FactSet, Federal Reserve, FTSE, MSCI, Standard & Poor's, J.P. Morgan Asset Management. *Global transport*: Levered yields for transport assets are calculated as the difference between charter rates (rental income), operating expenses, debt amortization and interest expenses, as a percentage of equity value. Yields for each of the sub-vessel types above are calculated and respective weightings are applied to each of the sub-sectors to arrive at the current levered yields for Global Transportation; asset classes are based on MSCI Global Property Fund Index (*Private real estate*), FTSE NAREIT Global REITs (*Global REITs*), MSCI Global Infrastructure Asset Index (*Infra. assets*), Bloomberg U.S. Convertibles Composite (*Convertibles*), Bloomberg Global High Yield Index (*Global HY bonds*), J.P. Morgan Government Bond Index EM Global (GBI-EM) (*Local currency EMD*), J.P. Morgan Emerging Market Bond Index Global (EMBIG) (*USD EMD*), J.P. Morgan Asia Credit Index Non-investment Grade (*Asia HY bonds*), MSCI Asia Pacific ex-Japan equities (*APAC ex-JP equity*), MSCI Asia Pacific ex-Japan High Dividend Yield Index (*APAC ex-JP high div. equity*), Emerging Markets High Dividend Yield Index (*EM high div. equity*), MSCI World High Dividend Yield Index (*DM high div. equity*), MSCI Europe (*Eur. equity*), MSCI USA (*U.S. equity*). Transport yield is as of 30/06/22, Infrastructure 31/03/22 and Private Real Estate 31/03/22. Past performance is not a reliable indicator of current and future results.

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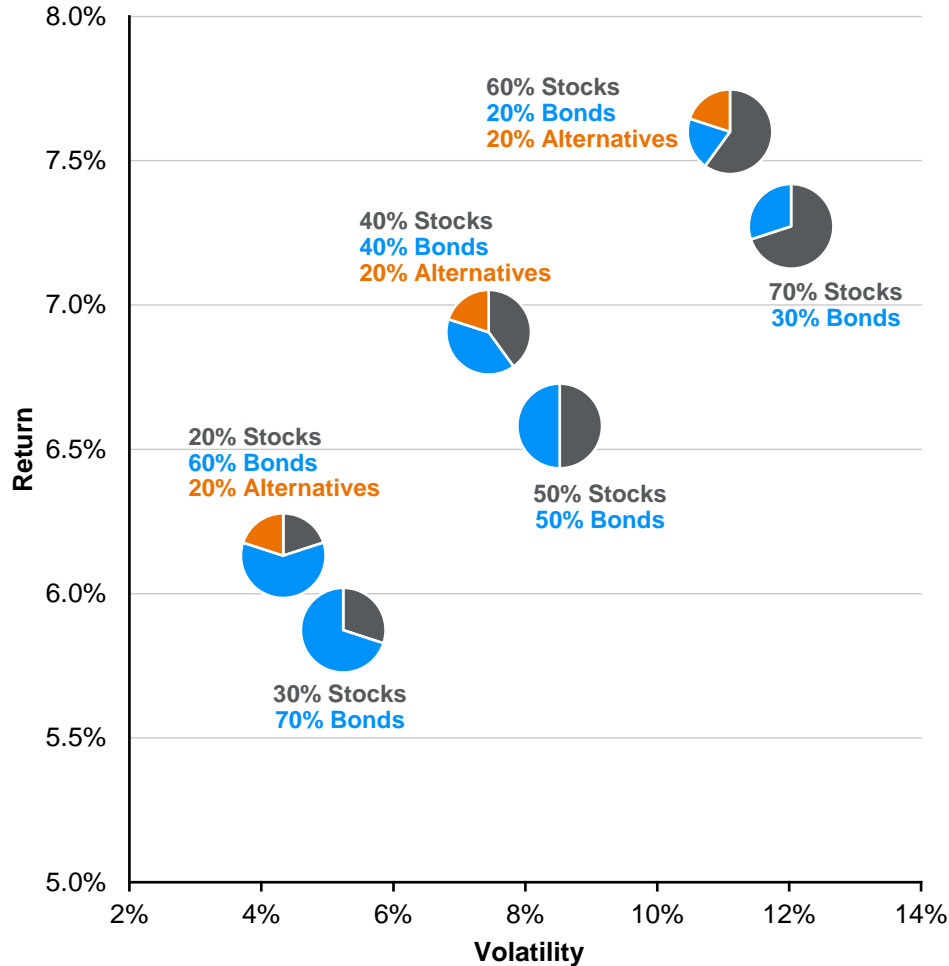


Understanding alternatives

Other asset classes

Alternatives and portfolio risk/return*

Annualized volatility and returns, 2Q96 – 2Q22



Public and private market correlations

Correlation coefficient based on quarterly returns

	Financial assets	Global real estate	Other real assets	Private markets	Hedge funds					
2008 - 2021	Global Bonds	Global Equities	U.S. Core RE	APAC Core RE	Global Infra.	U.S. Direct Lending	U.S. Private Equity	Equity Long/Short	Rel. Value	Global Macro
Global Bonds	1.0									
Global Equities	0.3	1.0								
U.S. Core RE	-0.2	0.1	1.0							
APAC Core RE	-0.1	0.1	0.8	1.0						
Global Infra.	-0.1	-0.1	0.3	0.2	1.0					
U.S. Direct Lending	0.0	0.7	0.3	0.3	0.2	1.0				
U.S. Private Equity	0.2	0.9	0.3	0.4	0.0	0.8	1.0			
Equity Long/Short	0.2	1.0	0.0	0.0	0.0	0.7	0.9	1.0		
Rel. Value	0.2	0.9	0.0	0.0	0.0	0.9	0.8	0.9	1.0	
Global Macro	0.3	0.4	-0.1	-0.1	0.0	0.2	0.3	0.5	0.4	1.0

Source: Bloomberg Finance L.P., FactSet, HFRI, NCREIF, J.P. Morgan Asset Management; (Left) Standard & Poor's; (Right) Cambridge Associates, Cliffwater, MSCI.
 *Stocks: S&P 500. Bonds: Bloomberg U.S. Aggregate. Alternatives: equally weighted composite of hedge funds (HFR FW Comp.) and private real estate. The volatility and returns are based on data from the period 30/06/96 – 30/06/22. RE – real estate. Global equities: MSCI AC World Index. Global bonds: Bloomberg Global Aggregate Index. U.S. core real estate: NCREIF Property Index – Open End Diversified Core Equity component. Asia Pacific (APAC) core real estate: IPD Global Property Fund Index – Asia-Pacific. Global infrastructure (infra.): MSCI Global Quarterly Infrastructure Asset Index (equal-weighted blend). U.S. direct lending: Cliffwater Direct Lending Index. U.S. private equity: Cambridge Associates U.S. Private Equity Index. Hedge fund indices include equity long/short, relative value and global macro and are all from HFRI. All correlation coefficients are calculated based on USD quarterly total return data for the period 30/06/08 – 31/12/21. Past performance is not a reliable indicator of current and future results. *Guide to the Markets – Asia*. Data reflect most recently available as of 30/09/22.

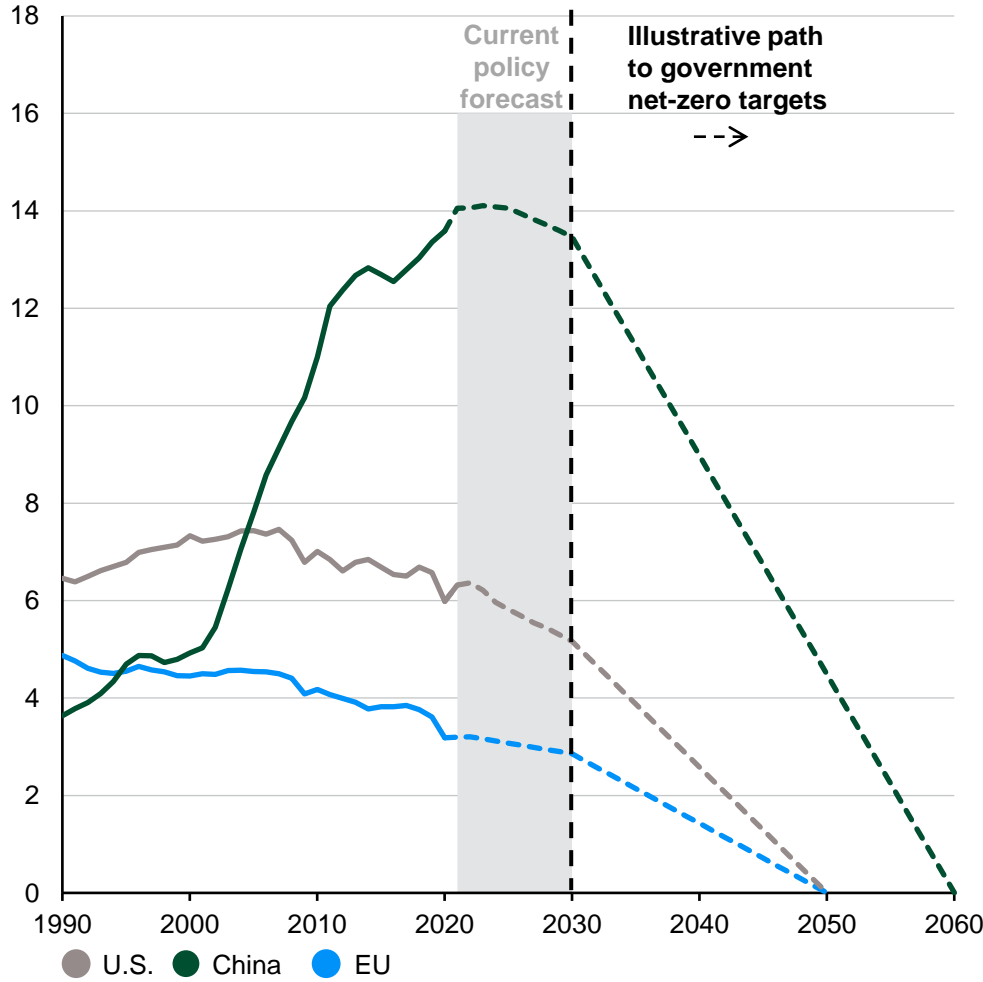


Emissions targets and global energy mix

Investing principles

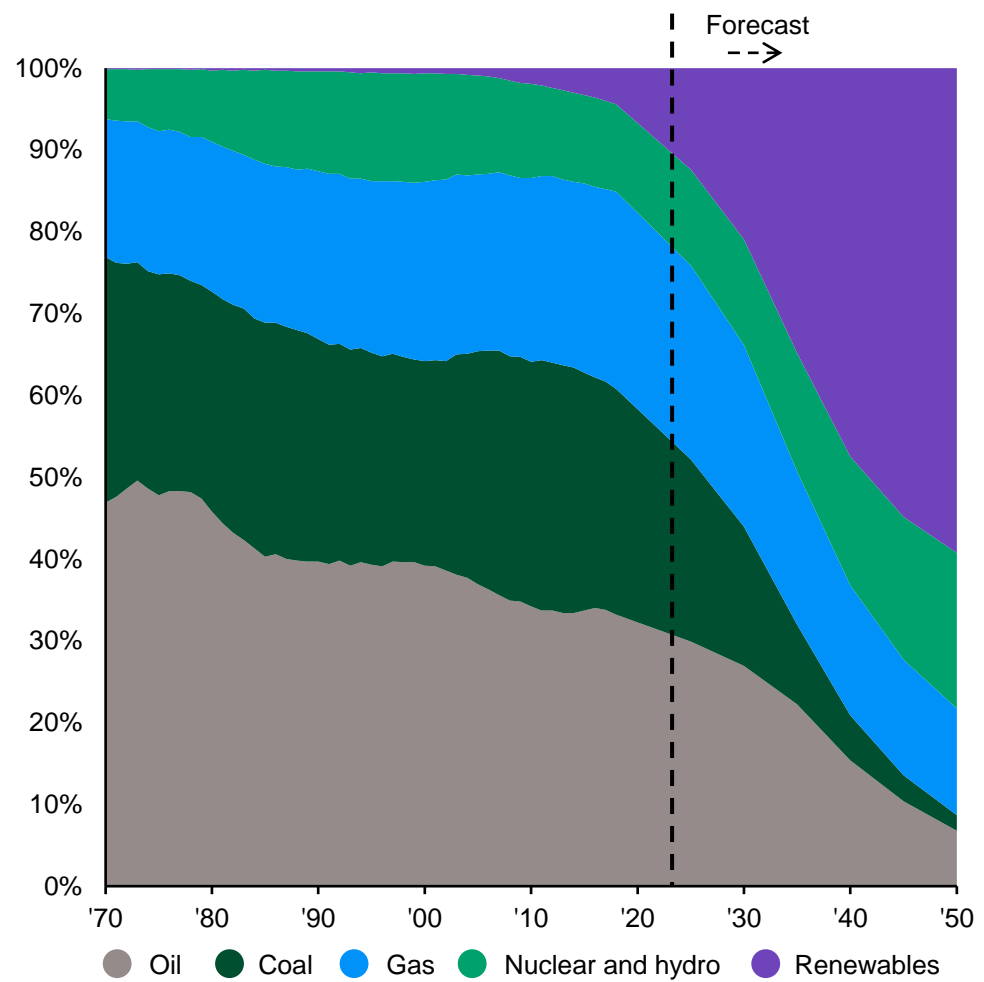
Greenhouse gas emission targets

Billion tons/year, CO₂ equivalent



Global energy mix

Share of primary energy consumption



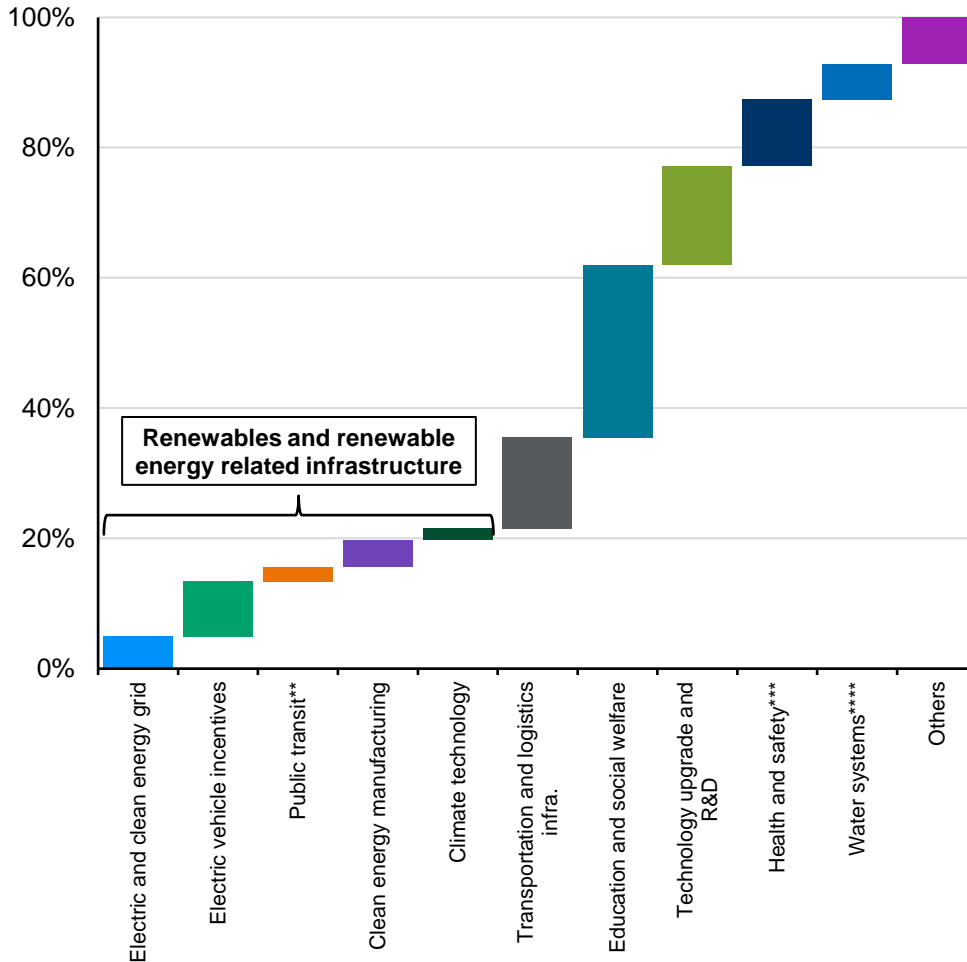
Source: J.P. Morgan Asset Management; (Left) Climate Action Tracker; (Right) BP Energy Outlook 2020. Forecast is based on BP's scenario for global net-zero emissions by 2050. Past performance is not a reliable indicator of current and future results. Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.



U.S. and Europe proposed green infrastructure spending

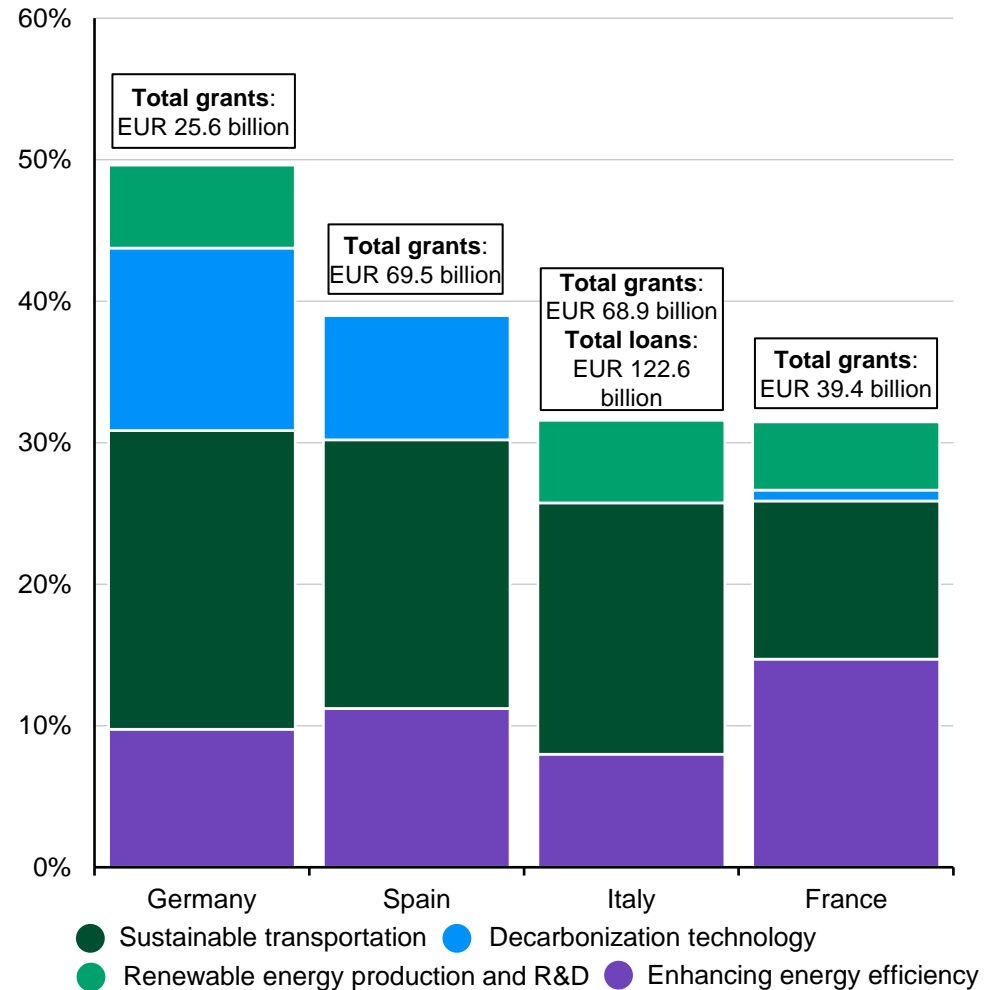
U.S. proposed spending on infrastructure

Percentage of proposed USD 2 trillion spending package*



Eurozone proposed spending on green infrastructure

Percentage of MFF***** and NextGenerationEU***** spending package



Source: J.P. Morgan Asset Management; (Left) The White House; (Right) European Commission. *Based on the initial spending proposal announced by the White House in March 2021, which was eventually signed into law at USD 1.2 trillion in November 2021. **Public transit spending includes the modernization of existing public transport infrastructure and electrification of bus fleets. ***Health and safety spending includes enhancing natural disaster resilience, improving road safety and improving pandemic preparedness. ****Water systems spending on drinking water and wastewater infrastructure and replacing lead pipes. *****MFF stands for the Multiannual Financial Framework, the European Union's long-term budget plan running from 2021 to 2027. *****NextGenerationEU is a fiscal recovery package established to help repair economic and social damage brought by the COVID-19 pandemic.

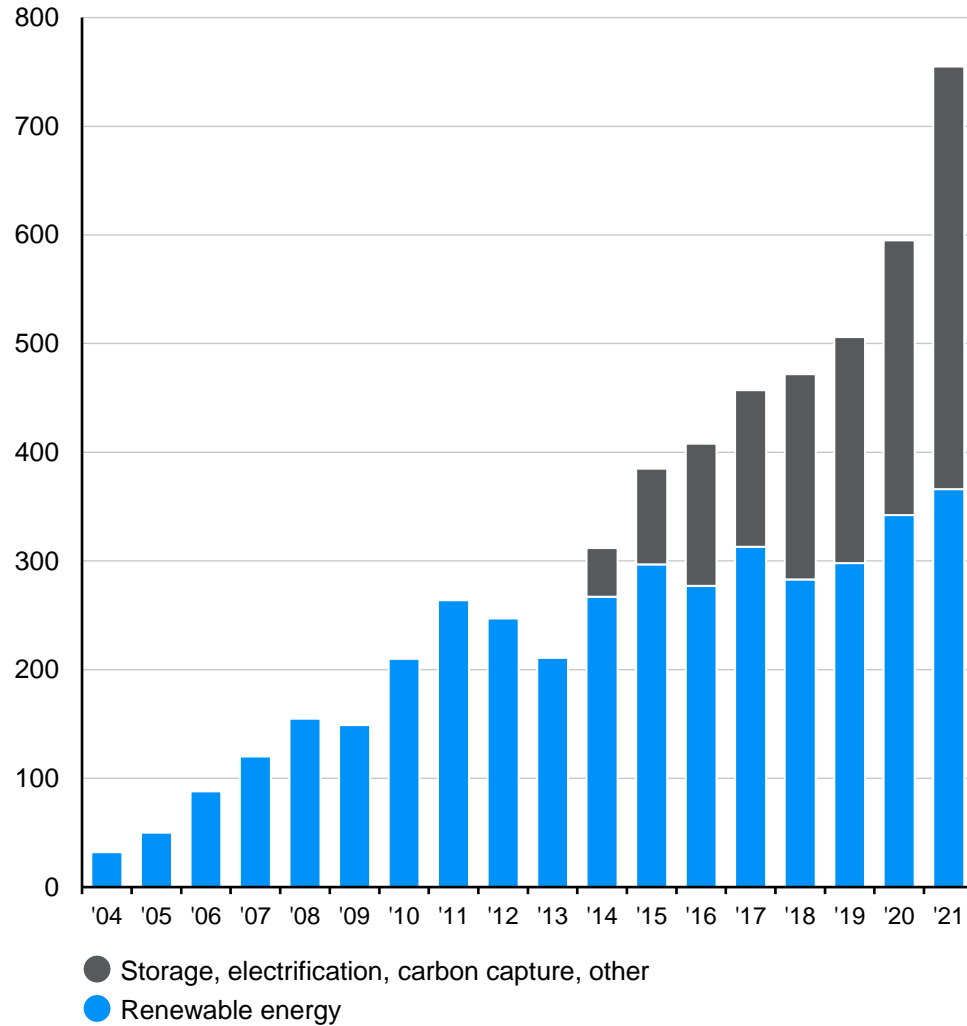
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Investments in sustainable energy

Global investments in energy transition

USD billions, nominal



Commodity input for sustainable energy technologies

Relative importance of commodities

	Copper	Cobalt	Nickel	Lithium	Zinc
Solar PV*	High (Red)	Low (Blue)	Low (Blue)	Low (Blue)	Low (Blue)
Wind	High (Red)	Low (Blue)	Moderate (Grey)	Low (Blue)	High (Red)
Hydro	Moderate (Grey)	Low (Blue)	Low (Blue)	Low (Blue)	Moderate (Grey)
Nuclear	Moderate (Grey)	Low (Blue)	Moderate (Grey)	Low (Blue)	Low (Blue)
EVs** and battery storage	High (Red)	High (Red)	High (Red)	High (Red)	Low (Blue)
Electricity networks	High (Red)	Low (Blue)	Low (Blue)	Low (Blue)	Low (Blue)

● High ● Moderate ● Low

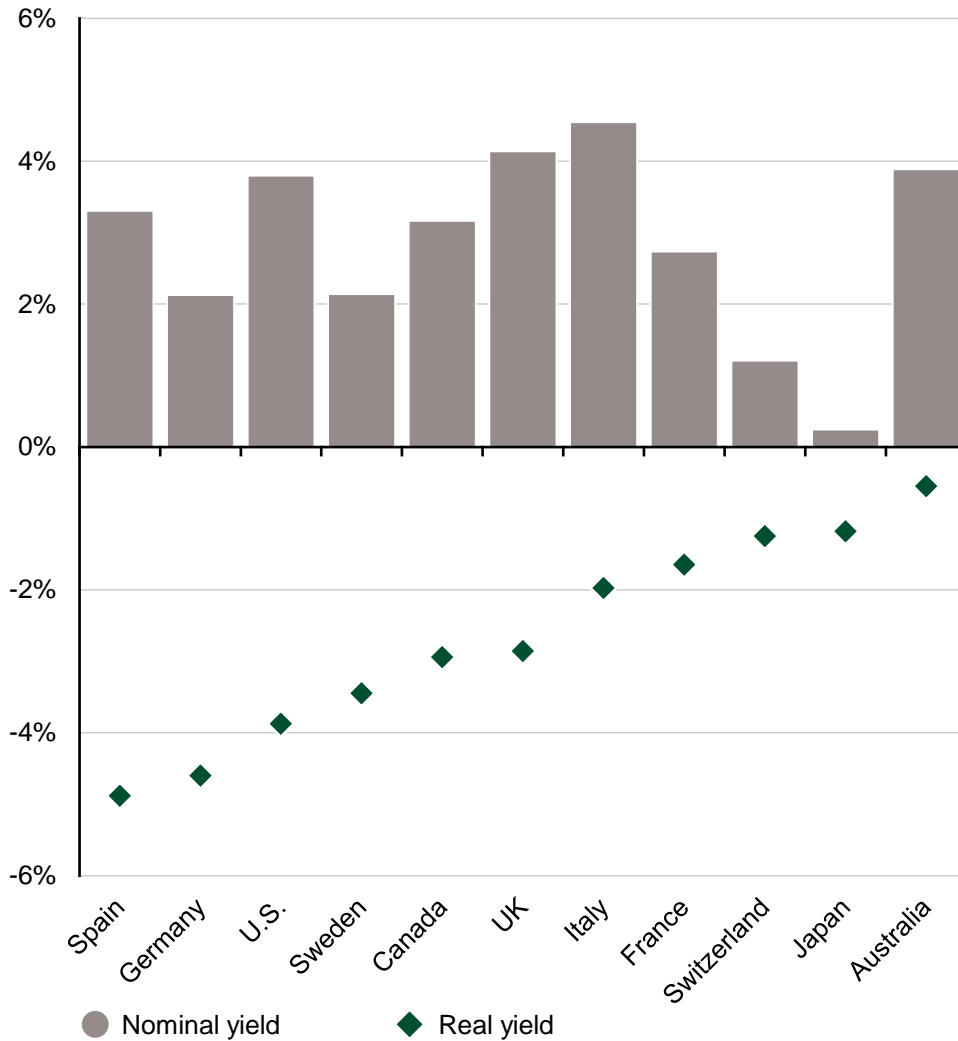
Source: J.P. Morgan Asset Management; (Left) Bloomberg L.P.; (Right) International Energy Agency. Based on the report "The role of critical minerals in clean energy transitions" where they elaborate further how the relative importance of commodities was determined. *PV = photovoltaic. **EVs = electric vehicles. Past performance is not a reliable indicator of current and future results.

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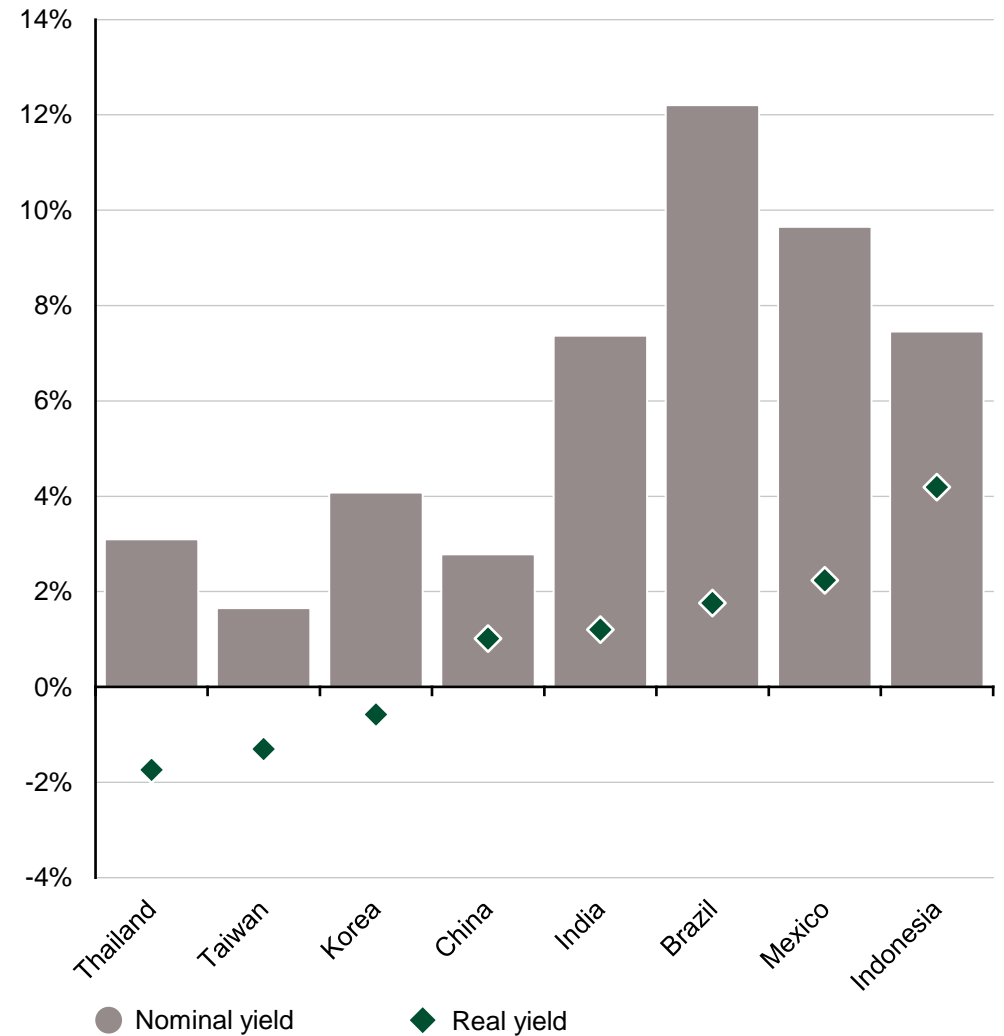


Developed market (DM) vs. emerging market (EM) yields

DM real and nominal yields*



EM real and nominal yields*



Source: FactSet, J.P. Morgan Asset Management. *Nominal yields are the 10-year local currency government bond yield for each respective market. Real yield is calculated based on nominal yield and the last 12-month average Consumer Price Index (CPI) for each respective market. Past performance is not a reliable indicator of current and future results.

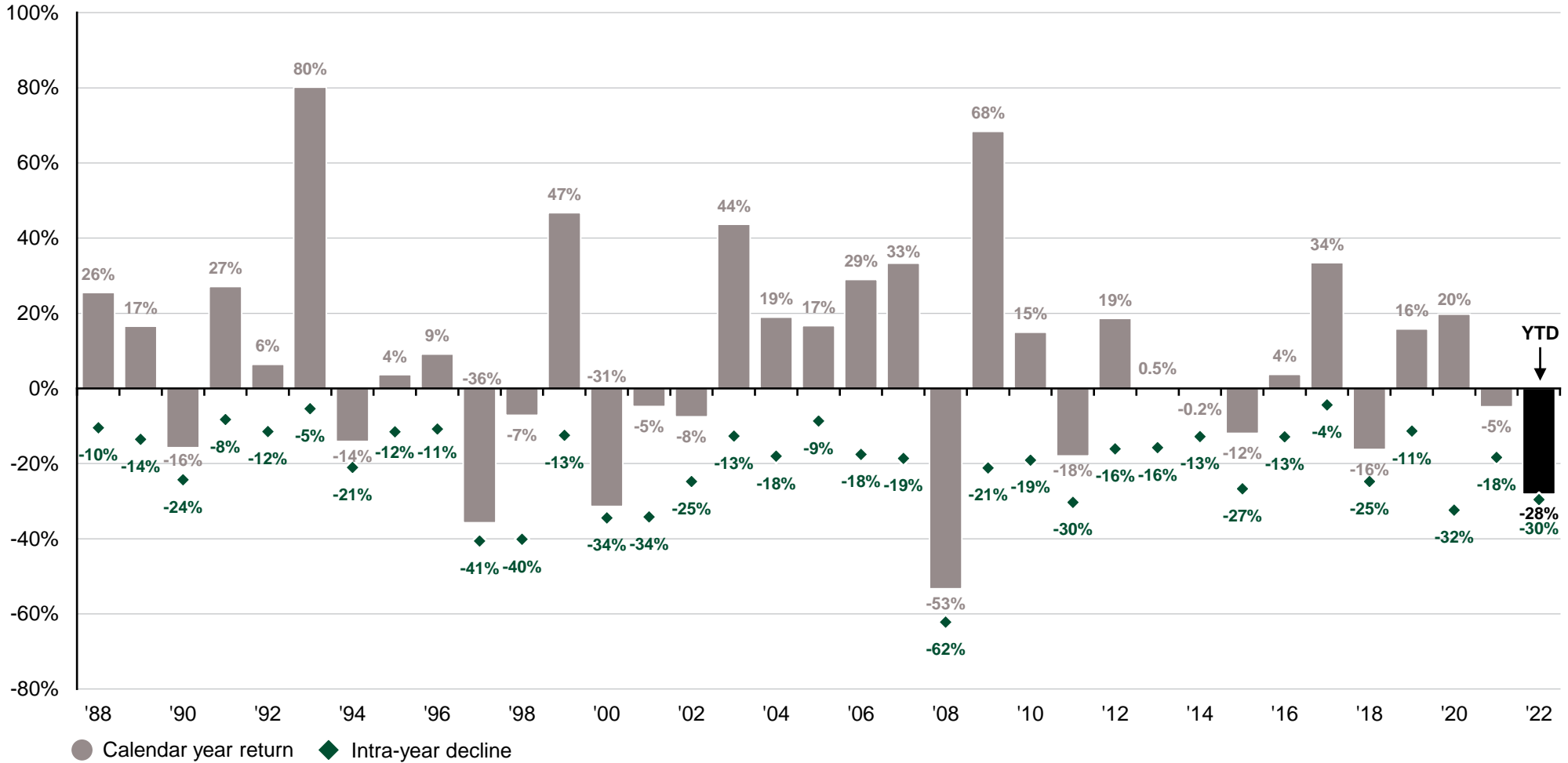
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Equity annual returns and intra-year declines

MSCI AC Asia Pacific ex-Japan intra-year declines vs. calendar year returns

Despite average intra-year drops of -20% (median: -18%), annual returns are positive in 21 of 34 (62%) years



Investing principles

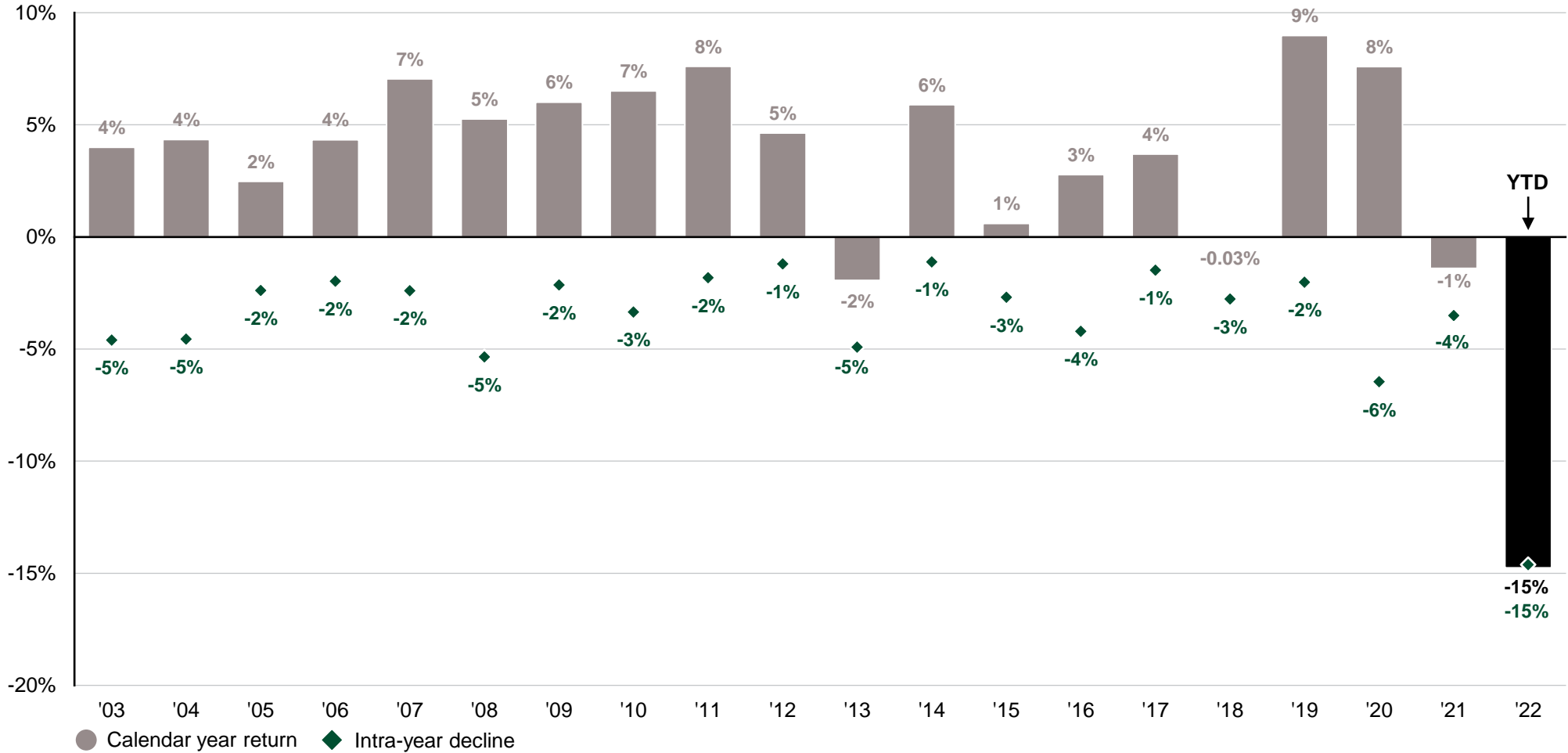
Source: FactSet, MSCI, J.P. Morgan Asset Management. Returns are price returns based on MSCI AC Asia Pacific ex-Japan Index in U.S. dollar terms. Intra-year decline is the largest peak to trough decline during the respective year. Past performance is not a reliable indicator of current and future results. Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.



Fixed income annual returns and intra-year declines

Bloomberg Global Aggregate USD intra-year declines vs. calendar year returns

Despite average intra-year drops of -3% (median: -3%), annual returns are positive in 16 of 19 (84%) years

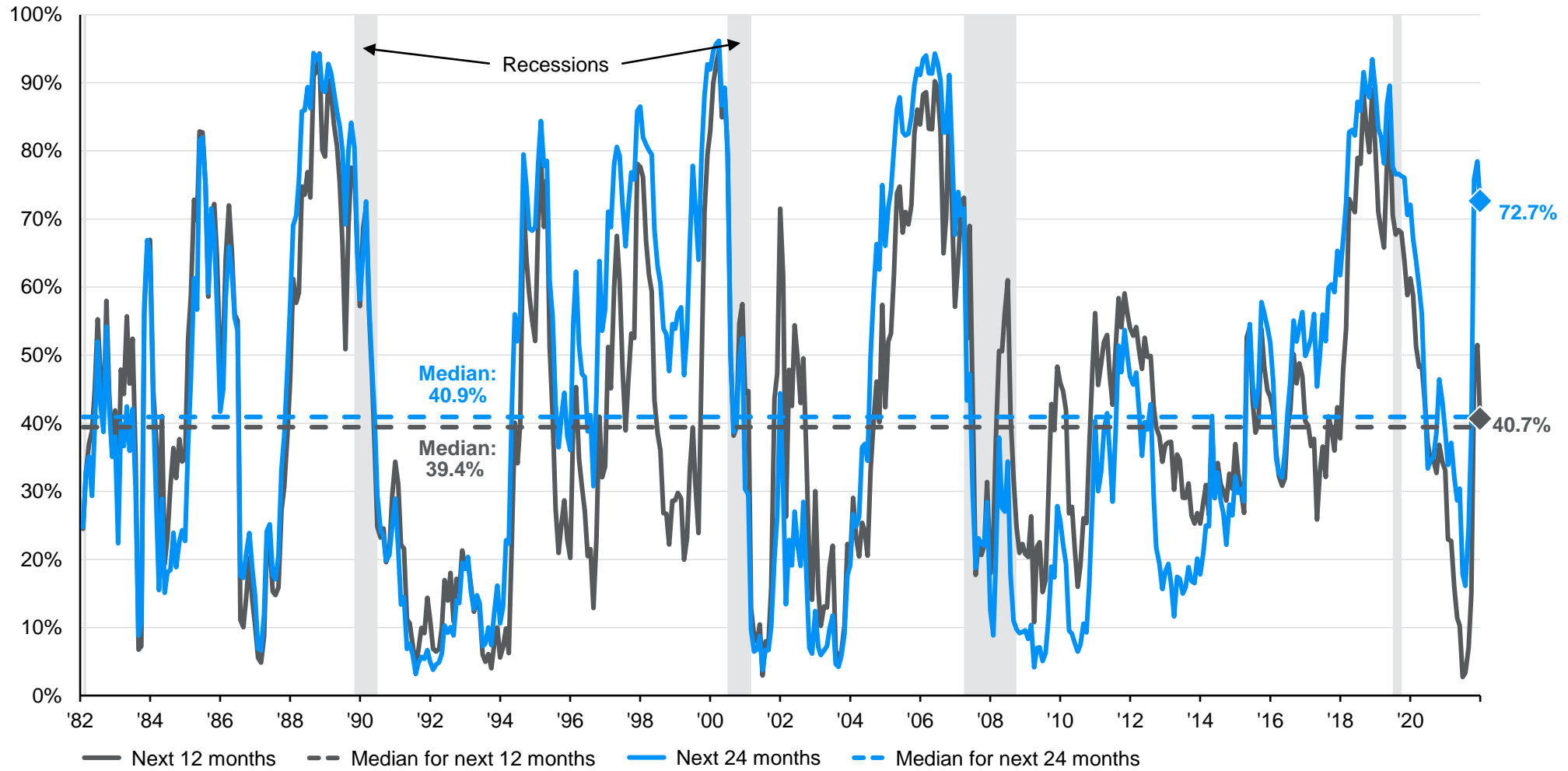


Source: Bloomberg, FactSet, J.P. Morgan Asset Management. Returns are total returns based on Bloomberg Global Aggregate USD Hedged Total Return Index. Intra-year decline is the largest peak to trough decline during the respective year. Past performance is not a reliable indicator of current and future results. Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.



U.S. market implied recession probabilities

Probability of a recession over the next 12 or 24 months



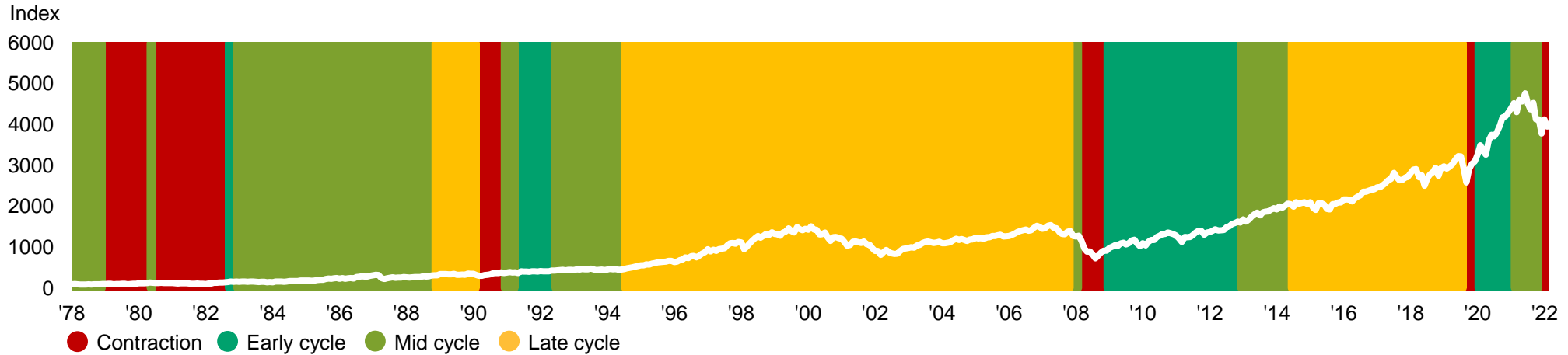
Investing principles

Source: Bloomberg L.P., National Bureau of Economic Research (NBER), J.P. Morgan Asset Management. Recession probabilities derived from a logistic regression model with the U.S. 10 year – U.S. 2 year spread, U.S. 10 year – U.S. 3 month spread and Goldman Sachs Financial Conditions Index deviation from average as inputs. Dependent variable is the binary classification of whether there is a recession in the next 12 or 24 months using NBER's classification of U.S. recessions. Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.



U.S. economic cycle and asset performance

S&P 500 Index across different phases of U.S. business cycle



Annualized return of various asset cycles during different phases of U.S. business cycle

Annualized Returns	U.S. Equities	Australian Equities	European Equities	EMU Equities	UK Equities	Japanese Equities	AxJ Equities	Chinese Equities	EM Equities	U.S. MBS	U.S. IG	U.S. HY	European IG	European HY	EM Sovereign Debt	U.S. 10Y Treasury
Contraction	(17.2%)	(24.1%)	(22.6%)	(26.1%)	(20.0%)	(16.6%)	0.1%	6.6%	(3.7%)	(2.0%)	(10.2%)	(12.9%)	(7.8%)	(9.9%)	(14.2%)	6.7%
Early Cycle	21.3%	14.3%	14.4%	13.1%	14.9%	12.4%	13.6%	8.3%	13.0%	2.4%	6.2%	13.1%	4.7%	13.5%	8.0%	4.2%
Mid Cycle	5.9%	8.6%	7.1%	6.9%	8.0%	9.4%	(6.7%)	(13.6%)	(7.6%)	2.9%	1.3%	4.1%	0.8%	(0.3%)	(1.5%)	(1.1%)
Late Cycle	10.7%	10.3%	9.0%	9.6%	7.4%	2.6%	11.1%	9.3%	13.6%	1.3%	0.7%	1.7%	1.2%	1.8%	4.5%	5.9%
Full Period	10.5%	8.9%	8.0%	8.0%	7.5%	3.7%	8.9%	6.4%	9.8%	1.6%	1.2%	3.3%	1.4%	3.5%	3.4%	4.5%

Source: Bloomberg L.P., J.P. Morgan Asset Management.

Regime analysis inception date: 31/01/78. K-Means Clustering applied to monthly data points of the following U.S. economic indicators – Core PCE Inflation, Private sector financial balance as a % of GDP, Consumer confidence, ISM manufacturing new orders, Unemployment rate, OECD composite leading indicator. Latest data as of 31/05/22. Monthly return analysis inception date: 31/01/93 for all assets except for AxJ Equities and EM Equities (start date: 31/01/01), EM Sovereign Debt (start date: 28/02/02), European IG (start date: 31/07/98), European HY (start date: 26/02/99). Local returns are used. Past performance is not a reliable indicator of current and future results.

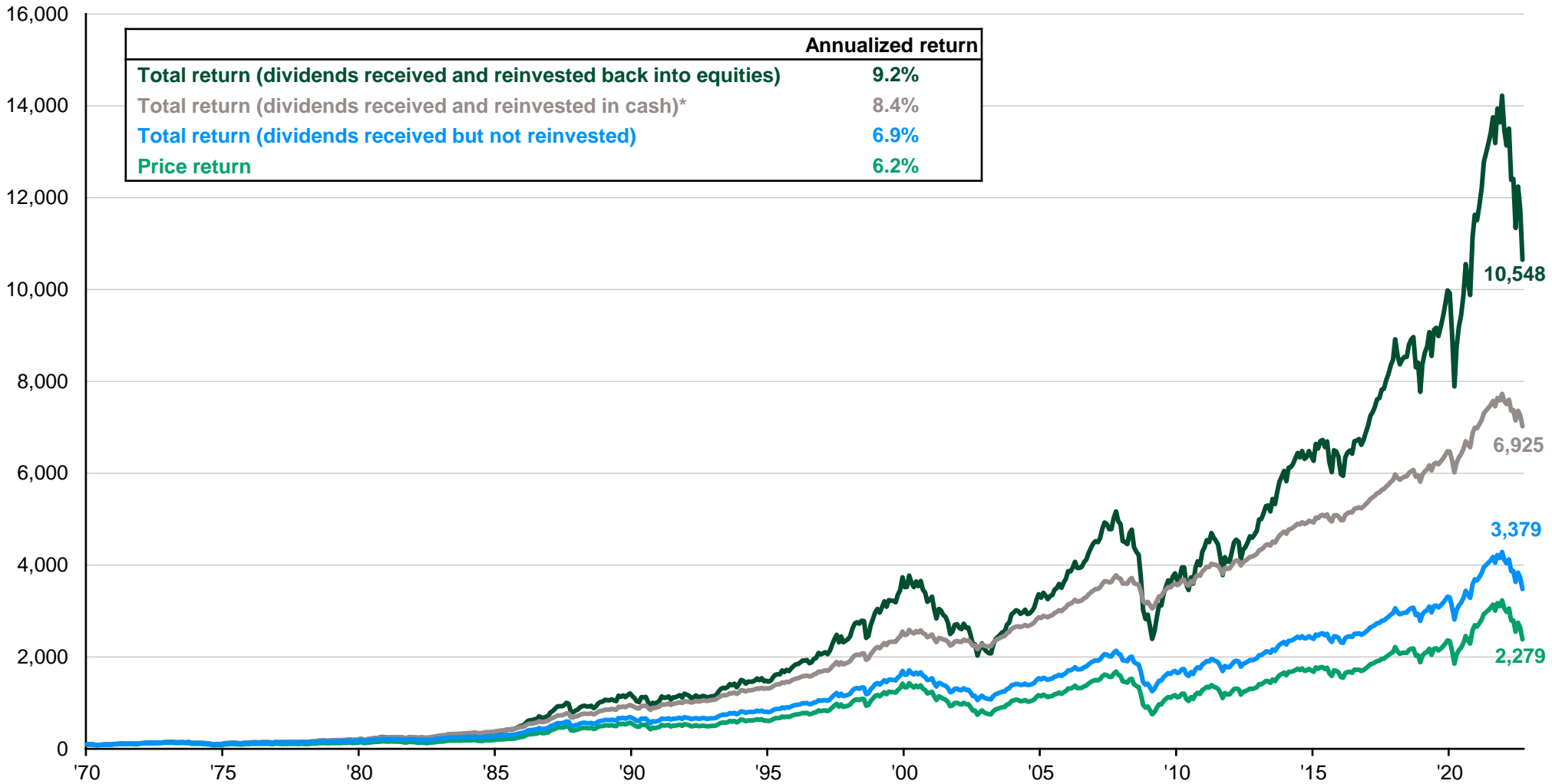
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The compounding effect

MSCI World Index: Performance under different scenarios

Index, 1970 = 100



Investing principles

Source: FactSet, MSCI, J.P. Morgan Asset Management.

*Reinvestment in cash based on the same month U.S. three-month Treasury bill (secondary market) yield. Past performance is not a reliable indicator of current and future results.

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Portfolio construction, asset class returns and volatility

Annualized returns and volatility

Total returns in USD*



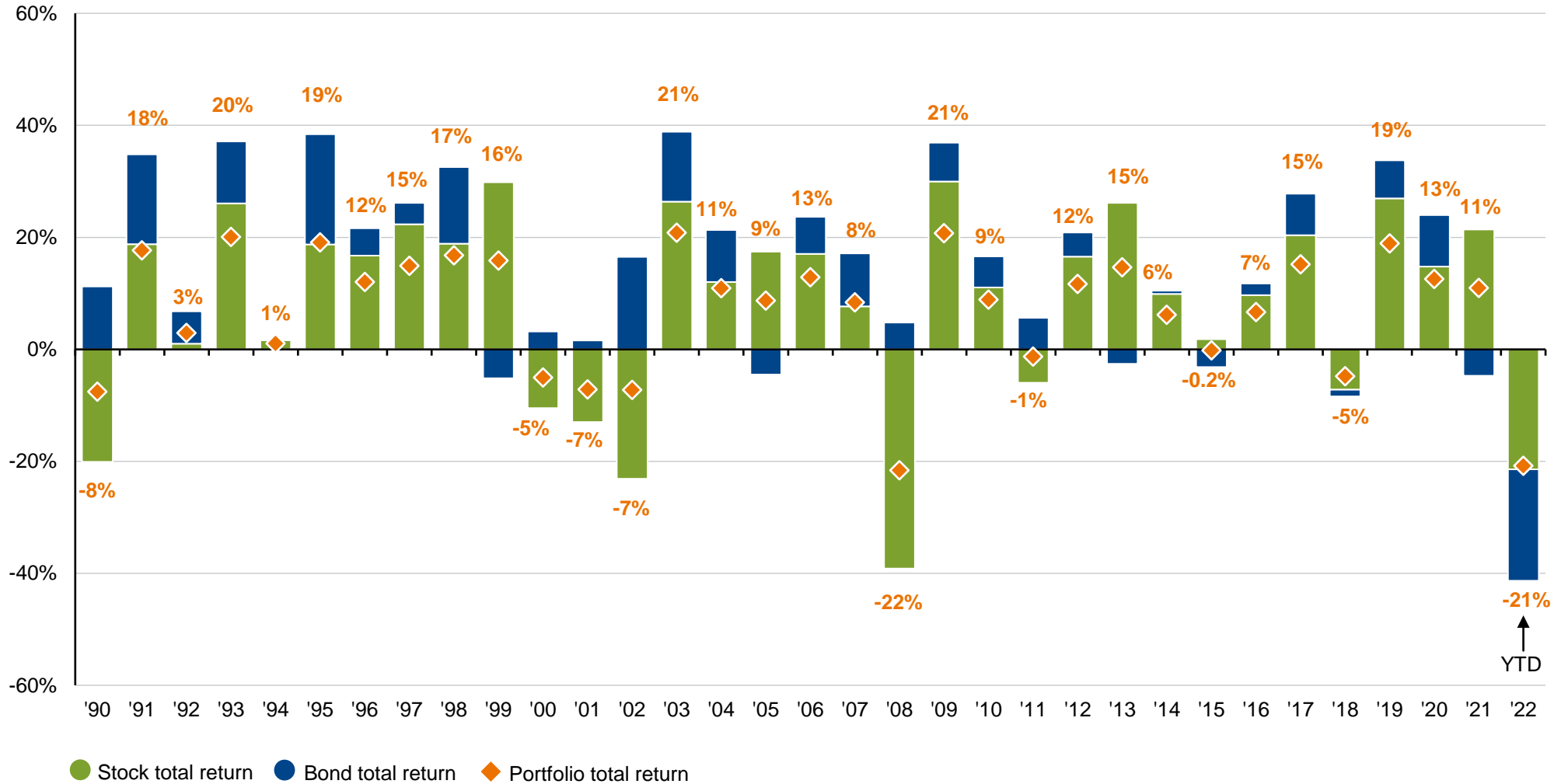
Investing principles

Source: Bloomberg Finance L.P., Dow Jones, FactSet, MSCI, Standard & Poor's, J.P. Morgan Asset Management.
 Hypothetical portfolios were created to illustrate different risk/return profiles and are not meant to represent actual asset allocation.
 U.S. dollar total return calculations are based on MSCI Total Return, Bloomberg and J.P. Morgan indices. AxJ stands for MSCI AC Asia ex-Japan and APxJ stands for MSCI AC Asia Pacific ex-Japan. *Monthly total returns between 30/09/07 and 30/09/22 are used for all asset classes except hedge funds, where monthly total returns between 31/08/07 and 31/08/22 are used.
 Past performance is not a reliable indicator of current and future results.
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60/40 stock-bond portfolio performance

Annual returns in a 60/40 stock-bond portfolio



Investing principles

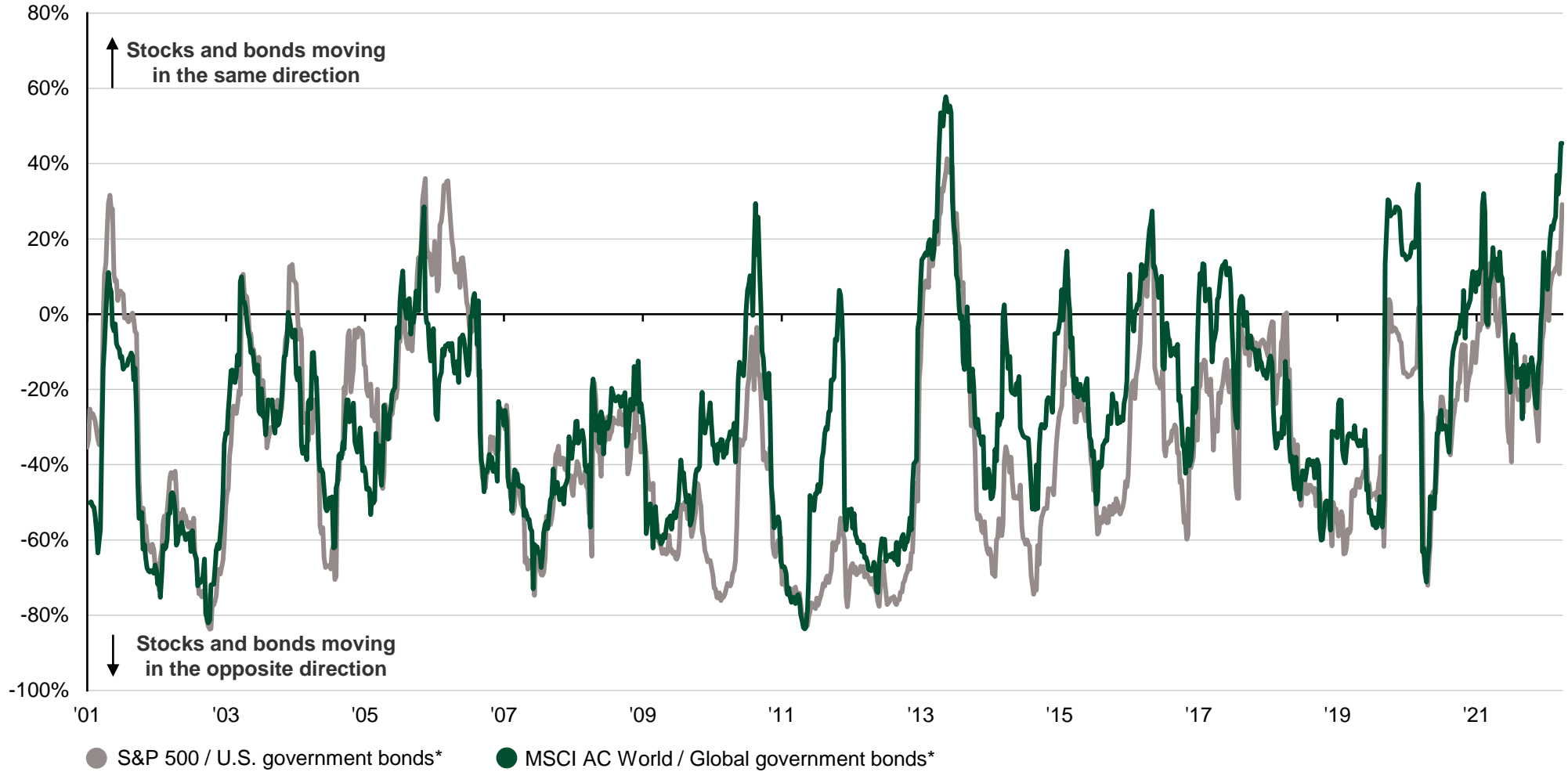
Source: Bloomberg L.P., FactSet, MSCI, J.P. Morgan Asset Management. Returns are calendar year with the exception of 2022, which is year-to-date. Portfolio returns reflect allocations of 60% in the MSCI AC World Index and 40% in the Bloomberg Aggregate Bond Index. Returns are total returns. Past performance is not a reliable indicator of current and future results. Guide to the Markets – Asia. Data reflect most recently available as of 30/09/22.



Correlation between stocks and bonds

Correlations between stocks and sovereign bonds

Weekly rolling six-month correlation of equities and sovereign bond prices*



Investing principles

Source: Bloomberg Finance L.P., FactSet, MSCI, J.P. Morgan Asset Management.

*Rolling six-month pairwise correlations between weekly returns in equity (S&P 500 and MSCI All Country World Index price indices) and bond (Bloomberg U.S. Aggregate Government Treasury and Bloomberg Global Aggregate Government Treasuries price indices) markets.

Past performance is not a reliable indicator of current and future results.

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All indexes are unmanaged and an individual cannot invest directly in an index. Index returns do not include fees or expenses.

The **S&P 500 Index** is widely regarded as the best single gauge of the U.S. equities market. This world-renowned index includes a representative sample of 500 leading companies in leading industries of the U.S. economy. Although the S&P 500 Index focuses on the large-cap segment of the market, with approximately 75% coverage of U.S. equities, it is also an ideal proxy for the total market. An investor cannot invest directly in an index.

The **Tokyo Stock Price Index ('TOPIX')** is a composite index of all common stocks listed on the First Section of Tokyo Stock Exchange (TSE). The index is basically a measure of the changes in aggregate market value of TSE common stocks. The base for the index is the aggregate market value of its component stocks as of the close on January 4, 1968. The aggregate market value is calculated by multiplying the number of listed shares of each component stock by its price and totaling the products derived there from.

The **Bombay Exchange Sensitive Index ('SENSEX')**, first compiled in 1986, was calculated on a "Market Capitalization-Weighted" methodology of 30 component stocks representing large, well-established and financially sound companies across key sectors. The base year of SENSEX was taken as 1978-79. SENSEX today is widely reported in both domestic and international markets through print as well as electronic media. It is scientifically designed and is based on globally accepted construction and review methodology. Since September 1, 2003, SENSEX is being calculated on a free-float market capitalization methodology.

The **Korea Composite Stock Price Index ('KOSPI')** is market capitalization based index on all common stocks listed on the Stock Market Division of the Korea Exchange (KRX) and excludes preferred stocks. The stock price index is calculated using the actual price traded on the market and not the "base price" used for market management such as establishment of price change limits. When no market price is available for issues that are not being traded or have halted trading, the latest closing price is used. KOSPI was assigned a base index of 100 set to January 4, 1980.

The **China Shenzhen Composite Index** is an actual market-cap weighted index that tracks the stock performance of all the A-share and B-share lists on Shenzhen Stock Exchange. The index was developed on April 3, 1991 with a base price of 100.

The **Euro Stoxx 600 Index** represents large, mid and small capitalization companies across 18 European countries.

The **MSCI® EAFE** (Europe, Australia, Far East) Net Index is recognized as the pre-eminent benchmark in the United States to measure international equity performance. It comprises 21 MSCI country indexes, representing the developed markets outside of North America.

The **MSCI Emerging Markets IndexSM** is a free float-adjusted market capitalization index that is designed to measure equity market performance in the global emerging markets. As of June 2007, the MSCI Emerging Markets Index consisted of the following 25 emerging markets indices: Argentina, Brazil, Chile, China, Colombia, Czech Republic, Egypt, Hungary, India, Indonesia, Israel, Jordan, Korea, Malaysia, Mexico, Morocco, Pakistan, Peru, Philippines, Poland, Russia, South Africa, Taiwan, Thailand, and Turkey.

The **MSCI ACWI (All Country World Index) Index** is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed and emerging markets. As of June 2009 the **MSCI ACWI** consisted of 45 country indices comprising 23 developed and 22 emerging market country indices.

The following **MSCI Total Return IndicesSM** are calculated with gross dividends: This series approximates the maximum possible dividend reinvestment. The amount reinvested is the dividend distributed to individuals resident in the country of the company, but does not include tax credits.

The **MSCI Europe IndexSM** is a free float-adjusted market capitalization index that is designed to measure developed market equity performance in Europe. As of June 2007, the MSCI Europe Index consisted of the following 16 developed market country indices: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

The **MSCI Pacific IndexSM** is a free float-adjusted market capitalization index that is designed to measure equity market performance in the Pacific region. As of June 2007, the MSCI Pacific Index consisted of the following 5 Developed Market markets: Australia, Hong Kong, Japan, New Zealand, and Singapore.

The **MSCI Europe ex UK IndexSM** is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of the developed markets in Europe, excluding the United Kingdom. The

MSCI Europe ex UK Index consists of the following 15 developed market country indices: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, and Switzerland.

The **MSCI Pacific ex Japan IndexSM** is a free float-adjusted market capitalization index that is designed to measure equity market performance in the Pacific region, excluding Japan. As of June 2007, the MSCI Pacific Index consisted of the following 4 Developed Markets: Australia, Hong Kong, New Zealand, and Singapore.

The **MSCI USA IndexSM** is designed to measure the performance of the large and mid cap segments of the U.S. market. With 586 constituents, the index covers approximately 84% of the free float-adjusted market capitalization in the U.S.. The MSCI USA Index was launched on December 31, 1969.

The **MSCI China IndexSM** captures large and mid cap representation across China H shares, B shares, Red chips and P chips. With 148 constituents, the index covers about 84% of this China equity universe. The MSCI China Index was launched on December 31, 1992.

The **MSCI Indonesia IndexSM** is designed to measure the performance of the large and mid cap segments of the Indonesian market. With 25 constituents, the index covers about 84% of the Indonesian equity universe. The MSCI Indonesia Index was launched on December 31, 1990.

The **MSCI Korea IndexSM** is designed to measure the performance of the large and mid cap segments of the South Korean market. With 105 constituents, the index covers about 84% of the Korean equity universe. The MSCI Korea Index was launched on December 31, 1989.

The **MSCI India IndexSM** is designed to measure the performance of the large and mid cap segments of the Indian market. With 71 constituents, the index covers about 84% of the Indian equity universe. The MSCI India Index was launched on December 31, 1993.

The **MSCI Japan IndexSM** is designed to measure the performance of the large and mid cap segments of the Japan market. With 315 constituents, the index covers approximately 84% of the free float-adjusted market capitalization in Japan. The MSCI Japan Index was launched on December 31, 1969.

The **MSCI Hong Kong IndexSM** is designed to measure the performance of the large and mid cap segments of the Hong Kong market. With 42 constituents, the index covers approximately 84% of the free float-adjusted market capitalization of the Hong Kong equity universe. The MSCI Hong Kong Index was launched on December 31, 1972.

The **MSCI Taiwan IndexSM** is designed to measure the performance of the large and mid cap segments of the Taiwan market. With 113 constituents, the index covers approximately 84% of the free float-adjusted market capitalization in Taiwan. The MSCI Taiwan Index was launched on December 31, 1989.

The **MSCI Environmental, Social and Governance (ESG) Universal Indices** are designed to address the needs of asset owners who may look to enhance their exposure to ESG while maintaining a broad and diversified universe to invest in. By re-weighting free-float market cap weights based upon certain ESG metrics tilting away from free-float market cap weights, the indices enhance exposure to those companies that demonstrate both a higher MSCI ESG Rating and a positive ESG trend, while maintaining a broad and diversified investment universe.



J.P. Morgan Asset Management: Index Definitions, Risks and Disclosures

West Texas Intermediate (WTI) is the underlying commodity for the New York Mercantile Exchange's oil futures contracts.

The **Bloomberg Commodity Index** is calculated on an excess return basis and reflects commodity futures price movements. The index rebalances annually weighted 2/3 by trading volume and 1/3 by world production and weight-caps are applied at the commodity, sector and group level for diversification. Roll period typically occurs from 6th-10th business day based on the roll schedule.

The **Bloomberg Commodity Subindexes** represent commodity groups and sectors, as well as single commodities, that make up the Bloomberg Commodity Index. The subindexes track exchange-traded futures of physical commodities, and the commodity groups and sectors, like in the case of the broad index, are weighted to account for economic significance and market liquidity. The various subindexes include Agriculture, Energy, Livestock, Grains, Industrial Metals, Precious Metals and Softs.

The **Bloomberg High Yield Index** covers the universe of fixed rate, non-investment grade debt. Pay-in-kind (PIK) bonds, Eurobonds, and debt issues from countries designated as emerging markets (e.g., Argentina, Brazil, Venezuela, etc.) are excluded, but Canadian and global bonds (SEC registered) of issuers in non-EMG countries are included. Original issue zeroes, step-up coupon structures, and 144-As are also included.

The **Bloomberg 1-3 Month U.S. Treasury Bill Index** includes all publicly issued zero-coupon U.S. Treasury Bills that have a remaining maturity of less than 3 months and more than 1 month, are rated investment grade, and have \$250 million or more of outstanding face value. In addition, the securities must be denominated in U.S. dollars and must be fixed rate and non convertible.

The **Bloomberg Corporate Bond Index** is the Corporate component of the U.S. Credit index.

The **Bloomberg TIPS Index** consists of Inflation-Protection securities issued by the U.S. Treasury.

The **J.P. Morgan EMBI Global Index** includes U.S. dollar denominated Brady bonds, Eurobonds, traded loans and local market debt instruments issued by sovereign and quasi-sovereign entities.

The **J.P. Morgan GBI-EM Global Diversified** consists of regularly traded, liquid fixed-rate, domestic currency government bonds to which international investors can gain exposure. The weightings among the countries are more evenly distributed within this index.

The **J.P. Morgan Corporate Emerging Markets Bond Index (CEMBI)**: The CEMBI tracks total returns of US dollar-denominated debt instruments issued by corporate entities in Emerging Markets countries, and consists of an investable universe of corporate bonds.

The **J.P. Morgan Domestic High Yield Index** is designed to mirror the investable universe of the U.S. dollar domestic high yield corporate debt market.

The **VIX-CBOE Volatility Index** measures market expectations of near-term volatility conveyed by S&P 500 Index (SPX) option prices.

The **MOVE-Merrill Lynch Option Volatility Index** is a blended implied normal volatility for constant one-month at-the-money options on U.S. Treasuries.

Price to forward earnings is a measure of the price-to-earnings ratio (P/E) using forecasted earnings. **Price to book value** compares a stock's market value to its book value. **Price to cash flow** is a measure of the market's expectations of a firm's future financial health. **Price to dividends** is the ratio of the price of a share on a stock exchange to the dividends per share paid in the previous year, used as a measure of a company's potential as an investment.

Bonds are subject to interest rate risks. Bond prices generally fall when interest rates rise.

The price of **equity** securities may rise, or fall because of changes in the broad market or changes in a company's financial condition, sometimes rapidly or unpredictably. These price movements may result from factors affecting individual companies, sectors or industries, or the securities market as a whole, such as changes in economic or political conditions. Equity securities are subject to "stock market risk" meaning that stock prices in general may decline over short or extended periods of time.

Small-capitalization investing typically carries more risk than investing in well-established "blue-chip" companies since smaller companies generally have a higher risk of failure. Historically, smaller companies' stock has experienced a greater degree of market volatility than the average stock.

Mid-capitalization investing typically carries more risk than investing in well-established "blue-chip" companies. Historically, mid-cap companies' stock has experienced a greater degree of market volatility than the average stock.

Real estate investments may be subject to a higher degree of market risk because of concentration in a specific industry, sector or geographical sector. Real estate investments may be subject to risks including, but not limited to, declines in the value of real estate, risks related to general and economic conditions, changes in the value of the underlying property owned by the trust and defaults by borrower.

International investing involves a greater degree of risk and increased volatility. Changes in currency exchange rates and differences in accounting and taxation policies can raise or lower returns. Also, some markets may not be as politically and economically stable as other nations. Investments in **emerging markets** can be more volatile. The normal risks of international investing are heightened when investing in emerging markets. In addition, the small size of securities markets and the low trading volume may lead to a lack of liquidity, which leads to increased volatility. Also, emerging markets may not provide adequate legal protection for private or foreign investment or private property.

Investments in **commodities** may have greater volatility than investments in traditional securities, particularly if the instruments involve leverage. The value of commodity-linked derivative instruments may be affected by changes in overall market movements, commodity index volatility, changes in interest rates, or factors affecting a particular industry or commodity, such as drought, floods, weather, livestock disease, embargoes, tariffs and international economic, political and regulatory developments. Use of leveraged commodity-linked derivatives creates an opportunity for increased return but, at the same time, creates the possibility for greater loss.

Derivatives may be riskier than other types of investments because they may be more sensitive to changes in economic or market conditions than other types of investments and could result in losses that significantly exceed the original investment. The use of derivatives may not be successful, resulting in investment losses, and the cost of such strategies may reduce investment returns.

There is no guarantee that the use of **long and short positions** will succeed in limiting an investor's exposure to domestic stock market movements, capitalization, sector swings or other risk factors. Investing using long and short selling strategies may have higher portfolio turnover rates. Short selling involves certain risks, including additional costs associated with covering short positions and a possibility of unlimited loss on certain short sale positions.

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J.P. Morgan Asset Management: Risks and Disclosures

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Prepared by: David Kelly, Tai Hui, Clara Cheong, Kerry Craig, Agnes Lin, Chaoping Zhu, Marcella Chow, Ian Hui, Shogo Maekawa and Adrian Tong.

Unless otherwise stated, all data are as of September 30, 2022 or most recently available.

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