



Guide to the Markets[®]

U.S. | 1Q 2023

As of December 31, 2022





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Page Reference

GTM

U.S.

3

Equities

4. S&P 500 Index at inflection points
5. S&P 500 valuation measures
6. P/E ratios and equity returns
7. Corporate earnings and analyst expectations
8. Sources of earnings per share growth
9. Profit margins
10. Value vs. Growth
11. Small cap vs. large cap stocks
12. Returns and valuations by style
13. Returns and valuations by sector
14. Factor performance
15. Annual returns and intra-year declines
16. Equity scenarios: Bull, bear and in-between
17. Market inflection points, recessions and the unemployment rate

Economy

18. Economic growth and the composition of GDP
19. Recession determinants
20. Cyclical sectors
21. Home prices and affordability
22. Residential real estate
23. Federal finances
24. Consumer finances
25. Consumer confidence and the stock market
26. Labor demand
27. Unemployment and wages
28. Inflation
29. Inflation heatmap
30. Inflation drivers and expectations
31. Dollar drivers
32. Oil markets
33. Global energy transition

Fixed Income

34. The Fed and interest rates
35. The Federal Reserve balance sheet
36. Interest rates and inflation
37. Fixed income market dynamics
38. Yield curve
39. High yield bonds
40. Fixed income valuations
41. Developed market monetary policy
42. Global fixed income
43. Municipal finance
44. Bloomberg U.S. Agg. annual returns and intra-year declines

International

45. Global equity markets
46. Currency and international equity returns
47. Cycles of U.S. equity outperformance
48. International valuations and dividend yields
49. International equity earnings and valuations
50. International markets
51. Global economic activity momentum
52. Global inflation
53. Global supply chains and inflation
54. The emergence of the EM middle class
55. China: Economic growth

Alternatives

56. Correlations and volatility
57. Equity market correlations and yields
58. Global commodities
59. U.S. real estate dynamics
60. Market volatility and hedge funds

Investing Principles

61. Asset class returns
62. Valuations monitor
63. 60/40 annual returns
64. Time, diversification and the volatility of returns
65. Diversification and the average investor
66. Cash account returns
67. Individual investor asset allocation
68. Institutional investor behavior



S&P 500 Index at inflection points

Equities

S&P 500 Price Index

| Characteristic | 3/24/2000 | 10/9/2007 | 2/19/2020 | 1/3/2022 | 12/31/2022 |
|------------------|-----------|-----------|-----------|----------|------------|
| Index Level | 1,527 | 1,565 | 3,386 | 4,797 | 3,840 |
| P/E Ratio (fwd.) | 25.2x | 15.1x | 19.2x | 21.4x | 16.7x |
| Dividend Yield | 1.4% | 1.9% | 1.9% | 1.3% | 1.8% |
| 10-yr. Treasury | 6.2% | 4.7% | 1.6% | 1.6% | 3.9% |



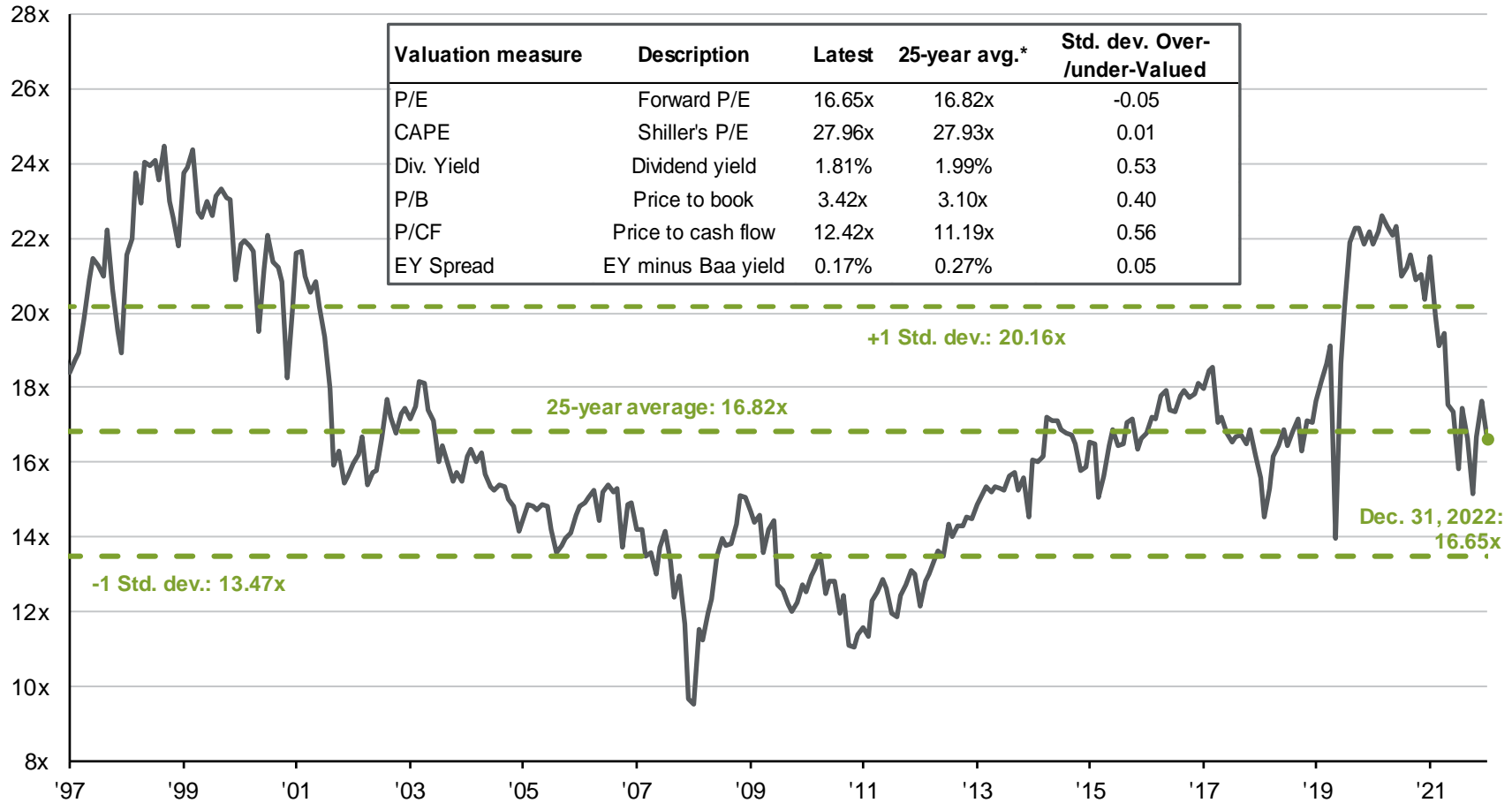
Source: Compustat, FactSet, Federal Reserve, Refinitiv Datastream, Standard & Poor's, J.P. Morgan Asset Management. Dividend yield is calculated as consensus estimates of dividends for the next 12 months, divided by most recent price, as provided by Compustat. Forward price-to-earnings ratio is a bottom-up calculation based on IBES estimates and FactSet estimates since January 2022. Returns are cumulative and based on S&P 500 Index price movement only, and do not include the reinvestment of dividends. Past performance is not indicative of future returns.
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S&P 500 valuation measures

Equities

S&P 500 Index: Forward P/E ratio



Source: FactSet, FRB, Refinitiv Datastream, Robert Shiller, Standard & Poor's, Thomson Reuters, J.P. Morgan Asset Management. Price-to-earnings is price divided by consensus analyst estimates of earnings per share for the next 12 months as provided by IBES since December 1997 and by FactSet since January 2022. Current next 12-months consensus earnings estimates are \$231. Average P/E and standard deviations are calculated using 25 years of history. Shiller's P/E uses trailing 10-years of inflation-adjusted earnings as reported by companies. Dividend yield is calculated as the next 12-months consensus dividend divided by most recent price. Price-to-book ratio is the price divided by book value per share. Price-to-cash flow is price divided by NTM cash flow. EY minus Baa yield is the forward earnings yield (consensus analyst estimates of EPS over the next 12 months divided by price) minus the Moody's Baa seasoned corporate bond yield. Std. dev. over-/under-valued is calculated using the average and standard deviation over 25 years for each measure. *P/CF is a 20-year average due to cash flow availability. Guide to the Markets - U.S. Data are as of December 31, 2022.

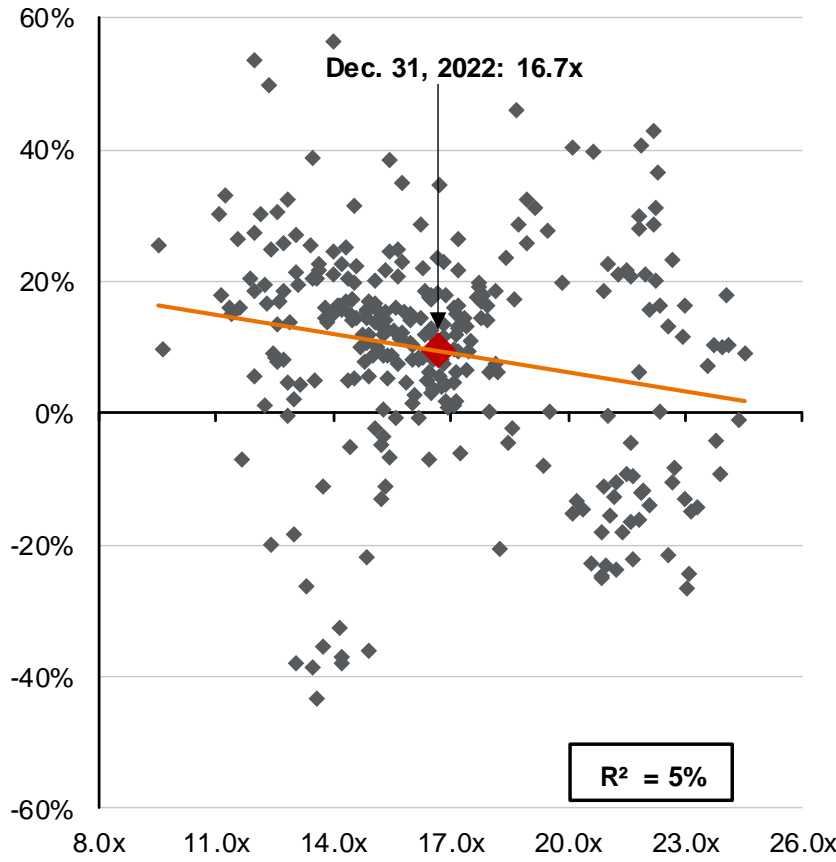


P/E ratios and equity returns

Equities

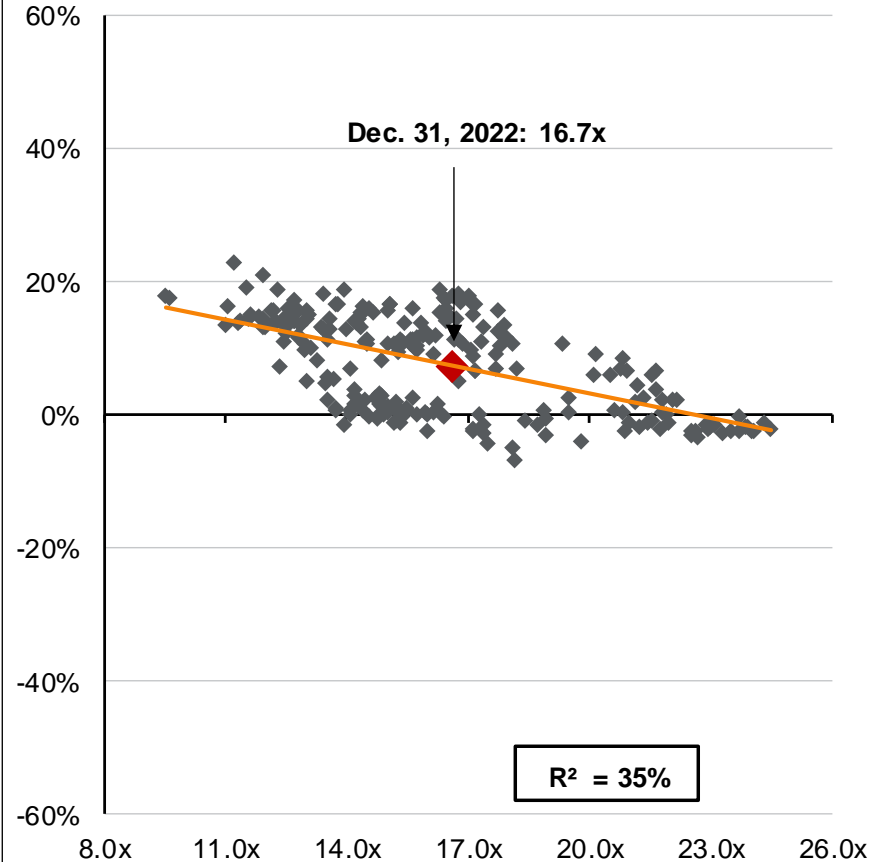
Forward P/E and subsequent 1-yr. returns

S&P 500 Total Return Index



Forward P/E and subsequent 5-yr. annualized returns

S&P 500 Total Return Index



Source: FactSet, Refinitiv Datastream, Standard & Poor's, Thomson Reuters, J.P. Morgan Asset Management. Returns are 12-month and 60-month annualized total returns, measured monthly, beginning 11/30/97. R^2 represents the percent of total variation in total returns that can be explained by forward price-to-earnings ratios. Price-to-earnings is price divided by consensus analyst estimates of earnings per share for the next 12 months as provided by IBES since January 1997 and by FactSet since January 2022. *Guide to the Markets – U.S.* Data are as of December 31, 2022.

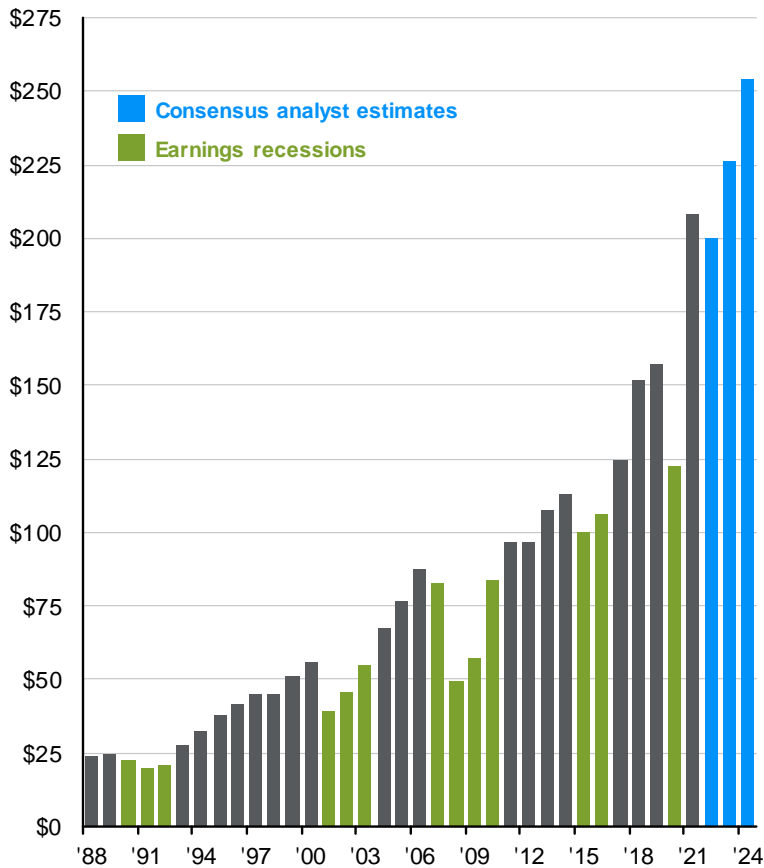


Corporate earnings and analyst expectations

Equities

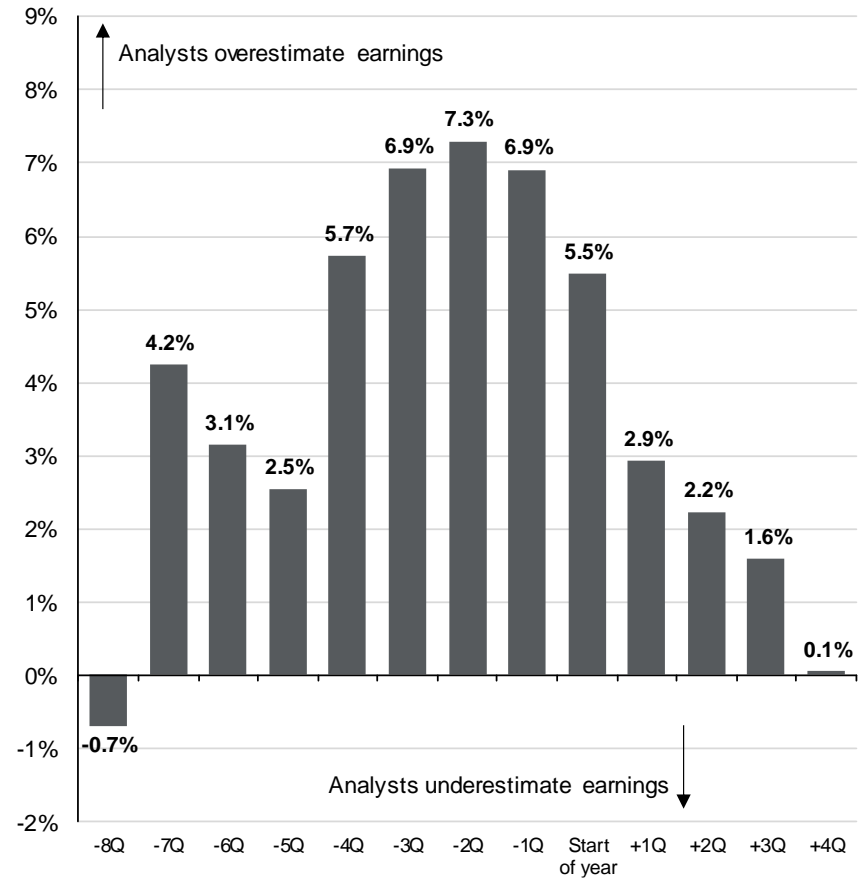
S&P 500 earnings per share

Index annual operating earnings



Average analyst over/underestimate of annual earnings

S&P 500, pro-forma EPS, 1996 - 2021



Source: Compustat, FactSet, Standard & Poor's, J.P. Morgan Asset Management. Historical EPS levels are based on annual operating earnings per share. Earnings estimates are based on estimates from Standard & Poor's and FactSet Market Aggregates. *Earnings and multiple growth are both year-to-date percent changes of next 12-month estimates. Past performance is not indicative of future returns. *Guide to the Markets – U.S.* Data are as of December 31, 2022.

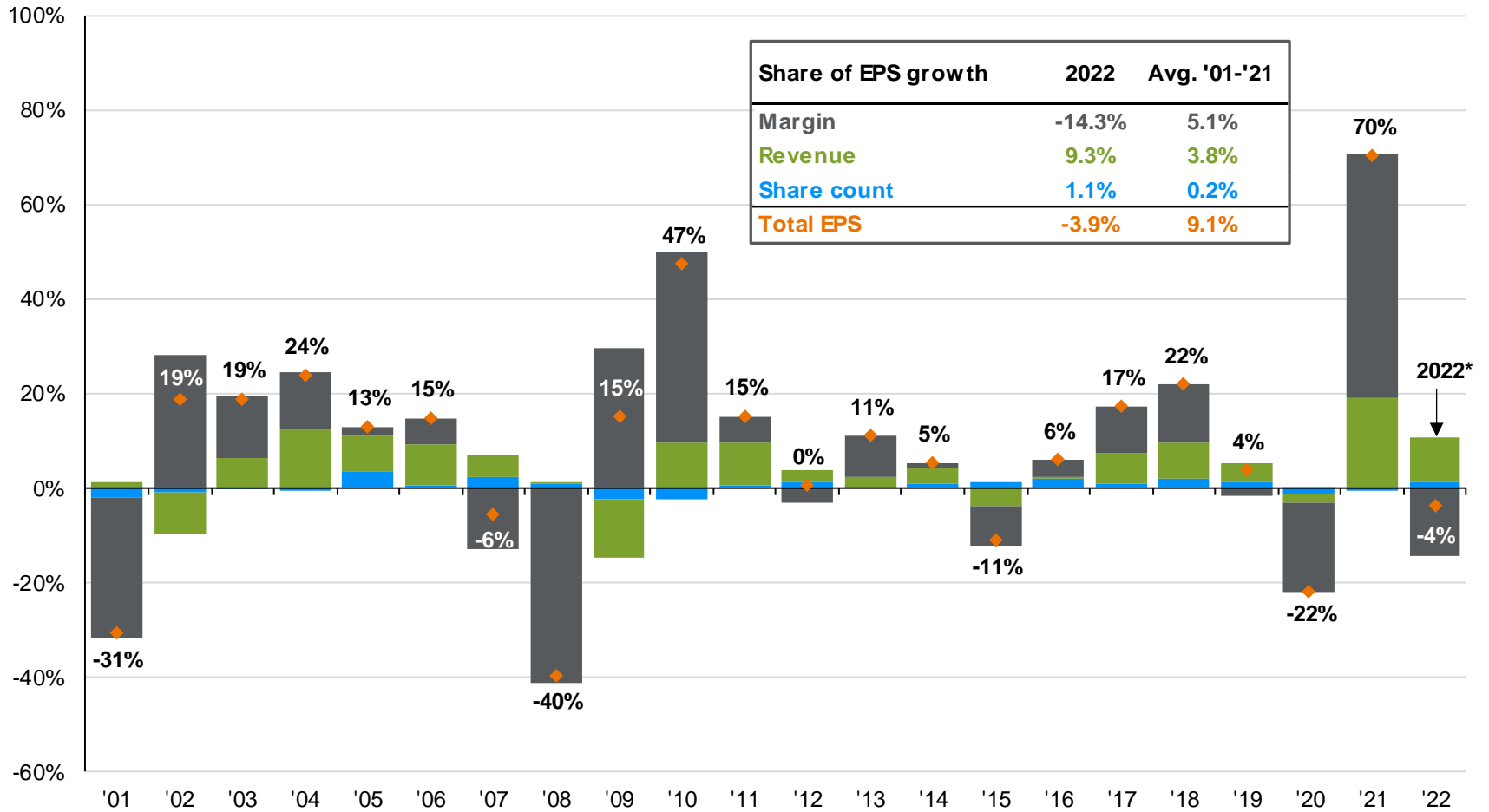


Sources of earnings per share growth

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.
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Profit margins

Equities

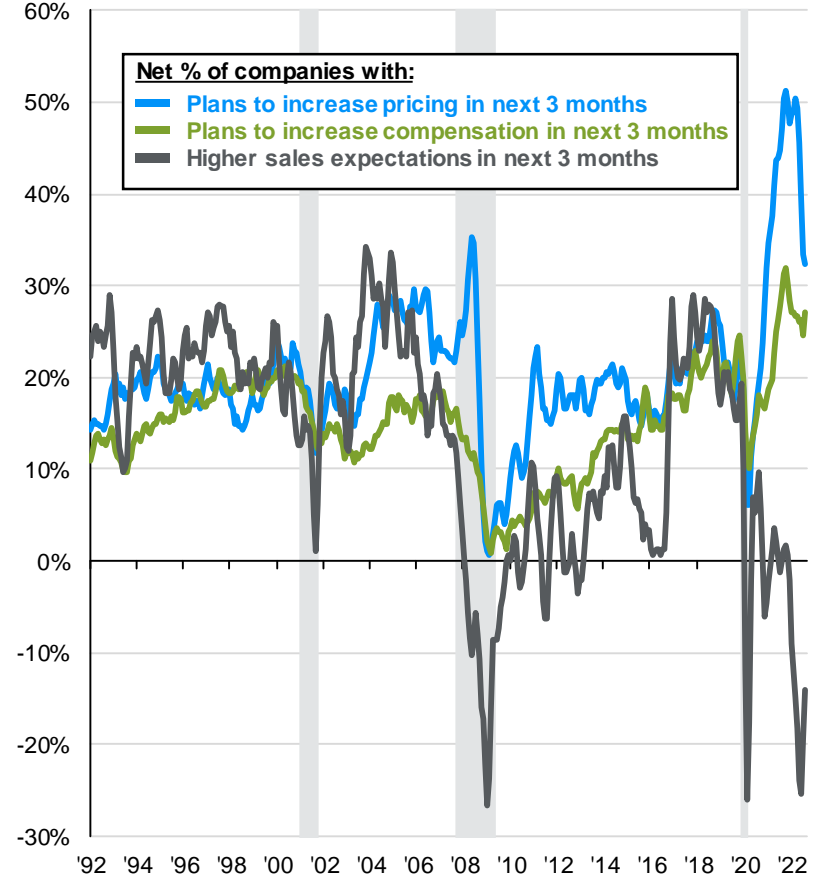
S&P 500 profit margins

Quarterly operating earnings/sales



Pricing, wages, and sales expectations for businesses

NFIB Small Business Economic Survey, three-month moving average



Source: Compustat, FactSet, NFIB, Standard & Poor's, J.P. Morgan Asset Management. Past performance is not indicative of future returns. (Left)* 3Q22 operating margins are based on 98.8% of S&P 500 companies having reported earnings. (Right) All three data series are net and represent the % of respondents answering higher less the % of respondents answering lower. Data reflects answers to the following three questions: "What are your pricing plans in the next 3 months?," "What are your compensation plans in the next 3 months?," "What are your sales expectations in the next 3 months?"
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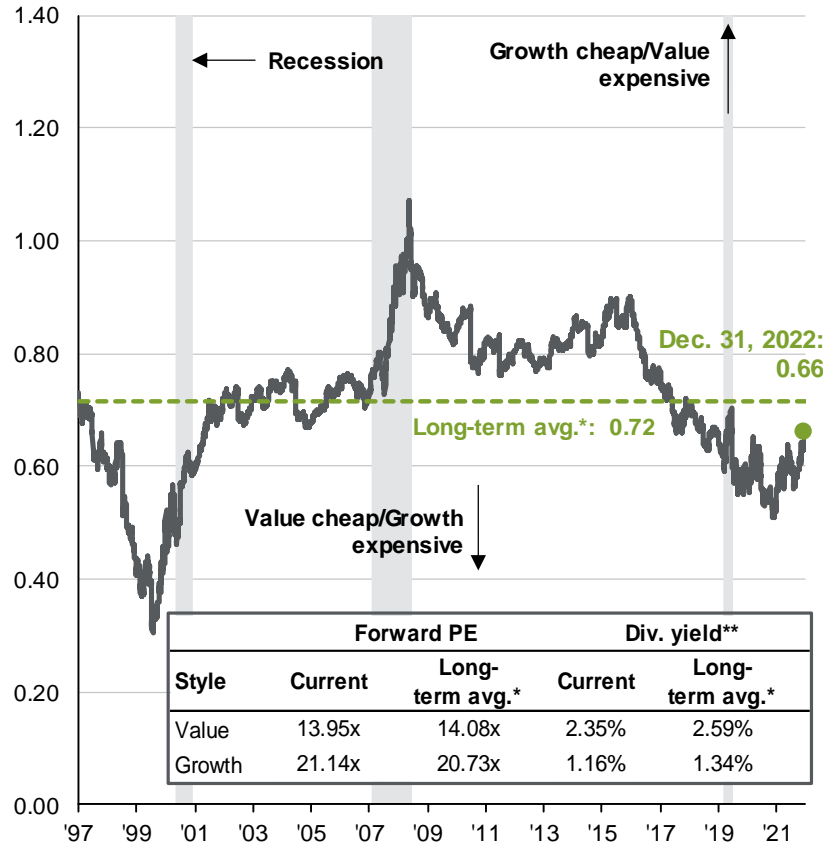


Value vs. Growth

Equities

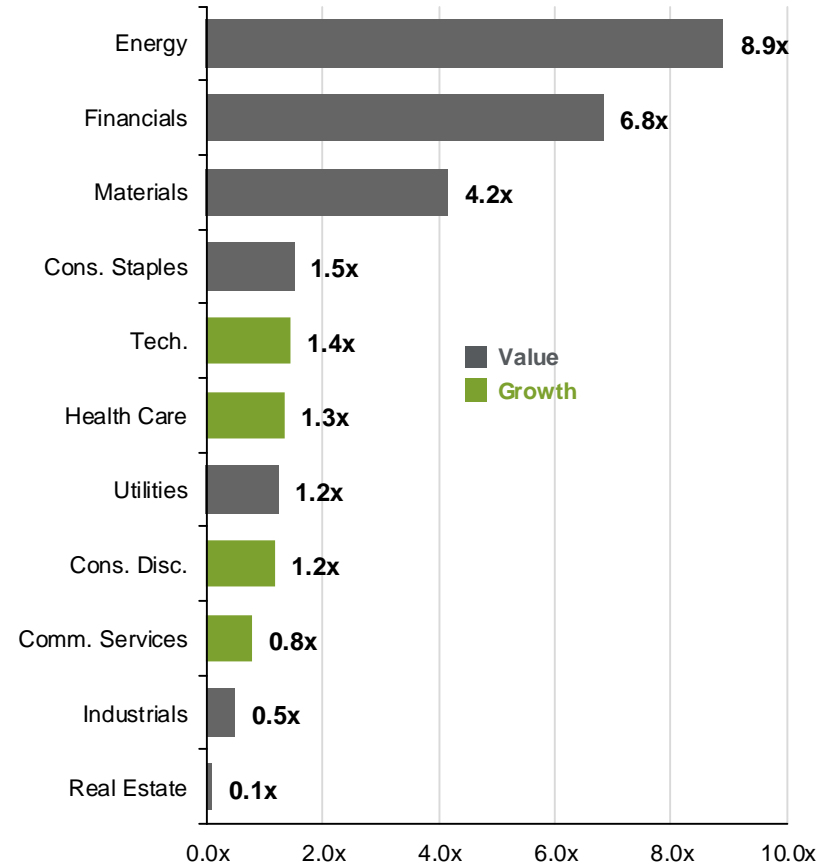
Value vs. Growth relative valuations

Rel. fwd. P/E ratio of Value vs. Growth, 1997 - present



S&P 500 operating leverage by sector

Impact on operating income from a 1% rise in revenues



Source: FactSet, FTSE Russell, NBER, J.P. Morgan Asset Management.

(Left) Growth is represented by the Russell 1000 Growth Index and Value is represented by the Russell 1000 Value Index. *Long-term averages are calculated monthly since December 1997. **Dividend yield is calculated as the next 12-month consensus dividend divided by most recent price. (Right) Operating leverage is a bottom-up calculation based on the 5-year compounded annual growth rate (CAGR) in EBIT divided by the 5-year CAGR in revenues. Each sector's operating leverage is weighted by market cap. Calculations use EBIT and revenue over the 5-year period between 2016 and 2021.

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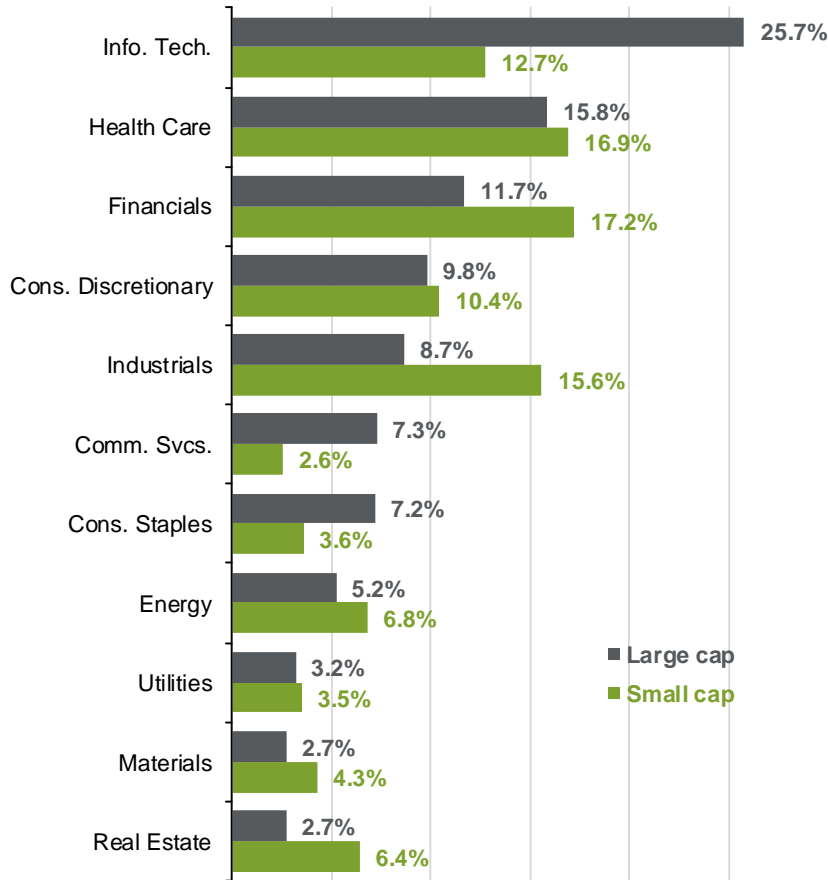


Small cap vs. large cap stocks

Equities

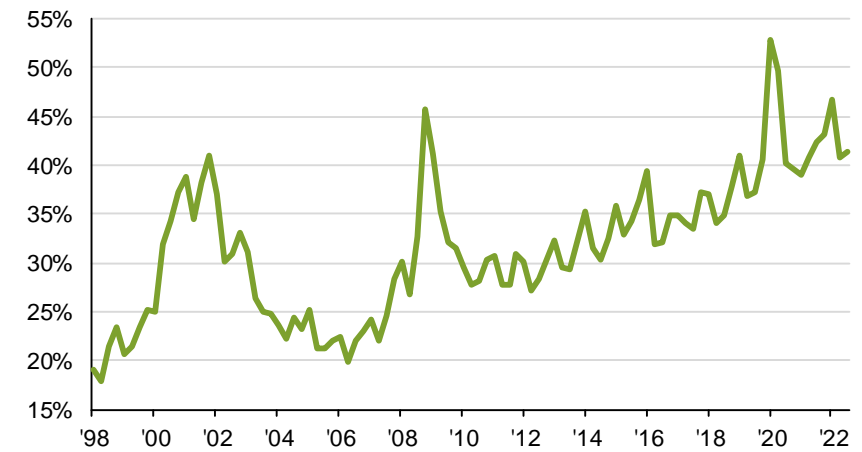
Sector composition

% of index market capitalization



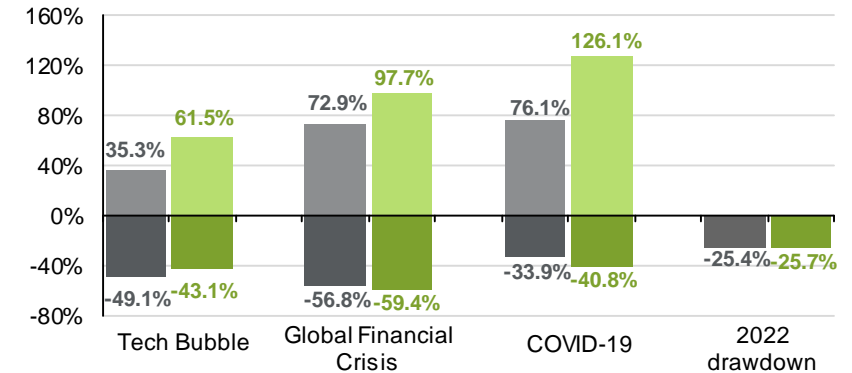
Percent of unprofitable companies in the Russell 2000

1Q98 – 3Q22, pro-forma EPS



Historical markets drawdown and next 12-month rebound

Price return



Source: Compustat, FactSet, FTSE Russell, NBER, J.P. Morgan Asset Management.

The S&P 500 is used for large cap and the Russell 2000 is used for small cap. Market drawdowns during the Tech Bubble, Global Financial Crisis, COVID-19 and the 2022 drawdown were calculated for the periods 3/24/00 – 10/9/02, 10/9/07 – 3/9/09, 2/19/20 – 3/23/20, and 1/3/2022 – 9/30/2022, respectively.

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Returns and valuations by style

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U.S.

12

10-year annualized

| | Value | Blend | Growth |
|-------|-------|-------|--------|
| Large | 10.3% | 12.6% | 14.1% |
| Mid | 10.1% | 11.0% | 11.4% |
| Small | 8.5% | 9.0% | 9.2% |

2022

| | Value | Blend | Growth |
|-------|--------|--------|--------|
| Large | -7.5% | -18.1% | -29.1% |
| Mid | -12.0% | -17.3% | -26.7% |
| Small | -14.5% | -20.4% | -26.4% |

Since market peak (February 2020)

| | Value | Blend | Growth |
|-------|-------|-------|--------|
| Large | 17.5% | 18.8% | 14.6% |
| Mid | 16.5% | 14.3% | 4.7% |
| Small | 17.2% | 7.9% | -3.0% |

Since market low (March 2020)

| | Value | Blend | Growth |
|-------|--------|-------|--------|
| Large | 90.0% | 79.4% | 67.2% |
| Mid | 105.9% | 91.4% | 62.9% |
| Small | 106.1% | 81.8% | 57.6% |

Current P/E vs. 20-year avg. P/E

| | Value | Blend | Growth |
|-------|-------------|-------------|-------------|
| Large | 13.9 / 13.7 | 16.7 / 15.5 | 21.1 / 18.6 |
| Mid | 13.4 / 14.4 | 15.3 / 16.3 | 21.0 / 20.3 |
| Small | 15.3 / 16.8 | 19.1 / 21.3 | 25.3 / 35.6 |

Current P/E as % of 20-year avg. PE

| | Value | Blend | Growth |
|-------|--------|--------|--------|
| Large | 102.0% | 107.6% | 113.7% |
| Mid | 92.6% | 93.8% | 103.3% |
| Small | 90.7% | 89.4% | 71.2% |

Source: FactSet, Refinitiv Datastream, Russell Investment Group, Standard & Poor's, J.P. Morgan Asset Management. All calculations are cumulative total return, including dividends reinvested for the stated period. Since Market Peak represents period from February 19, 2020 to December 31, 2022. Since Market Low represents period from March 23, 2020 to December 31, 2022. Returns are cumulative returns, not annualized. For all time periods, total return is based on Russell style indices except for the large blend category, which is based on the S&P 500 Index. Past performance is not indicative of future returns. The price-to-earnings is a bottom-up calculation based on the most recent index price, divided by consensus estimates for earnings in the next 12 months (NTM) and is provided by FactSet Market Aggregates and J.P. Morgan Asset Management.
Guide to the Markets – U.S. Data are as of December 31, 2022.



Returns and valuations by sector

GTM U.S. 13

Equities

| | Energy | Materials | Financials | Industrials | Cons. Disc. | Tech. | Comm. Services* | Real Estate | Health Care | Cons. Staples | Utilities | S&P 500 Index | |
|---|--------|-----------|------------|-------------|-------------|-------|-----------------|-------------|-------------|---------------|-----------|---------------|-------------------|
| S&P weight | 5.2% | 2.7% | 11.7% | 8.7% | 9.8% | 25.7% | 7.3% | 2.7% | 15.8% | 7.2% | 3.2% | 100.0% | Weight |
| Russell Growth weight | 1.7% | 1.5% | 3.3% | 8.1% | 14.2% | 43.2% | 6.8% | 1.6% | 13.5% | 6.1% | 0.1% | 100.0% | |
| Russell Value weight | 8.4% | 4.3% | 20.1% | 10.5% | 6.0% | 8.3% | 7.3% | 4.5% | 17.4% | 7.4% | 5.8% | 100.0% | |
| Russell 2000 weight | 6.8% | 4.3% | 17.2% | 15.6% | 10.4% | 12.7% | 2.6% | 6.4% | 16.9% | 3.6% | 3.5% | 100.0% | |
| 4Q22 | 22.8 | 15.0 | 13.6 | 19.2 | -10.2 | 4.7 | -1.4 | 3.8 | 12.8 | 12.7 | 8.6 | 7.6 | Return (%) |
| 2022 | 65.7 | -12.3 | -10.5 | -5.5 | -37.0 | -28.2 | -39.9 | -26.1 | -2.0 | -0.6 | 1.6 | -18.1 | |
| Since market peak (February 2020) | 86.6 | 36.9 | 17.4 | 23.1 | -1.8 | 24.0 | -15.2 | -0.9 | 37.4 | 27.3 | 10.6 | 18.8 | |
| Since market low (March 2020) | 323.4 | 114.1 | 105.7 | 111.2 | 43.8 | 80.1 | 18.8 | 59.1 | 90.6 | 67.6 | 71.8 | 79.4 | |
| Beta to S&P 500 | 1.3 | 1.1 | 1.1 | 1.1 | 1.2 | 1.1 | 1.0* | 0.8 | 0.8 | 0.6 | 0.5 | 1.0 | β |
| Correl. to Treas. yields | 0.1 | -0.4 | -0.3 | -0.4 | -0.5 | -0.7 | -0.6 | -0.5 | -0.4 | -0.3 | -0.4 | -0.5 | ρ |
| Foreign % of sales | 37.8 | 55.2 | 21.3 | 32.3 | 34.4 | 57.6 | 42.8 | 15.5 | 36.1 | 43.1 | 2.0 | 39.6 | % |
| NTM earnings growth | -13.2% | -11.2% | 14.1% | 14.5% | 30.4% | 3.9% | 7.8% | 2.5% | -3.6% | 3.5% | 7.4% | 4.6% | EPS |
| 20-yr avg. | 101.0% | 16.4% | 20.9% | 14.0% | 16.7% | 13.6% | 10.2%* | 6.7% | 8.4% | 7.7% | 4.2% | 11.2% | |
| Forward P/E ratio | 9.7x | 15.8x | 12.1x | 18.1x | 20.8x | 20.2x | 14.1x | 16.6x | 17.5x | 21.0x | 19.0x | 16.7x | P/E |
| 20-yr avg. | 13.8x | 14.7x | 12.4x | 16.2x | 19.2x | 18.0x | 19.0x* | 16.7x | 15.1x | 17.3x | 15.4x | 15.5x | |
| Buyback yield | 2.8% | 3.2% | 3.1% | 2.5% | 2.5% | 2.7% | 5.0% | -1.7% | 1.7% | 1.4% | -1.1% | 2.5% | Bbk |
| 20-yr avg. | 1.6% | 0.9% | 0.3% | 2.2% | 2.4% | 2.9% | 1.5% | -1.3% | 1.9% | 1.8% | -1.0% | 1.7% | |
| Dividend yield | 3.2% | 2.1% | 2.3% | 1.8% | 1.1% | 1.2% | 1.2% | 3.7% | 1.7% | 2.7% | 3.1% | 1.8% | Div |
| 20-yr avg. | 2.8% | 2.4% | 2.3% | 2.2% | 1.4% | 1.1% | 0.0% | 3.9% | 1.9% | 2.8% | 3.9% | 2.1% | |

Source: FactSet, Refinitiv Datastream, Russell Investment Group, Standard & Poor's, J.P. Morgan Asset Management. All calculations are cumulative total return, not annualized, including dividends for the stated period. Since market peak represents period from February 19, 2020 to December 31, 2022. Since market low represents period from March 23, 2020 to December 31, 2022. Correlation to Treasury yields are trailing 2-year monthly correlations between S&P 500 sector price returns and 10-year Treasury yield movements. Next 12 months (NTM) earnings growth is the percent change in next 12-months earnings estimates compared to last 12-months earnings provided by brokers. Forward P/E ratio is a bottom-up calculation based on the most recent S&P 500 Index price, divided by consensus estimates for earnings in the next 12 months (NTM), and is provided by FactSet Market Aggregates and J.P. Morgan Asset Management. Buyback yield is net of share issuance and is calculated as last 12-months net buybacks divided by market cap. Dividend yield is calculated as the next 12-months consensus dividend divided by most recent price. Beta calculations are based on 10-years of monthly price returns for the S&P 500 and its sub-indices. *Communication Services (formerly Telecom) averages and beta are based on 5-years of backtested data by JPMAM. Past performance is not indicative of future returns.

Guide to the Markets – U.S. Data are as of December 31, 2022.



Factor performance

Equities

| | | | | | | | | | | | | | | | 2008 - 2022 | |
|------------------------|-----------------------|-----------------------|----------------------|-----------------------|-----------------------|-----------------------|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------|----------------------|-----------------------|
| 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | Ann. | Vol. |
| Min. Vol. -25.7% | Value 38.8% | Small Cap 26.9% | High Div. 14.3% | Cyclical 20.1% | Value 43.2% | Value 17.7% | Momen. 9.3% | Small Cap 21.3% | Momen. 37.8% | Min. Vol. 1.5% | Cyclical 36.3% | Momen. 29.6% | Value 29.2% | Defens. 5.3% | Min. Vol. 9.5% | Small Cap 23.2% |
| Defens. -26.7% | Cyclical 36.9% | Multi-Factor 18.3% | Min. Vol. 12.9% | Value 16.8% | Small Cap 38.8% | Min. Vol. 16.5% | Min. Vol. 5.6% | High Div. 16.3% | Cyclical 27.3% | Momen. -1.6% | Quality 34.4% | Cyclical 27.8% | Cyclical 27.6% | High Div. -3.8% | Momen. 9.2% | Value 21.4% |
| High Div. -27.6% | Multi-Factor 29.8% | Momen. 18.2% | Defens. 10.1% | Small Cap 16.3% | Multi-Factor 37.4% | High Div. 14.9% | Quality 4.6% | Value 15.9% | Quality 22.5% | High Div. -2.3% | Momen. 28.1% | Small Cap 20.0% | Quality 27.2% | Min. Vol. -9.2% | Quality 9.2% | Cyclical 20.9% |
| Quality -31.2% | Small Cap 27.2% | Cyclical 17.9% | Quality 7.5% | Multi-Factor 15.7% | Cyclical 35.0% | Multi-Factor 14.8% | Cyclical 2.6% | Cyclical 14.0% | Value 22.2% | Defens. -2.9% | Min. Vol. 28.0% | Quality 17.1% | Multi-Factor 25.1% | Value -14.0% | High Div. 9.1% | Momen. 19.0% |
| Small Cap -33.8% | Quality 24.9% | High Div. 15.9% | Multi-Factor 7.3% | Momen. 15.1% | Momen. 34.8% | Momen. 14.7% | High Div. 0.7% | Multi-Factor 13.7% | Multi-Factor 21.5% | Cyclical -5.3% | Value 27.7% | Multi-Factor 11.4% | Defens. 25.0% | Multi-Factor -15.5% | Cyclical 8.9% | Multi-Factor 18.5% |
| Value -36.9% | High Div. 18.4% | Min. Vol. 14.7% | Momen. 6.1% | Quality 12.8% | Quality 34.3% | Cyclical 13.6% | Multi-Factor 0.4% | Min. Vol. 10.7% | High Div. 19.5% | Quality -5.6% | Multi-Factor 26.6% | Min. Vol. 5.8% | High Div. 21.9% | Momen. -17.4% | Multi-Factor 8.5% | Quality 17.0% |
| Multi-Factor -39.3% | Min. Vol. 18.4% | Quality 14.2% | Value -2.7% | Min. Vol. 11.2% | High Div. 28.9% | Defens. 13.0% | Defens. -0.9% | Quality 9.4% | Min. Vol. 19.2% | Multi-Factor -9.7% | Small Cap 25.5% | Defens. 5.2% | Min. Vol. 21.0% | Quality -20.3% | Defens. 8.3% | High Div. 15.7% |
| Momen. -40.9% | Momen. 17.6% | Value 12.7% | Cyclical -3.4% | Defens. 10.7% | Defens. 28.9% | Quality 10.7% | Small Cap -4.4% | Defens. 7.7% | Small Cap 14.6% | Small Cap -11.0% | High Div. 22.5% | High Div. 1.7% | Small Cap 14.8% | Small Cap -20.4% | Value 8.0% | Defens. 14.5% |
| Cyclical -44.8% | Defens. 16.5% | Defens. 12.0% | Small Cap -4.2% | High Div. 10.6% | Min. Vol. 25.3% | Small Cap 4.9% | Value -6.4% | Momen. 5.1% | Defens. 12.3% | Value -11.1% | Defens. 21.4% | Value -0.2% | Momen. 12.9% | Cyclical -27.2% | Small Cap 7.2% | Min. Vol. 13.9% |

Source: FactSet, MSCI, Russell, Standard & Poor's, J.P. Morgan Asset Management. The MSCI High Dividend Yield Index aims to offer a higher than average dividend yield relative to the parent index that passes dividend sustainability and persistence screens. The MSCI Minimum Volatility Index optimizes the MSCI USA Index using an estimated security co-variance matrix to produce low absolute volatility for a given set of constraints. The MSCI Defensive Sectors Index includes: Consumer Staples, Energy, Health Care and Utilities. The MSCI Cyclical Sectors Index contains: Consumer Discretionary, Communication Services, Financials, Industrials, Information Technology and Materials. Securities in the MSCI Momentum Index are selected based on a momentum value of 12-month and 6-month price performance. Constituents of the MSCI Sector Neutral Quality Index are selected based on stronger quality characteristics to their peers within the same GICS sector by using three main variables: high return-on-equity, low leverage and low earnings variability. Constituents of the MSCI Enhanced Value Index are based on three variables: price-to-book value, price-to-forward earnings and enterprise value-to-cash flow from operations. The Russell 2000 is used for small cap. The MSCI USA Diversified Multiple Factor Index aims to maximize exposure to four factors – Value, Momentum, Quality and Size. Annualized volatility is calculated as the standard deviation of quarterly returns multiplied by the square root of 4.

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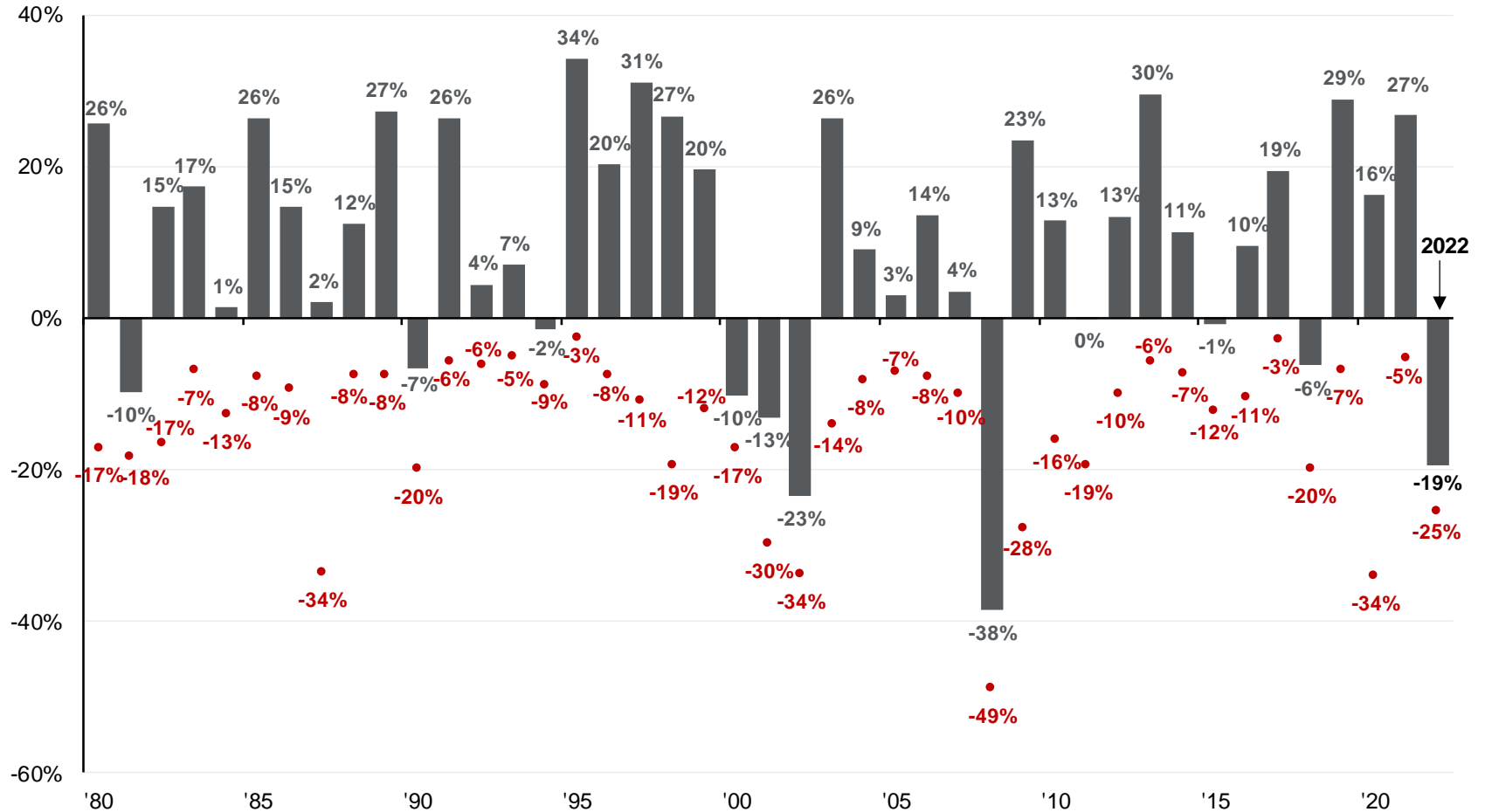


Annual returns and intra-year declines

Equities

S&P intra-year declines vs. calendar year returns

Despite average intra-year drops of 14.0%, annual returns were positive in 32 of 42 years



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

Returns are based on price index only and do not include dividends. Intra-year drops refers to the largest market drops from a peak to a trough during the year. For illustrative purposes only. Returns shown are calendar year returns from 1980 to 2021, over which time period the average annual return was 9.4%.

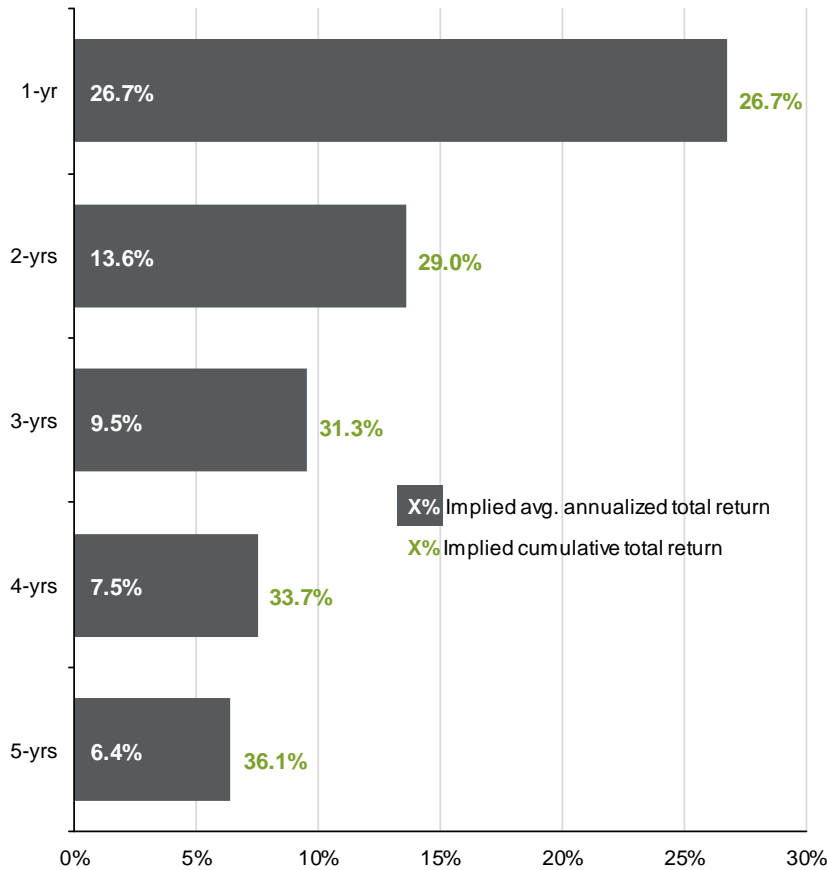
Guide to the Markets – U.S. Data are as of December 31, 2022.



Equity scenarios: Bull, bear and in-between

Equities

Return needed to reach January 2022 peak of 4797
S&P 500 level as of 12/31/2022 is 3,840



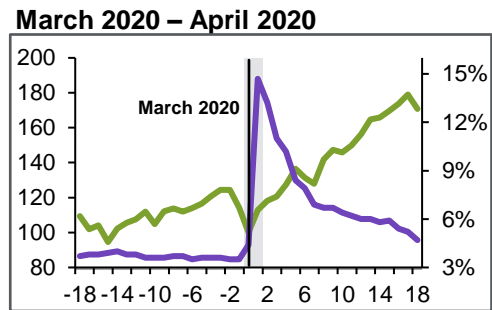
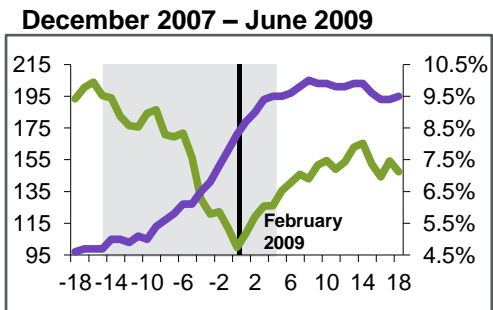
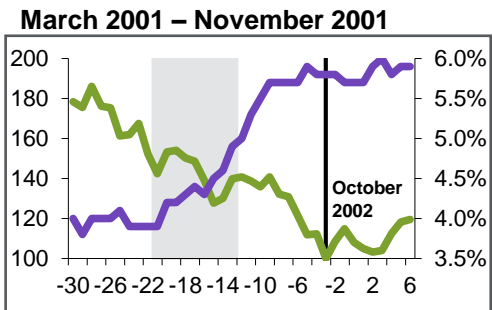
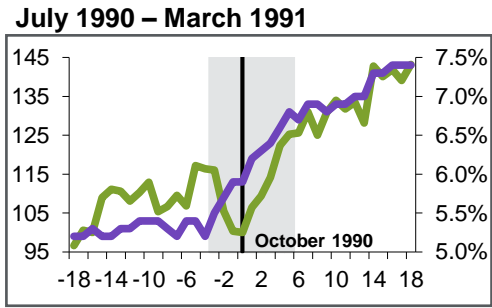
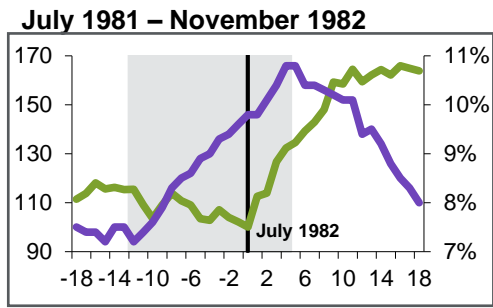
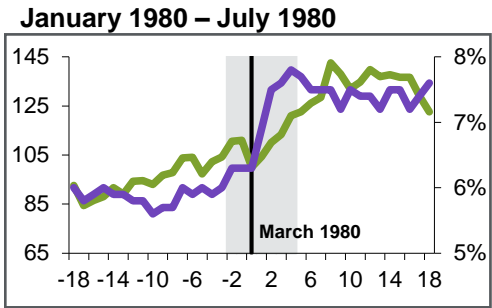
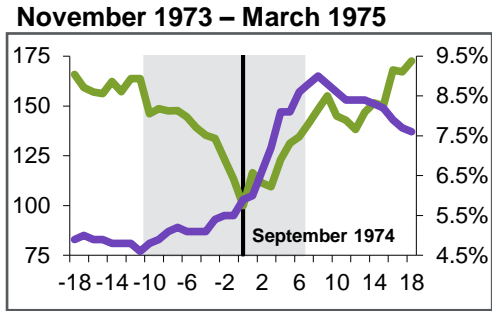
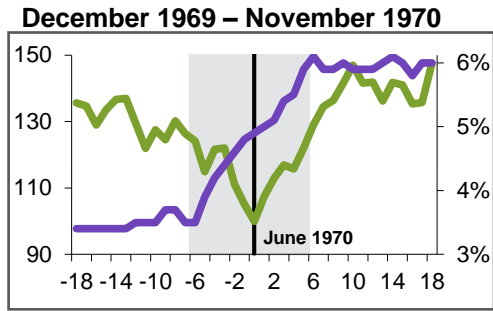
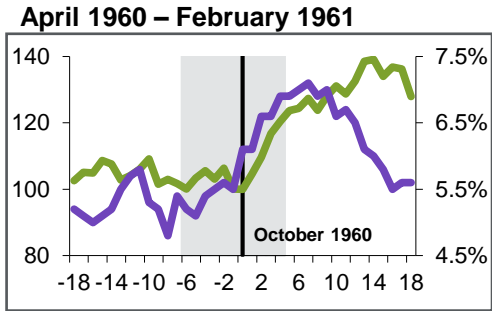
Bull and bear markets

| Bull markets | | | Bear markets | | |
|-----------------|-------------|-------------------|--------------|--------------|--------------------|
| Bull begin date | Bull return | Duration (months) | Market peak | Bear return* | Duration (months)* |
| Jul 1926 | 152% | 37 | Sep 1929 | -86% | 32 |
| Mar 1935 | 129% | 23 | Mar 1937 | -60% | 61 |
| Apr 1942 | 158% | 49 | May 1946 | -30% | 36 |
| Jun 1949 | 267% | 85 | Aug 1956 | -22% | 14 |
| Oct 1960 | 39% | 13 | Dec 1961 | -28% | 6 |
| Oct 1962 | 76% | 39 | Feb 1966 | -22% | 7 |
| Oct 1966 | 48% | 25 | Nov 1968 | -36% | 17 |
| May 1970 | 74% | 31 | Jan 1973 | -48% | 20 |
| Mar 1978 | 62% | 32 | Nov 1980 | -27% | 20 |
| Aug 1982 | 229% | 60 | Aug 1987 | -34% | 3 |
| Oct 1990 | 417% | 113 | Mar 2000 | -49% | 30 |
| Oct 2002 | 101% | 60 | Oct 2007 | -57% | 17 |
| Mar 2009 | 401% | 131 | Feb 2020 | -34% | 1 |
| Mar 2020 | 114% | 21 | Jan. 2022** | -25% | 9 |
| Averages | 162% | 51 | - | -41% | 20 |

Source: FactSet, NBER, Robert Shiller, Standard & Poor's, J.P. Morgan Asset Management. (Left) The current peak of 4797 was observed on January 3, 2022. (Right) *A bear market is defined as a 20% or more decline from the previous market high. The related market return is the peak to trough return over the cycle. Bear and bull returns are price returns. **The bear market beginning in January 2022 is currently ongoing, with the "bear return" and duration for this period calculated from the January 2022 market peak through the current trough in October 2022. Averages for the bear market return and duration do not include figures from the current cycle. *Guide to the Markets – U.S.* Data are as of December 31, 2022.



Market inflection points, recessions and the unemployment rate



— Unemployment Rate Recession
— S&P 500 Total Return Market Low

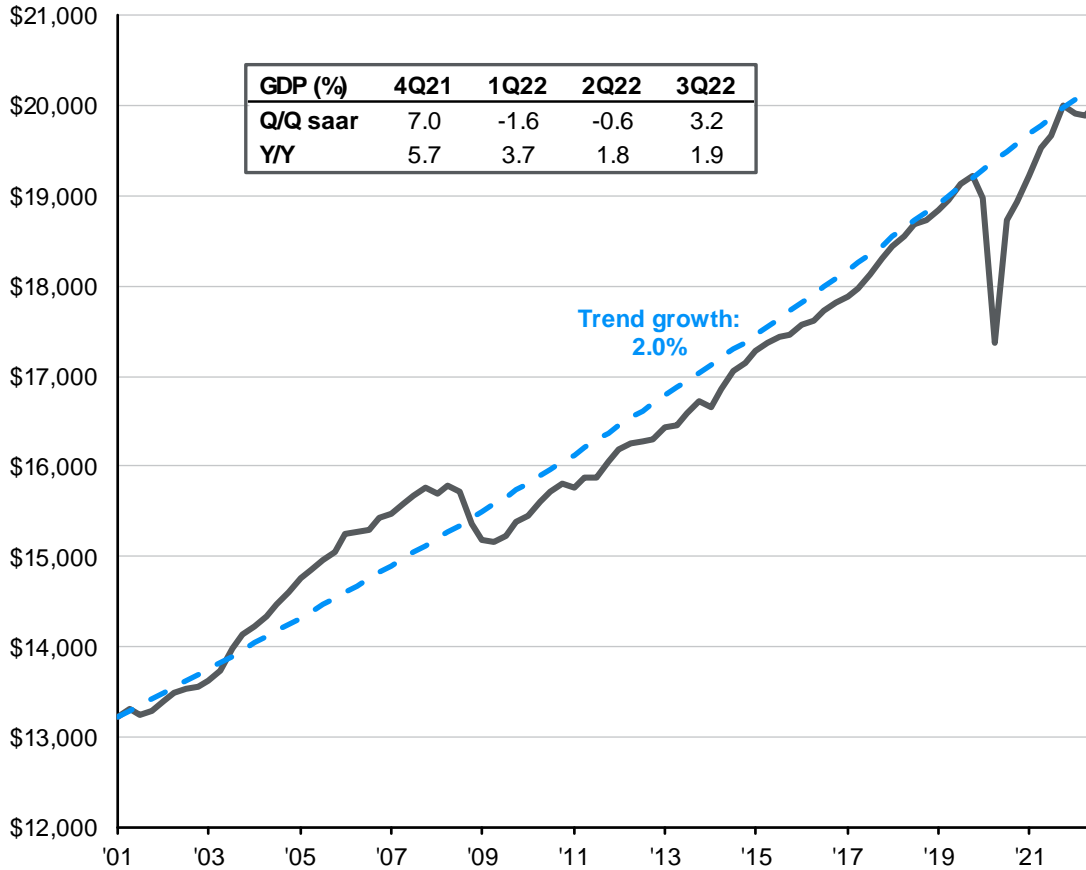
Source: BLS, Ibbotson, J.P. Morgan Asset Management. Time zero represents the numeric low of the S&P 500 Total Return Index associated with the recessionary period defined by the shaded grey area; data shown in months. S&P 500 Index is rebased to 100 at time zero. *Guide to the Markets – U.S.* Data are as of December 31, 2022.



Economic growth and the composition of GDP

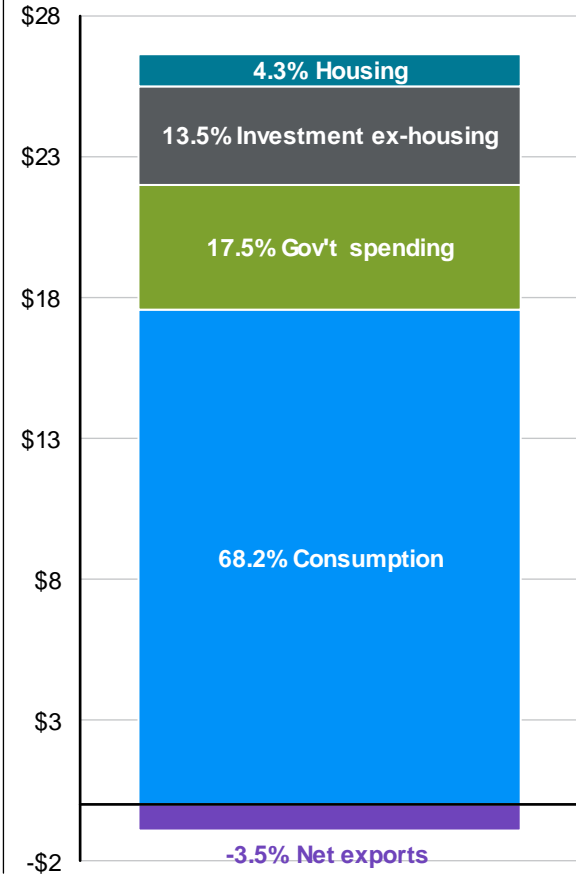
Real GDP

Billions of chained (2012) dollars, seasonally adjusted at annual rates



Components of GDP

3Q22 nominal GDP, USD trillions



Source: BEA, FactSet, J.P. Morgan Asset Management. Values may not sum to 100% due to rounding. Trend growth is measured as the average annual growth rate from business cycle peak 1Q01 to business cycle peak 4Q19. Guide to the Markets – U.S. Data are as of December 31, 2022.

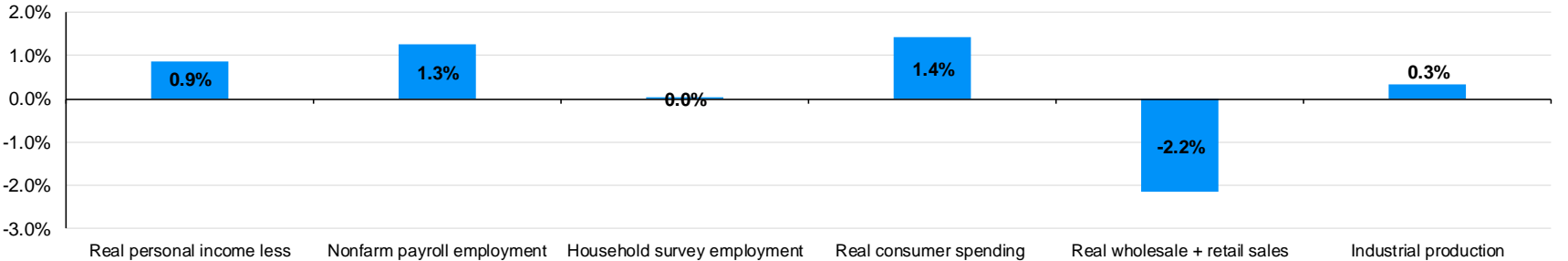


Recession determinants

Variables used by the NBER in making recession determination*
% change month-over-month



% change, last six months



Source: Bureau of Economic Analysis, Bureau of Labor Statistics, Census Bureau, Federal Reserve of St. Louis, NBER, J.P. Morgan Asset Management. Heatmap shading reflects 10 years of data, with green and red reflecting a range of +/- 0.5 standard deviations from a baseline of 0% monthly growth. *The NBER's definition of a recession involves a significant decline in economic activity that is spread across the economy and lasts more than a few months. Because a recession must influence the economy broadly and not be confined to one sector, the committee emphasizes economy-wide measures of economic activity. Specifically, they consider real personal income less transfers, nonfarm payroll employment, employment as measured by the household survey, real personal consumption expenditures, wholesale-retail sales adjusted for price changes and industrial production. There is no fixed rule about which measures contribute to the process or how they are weighted, but the committee notes that "in recent decades, the two measures we have put the most weight on are real personal income less transfers and nonfarm payroll employment."

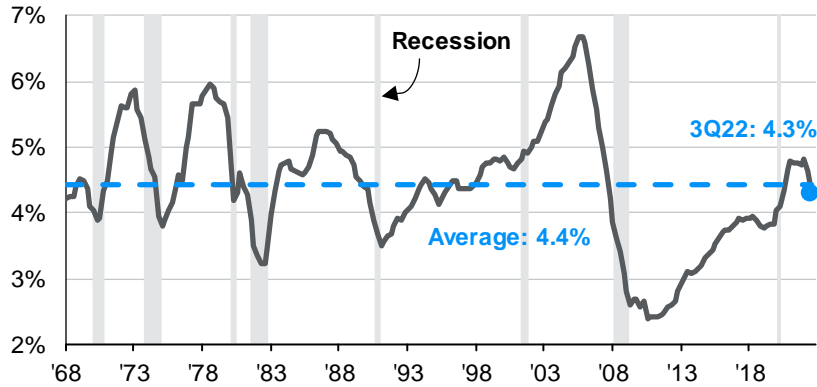
Guide to the Markets – U.S. Data are as of December 31, 2022.



Cyclical sectors

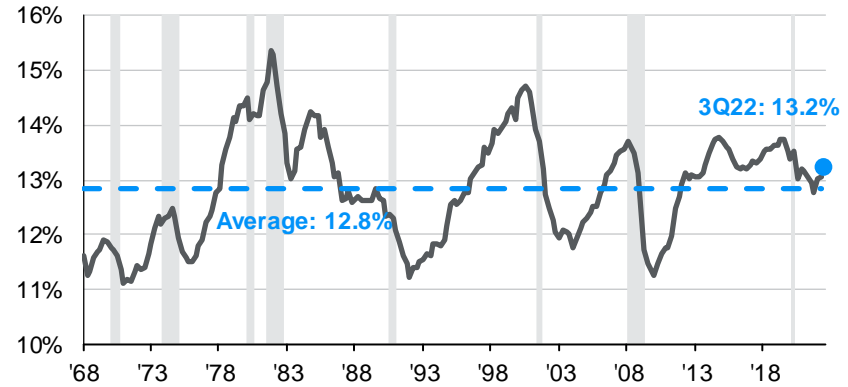
Residential investment as a % of GDP

Quarterly, seasonally adjusted



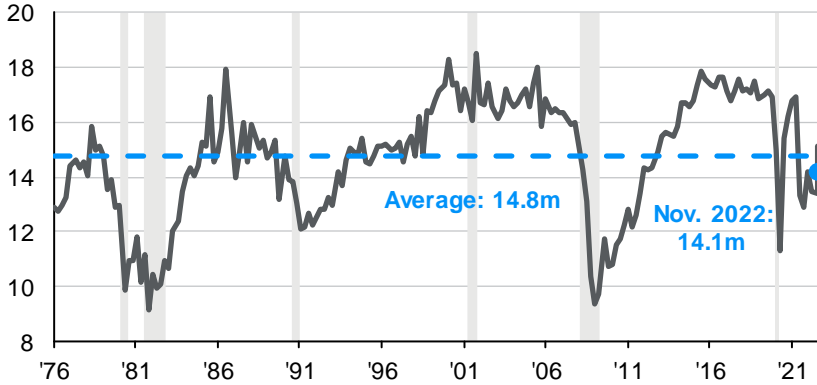
Business fixed investment as a % of GDP

Quarterly, seasonally adjusted



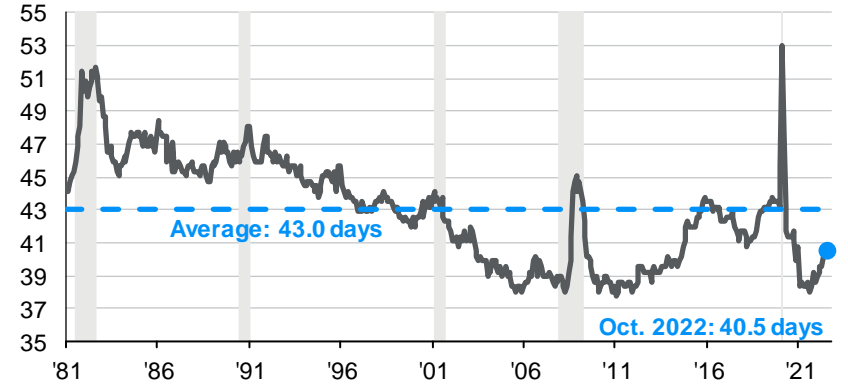
Light vehicle sales

Mil vehicles, seasonally adjusted ann. rate



Total business inventory/sales ratio

Days of sales, monthly, seasonally adjusted



Source: BEA, Census Bureau, FactSet, J.P. Morgan Asset Management. Data for light vehicle sales is quarterly apart from the latest monthly data point.

Guide to the Markets – U.S. Data are as of December 31, 2022.

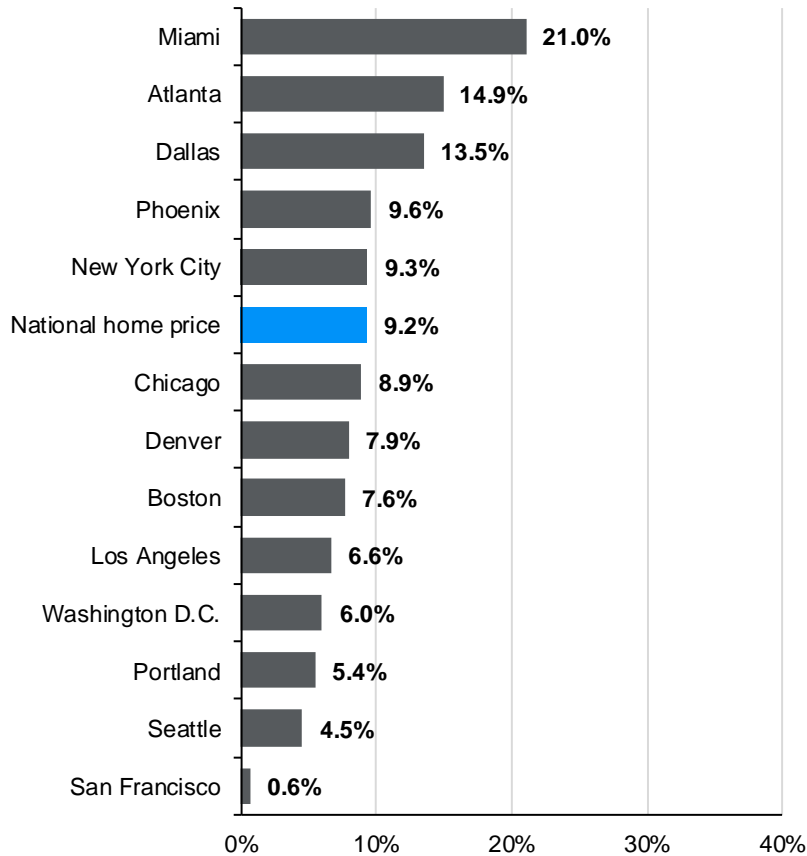


Home prices and affordability

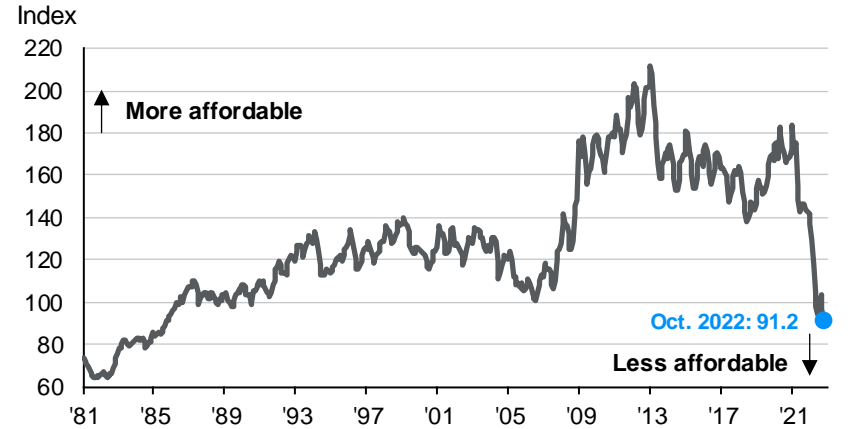
Economy

U.S. home price growth by city

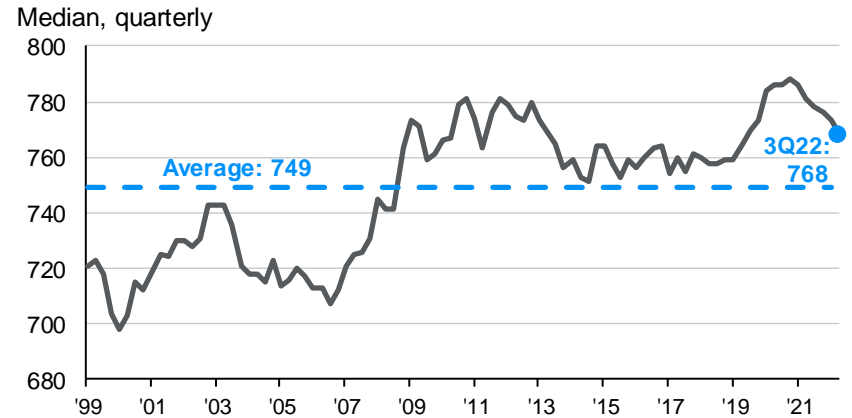
S&P Case-Shiller Home Price Index, Oct. 2022, y/y % change



Housing affordability index*



Credit score at mortgage origination



Source: J.P. Morgan Asset Management. (Left) FactSet, Robert Shiller, Standard & Poor's; (Top right) U.S. National Association of Realtors; (Bottom right) New York Fed Consumer Credit Panel/Equifax. *Based on the National Association of Realtors methodology, an index value above 100 signifies that a family earning the median income has more than enough income to qualify for a mortgage loan on a median-priced home. The calculation assumes a down payment of 20% of the home price and it assumes a qualifying ratio of 25%.
 Guide to the Markets – U.S. Data are as of December 31, 2022.

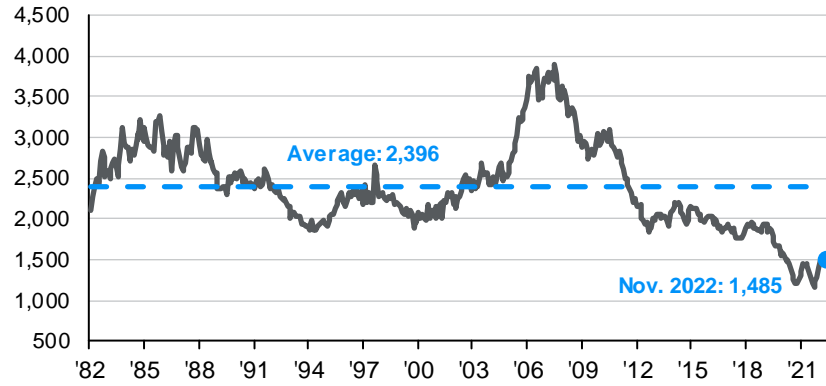


Residential real estate

Economy

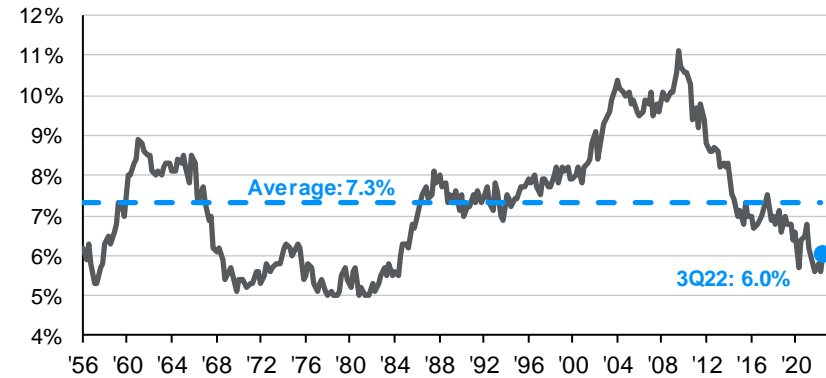
Housing inventories

Inventory of new and existing single family homes for sale, thous, SA*



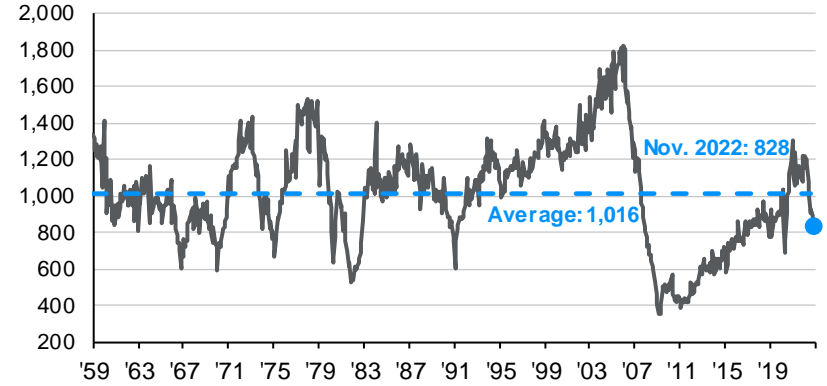
Rental vacancy rate

Percent



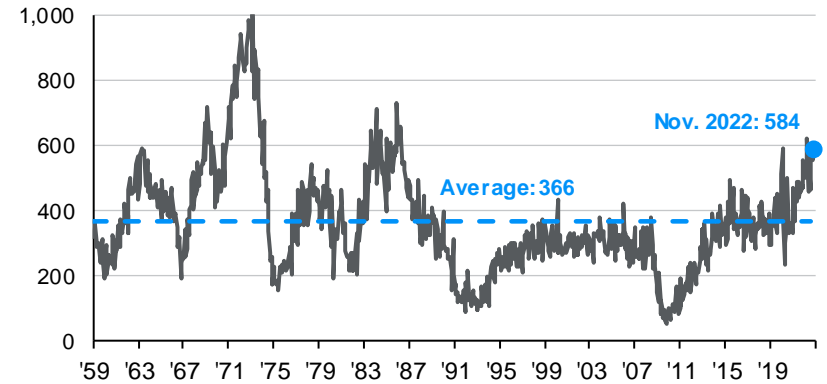
Single-family housing starts

Seasonally adjusted annual rate (SAAR), thous houses



Multi-family housing starts

Seasonally adjusted annual rate (SAAR), thous houses



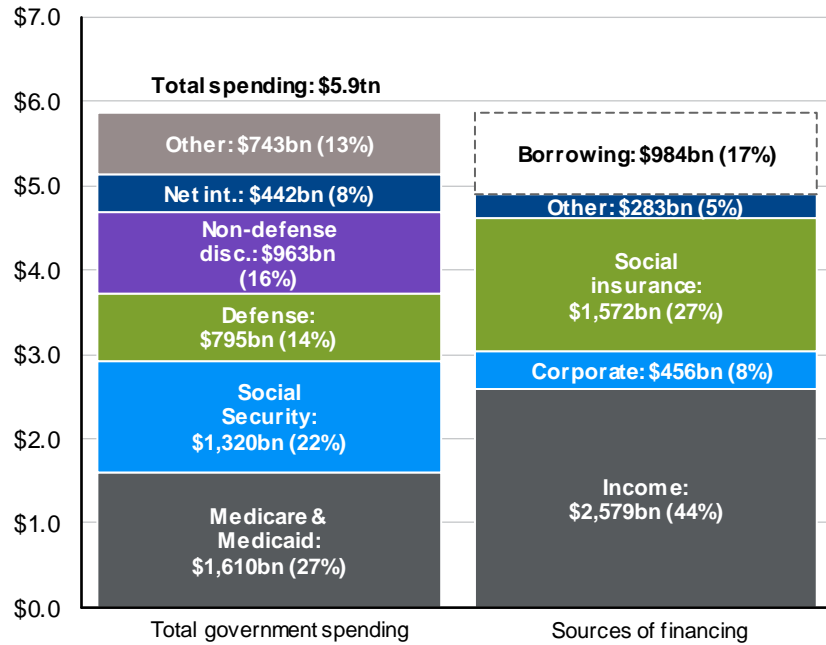
Source: U.S. Census Bureau, U.S. National Association of Realtors, J.P. Morgan Asset Management. *Inventory of new and existing single family homes for sale is seasonally adjusted by J.P. Morgan Asset Management. Guide to the Markets – U.S. Data are as of December 31, 2022.



Federal finances

The 2023 federal budget

CBO Baseline forecast, USD trillions

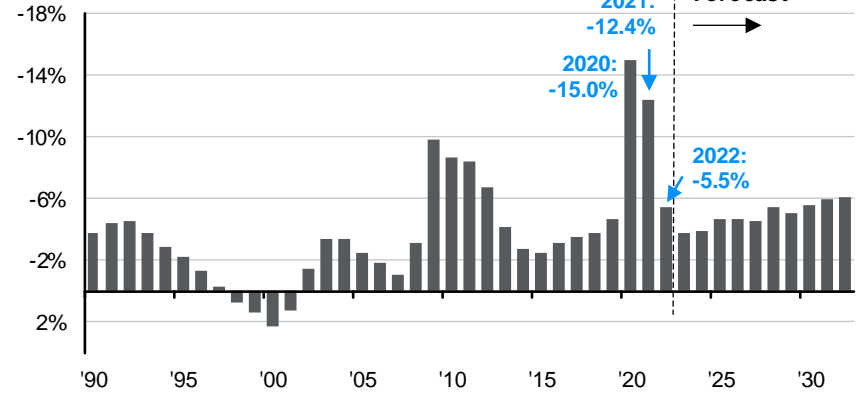


CBO's Baseline economic assumptions

| | 2023 | '24-'25 | '26-'27 | '28-'32 |
|--------------------------|------|---------|---------|---------|
| Real GDP growth | 3.0% | 1.6% | 1.5% | 1.7% |
| 10-year Treasury | 2.8% | 3.1% | 3.5% | 3.8% |
| Headline inflation (CPI) | 3.6% | 2.4% | 2.3% | 2.4% |
| Unemployment | 3.6% | 3.7% | 4.1% | 4.5% |

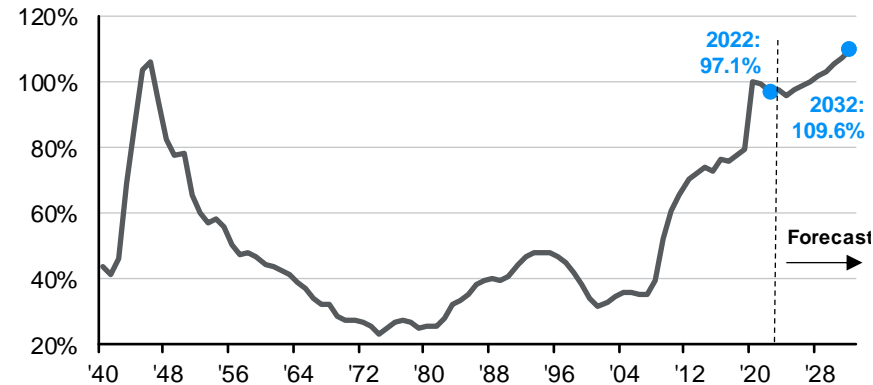
Federal budget surplus/deficit

% of GDP, 1990 – 2032, CBO Baseline Forecast



Federal net debt (accumulated deficits)

% of GDP, 1940 – 2032, CBO Baseline Forecast, end of fiscal year



Source: CBO, J.P. Morgan Asset Management; (Top and bottom right) BEA, Treasury Department.

Estimates are based on the Congressional Budget Office (CBO) May 2022 Update to the Budget and Economic Outlook. Data for fiscal year 2022 is from the CBO's Monthly Budget Review. Other spending includes, but is not limited to, health insurance subsidies, income security and federal civilian and military retirement. Note: Years shown are fiscal years. 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 – U.S. Data are as of December 31, 2022.

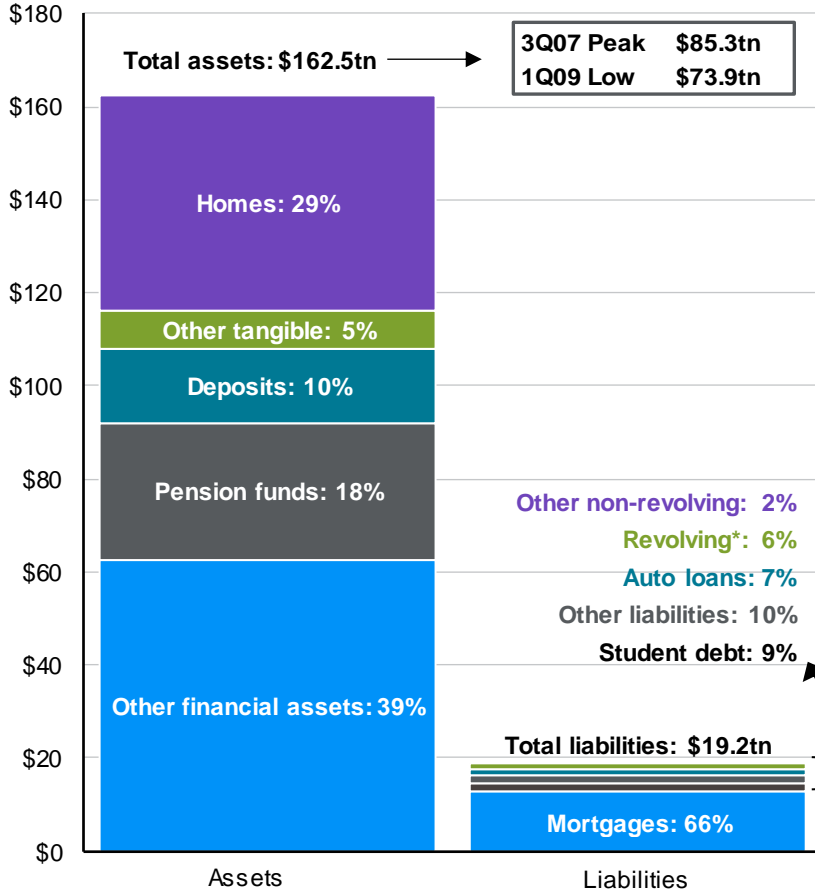


Consumer finances

Economy

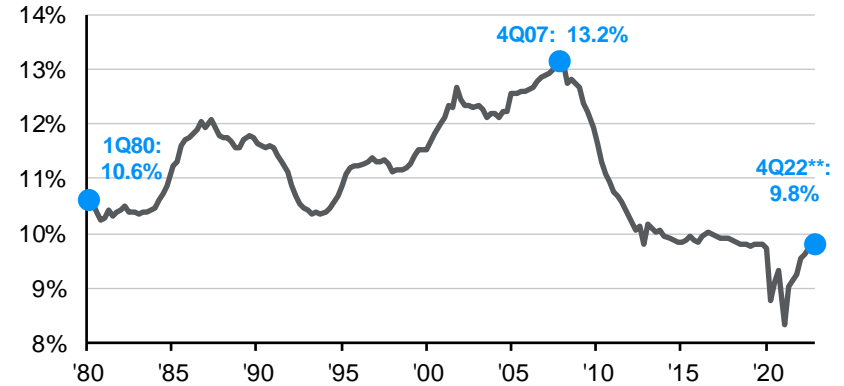
Consumer balance sheet

3Q22, trillions of dollars outstanding, not seasonally adjusted



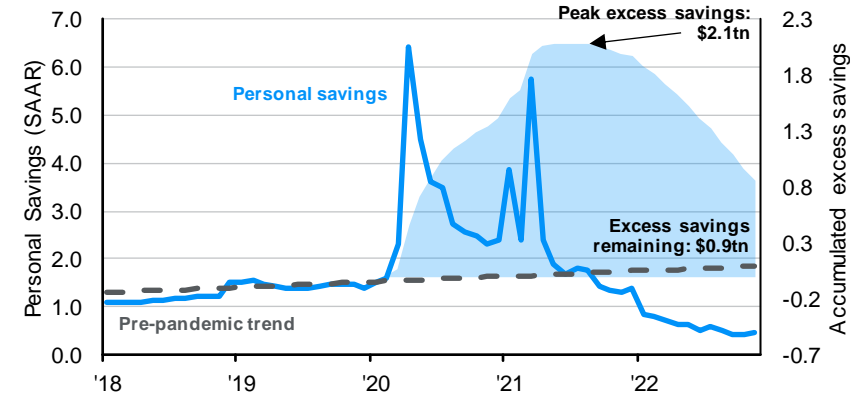
Household debt service ratio

Debt payments as % of disposable personal income, SA



Household excess savings

Trillions of USD

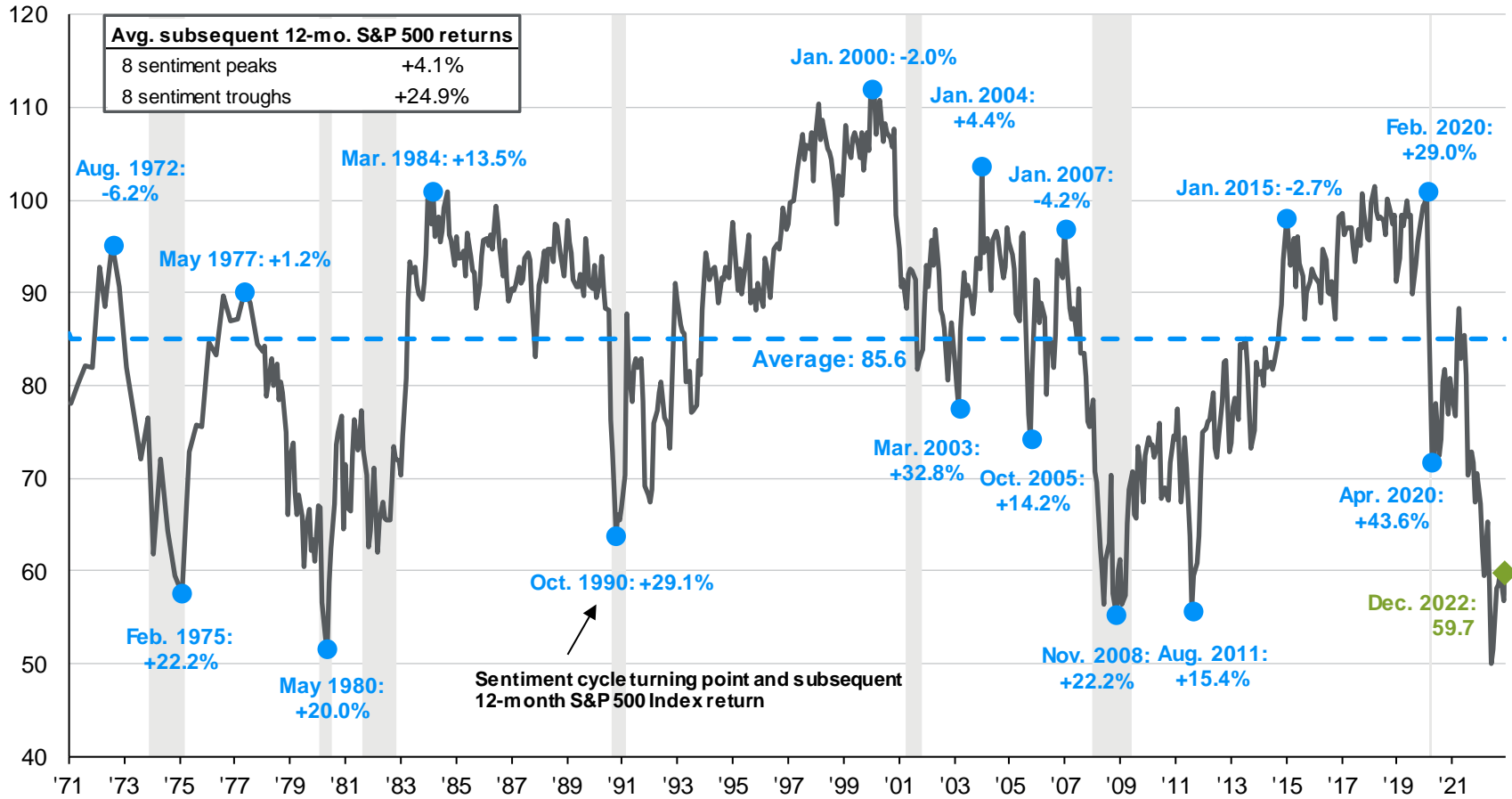


Source: FactSet, FRB, J.P. Morgan Asset Management; (Top and bottom right) BEA. Data include households and nonprofit organizations. SA – seasonally adjusted. *Revolving includes credit cards. Values may not sum to 100% due to rounding. **4Q22 figures for debt service ratio are J.P. Morgan Asset Management estimates. From March 2020 to August 2021, consumers amassed a peak \$2.1 trillion in excess savings relative to the pre-pandemic trend. Since August 2021, consumers have drawn down on those excess savings, with the remaining reflected in the chart annotation. *Guide to the Markets – U.S.* Data are as of December 31, 2022.



Consumer confidence and the stock market

Consumer Sentiment Index and subsequent 12-month S&P 500 returns



Source: FactSet, Standard & Poor's, University of Michigan, J.P. Morgan Asset Management. Peak is defined as the highest index value before a series of lower lows, while a trough is defined as the lowest index value before a series of higher highs. Subsequent 12-month S&P 500 returns are price returns only, which excludes dividends. Past performance is not a reliable indicator of current and future results. Guide to the Markets – U.S. Data are as of December 31, 2022.



Labor demand

Economy

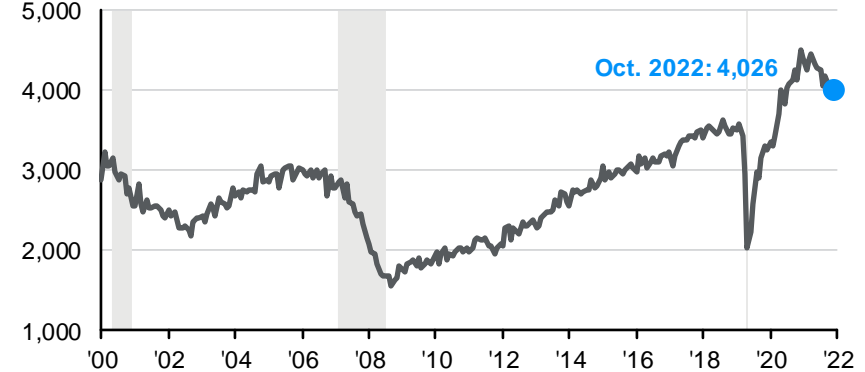
Ratio of job openings to job seekers

Job openings* lagged 1 month divided by unemployed persons, SA



JOLTS quits

Total nonfarm quits, thousands, seasonally adjusted



JOLTS layoffs

Total nonfarm layoffs, thousands, seasonally adjusted



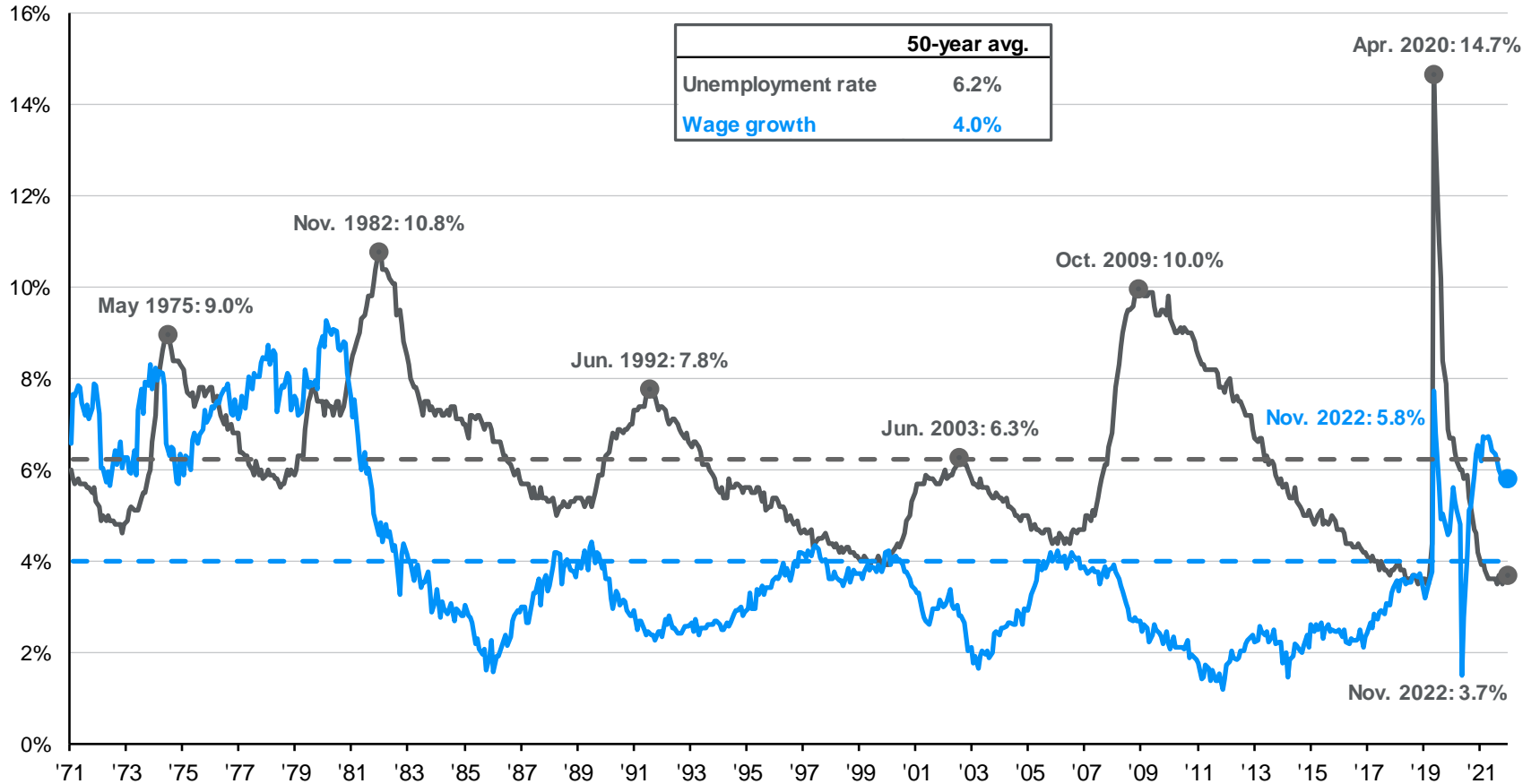
Source: U.S. Department of Labor, J.P. Morgan Asset Management. *JOLTS job openings from February 1974 to November 2000 are J.P. Morgan Asset Management estimates. Guide to the Markets – U.S. Data are as of December 31, 2022.



Unemployment and wages

Civilian unemployment rate and year-over-year wage growth

Private production and non-supervisory workers, seasonally adjusted, percent



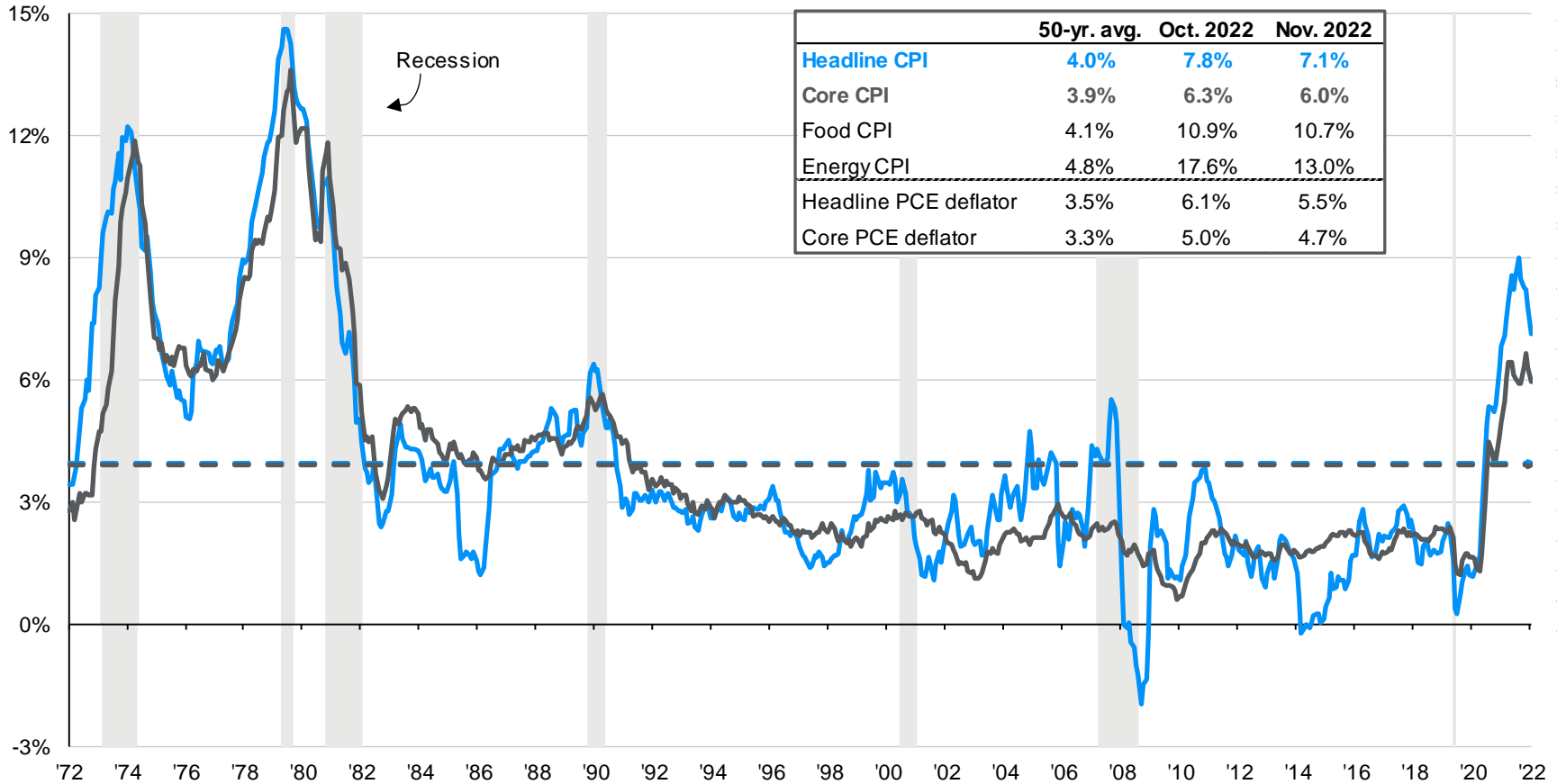
Source: BLS, FactSet, J.P. Morgan Asset Management. Guide to the Markets – U.S. Data are as of December 31, 2022.



Inflation

CPI and core CPI

% change vs. prior year, seasonally adjusted



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

CPI used is CPI-U and values shown are % change vs. one year ago. Core CPI is defined as CPI excluding food and energy prices. The Personal Consumption Expenditure (PCE) deflator employs an evolving chain-weighted basket of consumer expenditures instead of the fixed-weight basket used in CPI calculations.

Guide to the Markets – U.S. Data are as of December 31, 2022.



Inflation heatmap

GTM

U.S.

29

Economy

Consumer Price Index, components

m/m % change, seasonally adjusted

| | Weight | 2021 | | | | | | | | | | | 2022 | | | | | | | | | | | | |
|--------------------------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|-------|-------|-------|-------|-------|------|-------|-------|--------|-------|-------|-------|
| | | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov |
| Headline CPI, y/y | 100.0 | 1.3% | 1.4% | 1.7% | 2.7% | 4.2% | 4.9% | 5.3% | 5.3% | 5.2% | 5.4% | 6.2% | 6.8% | 7.1% | 7.5% | 7.9% | 8.6% | 8.2% | 8.5% | 9.0% | 8.5% | 8.2% | 8.2% | 7.8% | 7.1% |
| Core CPI, y/y | 78.3 | 1.6% | 1.4% | 1.3% | 1.7% | 3.0% | 3.8% | 4.4% | 4.2% | 4.0% | 4.0% | 4.6% | 5.0% | 5.5% | 6.0% | 6.4% | 6.4% | 6.1% | 6.0% | 5.9% | 5.9% | 6.3% | 6.7% | 6.3% | 6.0% |
| Headline CPI, m/m | 100.0 | 0.3% | 0.2% | 0.4% | 0.6% | 0.6% | 0.7% | 0.9% | 0.5% | 0.3% | 0.4% | 0.9% | 0.7% | 0.6% | 0.6% | 0.8% | 1.2% | 0.3% | 1.0% | 1.3% | 0.0% | 0.1% | 0.4% | 0.4% | 0.1% |
| Core CPI, m/m | 78.3 | 0.1% | 0.0% | 0.2% | 0.3% | 0.9% | 0.7% | 0.8% | 0.3% | 0.2% | 0.3% | 0.6% | 0.5% | 0.6% | 0.6% | 0.5% | 0.3% | 0.6% | 0.6% | 0.7% | 0.3% | 0.6% | 0.6% | 0.3% | 0.2% |
| Energy | 8.0 | 3.7% | 2.8% | 4.6% | 5.6% | -1.2% | 0.7% | 2.1% | 1.6% | 1.9% | 1.2% | 3.7% | 2.4% | 0.9% | 0.9% | 3.5% | 11.0% | -2.7% | 3.9% | 7.5% | -4.6% | -5.0% | -2.1% | 1.8% | -1.6% |
| Gasoline | 4.0 | 7.0% | 5.8% | 8.2% | 10.3% | -3.3% | 0.6% | 3.3% | 2.5% | 2.5% | 1.1% | 4.6% | 4.5% | 1.3% | -0.8% | 6.6% | 18.3% | -6.1% | 4.1% | 11.2% | -7.7% | -10.6% | -4.9% | 4.0% | -2.0% |
| Electricity | 2.7 | 0.6% | 0.0% | 0.5% | 0.2% | 0.7% | 0.5% | 0.2% | 0.2% | 1.0% | 0.6% | 1.4% | 0.2% | 0.5% | 4.2% | -1.1% | 2.2% | 0.7% | 1.3% | 1.7% | 1.6% | 1.5% | 0.4% | 0.1% | -0.2% |
| Utility Gas | 1.0 | 0.5% | -0.4% | 1.7% | 2.4% | 2.2% | 1.8% | 1.8% | 2.2% | 1.6% | 2.9% | 5.9% | 0.3% | -0.3% | -0.5% | 1.5% | 0.6% | 3.1% | 8.0% | 8.2% | -3.6% | 3.5% | 2.9% | -4.6% | -3.5% |
| Food | 13.7 | 0.3% | 0.2% | 0.1% | 0.2% | 0.4% | 0.5% | 0.7% | 0.7% | 0.4% | 0.9% | 0.9% | 0.8% | 0.5% | 0.9% | 1.0% | 1.0% | 0.9% | 1.2% | 1.0% | 1.1% | 0.8% | 0.8% | 0.6% | 0.5% |
| Food at home | 8.5 | 0.3% | 0.1% | 0.2% | 0.2% | 0.4% | 0.4% | 0.7% | 0.6% | 0.4% | 1.2% | 0.9% | 0.9% | 0.4% | 1.0% | 1.4% | 1.5% | 1.0% | 1.4% | 1.0% | 1.3% | 0.7% | 0.7% | 0.4% | 0.5% |
| Food away from home | 5.2 | 0.4% | 0.3% | 0.1% | 0.1% | 0.3% | 0.6% | 0.7% | 0.8% | 0.4% | 0.5% | 0.8% | 0.6% | 0.6% | 0.7% | 0.4% | 0.3% | 0.6% | 0.7% | 0.9% | 0.7% | 0.9% | 0.9% | 0.9% | 0.5% |
| Core goods | 21.2 | 0.0% | 0.1% | -0.1% | 0.2% | 2.0% | 1.8% | 2.1% | 0.4% | 0.4% | 0.3% | 1.1% | 0.9% | 1.2% | 1.0% | 0.4% | -0.4% | 0.2% | 0.7% | 0.8% | 0.2% | 0.5% | 0.0% | -0.4% | -0.5% |
| Apparel | 2.5 | 0.5% | 1.4% | -0.5% | 0.4% | 0.6% | 1.1% | 0.5% | 0.1% | 0.3% | -0.7% | 0.6% | 0.7% | 1.1% | 1.1% | 0.7% | 0.6% | -0.8% | 0.7% | 0.8% | -0.1% | 0.2% | -0.3% | -0.7% | 0.2% |
| New vehicles | 4.1 | 0.6% | -0.4% | 0.1% | 0.0% | 0.5% | 1.5% | 1.7% | 1.5% | 1.2% | 1.3% | 1.3% | 1.2% | 1.2% | 0.0% | 0.3% | 0.2% | 1.1% | 1.0% | 0.7% | 0.6% | 0.8% | 0.7% | 0.4% | 0.0% |
| Used cars | 3.8 | -1.1% | -0.9% | -0.7% | 0.3% | 9.8% | 7.7% | 10.1% | 0.0% | -1.2% | -0.5% | 2.5% | 2.4% | 3.3% | 1.5% | -0.2% | -3.8% | -0.4% | 1.8% | 1.6% | -0.4% | -0.1% | -1.1% | -2.4% | -2.9% |
| Medical care commod | 1.5 | -0.2% | -0.1% | -0.7% | 0.1% | 0.6% | 0.0% | -0.4% | 0.2% | -0.2% | 0.3% | 0.6% | 0.1% | 0.0% | 0.9% | 0.3% | 0.2% | 0.1% | 0.3% | 0.4% | 0.6% | 0.2% | -0.1% | 0.0% | 0.2% |
| Core services | 57.1 | 0.1% | 0.1% | 0.2% | 0.3% | 0.5% | 0.4% | 0.4% | 0.3% | 0.1% | 0.2% | 0.4% | 0.4% | 0.3% | 0.4% | 0.5% | 0.6% | 0.7% | 0.6% | 0.7% | 0.4% | 0.6% | 0.8% | 0.5% | 0.4% |
| Shelter | 32.6 | 0.1% | 0.1% | 0.2% | 0.3% | 0.4% | 0.3% | 0.4% | 0.4% | 0.2% | 0.4% | 0.5% | 0.5% | 0.4% | 0.3% | 0.5% | 0.5% | 0.5% | 0.6% | 0.6% | 0.5% | 0.7% | 0.7% | 0.8% | 0.6% |
| Rent of primary res. | 7.4 | 0.1% | 0.1% | 0.2% | 0.2% | 0.2% | 0.3% | 0.2% | 0.2% | 0.3% | 0.4% | 0.4% | 0.4% | 0.4% | 0.5% | 0.6% | 0.4% | 0.6% | 0.6% | 0.8% | 0.7% | 0.7% | 0.8% | 0.7% | 0.8% |
| OER | 24.0 | 0.2% | 0.1% | 0.2% | 0.2% | 0.2% | 0.3% | 0.3% | 0.3% | 0.3% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% | 0.5% | 0.6% | 0.7% | 0.6% | 0.7% | 0.8% | 0.6% | 0.7% |
| Medical care services | 6.9 | -0.1% | 0.5% | 0.4% | 0.1% | 0.0% | -0.1% | 0.0% | 0.2% | 0.2% | 0.2% | 0.4% | 0.3% | 0.3% | 0.6% | 0.1% | 0.6% | 0.5% | 0.4% | 0.7% | 0.4% | 0.8% | 1.0% | -0.6% | -0.7% |
| Transportation services | 5.9 | -0.2% | -0.3% | 0.4% | 1.0% | 2.2% | 1.7% | 1.1% | -0.9% | -1.2% | -1.0% | 0.2% | 0.7% | 0.0% | 1.0% | 1.4% | 2.0% | 3.1% | 1.3% | 2.1% | -0.5% | 0.5% | 1.9% | 0.8% | -0.1% |

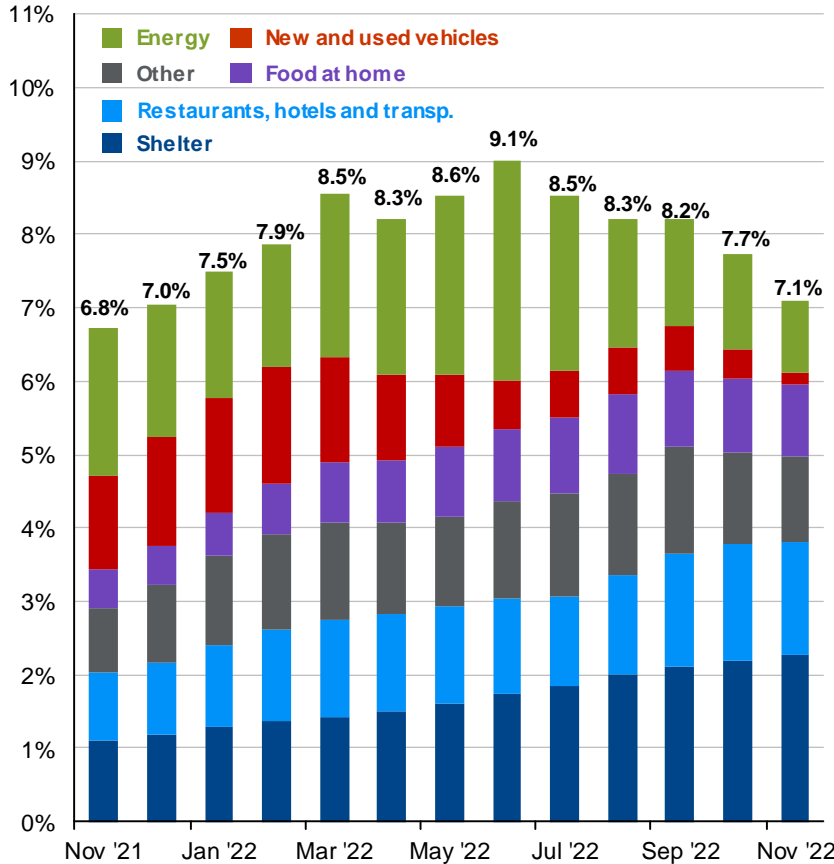
Source: BLS, FactSet, J.P. Morgan Asset Management. Heatmap shading is relative to the two-year period shown. Component weights may not add to 100. OER refers to owner's equivalent rent.
 Guide to the Markets – U.S. Data are as of December 31, 2022.



Inflation drivers and expectations

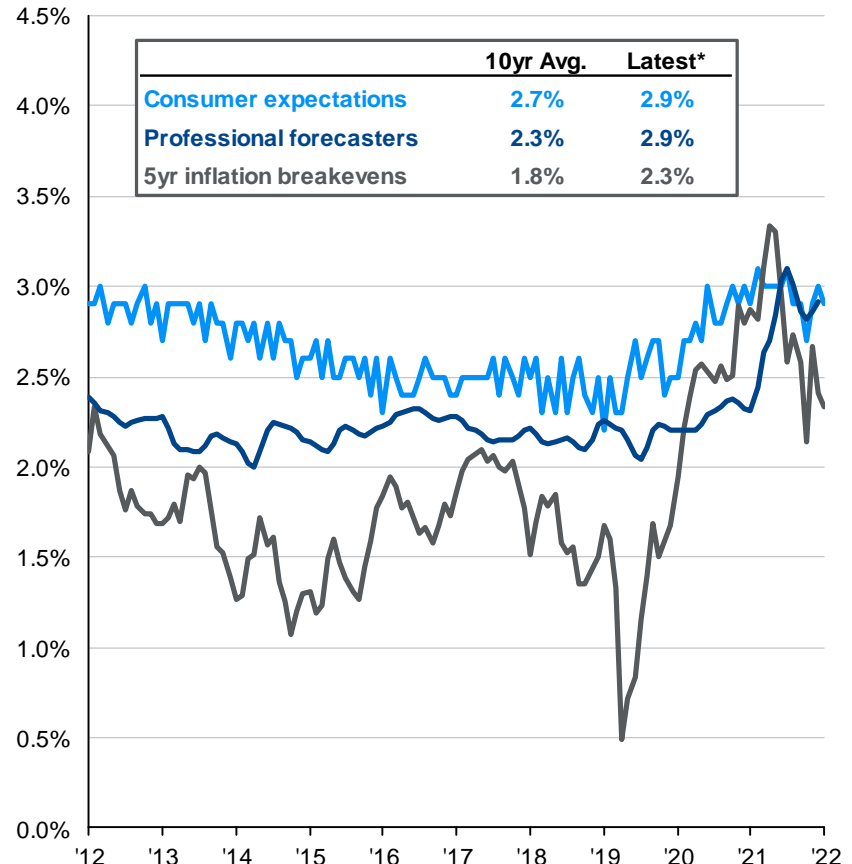
Contributors to headline inflation

Contribution to y/y % change in CPI, not seasonally adjusted



Inflation expectations, next 5 years

% change vs. prior year, non-seasonally adjusted



Source: Bureau of Labor Statistics, FactSet, Federal Reserve Bank of Philadelphia, University of Michigan, J.P. Morgan Asset Management. Contributions mirror the BLS methodology on Table 7 of the CPI report. Values may not sum to headline CPI figures due to rounding and underlying calculations. "Shelter" includes owner's equivalent rent and rent of primary residence. "Other" primarily reflects household furnishings, apparel, education and communication services, medical care services and other personal services. *Reflects the latest daily 5yr/5yr breakevens, preliminary or final Consumer Sentiment survey, and the quarterly Survey of Professional Forecasters interpolated to a monthly series. The Survey of Professional Forecasters reflects the median estimate by professional forecasters of average CPI inflation over the next 5 years. The series has been adjusted by J.P. Morgan Asset Management to exclude realized inflation readings within the forecast window. *Guide to the Markets - U.S.* Data are as of December 31, 2022.



Dollar drivers

The U.S. dollar

U.S. Dollar Index



The U.S. trade balance

Current account balance, % of GDP



Developed markets interest rate differentials

Difference between U.S. and international 10-year yields*



Source: J.P. Morgan Asset Management; (Left) FactSet, ICE; (Top right) Bureau of Economic Analysis, FactSet; (Bottom right) Tullett Prebon. Currencies in the DXY Index are: British pound, Canadian dollar, euro, Japanese yen, Swedish krona and Swiss franc. *Interest rate differential is the difference between the 10-year U.S. Treasury yield and a basket of the 10-year yields of each major trading partner (Australia, Canada, Europe, Japan, Sweden, Switzerland and UK). Weights in the basket are calculated using the 10-year average of total government bonds outstanding in each region. Europe is defined as the 19 countries in the euro area. *Guide to the Markets – U.S.* Data are as of December 31, 2022.



Oil markets

Change in production and consumption of liquid fuels

Production, consumption and inventories, millions of barrels per day

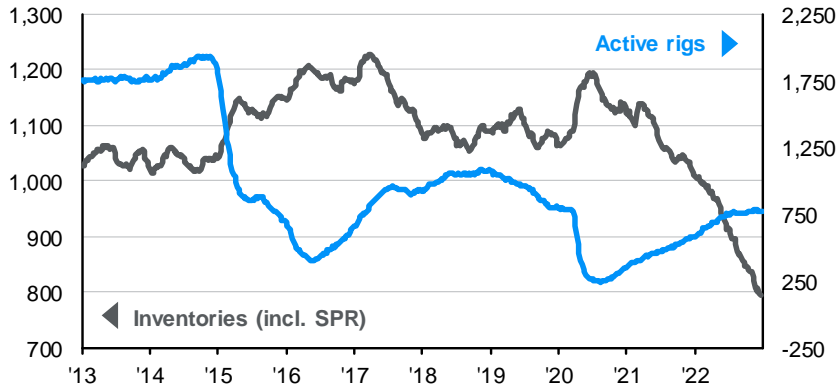
| Production | 2019 | 2020 | 2021 | 2022* | 2023* | Growth since '19 |
|---------------|--------------|-------------|-------------|--------------|--------------|------------------|
| U.S. | 19.5 | 18.6 | 19.0 | 20.3 | 21.1 | 8.2% |
| OPEC | 34.6 | 30.7 | 31.7 | 34.1 | 34.5 | -0.2% |
| Russia | 11.5 | 10.5 | 10.8 | 10.9 | 9.5 | -17.3% |
| Global | 100.3 | 93.9 | 95.7 | 100.0 | 101.1 | 0.8% |

| Consumption | 2019 | 2020 | 2021 | 2022* | 2023* | Growth since '19 |
|---------------|--------------|-------------|-------------|-------------|--------------|------------------|
| U.S. | 20.5 | 18.2 | 19.9 | 20.4 | 20.5 | -0.1% |
| China | 14.0 | 14.4 | 15.3 | 15.2 | 15.8 | 12.5% |
| Global | 100.8 | 92.0 | 97.6 | 99.8 | 100.8 | 0.0% |

| Inventory Change | 2019 | 2020 | 2021 | 2022* | 2023* |
|------------------|------|------|------|-------|-------|
| | -0.5 | 1.9 | -1.9 | 0.2 | 0.2 |

U.S. crude oil inventories and rig count**

Million barrels, number of active rigs



Price of oil

WTI crude, nominal prices, USD/barrel



Source: J.P. Morgan Asset Management; (Top and bottom left) EIA; (Right) FactSet; (Bottom left) Baker Hughes.

*Forecasts are from the December 2022 EIA Short-Term Energy Outlook and start in 2022. **U.S. crude oil inventories include the Strategic Petroleum Reserve (SPR). Liquid fuels include crude oil, natural gas, biodiesel and fuel ethanol. Active rig count includes both natural gas and oil rigs. WTI crude prices are continuous contract NYM prices in USD. Guide to the Markets – U.S. Data are as of December 31, 2022.

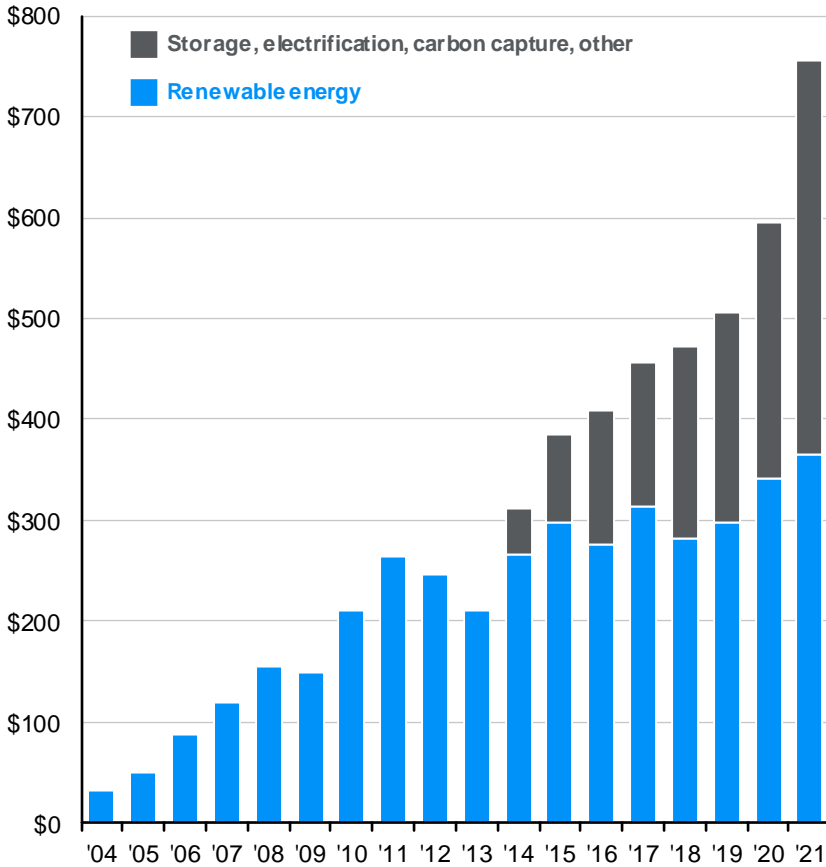


Global energy transition

Economy

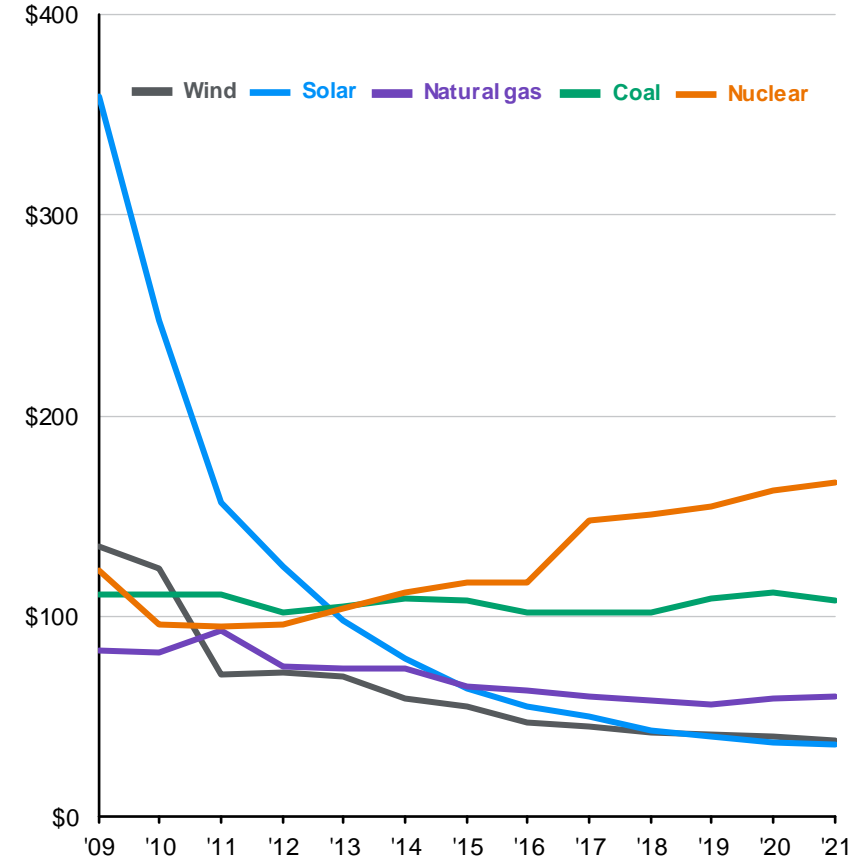
Global investment in energy transition

Billions USD, nominal



Cost of wind, solar, natural gas, nuclear and coal

Mean LCOE*, 2021, dollar per megawatt hour



Source: Bloomberg NEF, BP Statistical, Eurostat, Lazard, METI, J.P. Morgan Asset Management; (Left) Storage, electrification, other includes hydrogen, carbon capture and storage, energy storage, electrified transport and electrified heat; (Right) *LCOE is levelized cost of energy, the net present value of the unit-cost of electricity over the lifetime of a generating asset. It is often taken as a proxy for the average price that the generating asset must receive in a market to break even over its lifetime; 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 – U.S.* Data are as of December 31, 2022.

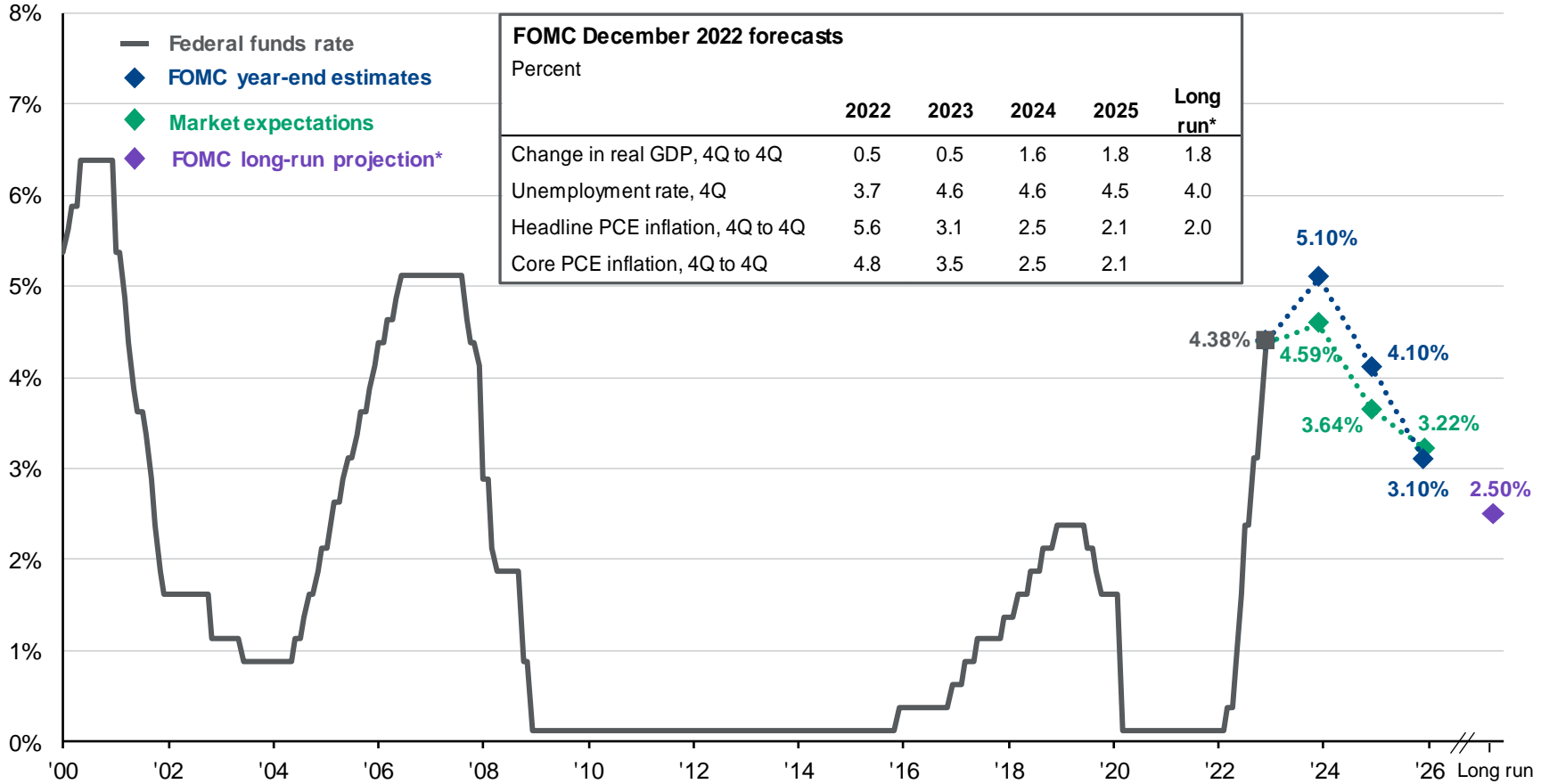


The Fed and interest rates

Fixed Income

Federal funds rate expectations

FOMC and market expectations for the federal funds rate



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

Market expectations are based off of the respective Federal Funds Futures contracts for December expiry. *Long-run projections are the rates of growth, unemployment and inflation to which a policymaker expects the economy to converge over the next five to six years in absence of further shocks and under appropriate monetary policy. 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 – U.S. Data are as of December 31, 2022.

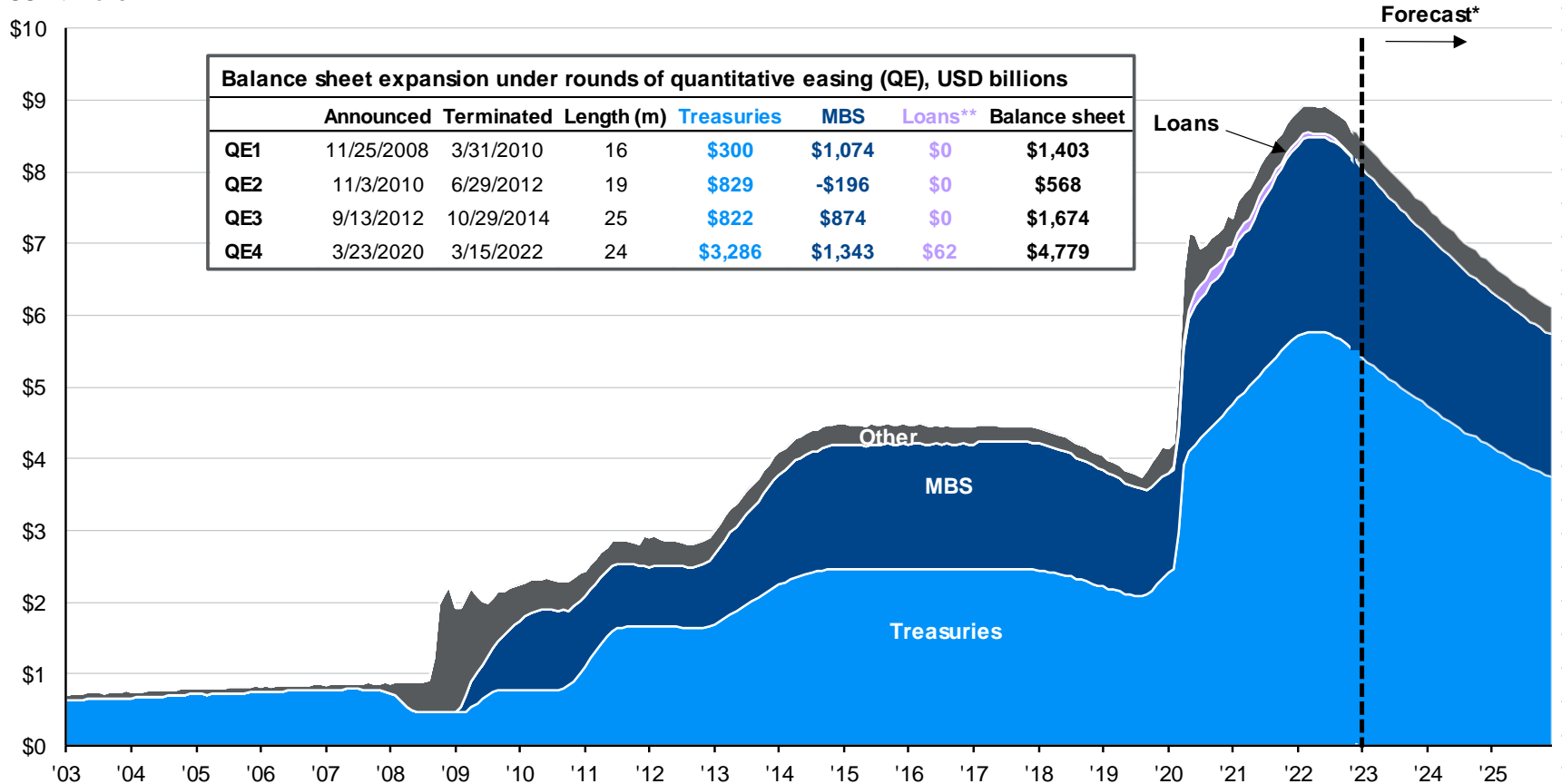


The Federal Reserve balance sheet

Fixed Income

The Federal Reserve balance sheet

USD trillions



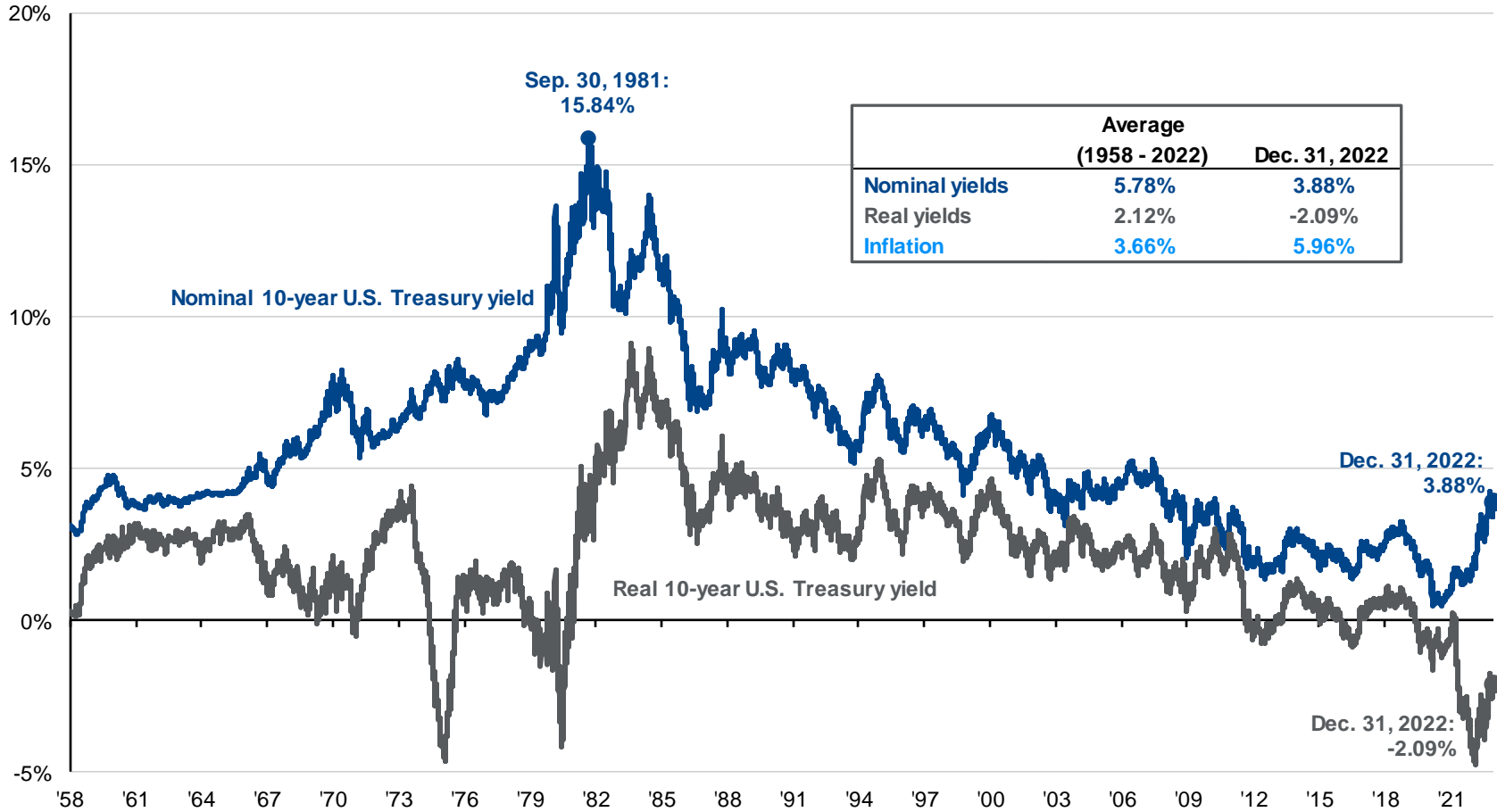
Source: FactSet, Federal Reserve, J.P. Morgan Investment Bank, J.P. Morgan Asset Management. At its peak, the balance sheet contained \$5.8tn in Treasuries and \$2.7tn in MBS. *Per the most recent Federal Reserve policy meeting, the forecast assumes the Federal Reserve began balance sheet runoff in June 2022. From June to August, the committee allowed up to \$30bn in U.S. Treasury securities and \$17.5bn in agency mortgage-backed securities to mature per month, with that pace doubling to \$60bn and \$35bn, respectively, in September. Any maturing amount in excess of these caps are reinvested. The forecast does not include the active selling of securities from the committee. **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 – U.S. Data are as of December 31, 2022.



Interest rates and inflation

Fixed Income

Nominal and real U.S. 10-year Treasury yields



Source: BLS, FactSet, Federal Reserve, J.P. Morgan Asset Management. Real 10-year Treasury yields are calculated as the daily Treasury yield less year-over-year core CPI inflation for that month. For the current month, we use the prior month's core CPI figures until the latest data is available. *Guide to the Markets – U.S.* Data are as of December 31, 2022.

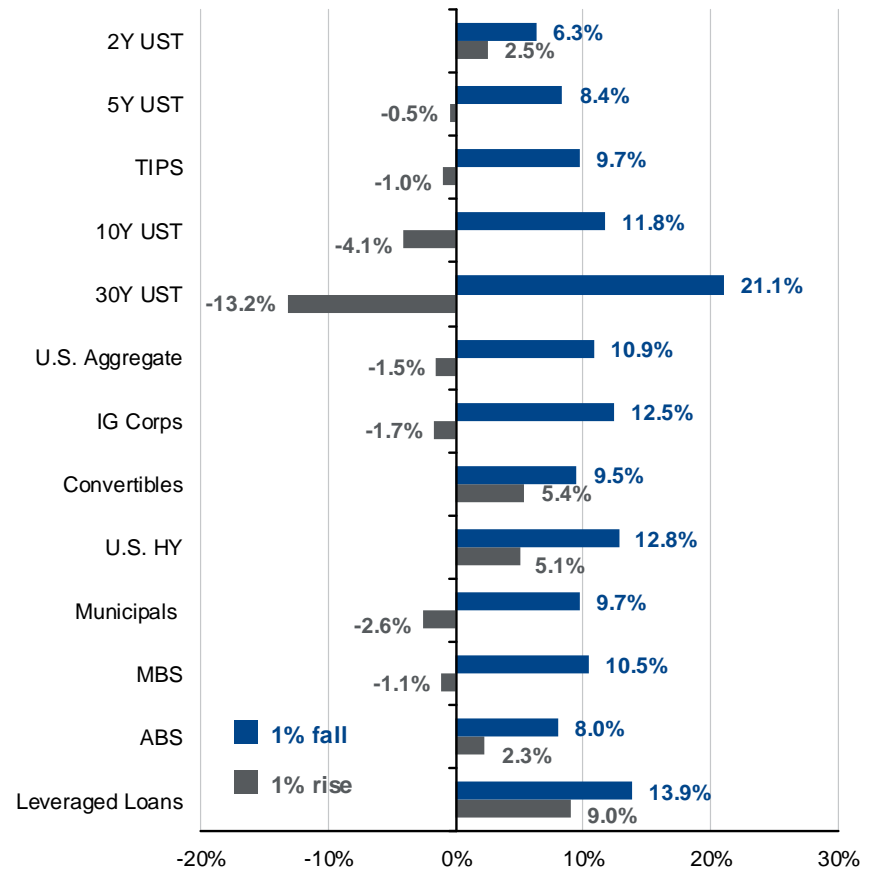


Fixed income market dynamics

| U.S. Treasuries | Yield | | Return | Avg. Maturity | Correlation to 10-year | Correlation to S&P 500 |
|------------------------|------------|------------|---------|---------------|------------------------|------------------------|
| | 12/31/2022 | 12/31/2021 | 2022 | | | |
| 2-Year | 4.41% | 0.73% | -4.11% | 2 years | 0.71 | -0.23 |
| 5-Year | 3.99% | 1.26% | -9.74% | 5 | 0.93 | -0.19 |
| TIPS | 1.58% | -1.04% | -11.85% | 10 | 0.60 | 0.33 |
| 10-Year | 3.88% | 1.52% | -16.33% | 10 | 1.00 | -0.17 |
| 30-Year | 3.97% | 1.90% | -33.29% | 30 | 0.93 | -0.19 |
| Sector | | | | | | |
| U.S. Aggregate | 4.68% | 1.75% | -13.01% | 8.4 | 0.85 | 0.19 |
| IG Corps | 5.42% | 2.33% | -15.76% | 10.9 | 0.51 | 0.46 |
| Convertibles | 7.05% | 3.66% | -18.92% | - | -0.17 | 0.87 |
| U.S. HY | 8.96% | 4.21% | -11.19% | 5.5 | -0.12 | 0.74 |
| Municipals | 3.55% | 1.11% | -8.53% | 13.0 | 0.48 | 0.20 |
| MBS | 4.71% | 1.98% | -11.81% | 7.8 | 0.78 | 0.11 |
| ABS | 5.89% | 1.96% | -3.23% | 3.6 | 0.01 | 0.06 |
| Leveraged Loans | 11.41% | 4.60% | 0.06% | 2.4 | -0.37 | 0.60 |

Impact of a 1% rise or fall in interest rates

Total return, assumes a parallel shift in the yield curve



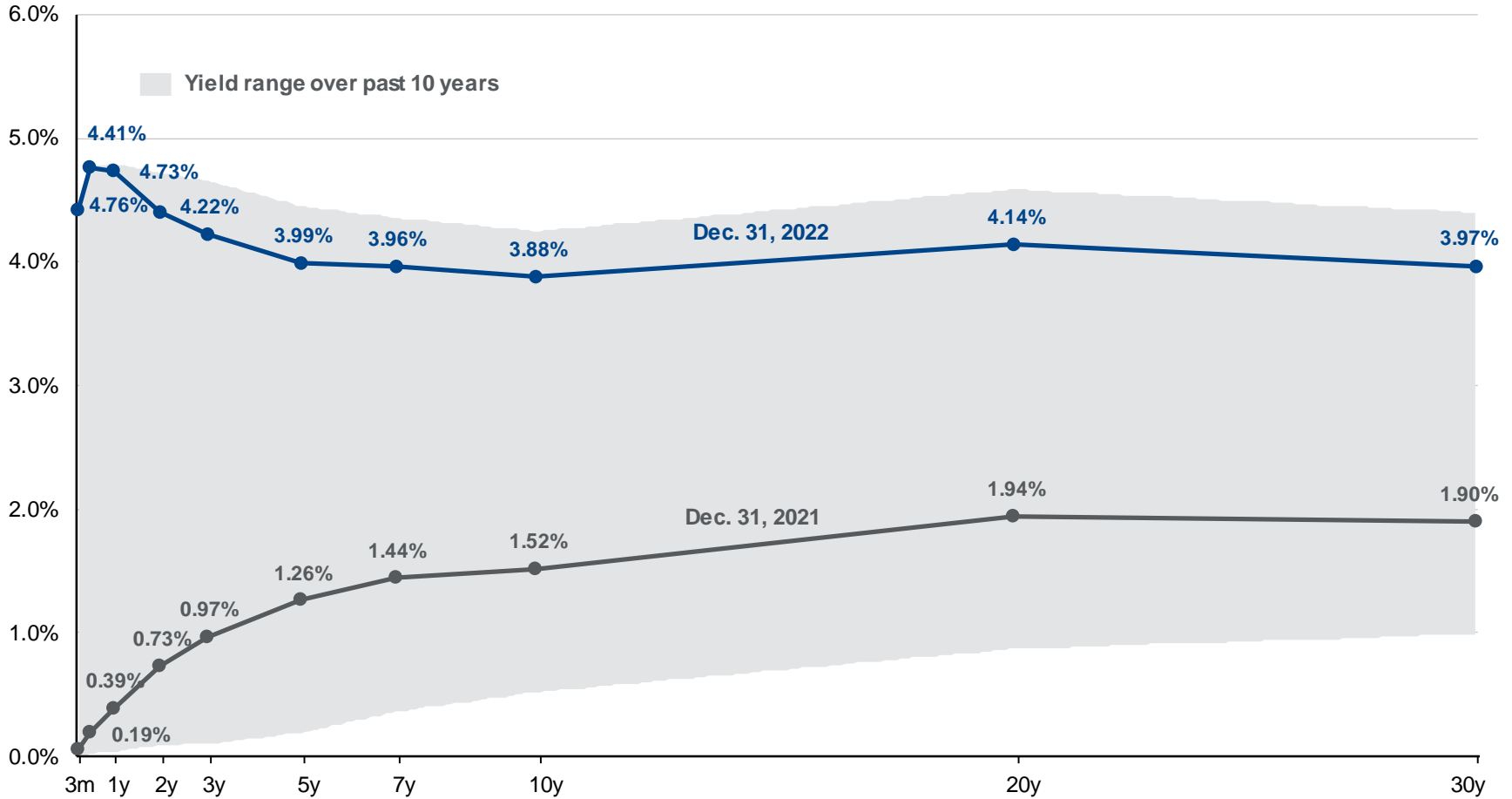
Source: Bloomberg, FactSet, Standard & Poor's, U.S. Treasury, J.P. Morgan Asset Management. Sectors shown above are provided by Bloomberg unless otherwise noted and are represented by – U.S. Aggregate; MBS: U.S. Aggregate Securitized - MBS; ABS: J.P. Morgan ABS Index; Corporates: U.S. Corporates; Municipals: Muni Bond; High Yield: Corporate High Yield; Leveraged Loans: J.P. Morgan Leveraged Loan Index; TIPS: Treasury Inflation-Protected Securities; Convertibles: U.S. Convertibles Composite. Convertibles yield is as of most recent month end and is based on U.S. portion of Bloomberg Global Convertibles Index. Yield and return information based on bellwethers for Treasury securities. Sector yields reflect yield-to-worst. Convertibles yield is based on U.S. portion of Bloomberg Global Convertibles. Correlations are based on 15-years of monthly returns for all sectors. Past performance is not indicative of future results. *Guide to the Markets – U.S.* Data are as of December 31, 2022.



Yield curve

Fixed Income

U.S. Treasury yield curve



Source: FactSet, Federal Reserve, J.P. Morgan Asset Management. Guide to the Markets – U.S. Data are as of December 31, 2022.



High yield bonds

Fixed Income

Default rate and spread-to-worst

Percent



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

Long-run average is based on monthly historical data beginning in January 1990. Default rates are defined as the par value percentage of the total market trading at or below 50% of par value and include any Chapter 11 filing, prepackaged filing or missed interest payments. The default rate is an LTM figure (last 12 months) and tracks the % of defaults over the period. Recovery rates are based on the price of the defaulted bonds or loans 30 days post the default date. Default and recovery rates are as of most recent month-end. Spread-to-worst indicated are the difference between the yield-to-worst of a bond and yield-to-worst of a U.S. Treasury security with a similar duration. High yield is represented by the J.P. Morgan Domestic High Yield Index.

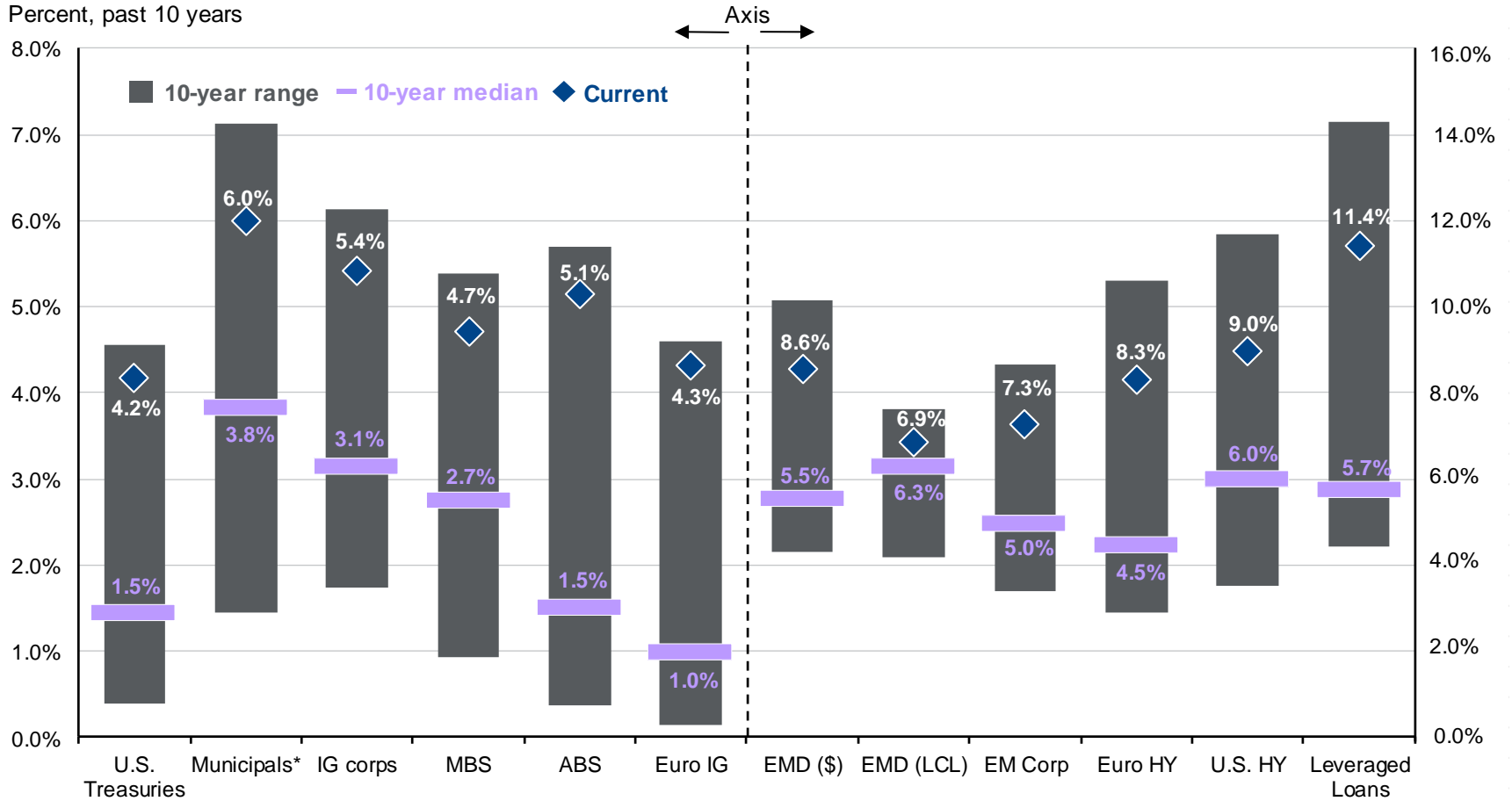
Guide to the Markets – U.S. Data are as of December 31, 2022.



Fixed income valuations

Yield-to-worst across fixed income sectors

Percent, past 10 years



Fixed Income

Source: Bloomberg, FactSet, J.P. Morgan Credit Research, J.P. Morgan Asset Management. Indices used are Bloomberg except for emerging market debt and leveraged loans: EMD (\$): J.P. Morgan EMIGLOBAL Diversified Index; EMD (LCL): J.P. Morgan GBI-EM Global Diversified Index; EM Corp.: J.P. Morgan CEMBI Broad Diversified; Leveraged loans: JPM Leveraged Loan Index; Euro IG: Bloomberg Euro Aggregate Corporate Index; Euro HY: Bloomberg Pan-European High Yield Index. Yield-to-worst is the lowest possible yield that can be received on a bond apart from the company defaulting. All sectors shown are yield-to-worst except for Municipals, which is based on the tax-equivalent yield-to-worst assuming a top-income tax bracket rate of 37% plus a Medicare tax rate of 3.8%.
 Guide to the Markets – U.S. Data are as of December 31, 2022.

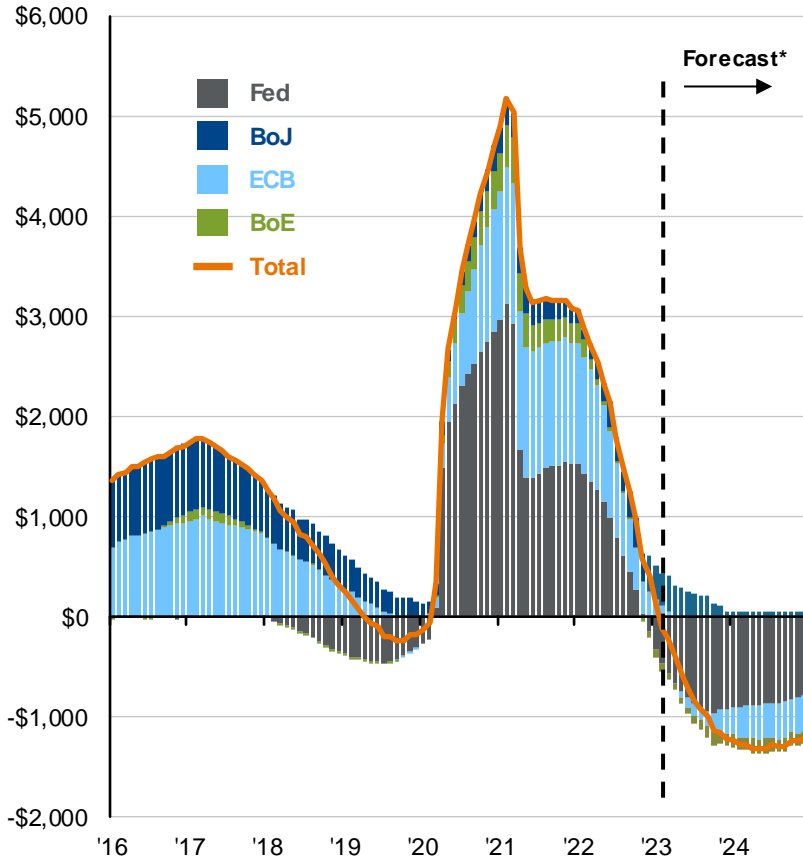


Developed market monetary policy

Fixed Income

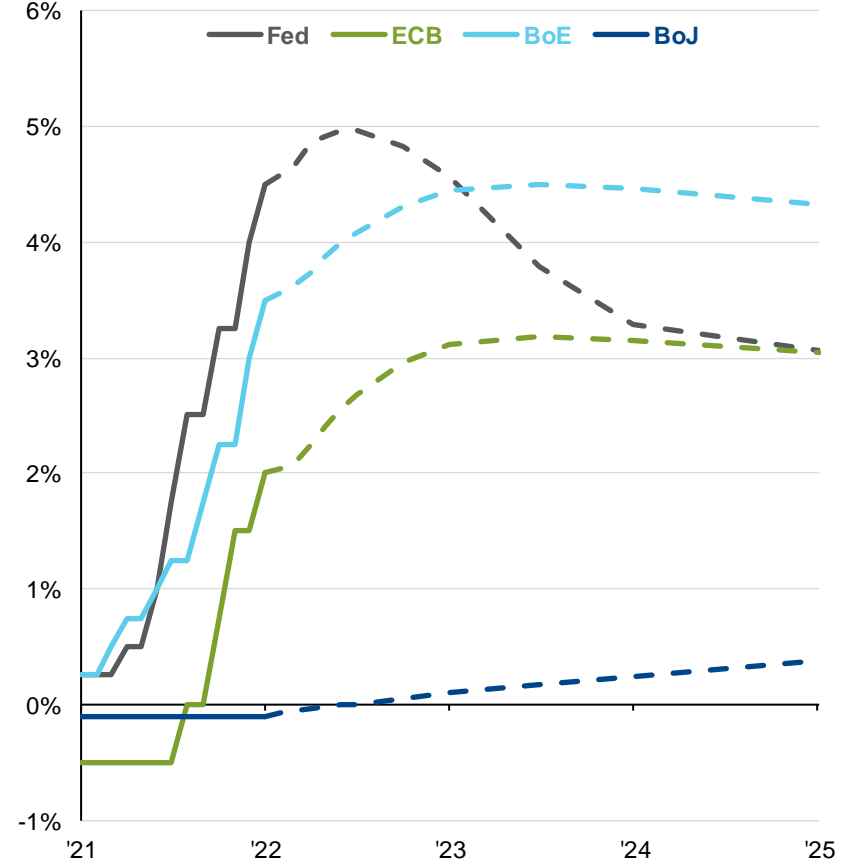
Developed market central bank bond purchases

USD billions, 12-month rolling flow



Historical policy rates and forward curves

Target policy rates and Global Overnight Index Swaps (OIS) curves



Source: BIS, Bloomberg, FactSet, J.P. Morgan Asset Management; (Left) Bank of England (BoE), Bank of Japan (BoJ), European Central Bank (ECB), Federal Reserve System (Fed), J.P. Morgan Global Economic Research. *DM bond purchase forecasts are internal assumptions based on government bond purchases as outlined in the most recent monetary policy announcements from the BoE, BoJ, ECB and Federal Reserve through December 2024. Forecasts, projections and other forward-looking statements are based upon current beliefs and expectations. They are for illustrative purposes only and are not a reliable indicator of future performance. Given the inherent uncertainties and risks associated with forecast, projections or other forward-looking statements, actual events, results or performance may differ materially from those reflected or contemplated.

Guide to the Markets – U.S. Data are as of December 31, 2022.



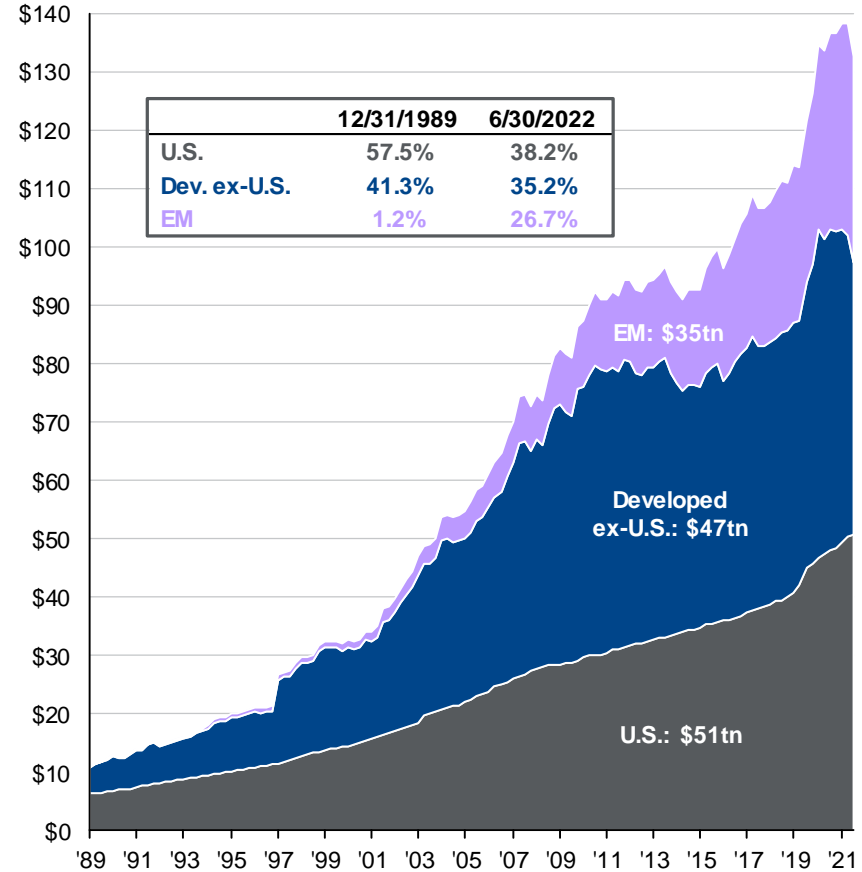
Global fixed income

Fixed Income

| Aggregates | Yield | | 2022 Return | | Duration | Correlation to 10yr |
|---------------------|------------|------------|-------------|---------|-----------|---------------------|
| | 12/31/2022 | 12/31/2021 | Local | USD | | |
| U.S. | 4.68% | 1.75% | -13.01% | -13.01% | 6.2 years | 0.91 |
| Gbl. ex-U.S. | 3.13% | 1.07% | - | -18.08% | 7.00 | 0.56 |
| Japan | 0.75% | 0.18% | -5.06% | -17.14% | 9.20 | 0.59 |
| Germany | 3.22% | 0.05% | -15.54% | -20.74% | 6.10 | 0.45 |
| UK | 4.29% | 1.18% | -20.47% | -29.37% | 8.30 | 0.47 |
| Italy | 4.10% | 0.76% | -16.59% | -21.72% | 6.00 | 0.30 |
| China | 2.94% | 2.75% | 0.46% | -5.72% | 5.80 | 0.54 |
| Sector | | | | | | |
| Euro Corp. | 4.32% | 0.52% | -13.65% | -18.96% | 4.5 years | 0.41 |
| Euro HY | 8.32% | 3.55% | -11.13% | -16.59% | 3.10 | 0.03 |
| EMD (\$) | 8.55% | 5.27% | - | -17.78% | 6.00 | -0.01 |
| EMD (LCL) | 6.86% | 5.72% | -5.91% | -11.69% | 4.90 | -0.08 |
| EM Corp. | 7.28% | 4.11% | - | -12.26% | 4.90 | -0.01 |

Global bond market

USD trillions



Source: J.P. Morgan Asset Management; (Left) Bloomberg, FactSet; (Right) BIS.

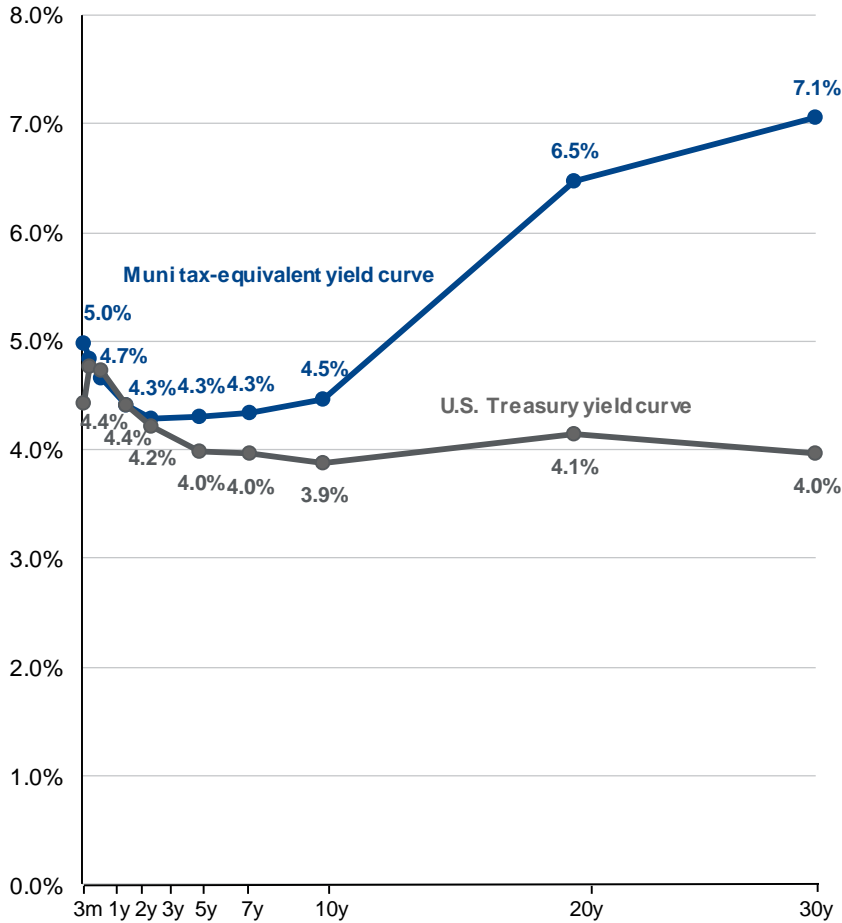
Fixed income sectors shown above are provided by Bloomberg and are represented by the global aggregate for each country except where noted. EMD sectors are represented by the J.P. Morgan EMBIG Diversified Index (USD), the J.P. Morgan GBI EM Global Diversified Index (LCL) and the J.P. Morgan CEMBI Broad Diversified Index (Corp). European Corporates are represented by the Bloomberg Euro Aggregate Corporate Index and the Bloomberg Pan-European High Yield Index. Sector yields reflect yield-to-worst. Correlations are based on 10-years of monthly returns for all sectors. Past performance is not indicative of future results. Global bond market regional breakdown may not sum to 100% due to rounding. *Guide to the Markets - U.S.* Data are as of December 31, 2022.



Municipal finance

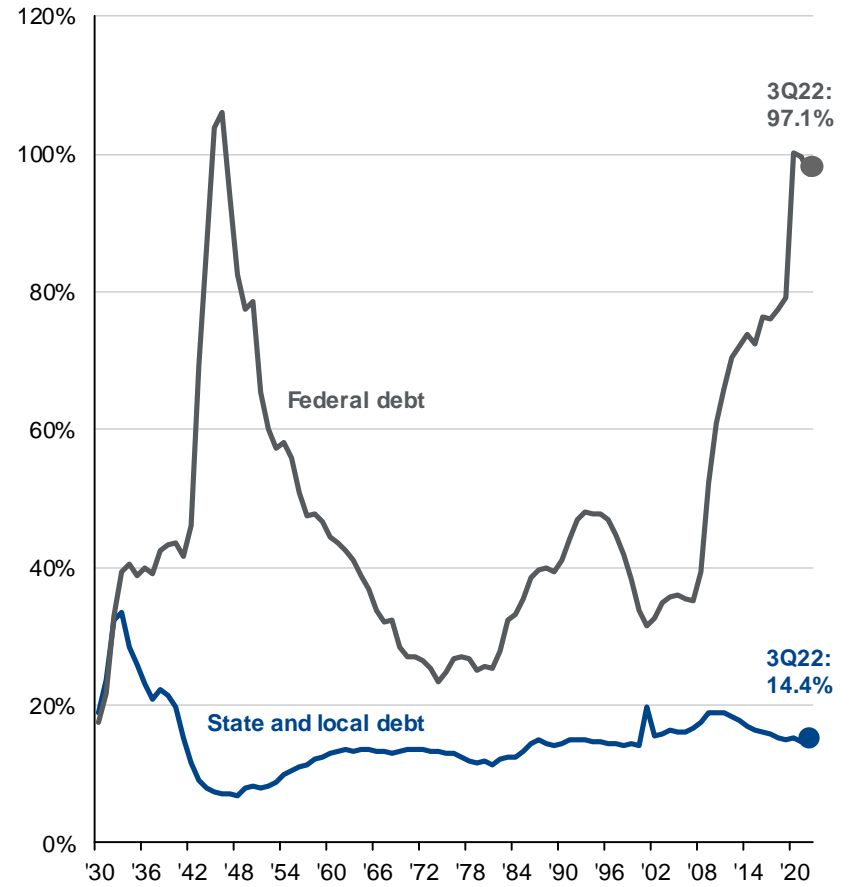
Fixed Income

Muni tax-equivalent and Treasury yield curves



State and local and federal net debt

% of GDP, 1930-2022, end of fiscal year



Source: J.P. Morgan Asset Management, (Left) Bloomberg, FactSet, Federal Reserve; (Right) Census Bureau, Congressional Budget Office (CBO). State and local debt are based on the Census Bureau's Annual Survey of State and Local Government Finances. Municipal tax-equivalent yield assumes a top-income tax bracket rate of 37% plus a Medicare tax rate of 3.8% for a total tax rate of 40.8%. *Guide to the Markets – U.S.* Data are as of December 31, 2022.

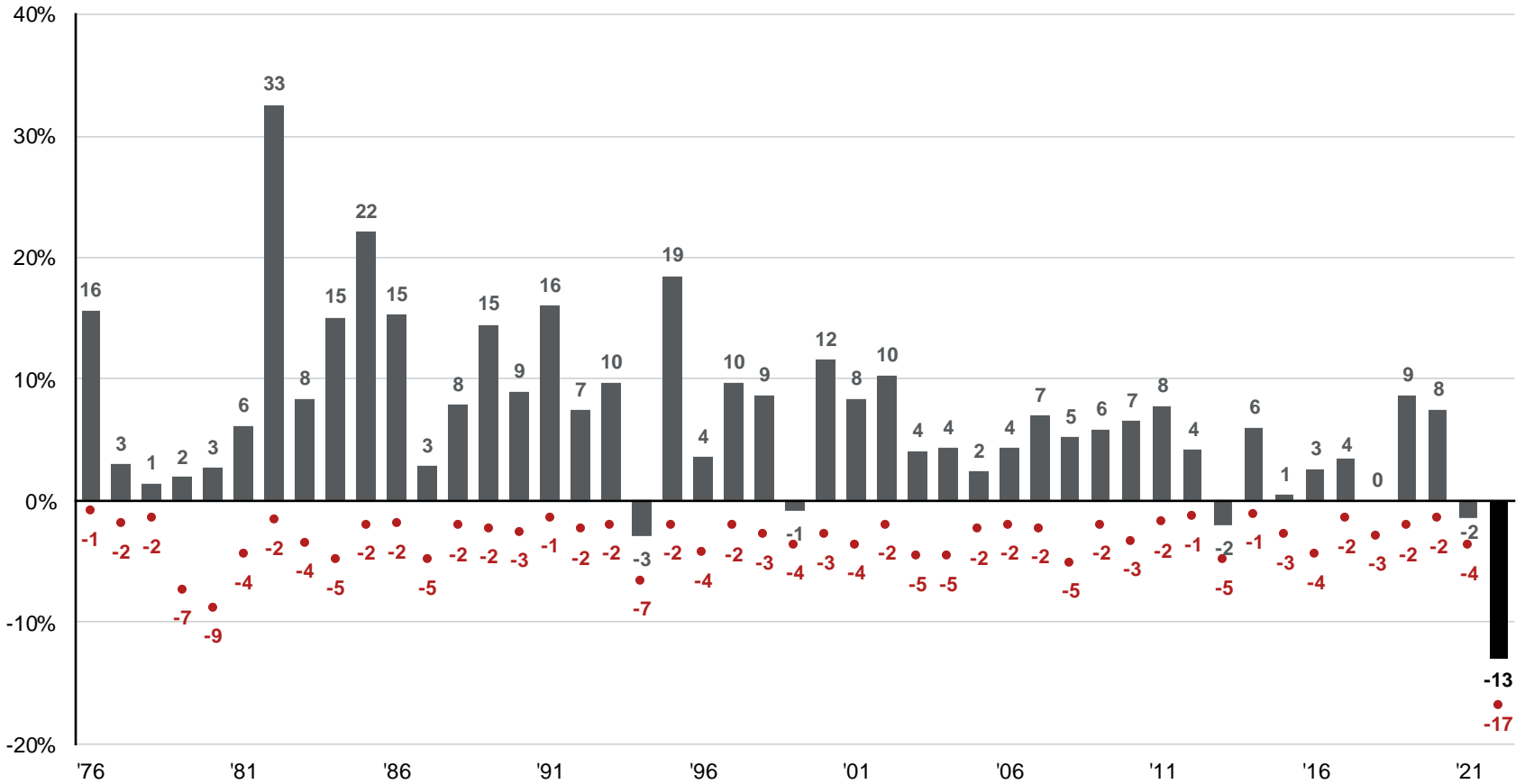


Bloomberg U.S. Agg. annual returns and intra-year declines

Fixed Income

Bloomberg U.S. Aggregate intra-year declines vs. calendar year returns

Despite average intra-year drops of 3.3%, annual returns positive in 42 of 47 years



Source: Bloomberg, FactSet, J.P. Morgan Asset Management.
 Returns are based on total return. Intra-year drops refers to the largest market drops from a peak to a trough during the year. For illustrative purposes only. Returns shown are calendar year returns from 1976 to 2022, over which time period the average annual return was 6.6%. Returns from 1976 to 1989 are calculated on a monthly basis; daily data are used afterwards.
 Guide to the Markets – U.S. Data are as of December 31, 2022.

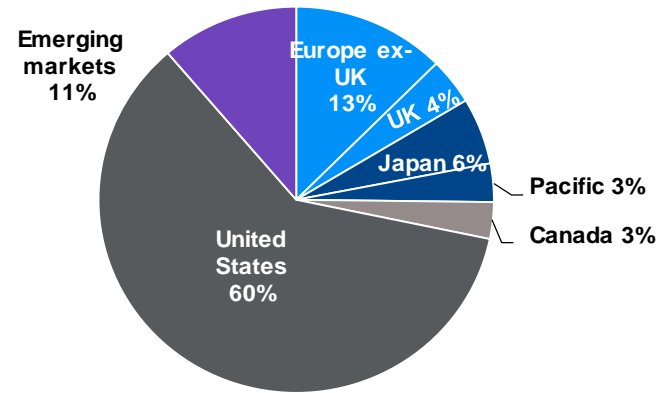


Global equity markets

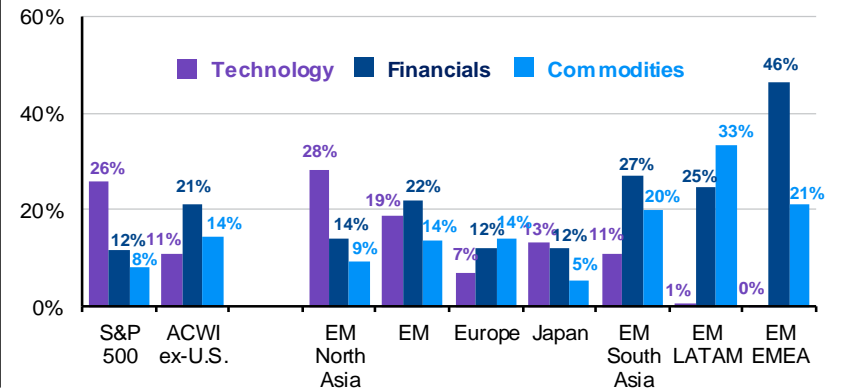
International

| Returns | 2022 | | 2021 | | 15-years | |
|---------------------------|-------|-------|-------|-------|----------|------|
| | Local | USD | Local | USD | Ann. | Beta |
| Regions | | | | | | |
| U.S. (S&P 500) | - | -18.1 | - | 28.7 | 8.8 | 0.90 |
| AC World ex-U.S. | -9.2 | -15.6 | 13.5 | 8.3 | 2.0 | 1.07 |
| EAFE | -6.5 | -14.0 | 19.2 | 11.8 | 2.3 | 1.04 |
| Europe ex-UK | -12.2 | -17.3 | 24.4 | 16.5 | 2.4 | 1.18 |
| Emerging markets | -15.2 | -19.7 | 0.1 | -2.2 | 1.0 | 1.18 |
| Selected Countries | | | | | | |
| United Kingdom | 7.2 | -4.8 | 19.6 | 18.5 | 1.4 | 1.02 |
| France | -6.9 | -12.7 | 29.7 | 20.6 | 2.8 | 1.22 |
| Germany | -16.5 | -21.6 | 13.9 | 5.9 | 0.9 | 1.31 |
| Japan | -4.1 | -16.3 | 13.8 | 2.0 | 2.5 | 0.72 |
| China | -20.6 | -21.8 | -21.6 | -21.6 | 0.6 | 1.10 |
| India | 3.0 | -7.5 | 28.9 | 26.7 | 2.4 | 1.26 |
| Brazil | 8.6 | 14.6 | -11.2 | -17.2 | -2.1 | 1.50 |
| Korea | -24.4 | -28.9 | 0.8 | -7.9 | 1.6 | 1.49 |

Weights in MSCI All Country World Index
% global market capitalization, float adjusted



Representation of key sectors in international markets
% of index market capitalization



Source: FactSet, Federal Reserve, MSCI, Standard & Poor's, J.P. Morgan Asset Management. All return values are MSCI Gross Index data. 15-year history based on USD returns. 15-year return and beta figures are calculated for the time period 12/31/2007 to 12/31/2022. Beta is for monthly returns relative to the MSCI AC World Index. Annualized volatility is calculated as the standard deviation of quarterly returns multiplied by the square root of 4. Chart is for illustrative purposes only. Please see disclosure page for index definitions. Past performance is not a reliable indicator of current and future results. EM North Asia includes China, Taiwan and South Korea. EM South Asia includes India, Indonesia, Malaysia, Pakistan, Philippines, Taiwan and Thailand. *Guide to the Markets* – U.S. Data are as of December 31, 2022.

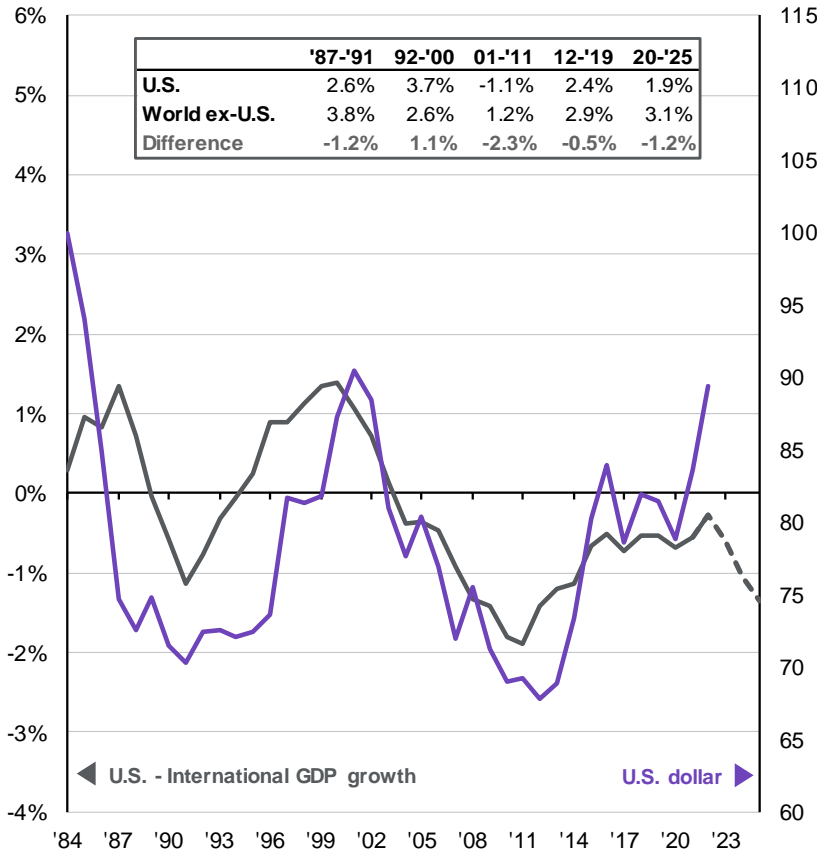


Currency and international equity returns

International

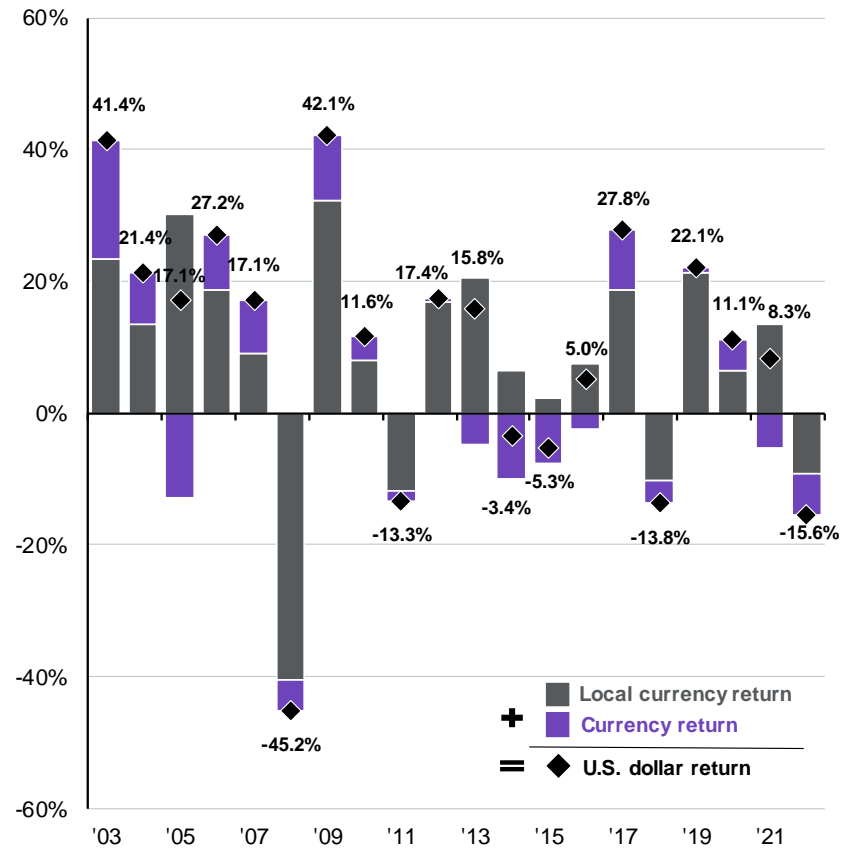
U.S. dollar and international GDP growth

Real GDP growth: U.S.-intl. (5-year moving avg.); U.S. dollar: 100 = 1984



Currency impact on international returns

MSCI All Country World ex-U.S. Index, total return



Source: J.P. Morgan Asset Management; (Left) IMF, J.P. Morgan Global Economic Research; (Right) MSCI.

Global GDP growth is based on GDP at market exchange rates as weights. U.S. dollar is the J.P. Morgan Global Economic Research real broad effective exchange rate (CPI), calculated as year-end moves versus the prior year-end. Past performance is not a reliable indicator of current and future results. 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 – U.S. Data are as of December 31, 2022.

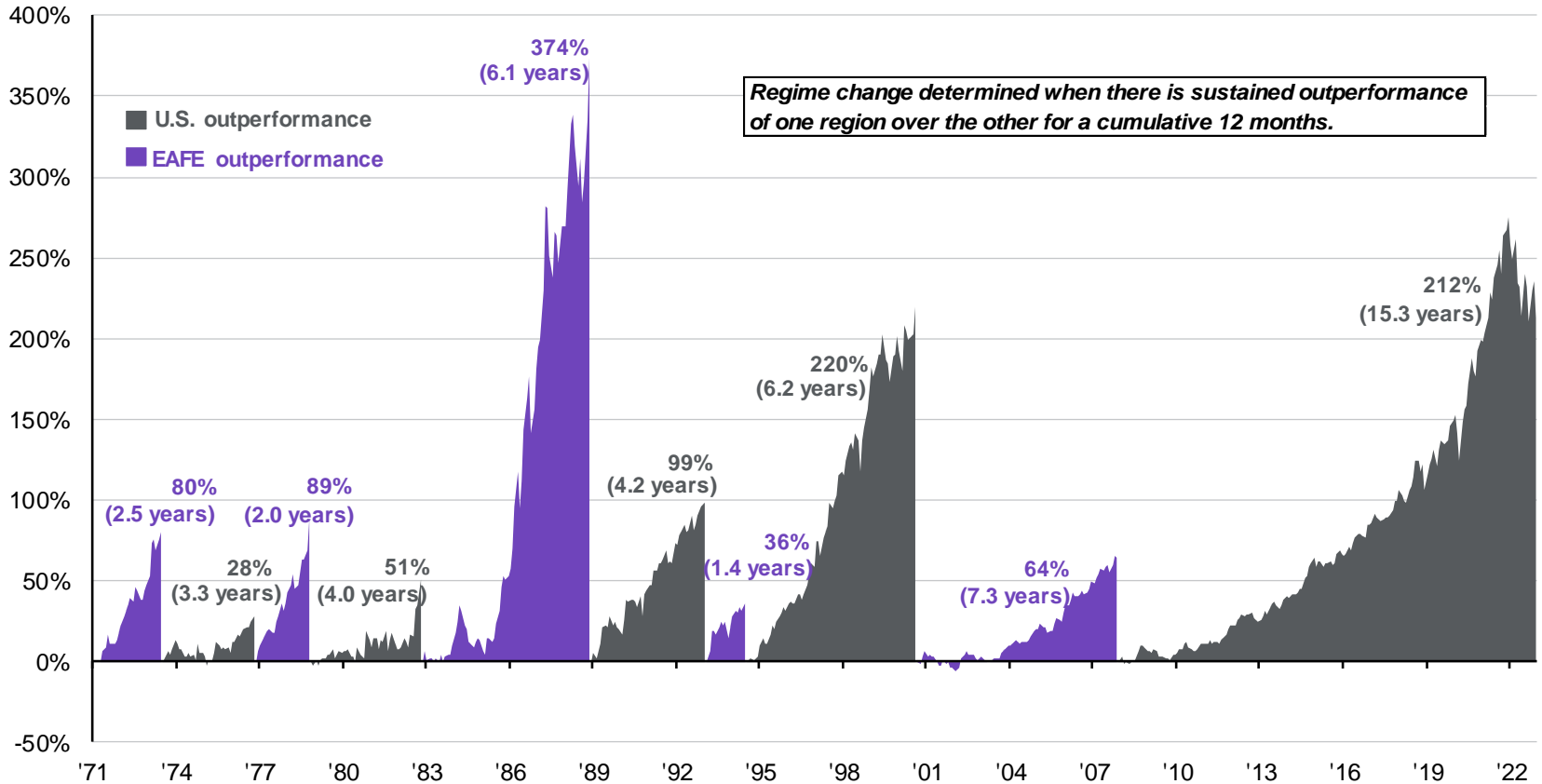


Cycles of U.S. equity outperformance

International

MSCI EAFE and MSCI USA relative performance

U.S. dollar, total return, cumulative outperformance*



Regime change determined when there is sustained outperformance of one region over the other for a cumulative 12 months.

Source: FactSet, MSCI, J.P. Morgan Asset Management. *Cycles of outperformance include a qualitative component to determine turning points in leadership. Guide to the Markets – U.S. Data are as of December 31, 2022.

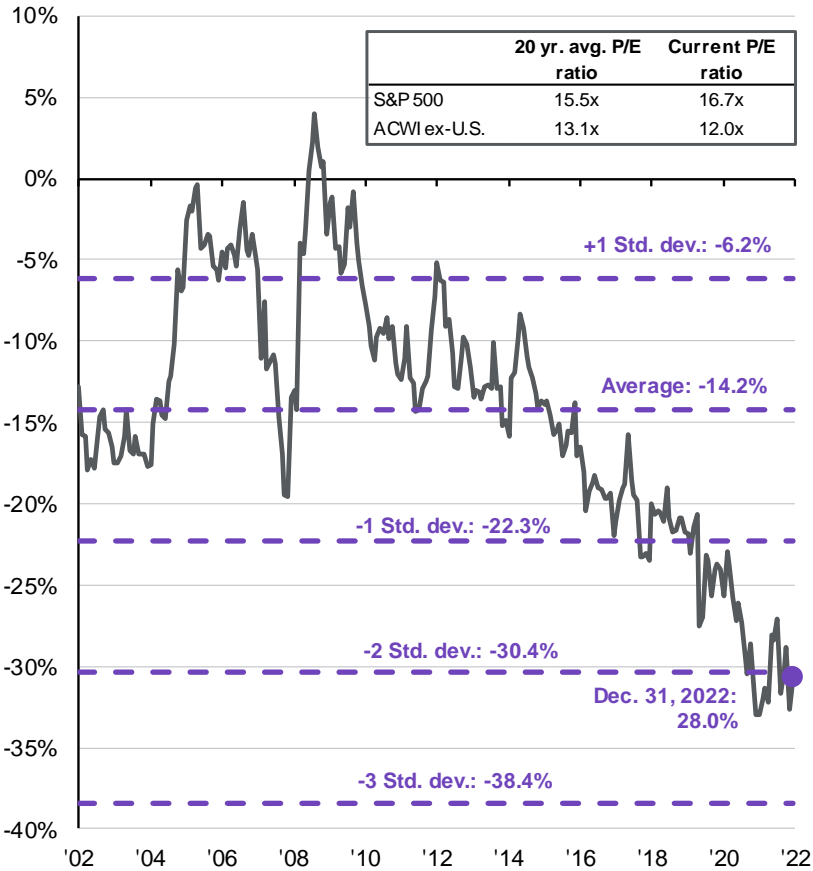


International valuations and dividend yields

International

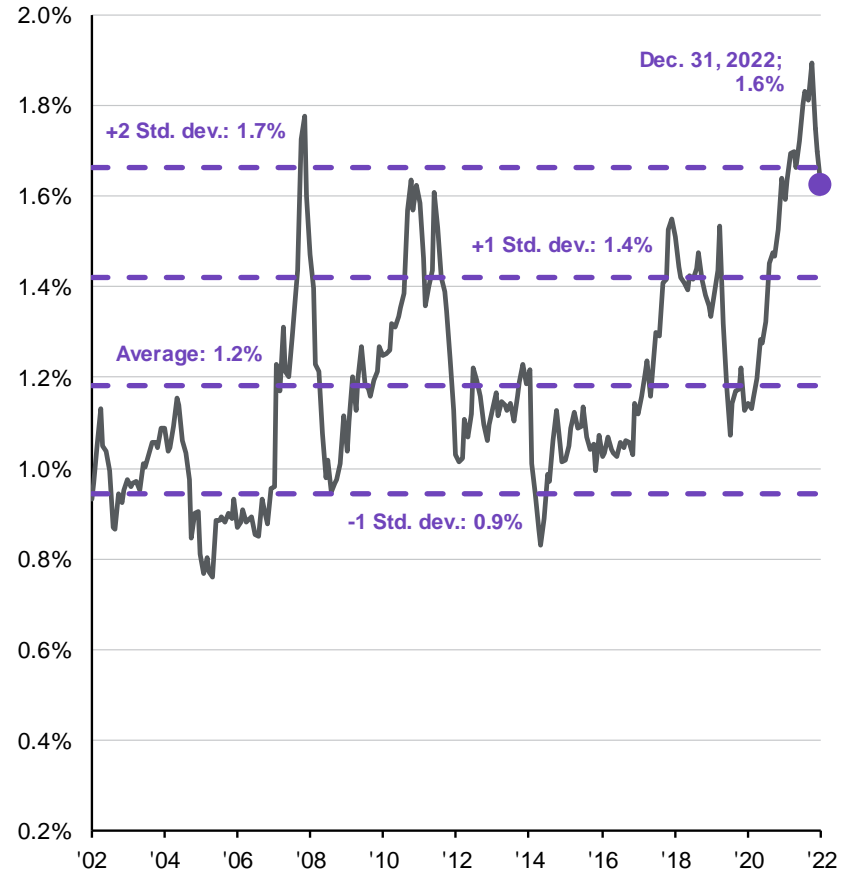
International: Price-to-earnings discount vs. U.S.

MSCI AC World ex-U.S. vs. S&P 500 Indices, next 12 months



International: Difference in dividend yields vs. U.S.

MSCI AC World ex-U.S. minus S&P 500 Indices, next 12 months



Source: FactSet, MSCI, Standard & Poor's, J.P. Morgan Asset Management. Guide to the Markets – U.S. Data are as of December 31, 2022.

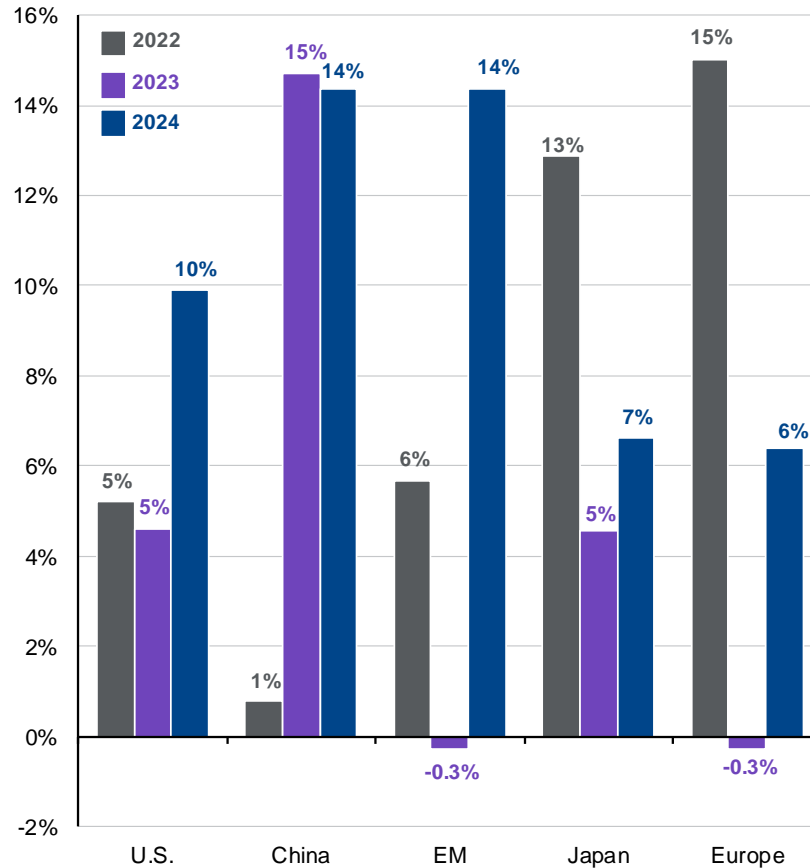


International equity earnings and valuations

International

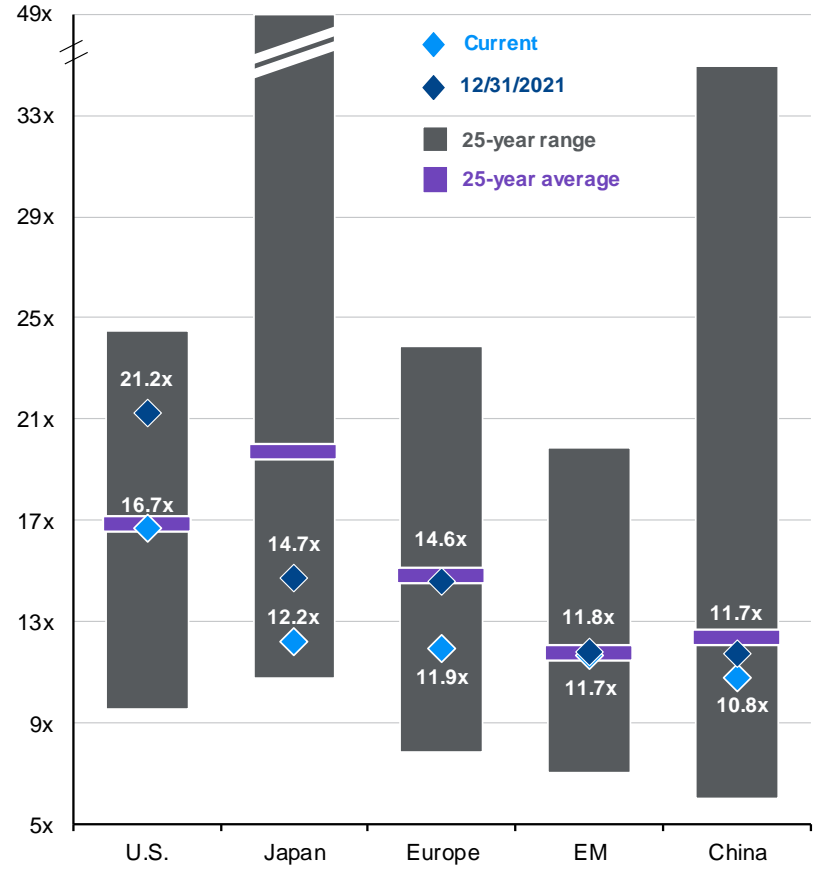
Global earnings growth

Calendar year consensus estimates



Global valuations

Current and 25-year next 12 months price-to-earnings ratio



Source: FactSet, MSCI, Standard & Poor's, Thomson Reuters, J.P. Morgan Asset Management. Calendar year consensus estimates are based on pro-forma earnings. MSCI Europe includes the eurozone as well as countries not in the currency bloc, such as Norway, Sweden, Switzerland and the UK (which collectively make up 44% of the overall index). Past performance is not a reliable indicator of current and future results. *Guide to the Markets* – U.S. Data are as of December 31, 2022.

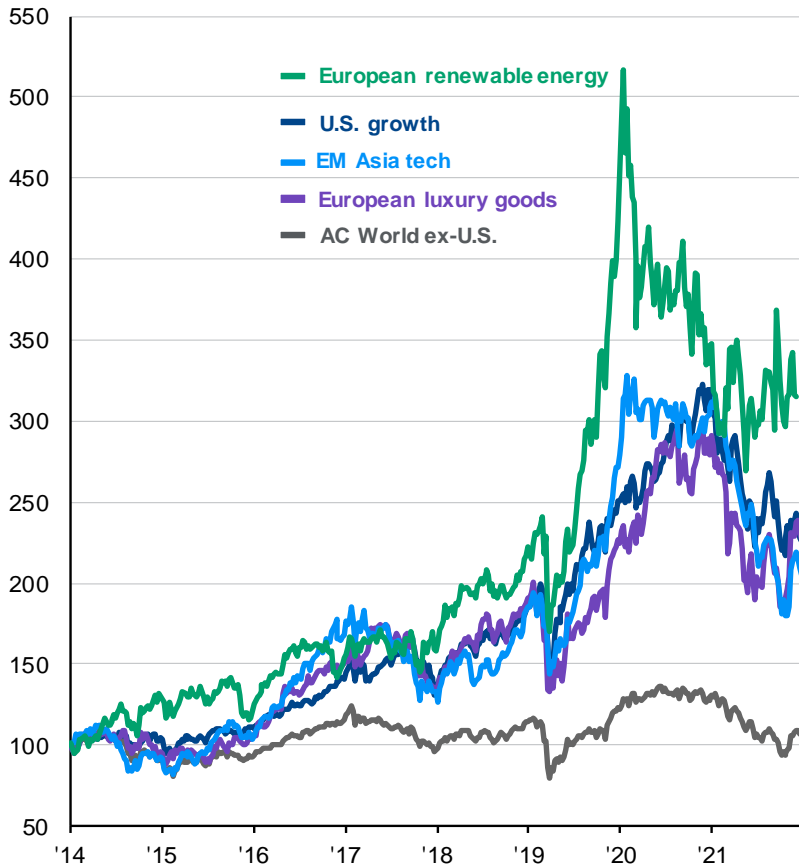


International markets

International

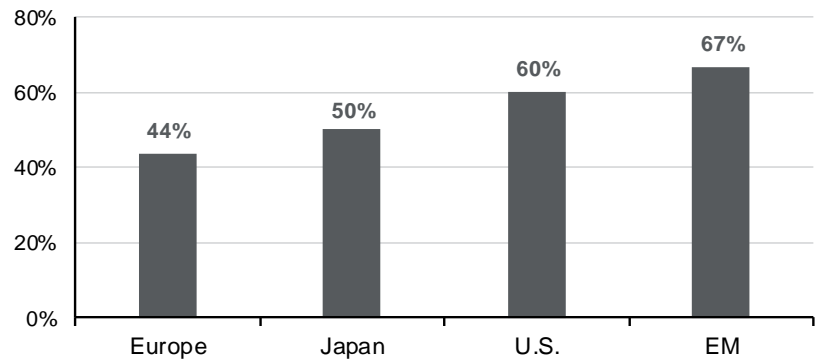
Returns of thematic indices

Total return, U.S. dollar, Dec. 31, 2014 = 100



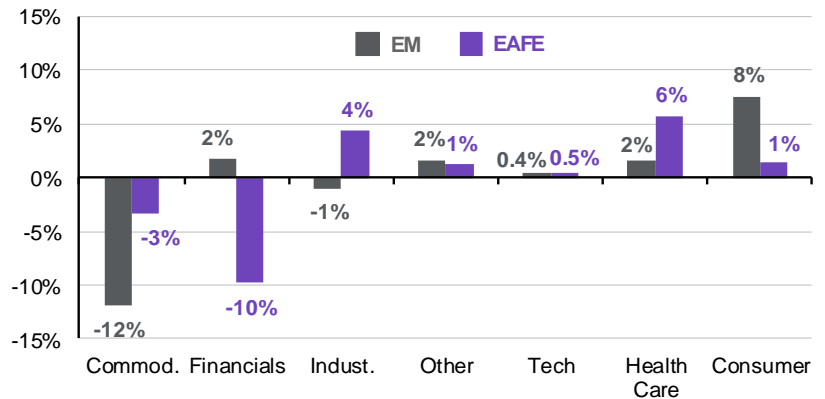
Revenue exposure vs. country of listing

% of total revenue from home countries



Change in international sector weightings

% point change from Dec. 31, 2005



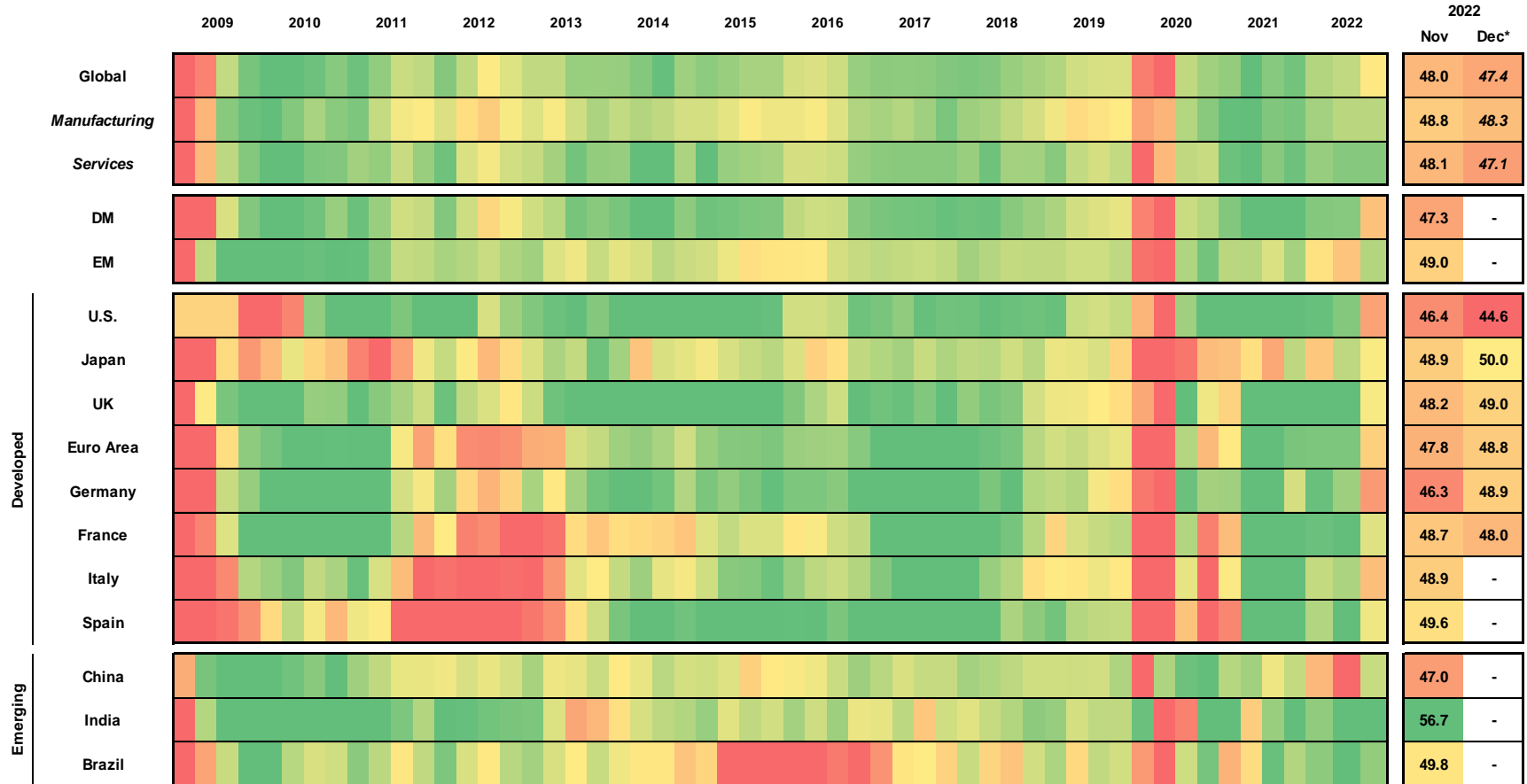
Source: Bloomberg, FactSet, MSCI, Russell, Societe Generale, J.P. Morgan Asset Management. Indices used are as follows: EM Asia Tech: MSCI EM Asia Information Technology, European Luxury Goods: MSCI Europe Textiles, Apparel and Luxury Goods, U.S. Growth: Russell 1000 Growth, AC World ex-U.S.: MSCI AC World ex USA, European Renewable Energy: Societe Generale European Renewable Energy, Europe: MSCI Europe, Japan: MSCI Japan, U.S.: S&P 500, EM: MSCI EM, EAFE: MSCI EAFE. Revenue exposure vs. country of listing and change in international sector weightings is as of 12/31/2022.

Guide to the Markets – U.S. Data are as of December 31, 2022.



Global economic activity momentum

Global Composite (manufacturing & services combined) Purchasing Managers' Index, quarterly



International

Developed

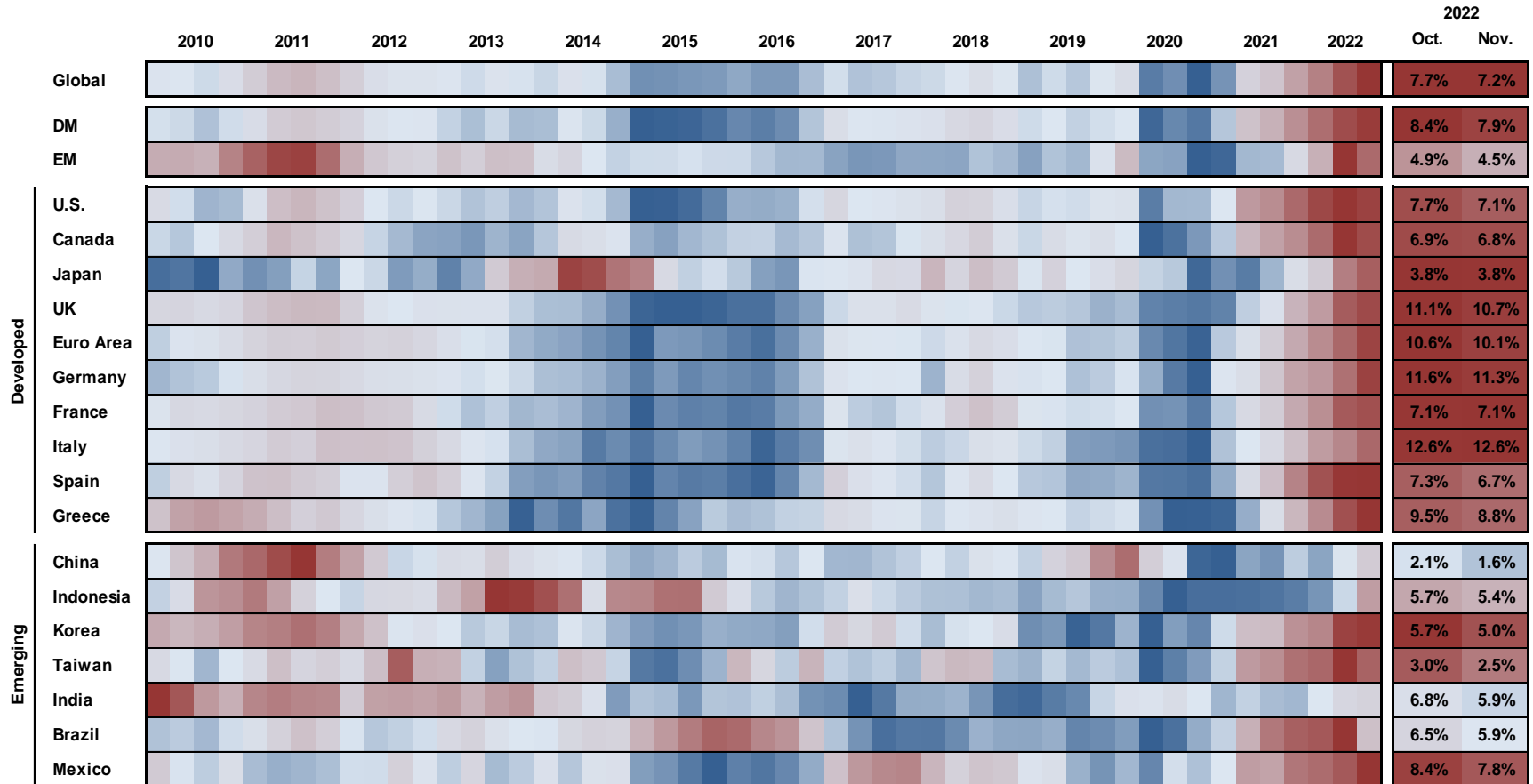
Emerging

Source: Standard & Poor's, J.P. Morgan Asset Management.
 The Composite PMI includes both manufacturing and services sub-indices. Heatmap colors are based on PMI relative to the 50 level, which indicates acceleration or deceleration of the sector, for the time period shown. Heatmap is based on quarterly averages, with the exception of the two most recent figures, which are single month readings. Data for the U.S. are back-tested and filled in from December 2007 to September 2009 due to lack of existing PMI figures. DM and EM represent developed markets and emerging markets, respectively. *December composite figures are J.P. Morgan Asset Management estimates.
 Guide to the Markets – U.S. Data are as of December 31, 2022.



Global inflation

Year-over-year headline inflation by country and region, quarterly



International

Source: Bank of Mexico, DGBAS, Eurostat, FactSet, Federal Reserve, Goskomstat of Russia, IBGE, India Ministry of Statistics & Programme Implementation, Japan Ministry of Internal Affairs & Communications, Korean National Statistical Office, Melbourne Institute, National Bureau of Statistics China, Statistics Canada, Statistics Indonesia, UK Office for National Statistics (ONS), J.P. Morgan Asset Management. Heatmap is based on quarterly averages, with the exception of the two most recent figures, which are single month readings. Colors determined by percentiles of inflation values over the time period shown. Deep blue = lowest value, light blue = median, deep red = highest value. DM and EM represent developed markets and emerging markets, respectively.
 Guide to the Markets – U.S. Data are as of December 31, 2022.

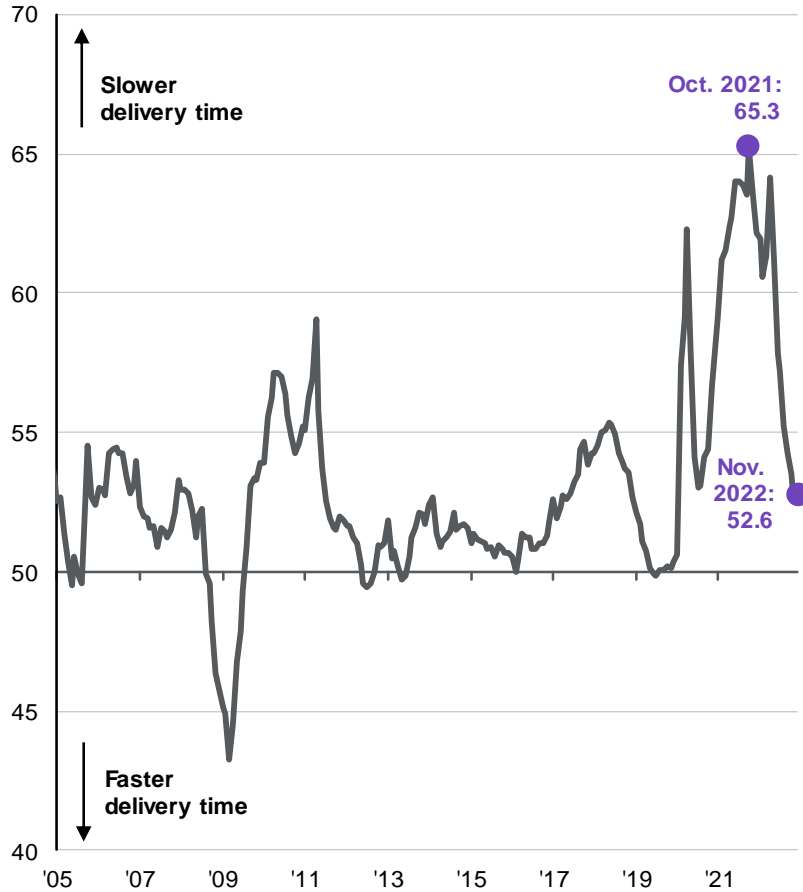


Global supply chains and inflation

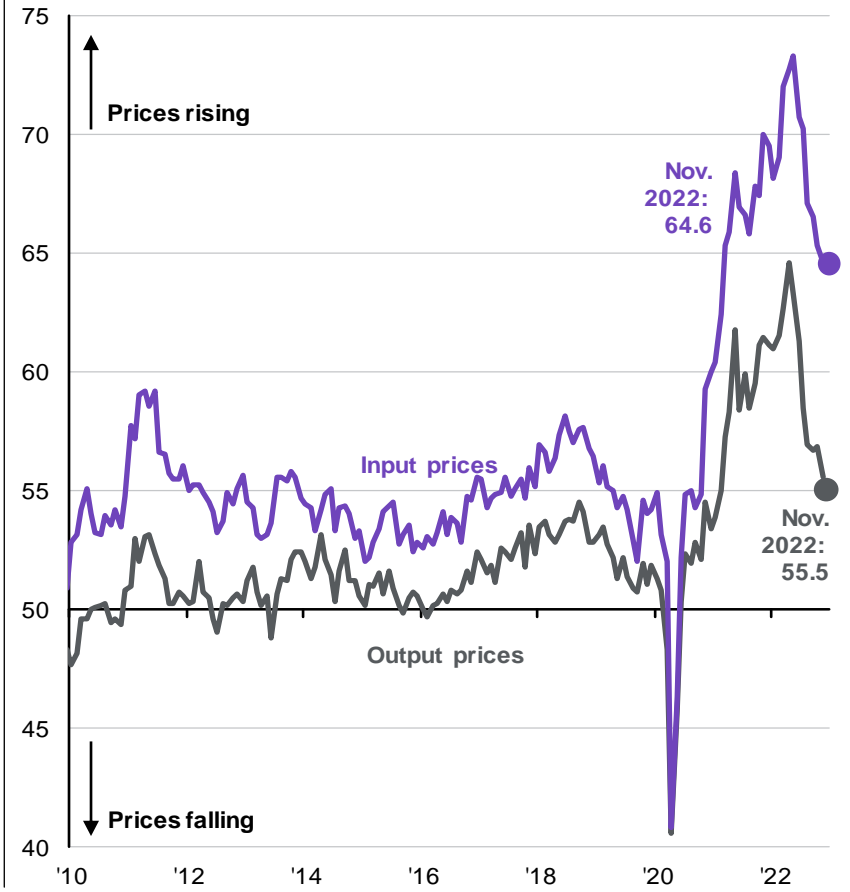
International

Global PMI suppliers' delivery times index*

Figure shown is 100 - Global PMI suppliers' delivery times index



Global PMI input and output prices**



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

*Participants in Standard & Poor's PMI business surveys, conducted in 44 countries, are asked: "Are your suppliers' delivery times slower, faster or unchanged on average than one month ago?". Index includes the manufacturing and construction sectors. PMI score reflected above is 100 - PMI report by Standard & Poor's. A reading of 50 = no change, <50 = faster delivery time, >50 = slower delivery time.**Participants are asked: "Are input/output prices the same, higher or lower?". Values shown reflect the composite index, which includes both manufacturing and services. A reading of 50 = no change, >50 = price increase, <50 = price decrease.

Guide to the Markets - U.S. Data are as of December 31, 2022.

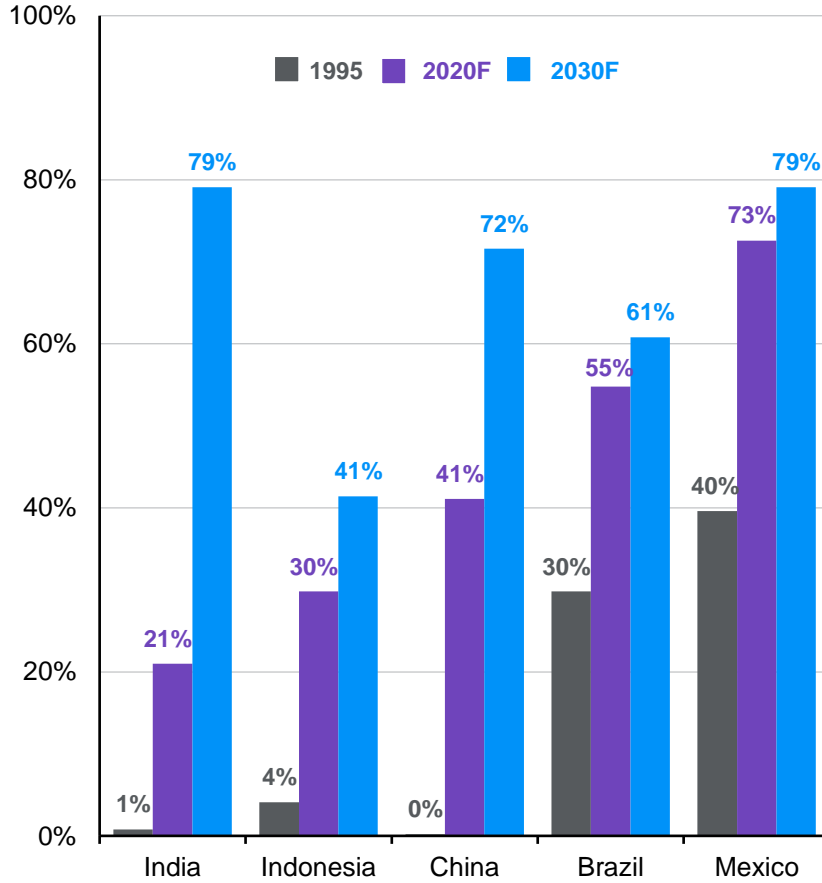


The emergence of the EM middle class

International

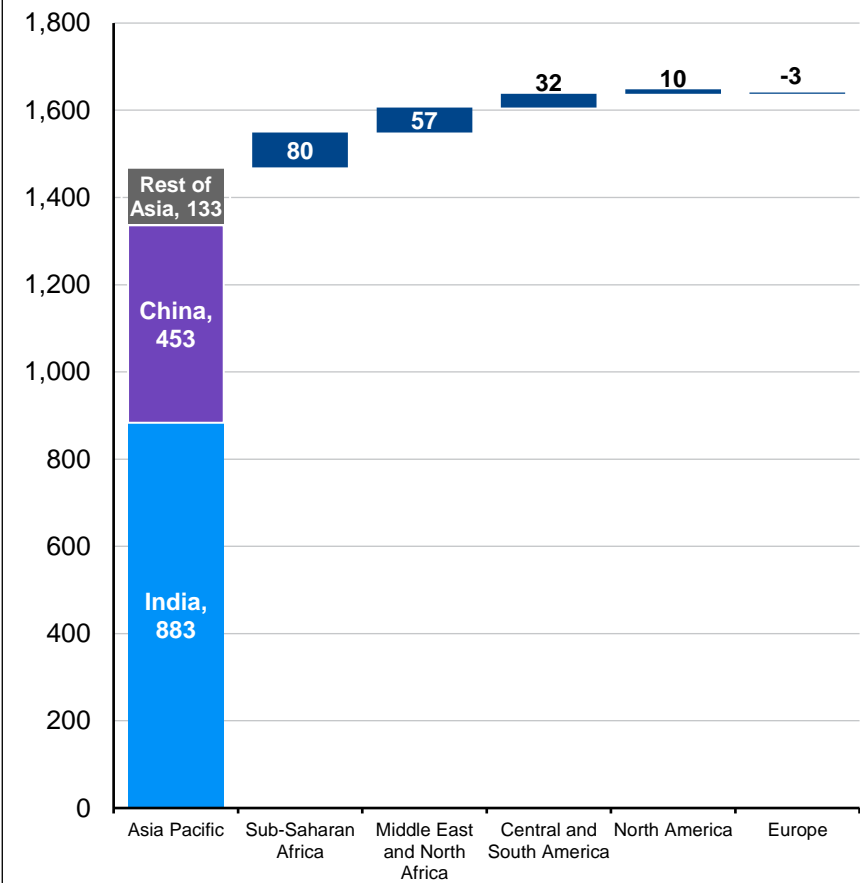
China real GDP contribution

Year-over-year % change for GDP, contribution to GDP for components



Regional contribution to middle class growth: 2020 to 2030

Millions of people



Source: Brookings Institution, J.P. Morgan Asset Management. Estimates for regional contribution are from Kharas, Homi. The Unprecedented Expansion of the Global Middle Class, An Update, Brookings Institution, 2017. Middle class is defined as households with per capita incomes between \$11 and \$110 per person per day in 2011 PPP terms. 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 – U.S. Data are as of December 31, 2022.

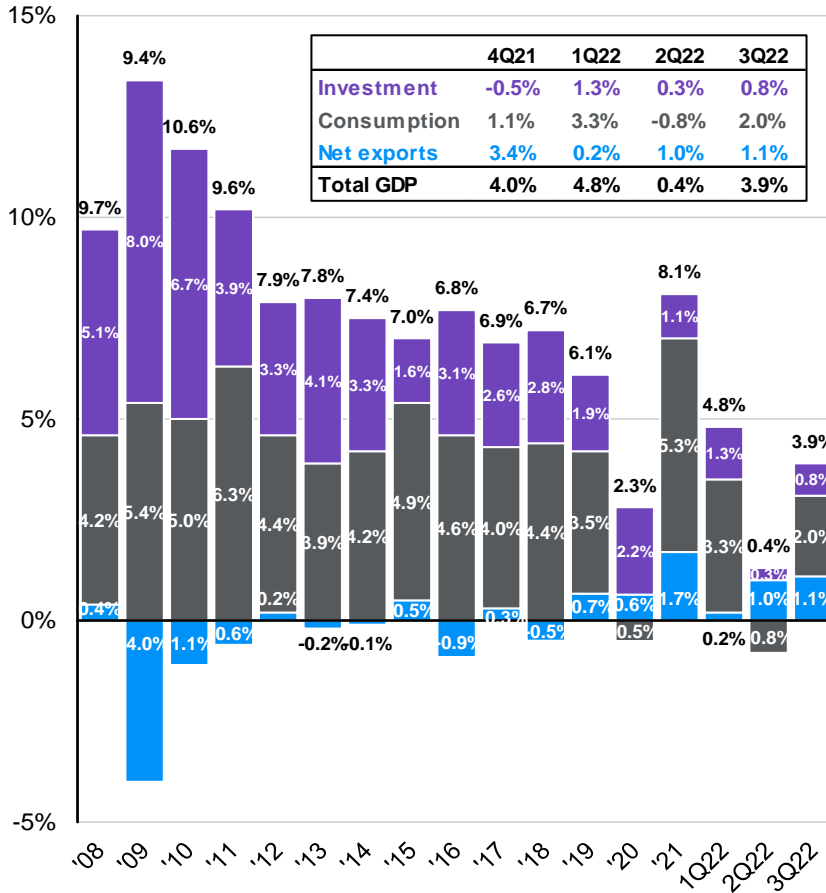


China: Economic growth

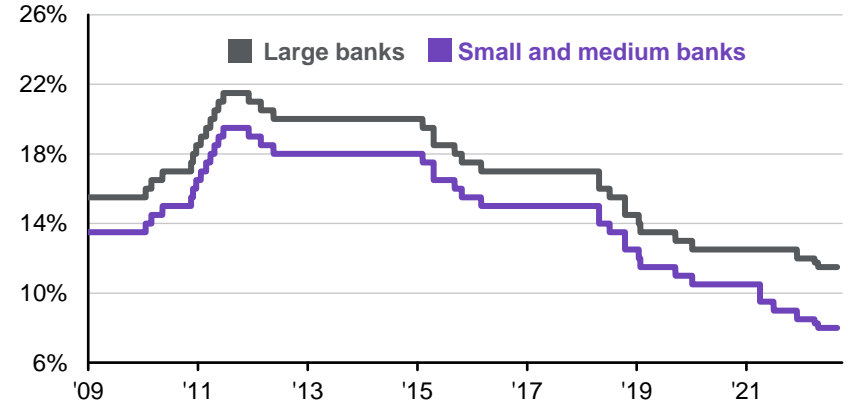
International

China real GDP contribution

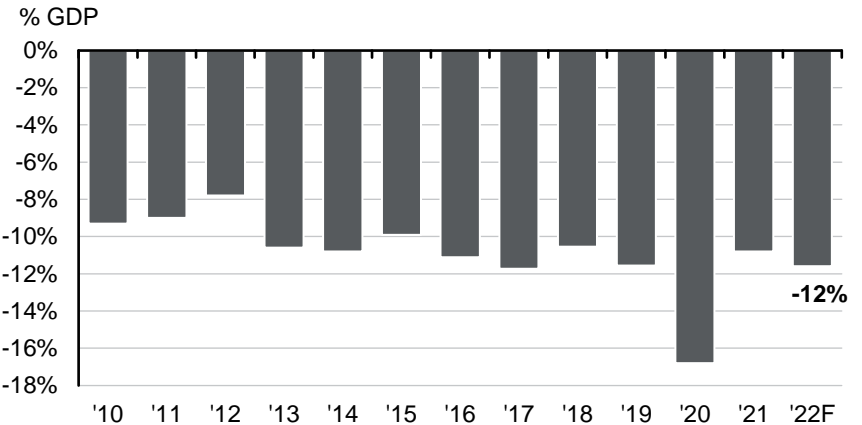
Year-over-year % change for GDP, contribution to GDP for components



Monetary stimulus: Reserve requirement ratio



Fiscal stimulus: Fiscal deficit*



Source: FactSet, J.P. Morgan Asset Management; (Left) CEIC; (Top right) People's Bank of China; (Bottom right) China Agriculture Development Bank, China Development Bank, Ministry of Finance, People's Bank of China, Wind. *The fiscal deficit is a J.P. Morgan Global Economic Research estimate of the augmented fiscal deficit. It measures the aggregate resources controlled by the government and used to support economic growth. It consists of the official budgetary deficit of the central and local governments, and additional funding raised and spent by local governments through Local Government Financing Vehicles and various government-guided funds, whose activities are considered quasi-fiscal. Large banks are six major banks in China, including Industrial and Commercial Bank of China, Agricultural Bank of China, Bank of China, China Construction Bank, Bank of Communications, Postal Savings Bank of China. The other banks are categorized as small and medium-sized banks. PBoC sets favorable required reserve ratio (RRR) for banks that have met specific criteria, such as loans to small and medium-sized enterprises and agricultural sectors. These measures have significantly brought down the actual RRR for banks. 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 - U.S. Data are as of December 31, 2022.



Correlations and volatility

Alternatives

| | U.S. Large Cap | EAFE | EME | Bonds | Corp. HY | Munis | Currency. | EMD | Cmdty. | REITs | Hedge funds | Private equity | Gold | Ann. Volatility |
|----------------|----------------|------|------|-------|----------|-------|-----------|-------|--------|-------|-------------|----------------|-------|-----------------|
| U.S. Large Cap | 1.00 | 0.87 | 0.76 | 0.25 | 0.85 | 0.35 | -0.42 | 0.69 | 0.43 | 0.77 | 0.84 | 0.82 | 0.10 | 0.15 |
| EAFE | | 1.00 | 0.89 | 0.26 | 0.85 | 0.42 | -0.60 | 0.76 | 0.45 | 0.62 | 0.82 | 0.82 | 0.20 | 0.15 |
| EME | | | 1.00 | 0.30 | 0.82 | 0.44 | -0.69 | 0.81 | 0.48 | 0.53 | 0.75 | 0.74 | 0.38 | 0.18 |
| Bonds | | | | 1.00 | 0.37 | 0.85 | -0.35 | 0.67 | -0.20 | 0.42 | -0.02 | 0.02 | 0.56 | 0.04 |
| Corp. HY | | | | | 1.00 | 0.45 | -0.48 | 0.86 | 0.49 | 0.69 | 0.80 | 0.75 | 0.26 | 0.08 |
| Munis | | | | | | 1.00 | -0.38 | 0.76 | -0.13 | 0.54 | 0.13 | 0.21 | 0.49 | 0.04 |
| Currencies | | | | | | | 1.00 | -0.59 | -0.42 | -0.21 | -0.29 | -0.42 | -0.56 | 0.06 |
| EMD | | | | | | | | 1.00 | 0.26 | 0.62 | 0.55 | 0.55 | 0.49 | 0.08 |
| Commodities | | | | | | | | | 1.00 | 0.33 | 0.61 | 0.58 | 0.32 | 0.17 |
| REITs | | | | | | | | | | 1.00 | 0.61 | 0.63 | 0.18 | 0.16 |
| Hedge funds | | | | | | | | | | | 1.00 | 0.86 | 0.01 | 0.05 |
| Private equity | | | | | | | | | | | | 1.00 | 0.01 | 0.08 |
| Gold | | | | | | | | | | | | | 1.00 | 0.15 |

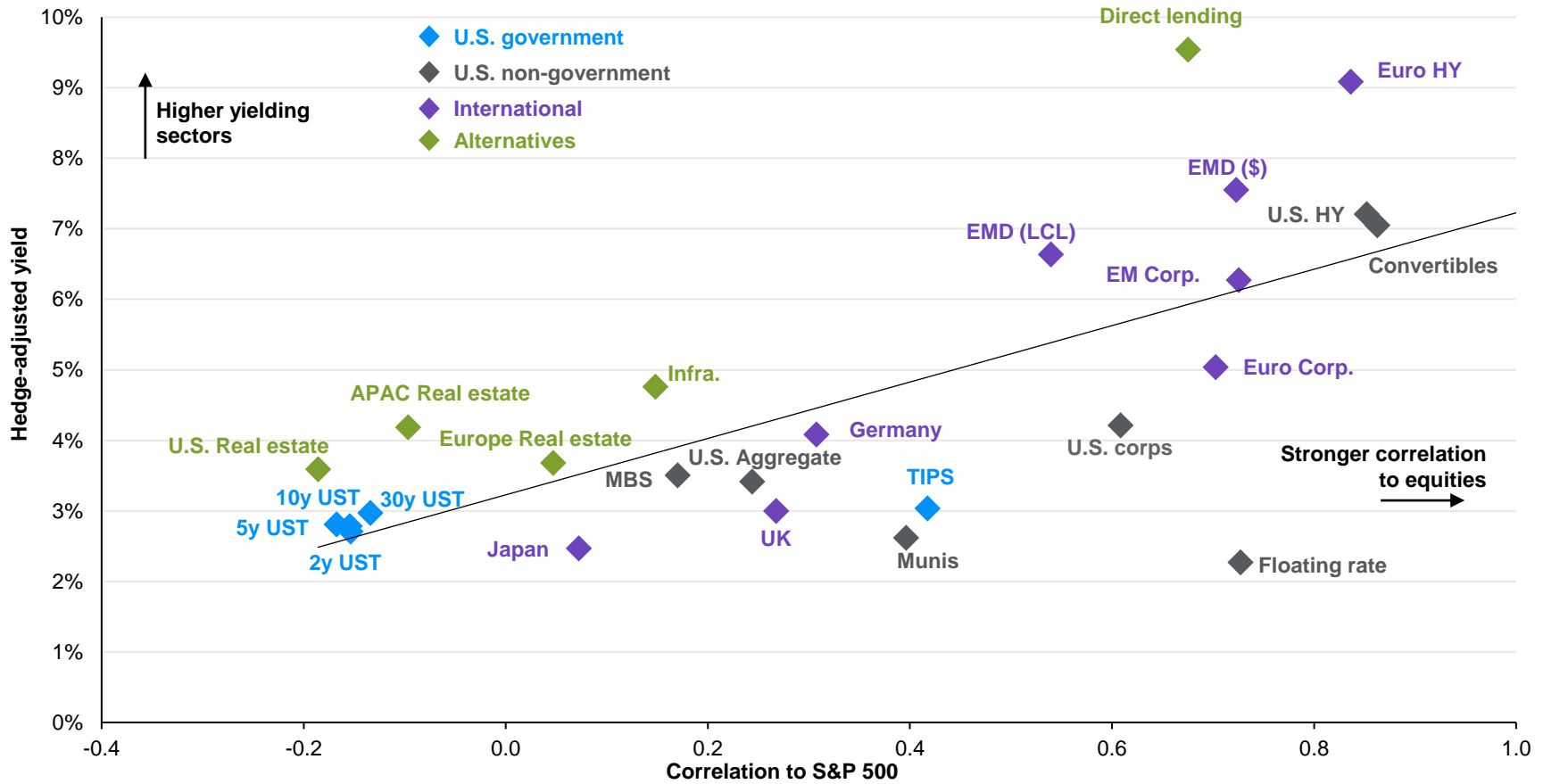
Source: Bloomberg, Burgiss, Credit Suisse/Tremont, FactSet, Federal Reserve, MSCI, Standard & Poor's, J.P. Morgan Asset Management. Indices used – Large Cap: S&P 500 Index; Currencies: Federal Reserve Trade-Weighted Dollar; EAFE: MSCI EAFE; EME: MSCI Emerging Markets; Bonds: Bloomberg Aggregate; Corp HY: Bloomberg Corporate High Yield; EMD: Bloomberg Emerging Market; Cmdty.: Bloomberg Commodity Index; REITs: NAREIT All Equity Index; Hedge funds: CS/Tremont Hedge Fund Index; Private equity: Time weighted returns from Burgiss; Gold: Gold continuous contract (\$/oz). Private equity data are reported on a one- to two-quarter lag. All correlation coefficients and annualized volatility are calculated based on quarterly total return data for period from 12/31/2012 to 12/31/2022, except for Private equity, which is based on the period from 6/30/2012 to 6/30/2022. This chart is for illustrative purposes only. Guide to the Markets – U.S. Data are as of December 31, 2022.



Equity market correlations and yields

Equity market correlations and yields

Hedge-adjusted yield, last 12 months, 10-year correlations, quarterly



Alternatives

Source: Bloomberg, Gilberto-Levy, NCREIF, MSCI, FactSet, ICE, J.P. Morgan Asset Management. *CML is commercial mortgage loans. Fixed income shown above are represented by Bloomberg indices except for EMD and ABS – U.S. Aggregate; MBS: U.S. Aggregate Securitized - MBS; U.S. corps: U.S. Corporates; Munis: Municipal Bond; U.S. HY: Corporate High Yield; TIPS: Treasury Inflation-Protected Securities (TIPS); Floating Rate: U.S. Floating Rate; Convertibles: U.S. Convertibles Composite; ABS: J.P. Morgan ABS Index; EMD (\$): J.P. Morgan EMBIG Diversified Index; EMD (LCL): J.P. Morgan GBI EM Global Diversified Index; EM Corp.: J.P. Morgan CEMBI Broad Diversified Index; Euro Corp.: Euro Aggregate Corporate Index; Euro HY: Pan-European High Yield Index; U.S. Real Estate: NCREIF Property Index – ODCE ; Europe Real Estate: Market weighted-avg. of MSCI Global Property Fund Indices - U.K. & Cont. Europe; APAC Real Estate: MSCI Global Property Index - Asia-Pacific; Global infra.: MSCI Global Quarterly Infrastructure Asset Index (equal weighted blend); U.S. Direct Lending: Cliffwater Direct Lending Index; Timber: NCREIF Timberland Property Index (U.S.); Transport returns and yield are derived from a J.P. Morgan Asset Management index; CML – Senior: Gilberto-Levy Commercial Mortgage Performance Aggregate Index. Convertibles yield is based on the U.S. portion of the Bloomberg Global Convertibles. Country yields are represented by the global aggregate for each country. Yield and return information based on bellwethers for Treasury securities. U.S. Real Estate yield is calculated using the MSCI Global Property Fund Index – North America. Correlations are based on quarterly return over the past 10 years through 9/30/2022. All non-alternative yields are as of 11/30/2022. Alt yields are as of 9/30/2022. Quarterly return correlations and yields for Infrastructure are as of 6/30/2022. Guide to the Markets – U.S. Data are as of December 31, 2022.



Bloomberg Commodity Index

Since index inception, total returns



Commodity prices

Bloomberg commodity index constituents

| Bloomberg Commodity Index | | | |
|---------------------------|---------------------|--------------|------------------------|
| Constituents | Current price level | YTD change | Change since 6/9/2022* |
| Sub-indices | | | |
| Energy | \$41.23 | 33.5% | -33.5% |
| WTI crude oil | \$80.26 | 6.5% | -34.0% |
| Natural gas | \$0.18 | 17.5% | -52.4% |
| Brent crude | \$487.22 | 38.9% | -19.7% |
| Low sulphur gas oil | \$309.39 | 77.9% | -18.9% |
| RBOB gasoline | \$472.34 | 45.7% | -22.8% |
| ULS diesel | \$4.54 | 25.5% | -18.1% |
| Grains | \$48.64 | 15.6% | -13.5% |
| Corn | \$13.66 | 20.5% | -7.8% |
| Soybeans | \$81.94 | 27.0% | -14.7% |
| Soybean meal | \$920.27 | 28.2% | 18.8% |
| Wheat | \$39.02 | -4.2% | -29.2% |
| Soybean oil | \$84.27 | 12.2% | -24.5% |
| HRW w heat | \$138.41 | 14.2% | -17.2% |
| Industrial metals | \$165.34 | -4.4% | -10.2% |
| Copper | \$341.68 | -15.3% | -13.4% |
| Aluminum | \$33.13 | -16.8% | -14.8% |
| Zinc | \$96.86 | -12.3% | -18.0% |
| Nickel | \$283.62 | 43.7% | 5.7% |
| Precious metals | \$534.84 | 0.7% | 1.2% |
| Gold | \$195.79 | -2.7% | -3.3% |
| Silver | \$212.81 | 0.5% | 8.1% |
| Softs | \$45.40 | -5.4% | -14.8% |
| Sugar | \$103.23 | 9.9% | 4.8% |
| Coffee | \$10.53 | -23.4% | -26.1% |
| Cotton | \$30.44 | -8.8% | -31.5% |
| Livestock | \$23.60 | 5.3% | 6.7% |
| Live cattle | \$57.77 | 2.6% | 5.9% |
| Lean hogs | \$4.38 | 10.8% | 7.1% |

Source: Bloomberg, FactSet, J.P. Morgan Asset Management. All the Bloomberg subsectors and constituents are represented by the respective Bloomberg subindex except ULS Diesel, which is represented by the EIA composite for U.S. ULS diesel prices. *The Bloomberg Commodity Index peaked on June 9, 2022.
 Guide to the Markets – U.S. Data are as of December 31, 2022.

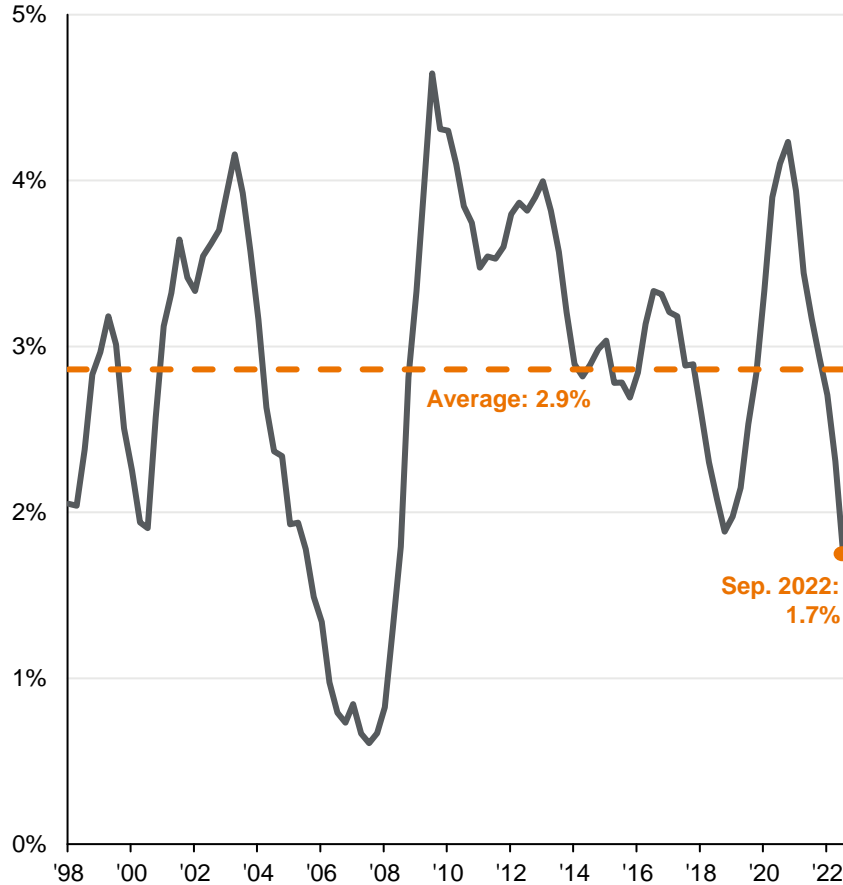


U.S. real estate dynamics

Alternatives

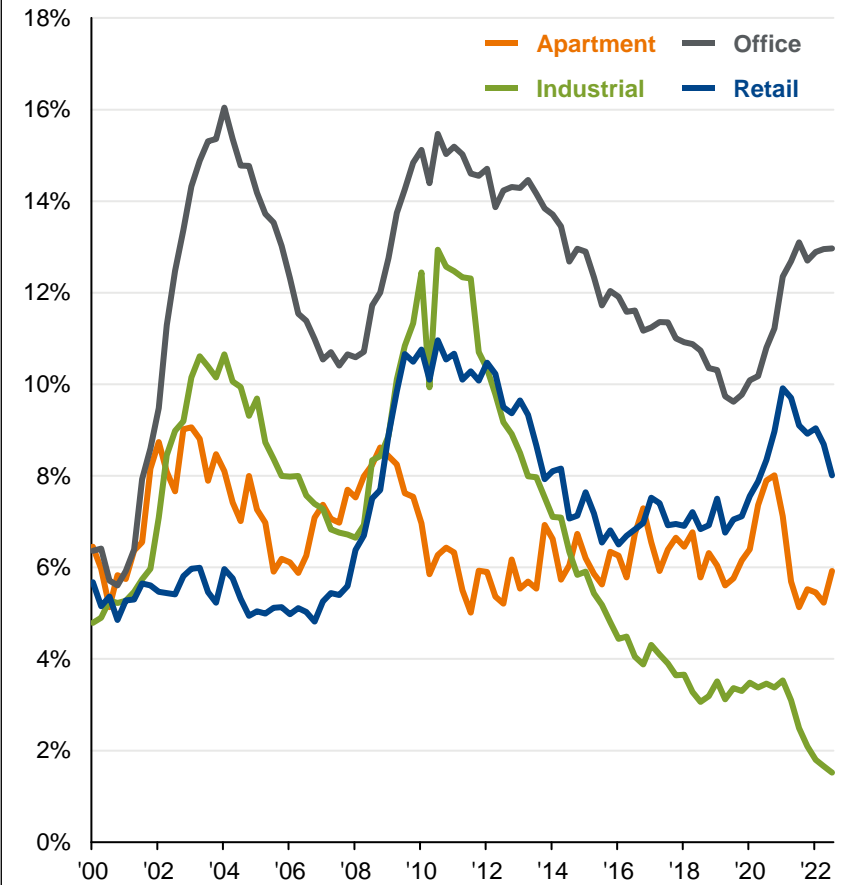
U.S. real estate cap rate spreads

Transaction based, spread to 10y UST, 4-quarter rolling average



U.S. vacancy rates by property type

Percent



Source: NAREIT, NCREIF, Statista, J.P. Morgan Asset Management.

The cap rate, which is computed as the net operating income over sales price, is the rate of return on a real estate investment property. Vacancy rate data is as of 9/30/2022. Data is based on availability as of 12/31/2022. This slide comes from our [Guide to Alternatives](#). *Guide to the Markets – U.S.* Data are as of December 31, 2022.

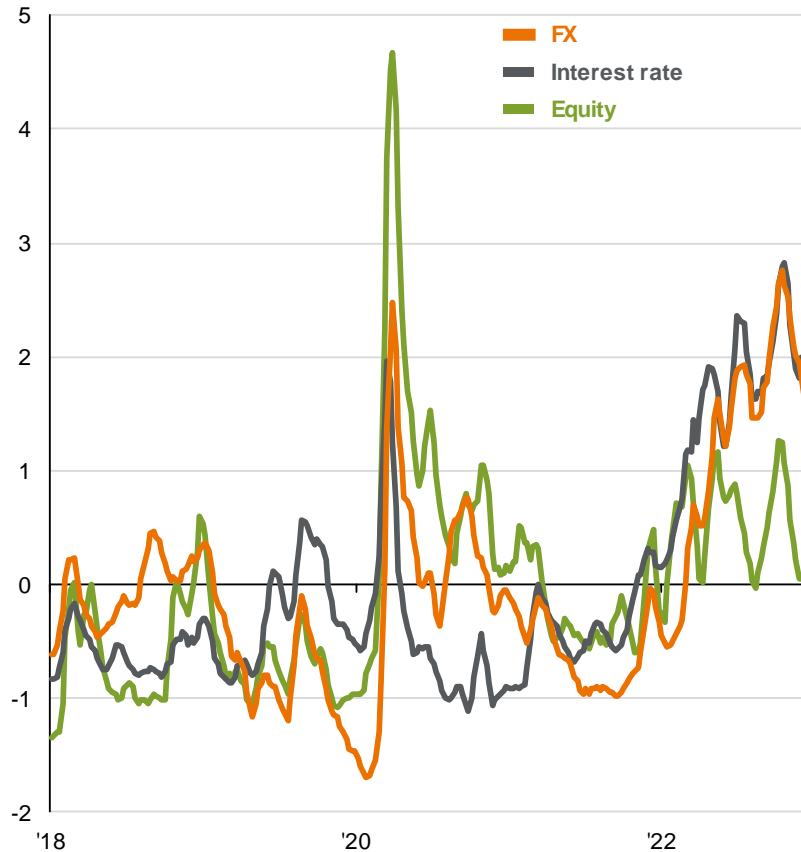


Market volatility and hedge funds

Alternatives

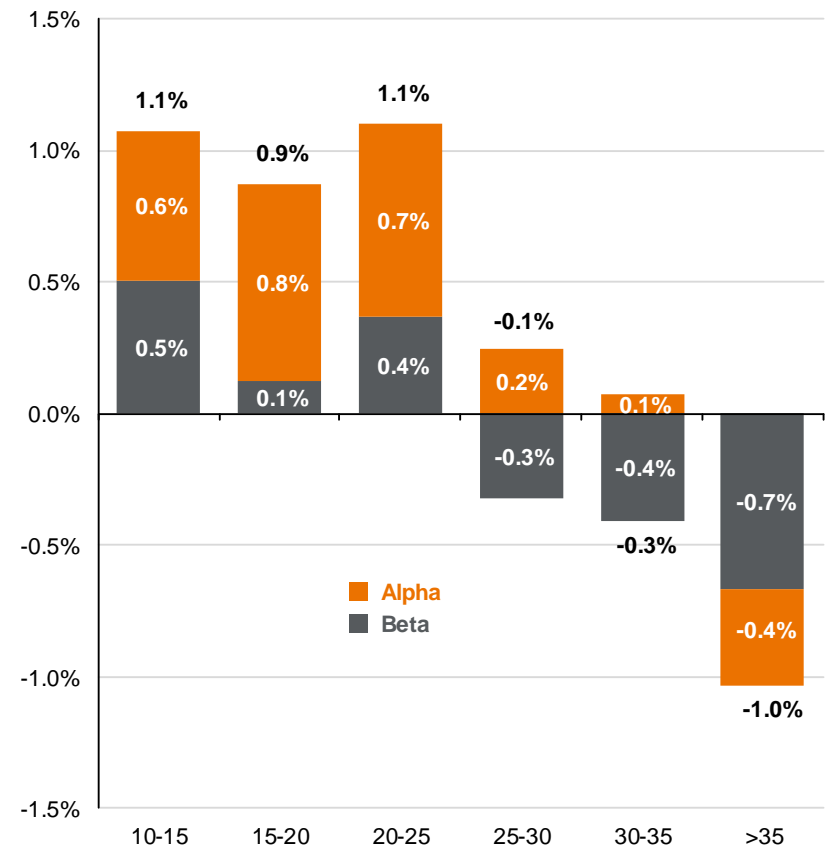
Equity, interest rate and foreign exchange volatility

Z-score, 4-week moving average



Hedge funds and volatility

Average monthly hedge fund returns by VIX level, 1990 – present



Source: CBOE, HFRI, MSCI, ICE BofA, J.P. Morgan Index Research, FactSet, J.P. Morgan Asset Management. (Right) Historical beta is based on regression analysis, where the HFRI is the dependent variable and the MSCI AC World Index is the independent variable. Monthly VIX reading is an average. Numbers may not sum to 100% due to rounding. (Left) Equity volatility is represented by the VIX Index, interest rate volatility is represented by the MOVE Index and foreign exchange volatility is represented by the J.P. Morgan Global FX Volatility Index. This slide comes from our [Guide to Alternatives](#).

Guide to the Markets – U.S. Data are as of December 31, 2022.



Asset class returns

| | | | | | | | | | | | | | | | 2008 - 2022 | |
|------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------|-----------------------|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------|----------------------|-----------------------|
| 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | Ann. | Vol. |
| Fixed Income 5.2% | EM Equity 79.0% | REITs 27.9% | REITs 8.3% | REITs 19.7% | Small Cap 38.8% | REITs 28.0% | REITs 2.8% | Small Cap 21.3% | EM Equity 37.8% | Cash 1.8% | Large Cap 31.5% | Small Cap 20.0% | REITs 41.3% | Comdty. 16.1% | Large Cap 8.8% | REITs 23.4% |
| Cash 1.8% | High Yield 59.4% | Small Cap 26.9% | Fixed Income 7.8% | High Yield 19.6% | Large Cap 32.4% | Large Cap 13.7% | Large Cap 1.4% | High Yield 14.3% | DM Equity 25.6% | Fixed Income 0.0% | REITs 28.7% | EM Equity 18.7% | Large Cap 28.7% | Cash 1.5% | Small Cap 7.2% | Small Cap 23.2% |
| Asset Alloc. -25.4% | DM Equity 32.5% | EM Equity 19.2% | High Yield 3.1% | EM Equity 18.6% | DM Equity 23.3% | Fixed Income 6.0% | Fixed Income 0.5% | Large Cap 12.0% | Large Cap 21.8% | REITs -4.0% | Small Cap 25.5% | Large Cap 18.4% | Comdty. 27.1% | High Yield -12.7% | REITs 6.6% | EM Equity 23.0% |
| High Yield -26.9% | REITs 28.0% | Comdty. 16.8% | Large Cap 2.1% | DM Equity 17.9% | Asset Alloc. 14.9% | Asset Alloc. 5.2% | Cash 0.0% | Comdty. 11.8% | Small Cap 14.6% | High Yield -4.1% | DM Equity 22.7% | Asset Alloc. 10.6% | Small Cap 14.8% | Fixed Income -13.0% | Asset Alloc. 6.1% | Comdty. 20.2% |
| Small Cap -33.8% | Small Cap 27.2% | Large Cap 15.1% | Cash 0.1% | Small Cap 16.3% | High Yield 7.3% | Small Cap 4.9% | DM Equity -0.4% | EM Equity 11.6% | Asset Alloc. 14.6% | Large Cap -4.4% | Asset Alloc. 19.5% | DM Equity 8.3% | Asset Alloc. 13.5% | Asset Alloc. -13.9% | High Yield 5.4% | DM Equity 20.0% |
| Comdty. -35.6% | Large Cap 16.5% | High Yield 14.8% | Asset Alloc. -0.7% | Large Cap 16.0% | REITs 2.9% | Cash 0.0% | Asset Alloc. -2.0% | REITs 8.6% | High Yield 10.4% | Asset Alloc. -5.8% | EM Equity 18.9% | Fixed Income 7.5% | DM Equity 11.8% | DM Equity -14.0% | Fixed Income 2.7% | Large Cap 17.7% |
| Large Cap -37.0% | Asset Alloc. 25.0% | Asset Alloc. 13.3% | Small Cap -4.2% | Asset Alloc. 12.2% | Cash 0.0% | High Yield 0.0% | High Yield -2.7% | Asset Alloc. 8.3% | REITs 8.7% | Small Cap -11.0% | High Yield 12.6% | High Yield 7.0% | High Yield 1.0% | Large Cap -18.1% | DM Equity 2.3% | High Yield 13.0% |
| REITs -37.7% | Comdty. 18.9% | DM Equity 8.2% | DM Equity -11.7% | Fixed Income 4.2% | Fixed Income -2.0% | EM Equity -1.8% | Small Cap -4.4% | Fixed Income 2.6% | Fixed Income 3.5% | Comdty. -11.2% | Fixed Income 8.7% | Cash 0.5% | Cash 0.0% | EM Equity -19.7% | EM Equity 1.0% | Asset Alloc. 12.4% |
| DM Equity -43.1% | Fixed Income 5.9% | Fixed Income 6.5% | Comdty. -13.3% | Cash 0.1% | EM Equity -2.3% | DM Equity -4.5% | EM Equity -14.6% | DM Equity 1.5% | Comdty. 1.7% | DM Equity -13.4% | Comdty. 7.7% | Comdty. -3.1% | Fixed Income -1.5% | Small Cap -20.4% | Cash 0.6% | Fixed Income 4.2% |
| EM Equity -53.2% | Cash 0.1% | Cash 0.1% | EM Equity -18.2% | Comdty. -1.1% | Comdty. -9.5% | Comdty. -17.0% | Comdty. -24.7% | Cash 0.3% | Cash 0.8% | EM Equity -14.2% | Cash 2.2% | REITs -5.1% | EM Equity -2.2% | REITs -24.9% | Comdty. -2.6% | Cash 0.4% |

Investing Principles

Source: Bloomberg, FactSet, MSCI, NAREIT, Russell, Standard & Poor's, J.P. Morgan Asset Management. Large cap: S&P 500, Small cap: Russell 2000, EM Equity: MSCI EME, DM Equity: MSCI EAFE, Comdty: Bloomberg Commodity Index, High Yield: Bloomberg Global HY Index, Fixed Income: Bloomberg US Aggregate, REITs: NAREIT Equity REIT Index, Cash: Bloomberg 1-3m Treasury. The "Asset Allocation" portfolio assumes the following weights: 25% in the S&P 500, 10% in the Russell 2000, 15% in the MSCI EAFE, 5% in the MSCI EME, 25% in the Bloomberg US Aggregate, 5% in the Bloomberg 1-3m Treasury, 5% in the Bloomberg Global High Yield Index, 5% in the Bloomberg Commodity Index and 5% in the NAREIT Equity REIT Index. Balanced portfolio assumes annual rebalancing. Annualized (Ann.) return and volatility (Vol.) represents period from 12/31/2007 to 12/31/2022. Please see disclosure page at end for index definitions. All data represents total return for stated period. The "Asset Allocation" portfolio is for illustrative purposes only. Past performance is not indicative of future returns.

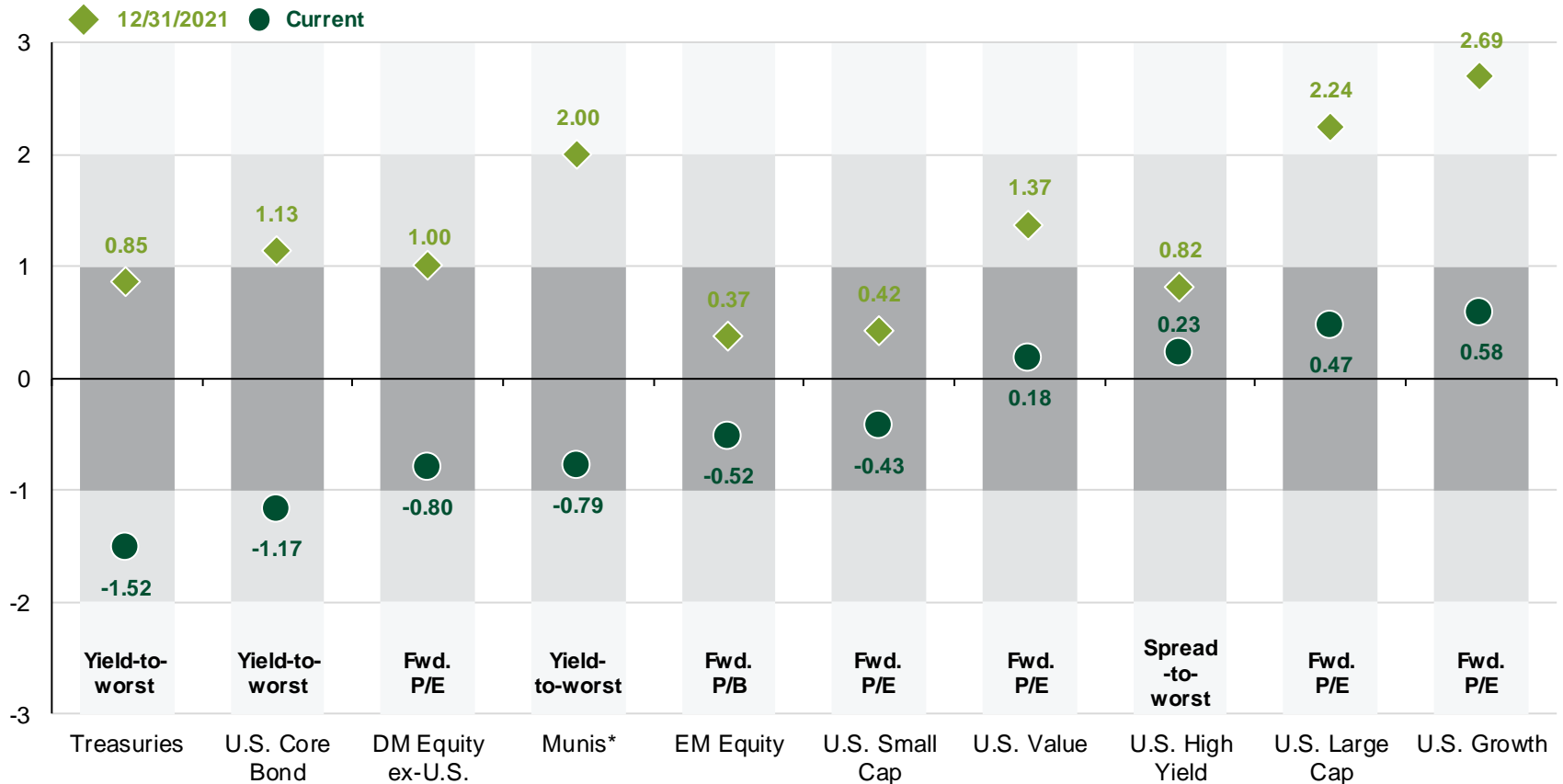
Guide to the Markets – U.S. Data are as of December 31, 2022.



Valuations monitor

Asset class valuations

Z-scores based on 20-year average valuation measures



Investing Principles

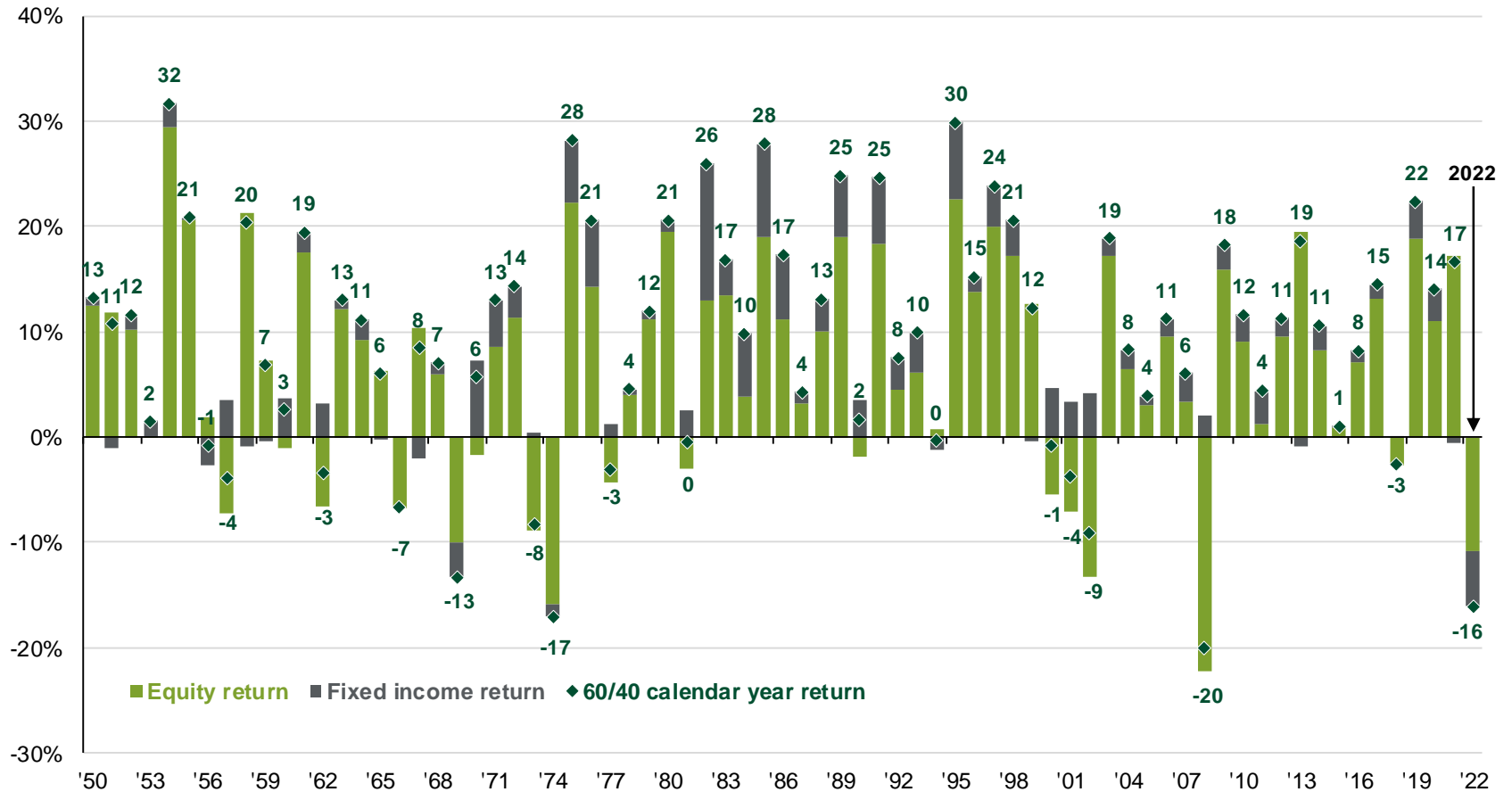
Source: Bloomberg, BLS, CME, FactSet, MSCI, Russell, Standard & Poor's, J.P. Morgan Asset Management.
 U.S. Large Cap: S&P 500, U.S. Small Cap: Russell 2000, U.S. Mid Cap: Russell Midcap; EM Equity: MSCI EME, DM Equity: MSCI EAFE, U.S. Value: Russell 1000 Value, U.S. Growth: Russell 1000 Growth, U.S. High Yield: J.P. Morgan Domestic High Yield Index, U.S. Core Bond: Bloomberg US Aggregate, Treasuries: Bloomberg U.S. Aggregate Government – Treasury, Munis: Bloomberg Municipal Bond. *Munis yield-to-worst is based on the tax-equivalent yield-to-worst assuming a top-income tax bracket rate of 37% plus a Medicare tax rate of 3.8%.
 Guide to the Markets – U.S. Data are as of December 31, 2022.



60/40 annual returns

60/40 annual return decomposition

Total returns, 1950 – present



Investing Principles

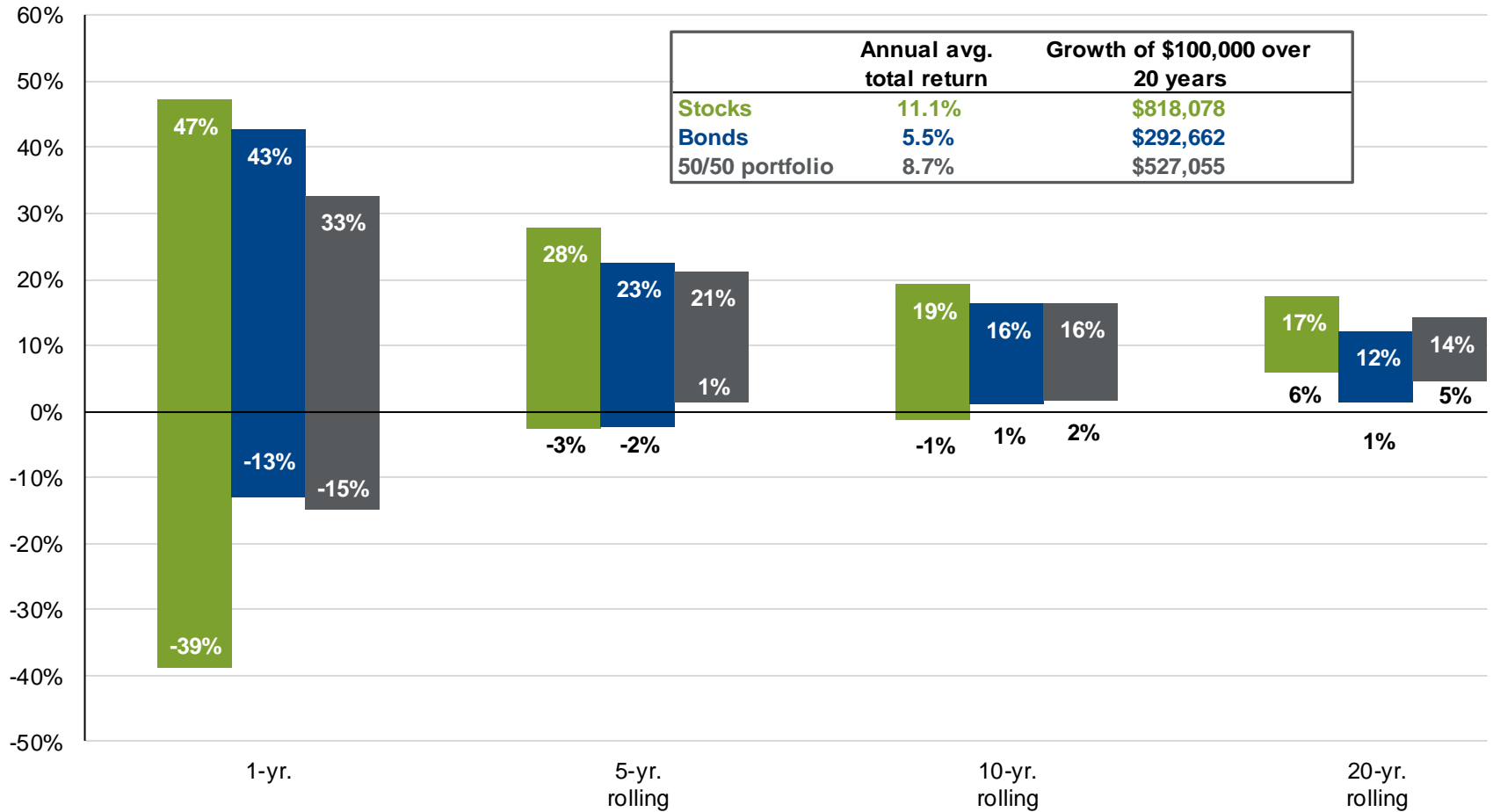
Source: FactSet, Standard & Poor's, Robert Shiller, Yale University, Bloomberg, Ibbotson/Strategas, J.P. Morgan Asset Management. The 60/40 portfolio is 60% invested in S&P 500 Total Return Index and 40% invested in Bloomberg U.S. Aggregate Total Return Index. S&P 500 returns from 1950 – 1970 are estimated using the Shiller S&P Composite. U.S. fixed income total returns from 1950 – 1975 are estimated using data from Strategas/Ibbotson. The portfolio is rebalanced annually. *Guide to the Markets – U.S.* Data are as of December 31, 2022.



Time, diversification and the volatility of returns

Range of stock, bond and blended total returns

Annual total returns, 1950-2022

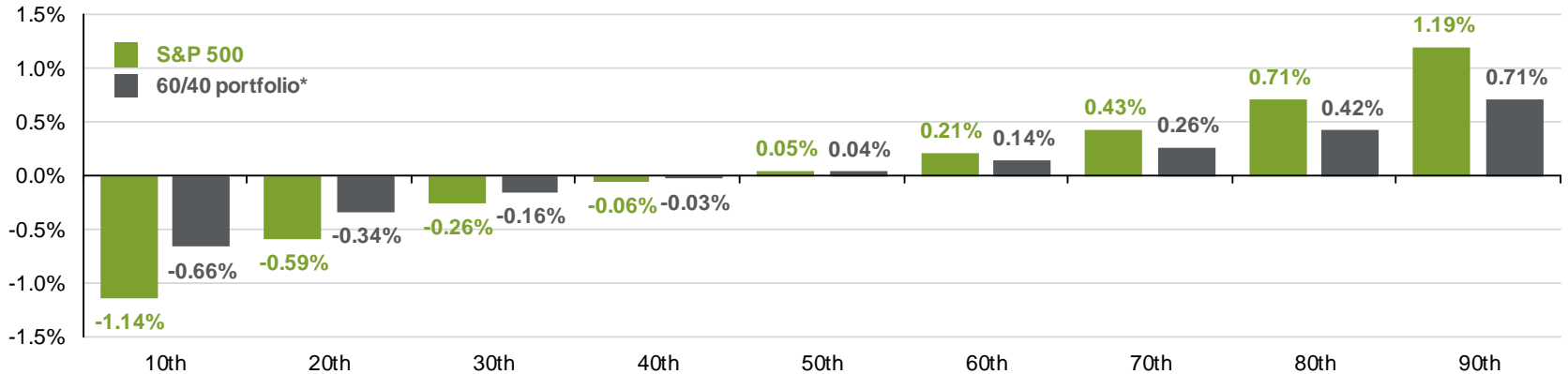


Source: Bloomberg, FactSet, Federal Reserve, Robert Shiller, Strategas/Ibbotson, J.P. Morgan Asset Management. Returns shown are based on calendar year returns from 1950 to 2021. Stocks represent the S&P 500 Shiller Composite and Bonds represent Strategas/Ibbotson for periods from 1950 to 2010 and Bloomberg Aggregate thereafter. Growth of \$100,000 is based on annual average total returns from 1950 to 2022. *Guide to the Markets – U.S.* Data are as of December 31, 2022.

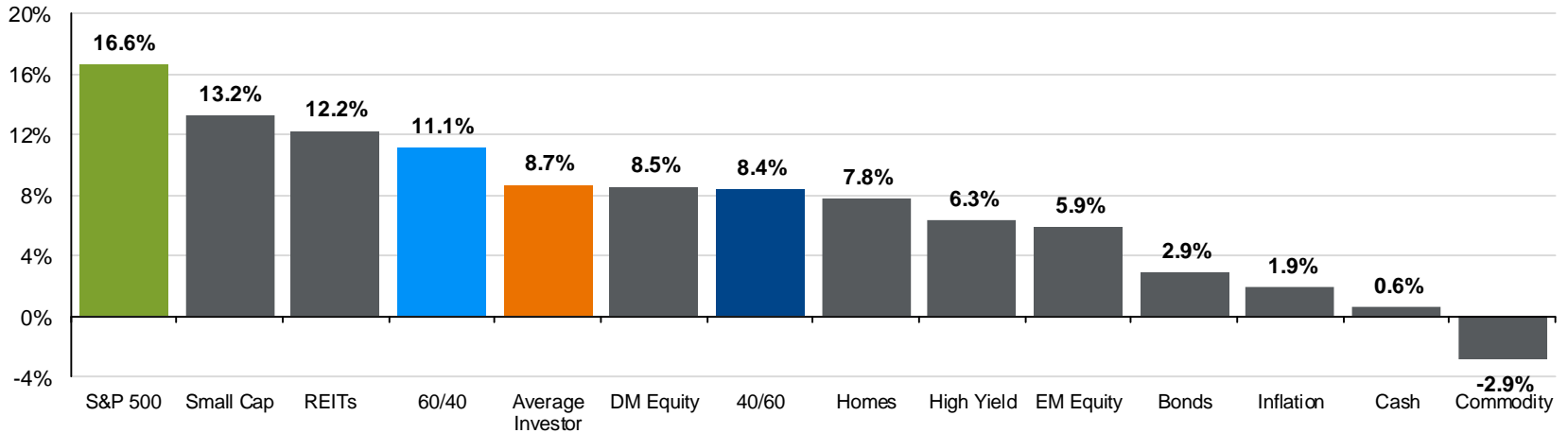


Diversification and the average investor

Equities vs. 60/40 portfolio: Last 20 years' daily market performance by decile



10-year annualized returns by asset class (2012 – 2021)



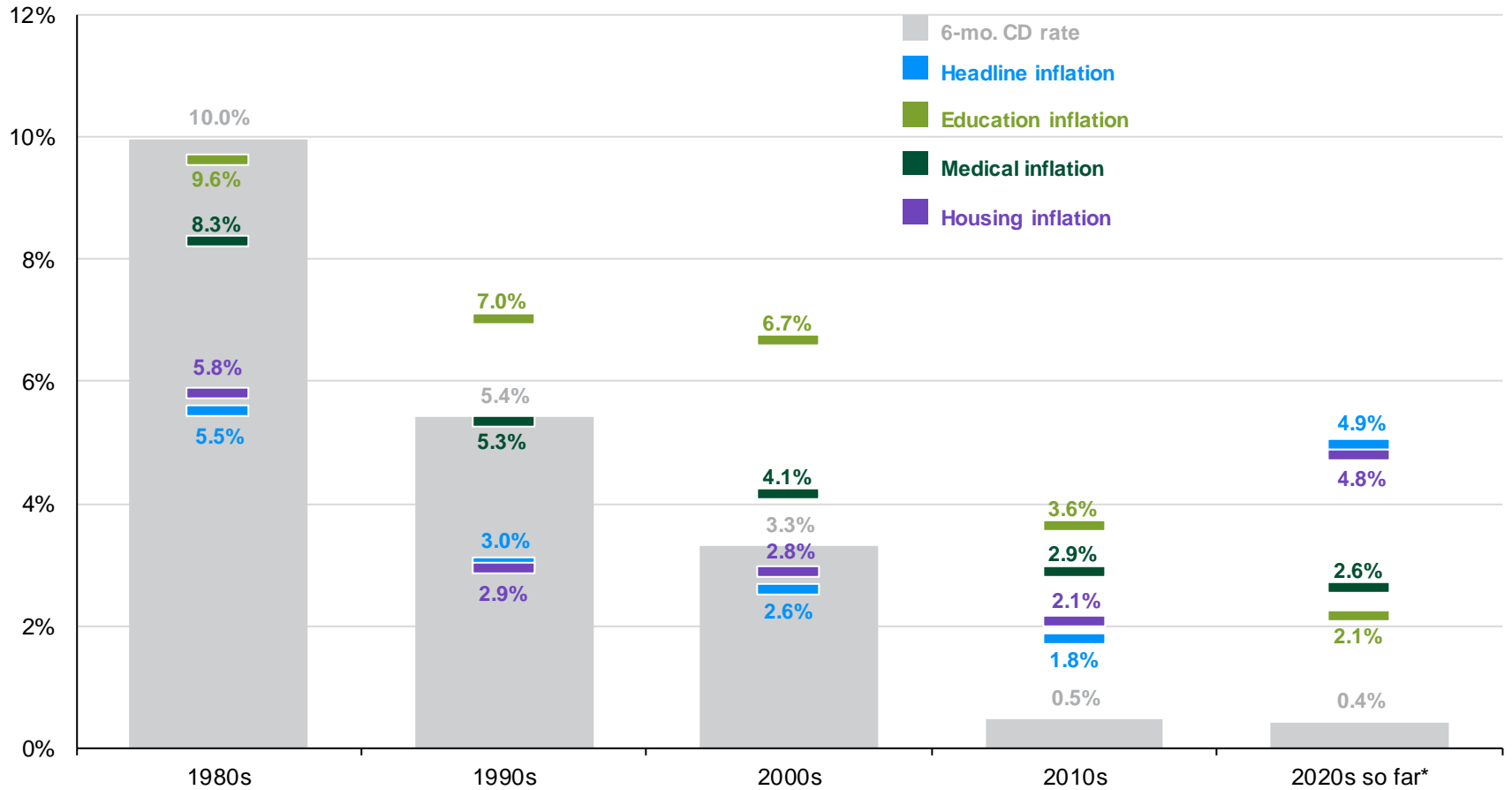
Source: Bloomberg, FactSet, Standard & Poor's, J.P. Morgan Asset Management; (Bottom) Morningstar, MSCI, NAREIT, Russell. Indices used are as follows: REITs: NAREIT Equity REIT Index, Small Cap: Russell 2000, EM Equity: MSCI EM, DM Equity: MSCI EAFE, Commodity: Bloomberg Commodity Index, High Yield: Bloomberg Global HY Index, Bonds: Bloomberg U.S. Aggregate Index, Homes: median sale price of existing single-family homes, Cash: Bloomberg 1-3m Treasury, Inflation: CPI. *60/40: A balanced portfolio with 60% invested in S&P 500 Index and 40% invested in high-quality U.S. fixed income, represented by the Bloomberg U.S. Aggregate Index. The portfolio is rebalanced annually. Average asset allocation investor return is based on an analysis from Morningstar. *Guide to the Markets – U.S.* Data are as of December 31, 2022.



Cash account returns

Average annualized return on 6-month CD vs. annualized CPI inflation and subcomponents

By decade, derived from subcomponents of the consumer price index

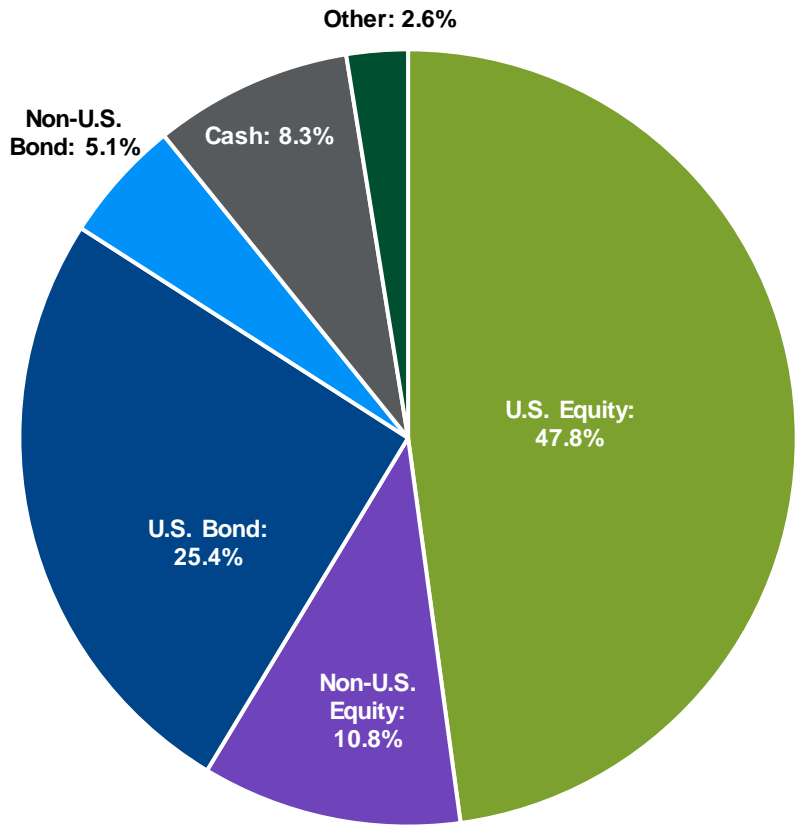


Source: Bankrate.com, BLS, FactSet, Federal Reserve System, J.P. Morgan Asset Management.
 6-month CD return is the average annualized return over the period. Headline CPI and subcomponents inflation is based on the annualized change over the period.
 *2020s so far is based on annualized change in headline CPI from December 2019 through November 2022, and the average annualized return on a 6-month CD through December 2022. Past performance is not indicative of comparable future results.
 Guide to the Markets – U.S. Data as of December 31, 2022.

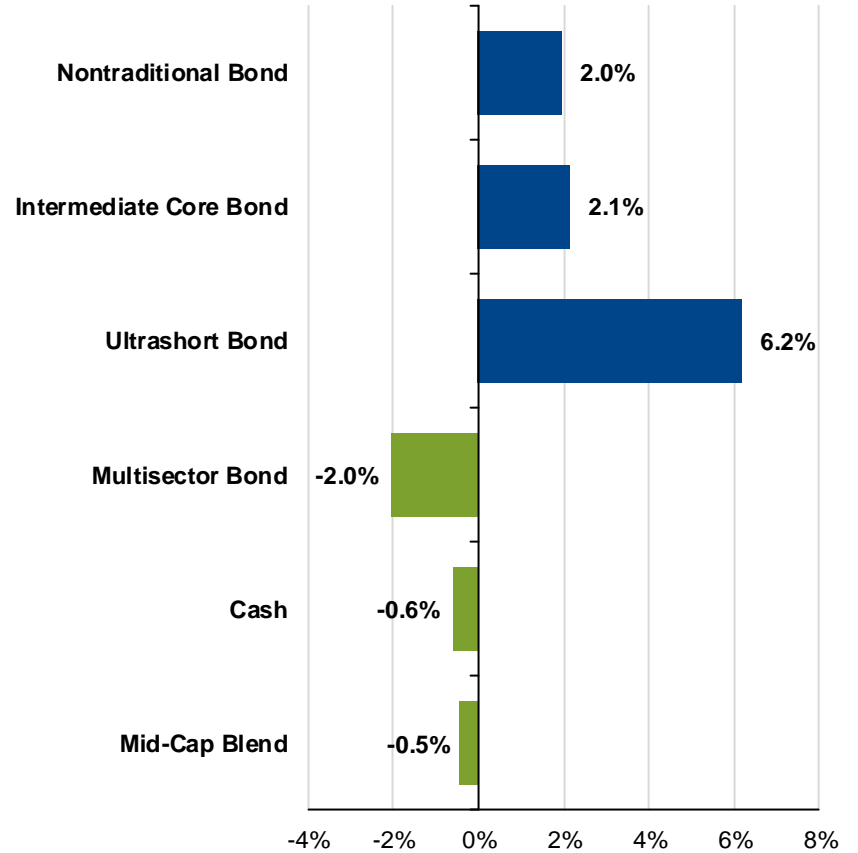


Individual investor asset allocation

Asset allocation: Current portfolio positioning
Average moderate (60/40) allocation as of November 2022



Biggest portfolio shifts
Largest % allocation changes by Morningstar category, last 3 months**



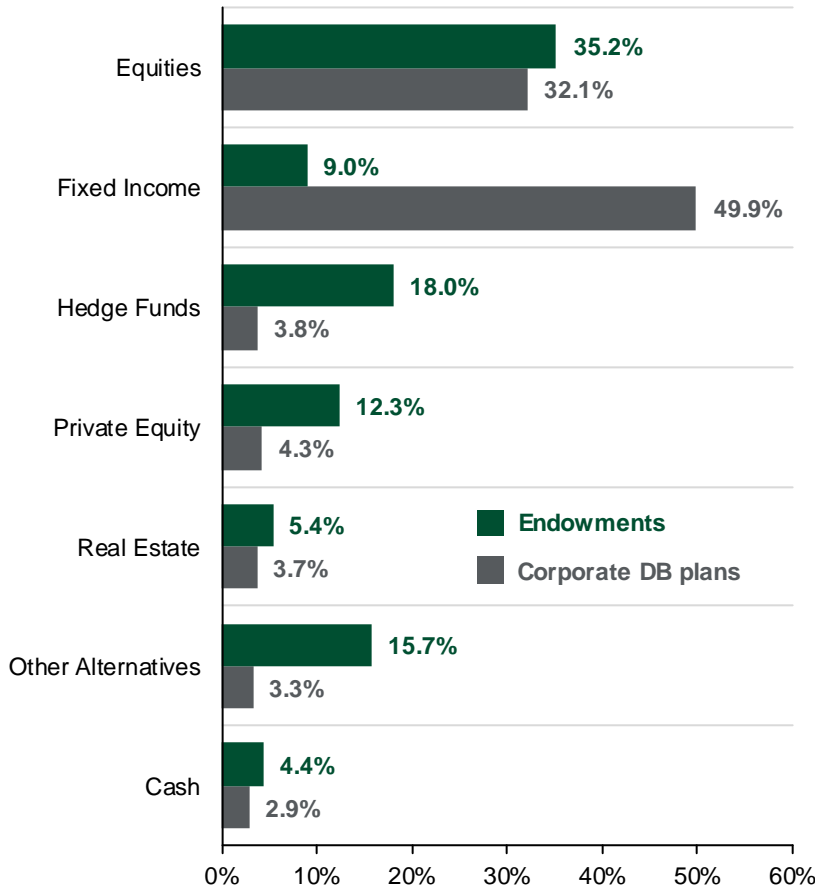
Investing Principles

Source: J.P. Morgan Portfolio Insights, J.P. Morgan Asset Management. Data is aggregated from 5,501 portfolios analyzed through the Portfolio Insights tools over trailing 12 months. The current portfolio positioning chart represents the average overall asset allocation for all portfolios benchmarked relative to the JPMorgan 60/40 Benchmark. *Other includes preferred stocks, warrants, options and other miscellaneous securities. **The biggest portfolio shifts show the largest average % changes in moderate portfolios within the most used Morningstar categories from August 2022 to November 2022. The most used Morningstar categories is defined as those that appear with the greatest frequency in portfolio analysis. All information is shown for illustrative purposes only. *Guide to the Markets – U.S.* Data are as of December 31, 2022.

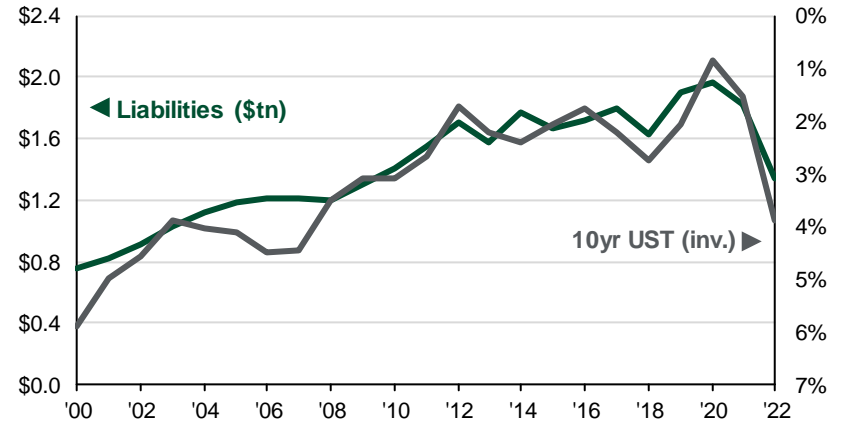


Institutional investor behavior

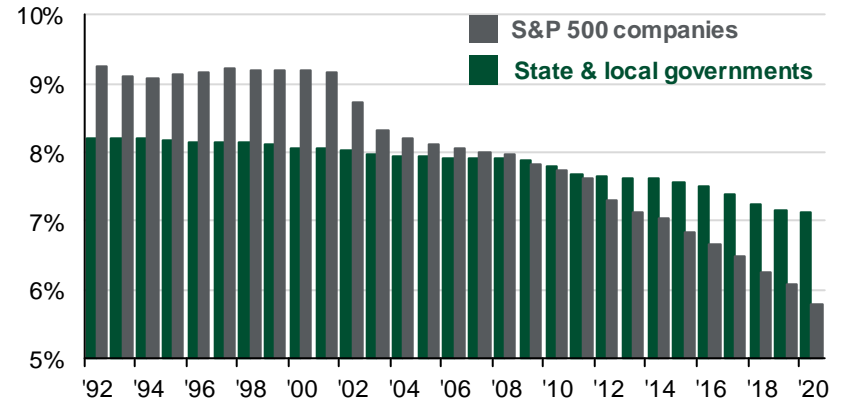
Asset allocation: Corporate DB plans vs. endowments



Corporate pension liabilities and 10-year UST yield



Pension return assumptions



Source: J.P. Morgan Asset Management; (Left) NACUBO (National Association of College and University Business Officers), Towers Watson; (Top right) Milliman Pension Funding Index; (Bottom right) Census for Governments, Compustat, FactSet, S&P 500 corporate 10-Ks. Endowment asset allocation is as of 2019. Corporate DB plan asset allocation as of 2018. Endowments represents dollar-weighted average data of 749 colleges and universities. Corporate DB plans represents aggregate asset as of 12/31/2020 for Fortune 1000 pension plans. Pension return assumptions based on all available and reported data from S&P 500 Index companies and are as of 12/31/2019. State and local pension return assumptions are weighted by plan size. Pension assets, liabilities and funded status based on Milliman 100 companies reporting pension data as of November 2022. All information is shown for illustrative purposes only. *Guide to the Markets - U.S.* Data are as of December 31, 2022.



J.P. Morgan Asset Management – Index definitions

GTM

U.S.

69

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

Equities:

The **Dow Jones Industrial Average** is a price-weighted average of 30 actively traded blue-chip U.S. stocks.

The **MSCI ACWI (All Country World Index)** is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed and emerging markets.

The **MSCI EAFE Index (Europe, Australasia, Far East)** is a free float-adjusted market capitalization index that is designed to measure the equity market performance of developed markets, excluding the US & Canada.

The **MSCI Emerging Markets Index** is a free float-adjusted market capitalization index that is designed to measure equity market performance in the global emerging markets.

The **MSCI Europe Index** is a free float-adjusted market capitalization index that is designed to measure developed market equity performance in Europe.

The **MSCI Pacific Index** is a free float-adjusted market capitalization index that is designed to measure equity market performance in the Pacific region.

The **Russell 1000 Index**® measures the performance of the 1,000 largest companies in the Russell 3000.

The **Russell 1000 Growth Index**® measures the performance of those Russell 1000 companies with higher price-to-book ratios and higher forecasted growth values.

The **Russell 1000 Value Index**® measures the performance of those Russell 1000 companies with lower price-to-book ratios and lower forecasted growth values.

The **Russell 2000 Index**® measures the performance of the 2,000 smallest companies in the Russell 3000 Index.

The **Russell 2000 Growth Index**® measures the performance of those Russell 2000 companies with higher price-to-book ratios and higher forecasted growth values.

The **Russell 2000 Value Index**® measures the performance of those Russell 2000 companies with lower price-to-book ratios and lower forecasted growth values.

The **Russell 3000 Index**® measures the performance of the 3,000 largest U.S. companies based on total market capitalization.

The **Russell Midcap Index**® measures the performance of the 800 smallest companies in the Russell 1000 Index.

The **Russell Midcap Growth Index**® measures the performance of those Russell Midcap companies with higher price-to-book ratios and higher forecasted growth values. The stocks are also members of the Russell 1000 Growth index.

The **Russell Midcap Value Index**® measures the performance of those Russell Midcap companies with lower price-to-book ratios and lower forecasted growth values. The stocks are also members of the Russell 1000 Value index.

The **S&P 500 Index** is widely regarded as the best single gauge of the U.S. equities market. The index includes a representative sample of 500 leading companies in leading industries of the U.S. economy. The **S&P 500 Index** focuses on the large-cap segment of the market; however, since it includes a significant portion of the total value of the market, it also represents the market.

Fixed income:

The **Bloomberg 1-3 Month U.S. Treasury Bill Index** includes all publicly issued zero-coupon US 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 Global High Yield Index** is a multi-currency flagship measure of the global high yield debt market. The index represents the union of the US High Yield, the Pan-European High Yield, and Emerging Markets (EM) Hard Currency High Yield Indices. The high yield and emerging markets sub-components are mutually exclusive. Until January 1, 2011, the index also included CMBS high yield securities.

The **Bloomberg Municipal Index**: consists of a broad selection of investment-grade general obligation and revenue bonds of maturities ranging from one year to 30 years. It is an unmanaged index representative of the tax-exempt bond market.

The **Bloomberg US Dollar Floating Rate Note (FRN) Index** provides a measure of the U.S. dollar denominated floating rate note market.

The **Bloomberg US Corporate Investment Grade Index** is an unmanaged index consisting of publicly issued US Corporate and specified foreign debentures and secured notes that are rated investment grade (Baa3/BBB or higher) by at least two ratings agencies, have at least one year to final maturity and have at least \$250 million par amount outstanding. To qualify, bonds must be SEC-registered.

The **Bloomberg US High Yield Index** covers the universe of fixed rate, non-investment grade debt. Eurobonds and debt issues from countries designated as emerging markets (sovereign rating of Baa1/BBB-/BBB+ and below using the middle of Moody's, S&P, and Fitch) are excluded, but Canadian and global bonds (SEC registered) of issuers in non-EMG countries are included.

The **Bloomberg US Mortgage Backed Securities Index** is an unmanaged index that measures the performance of investment grade fixed-rate mortgage backed pass-through securities of GNMA, FNMA and FHLMC.

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

The **J.P. Morgan Emerging Market Bond Global Index (EMBI)** 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 Domestic High Yield Index** is designed to mirror the investable universe of the U.S. dollar domestic high yield corporate debt market.

The **J.P. Morgan Corporate Emerging Markets Bond Index Broad Diversified (CEMBI Broad Diversified)** is an expansion of the **J.P. Morgan Corporate Emerging Markets Bond Index (CEMBI)**. The CEMBI is a market capitalization weighted index consisting of U.S. dollar denominated emerging market corporate bonds.

The **J.P. Morgan Emerging Markets Bond Index Global Diversified (EMBI Global Diversified)** tracks total returns for U.S. dollar-denominated debt instruments issued by emerging market sovereign and quasi-sovereign entities: Brady bonds, loans, Eurobonds. The index limits the exposure of some of the larger countries.

The **J.P. Morgan GBI EM Global Diversified** tracks the performance of local currency debt issued by emerging market governments, whose debt is accessible by most of the international investor base.

The **U.S. Treasury Index** is a component of the U.S. Government index.



J.P. Morgan Asset Management – Definitions

GTM

U.S.

70

Other asset classes:

The **Alerian MLP Index** is a composite of the 50 most prominent energy Master Limited Partnerships (MLPs) that provides investors with an unbiased, comprehensive benchmark for the asset class.

The **Bloomberg Commodity Index** and related sub-indices are composed of futures contracts on physical commodities and represents twenty two separate commodities traded on U.S. exchanges, with the exception of aluminum, nickel, and zinc

The **Cambridge Associates U.S. Global Buyout and Growth Index®** is based on data compiled from 1,768 global (U.S. & ex-U.S.) buyout and growth equity funds, including fully liquidated partnerships, formed between 1986 and 2013.

The **CS/Tremont Hedge Fund Index** is compiled by Credit Suisse Tremont Index, LLC. It is an asset-weighted hedge fund index and includes only funds, as opposed to separate accounts. The Index uses the Credit Suisse/Tremont database, which tracks over 4500 funds, and consists only of funds with a minimum of US\$50 million under management, a 12-month track record, and audited financial statements. It is calculated and rebalanced on a monthly basis, and shown net of all performance fees and expenses. It is the exclusive property of Credit Suisse Tremont Index, LLC.

The **HFRI Monthly Indices (HFRI)** are equally weighted performance indexes, utilized by numerous hedge fund managers as a benchmark for their own hedge funds. The HFRI are broken down into 4 main strategies, each with multiple sub strategies. All single-manager HFRI Index constituents are included in the HFRI Fund Weighted Composite, which accounts for over 2200 funds listed on the internal HFR Database.

The **NAREIT EQUITY REIT Index** is designed to provide the most comprehensive assessment of overall industry performance, and includes all tax-qualified real estate investment trusts (REITs) that are listed on the NYSE, the American Stock Exchange or the NASDAQ National Market List.

The **NFI-ODCE**, short for NCREIF Fund Index -Open End Diversified Core Equity, is an index of investment returns reporting on both a historical and current basis the results of 33 open-end commingled funds pursuing a core investment strategy, some of which have performance histories dating back to the 1970s. The NFI-ODCE Index is capitalization-weighted and is reported gross of fees. Measurement is time-weighted.

Definitions:

Investing in **alternative assets** involves higher risks than traditional investments and is suitable only for sophisticated investors. Alternative investments involve greater risks than traditional investments and should not be deemed a complete investment program. They are not tax efficient and an investor should consult with his/her tax advisor prior to investing. Alternative investments have higher fees than traditional investments and they may also be highly leveraged and engage in speculative investment techniques, which can magnify the potential for investment loss or gain. The value of the investment may fall as well as rise and investors may get back less than they invested.

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

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.

Distressed Restructuring Strategies employ an investment process focused on corporate fixed income instruments, primarily on corporate credit instruments of companies trading at significant discounts to their value at issuance or obliged (par value) at maturity as a result of either formal bankruptcy proceeding or financial market perception of near term proceedings.

Investments in **emerging markets** can be more volatile. The normal risks of investing in foreign countries 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.

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.

Equity market neutral strategies employ sophisticated quantitative techniques of analyzing price data to ascertain information about future price movement and relationships between securities, select securities for purchase and sale. Equity Market Neutral Strategies typically maintain characteristic net equity market exposure no greater than 10% long or short.

Global macro strategies trade a broad range of strategies in which the investment process is predicated on movements in underlying economic variables and the impact these have on equity, fixed income, hard currency and commodity markets.

International investing involves a greater degree of risk and increased volatility. Changes in currency exchange rates and differences in accounting and taxation policies outside the U.S. can raise or lower returns. Some overseas markets may not be as politically and economically stable as the United States and other nations.

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. 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.

Merger arbitrage strategies which employ an investment process primarily focused on opportunities in equity and equity related instruments of companies which are currently engaged in a corporate transaction.

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.

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.

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.

Relative Value Strategies maintain positions in which the investment thesis is predicated on realization of a valuation discrepancy in the relationship between multiple securities.

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.



J.P. Morgan Asset Management – Risks & disclosures

GTM

U.S.

71

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Unless otherwise stated, all data are as of December 31, 2022 or most recently available.

Guide to the Markets – U.S.

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