ECONOMIC AND MARKET COMMENTARY

4th Quarter 2022

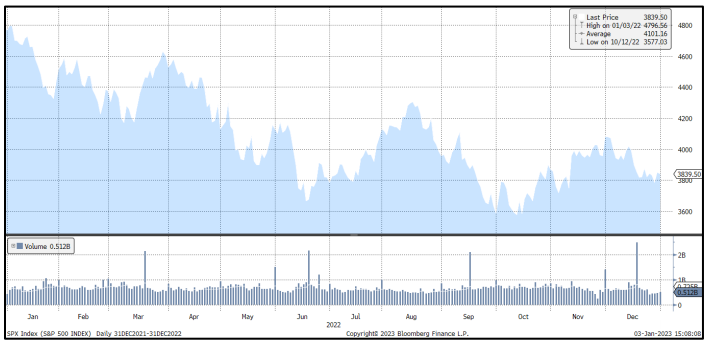
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I. FOURTH-QUARTER 2022 EQUITY MARKET RECAP

The 4th quarter and the year ended on a sour note as the U.S. equity market appears to be failing through its 3rd bear market bounce of the past 12 months. On three separate occasions, the market as measured by the S&P 500, staged a rally only to disappoint investors and drop to new market lows. As shown in the graph below, the market experienced bear market bounces in March, July/August, and October/November. If this trend continues, we can expect the S&P 500 to fall below 3,600 in January touching new cycle lows.



During the quarter, equities had positive numbers in October and November. December reversed course with the technology-heavy NASDAQ dropping the most and finishing the quarter slightly in the red. The NASDAQ's (a market capitalization weighted index) five largest companies now include: Microsoft, Apple, Amazon, Google, and NVIDIA. Telsa, which fell 54% during the 4th quarter, has dropped out of the top five.

	Oct	Nov	Dec	Quarter
S&P 500	8.10%	5.59%	(5.77%)	7.55%
NASDAQ	3.94%	4.51%	(8.66%)	(0.76%)
Russell 2000	11.01%	2.31%	(6.49%)	6.20%
MSCI EAFE	5.38%	11.29%	0.11%	17.40%

International stocks had the best performance compared to U.S. indices. The EAFE returned 17.40% for the quarter, finishing the year at (13.92%).

Going forward we expect equities to have a challenging period for at least the first half of 2023. In the U.S., companies will have difficult earnings comparisons year-over-year as recessionary pressures are expected to take hold in early 2023, versus early 2022, when earnings were robust coming out of the Covid-restricted 2021.

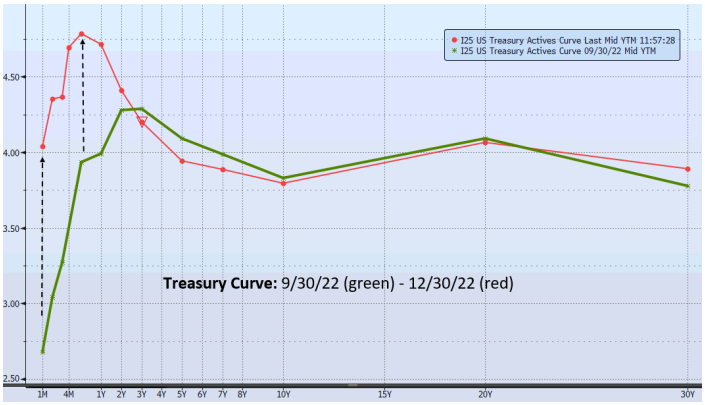
Economic numbers show the U.S. consumer is losing steam as inflation has driven up costs and the negative wealth effect of losses in investment portfolios, crypto, automobiles and real estate has reduced consumption ability.

Internationally, economic numbers are also weak. Inflation in many parts of the world is materially higher than in the U.S. The U.S. dollar gained 9% last year relative to a basket of the largest international currencies. The gain in the value of the dollar translated to more expensive goods valued in USD like corn, soybeans, wheat, and oil. The war in Ukraine still weighs heavy on European equities. The positive performance of European markets in the 4th quarter was driven by the material reduction in energy costs and the positive moves countries have made to reduce their dependence on Russian oil and gas. The weather in the winter months and energy consumption will drive market expectations in the coming few months.

II. FOURTH-QUARTER 2022 BOND MARKET RECAP

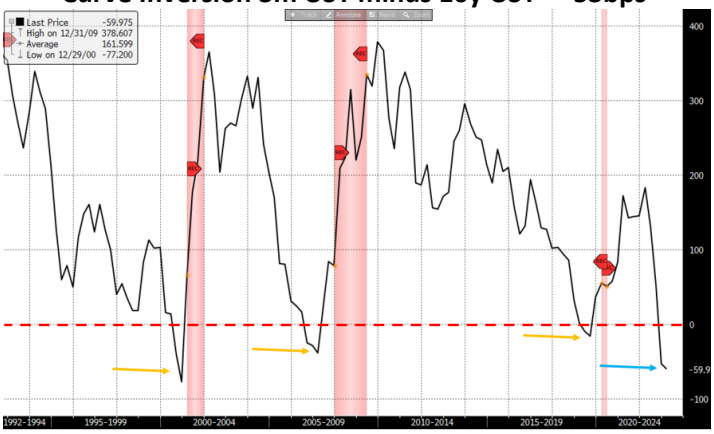
Bond yields rotated around high volatility during the final quarter of 2022. The 5- and 10-year Treasury yields remained relatively unchanged, from start to finish, but the range of movement was massive. For example, the 10-year U.S. Treasury yield started the quarter at 3.83% and finished the quarter at 3.87%. However during the quarter, it had a yield range of eighty-two basis points, with a high of 4.24% in October and a low of 3.42% in December. The 5-year Treasury had similar range movement of 83 basis points.

4th Quarter Treasury Curve:
Short rates rise, curve continues inversion
09/30/2022 to 12/30/2022



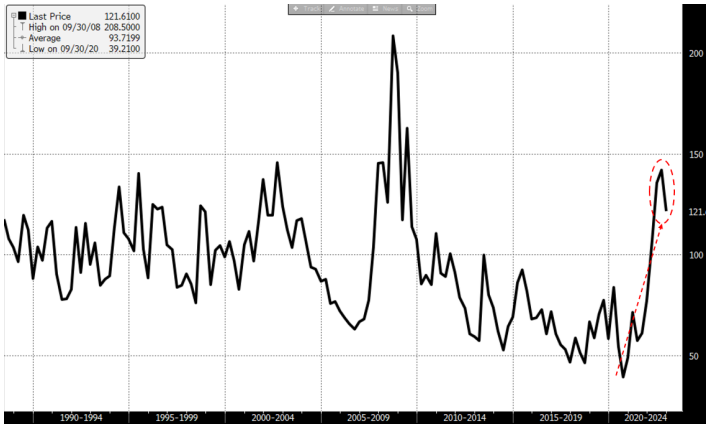
Short-term rates are where the curve took on a different shape (see above). This was primarily due to FOMC rate hikes totaling 125 basis points. The 3-month Treasury was up 110 basis points. The spread between the 3-month Treasury and the 10-year Treasury started the quarter at +54 basis points but finished 2022 at -53 basis points. This negative 3-month to 10-year inversion has historically preceded recessions (see below) and is an indication that market participants are predicting tougher economic times ahead.

Curve Inversion 3m UST minus 10y UST = -53bps



The dominant bond market storyline remains the elevated level of volatility/uncertainty. Volatility encompasses credit risk, option risk, duration risk, and liquidity risk. Rising volatility is what drives the spread that bond buyers generate, above Treasury bonds. For example, municipal bonds and corporate bonds have credit spreads that are driven by credit risk and liquidity risk. While we did see some pullback in volatility during the fourth quarter (due to declining inflation), it is still running 22% higher than its forty-year average (see top right).

Elevated Volatility (MOVE Index):
Driving Bond Spreads Higher



The elevated volatility presents a good opportunity for bond buyers. For example, the yields on Agency MBS, investment grade corporates and municipals ended the year 73%, 74% and 58%, respectively higher than each of their ten-year average yields.

III. 2023 LIKELY TO SEE A SLOWING U.S. ECONOMY

After a difficult 2022, better days lie ahead for financial markets as inflation falls and the Fed brings to a close and ends its tightening cycle. However, many signs indicate that the U.S. economy is nearing a recession, with higher interest rates and higher prices weighing on consumer wallets and boosting credit card balances. The dollar rose roughly 9% in 2022, creating a drag on overall economic growth. In addition, the labor market is showing early signs of cooling as businesses slow hiring efforts as demand slows inflation increase cost. In 2023, S&P 500 earnings will likely be flat-to-down relative to 2022, with rising expenses, increased interest rates, and lower nominal sales growth likely to bite into profits. A higher dollar and recession concerns could cause management teams to further reel in spending and investment.

The Fed

Inflation has peaked and should gradually fall in 2023. The good news is that the significant inflation hotspots from earlier in 2022 have slowed. The remaining problem for inflation, outside of shelter, is the service sector which is highly correlated with labor market dynamics. The Fed may be near the end of its tightening cycle but is expected to continue to hike rates into mid-2023. The Fed will also continue to reduce its bond holdings (max of $95 billion per month). It should be noted that Chairman Powell continues to have a hawkish tone.

Global Economic Slowdown
Global economic momentum has slowed, with elevated inflation and tighter financial conditions becoming a global phenomenon. In particular, the Eurozone economies and the U.K. have been hindered by increased energy prices and energy shortages due to the war in Ukraine. However, growth in China should improve in the coming years, thanks to policy changes such as easing zero-Covid policies and efforts to ease geopolitical tensions.

Markets Moving Forward
In 2022, a bear market in stocks was magnified by a highly correlated bear market in the bond market. Consumer sentiment was at its lowest on record in June and has only staged a modest rebound since then. However, history suggests that trying to time markets is a mistake, and investors should stay the course rather than overreact to recent market volatility. Further, a low correlation between stocks and bonds is still the norm, and a bear market in both stocks and bonds has never repeated itself.

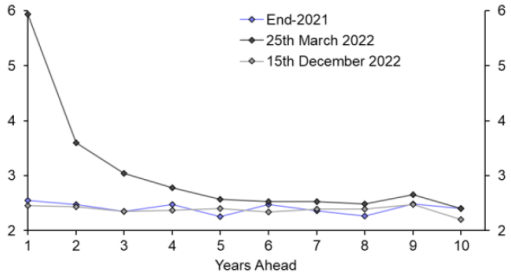
IV. GLOBAL MARKETS UPDATE - THE WORLD IN 2023: WHAT TO LOOK FOR IN FINANCIAL MARKETS

Article by Capital Economics. Written By: John Higgins, Chief Markets Economist | Date: December 15, 2022

Two of the three topics we expect to dominate the global macroeconomic debate in 2023 - falling inflation and future monetary policy loosening - are now largely priced into markets in the U.S. The question of whether the other topic - recessions - is discounted there is debatable. Our judgement is that it is not adequately reflected, and that "risky" assets will therefore drop back in the spring before recovering.

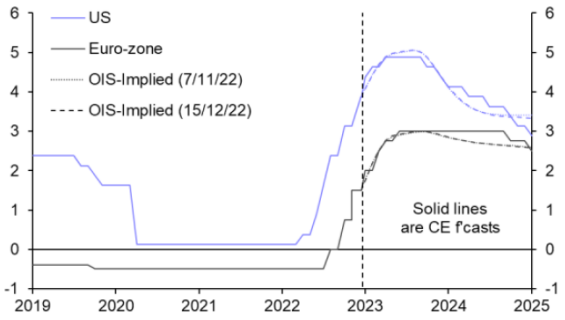
Although we think that inflation is poised to come down sharply in the U.S. [this year], that is also what investors are banking on - especially after a couple of months of better-than-expected CPI reports. Indeed, the term structure of future inflation implied by swaps is now very similar to what it was at the end of 2021, unlike, for example, in late March [last] year. (See Chart 1.) Although inflation is expected to fall back towards target more slowly in the euro-zone and UK, we anticipate it will be slower to recede there in any case.

Chart 1: US CPI Inflation Implied By Inflation Swaps (%)



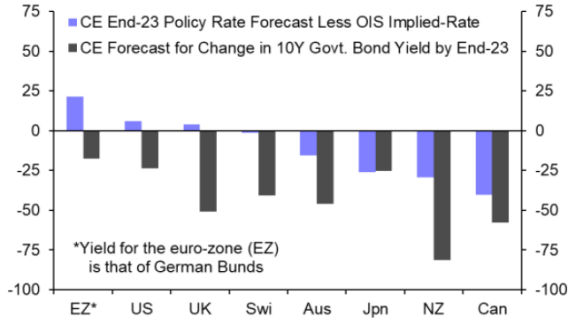
Investors have revised their expectations for developed market (DM) monetary policy in the wake of better news on inflation, despite a persistently hawkish tone from some central banks including the FOMC. As a result, the paths of policy rates implied by overnight indexed swap (OIS) rates are now close to those implied by our own forecasts, which we have just tweaked in the U.S. (See Chart 2.)

Chart 2: US & Euro-zone Policy Rates (%)



This revision has been accompanied by rallies in government bonds in many countries, leaving the yields of those with 10-year maturities not far above the levels we project for the end of [this] year. (See Chart 3.) For example, our respective end-2023 forecasts for 10-year Treasury, Bund and Gilt yields, to which we are sticking, are 3.25%, 1.75% and 2.75%. This compares to current levels of ~3.5%, ~1.95% and ~3.25%.

Chart 3: CE End-2023 Policy Rate Forecasts Vs. OIS & Forecasts For Δs In 10Y Sov. Yields By End-2023 (bp)



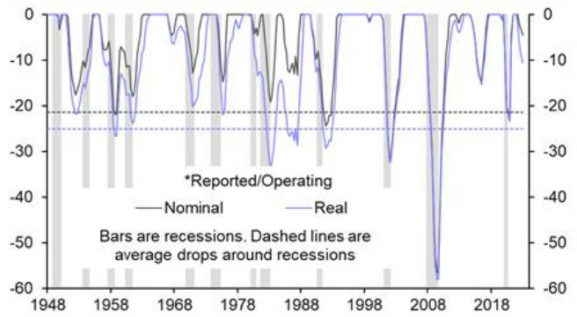
While falling inflation and future policy loosening are now heavily priced into markets in the U.S., it is not clear to us that this is the case when it comes to a recession.

Admittedly, the consensus of economists is anticipating one; the Treasury yield curve is deeply inverted, which has often signaled an economic downturn; credit spreads have increased on net since the start of the year; and the valuation of the stock market has fallen significantly in the meantime.

But not all investors are economists; an inverted yield curve does not tell us the extent to which a recession is priced into

the stock market - earnings per share (EPS) haven't come down much even in real terms (see Chart 4); credit spreads have dropped back since mid-October; and the valuation of the stock market was driven lower this year by a surge in "risk-free" real yields - the *ex-ante* equity risk premium was *falling*.

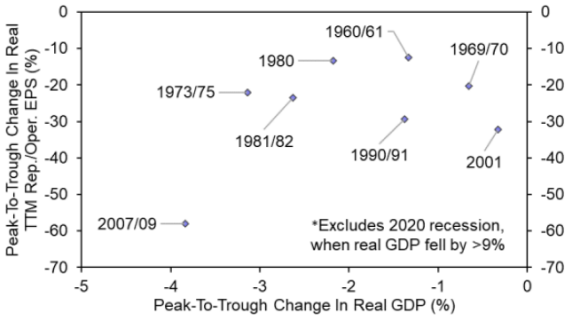
Chart 4: Changes From Previous Peaks In Selected Measures Of S&P 500 EPS, Quarterly (%)



One rejoinder is that the recession we are anticipating in the U.S. [this] year would be mild by past standards - a cumulative drop of ~0.5% spread over Q1, Q2 and Q3 - so it wouldn't be surprising if EPS fell very little. **However, there has not been a good correlation since 1960 between the peak-to-trough-decline in real GDP and that in S&P 500 real trailing 12m (TTM) EPS.** (For the latter, we use a mix of reported (pre-Q4 1988) and operating figures and the non-financial corporate sector deflator.)

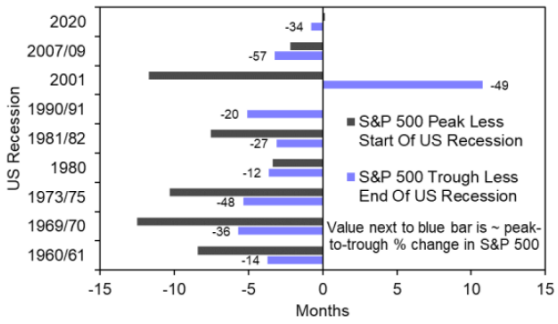
There were two recessions (1969/70 and 2001) when the peak-to-trough drop in U.S. real GDP was similar to the fall we envisage [this] year. In both cases, the peak-to-trough drop in real trailing 12m (TTM) EPS exceeded 20%. (See Chart 5.) **It is also worth noting that we foresee a worse economic outcome in many DMs outside the U.S.** This ought to be relevant for multinationals that dominate indices like the S&P 500.

Chart 5: Drawdowns In US Real GDP & S&P 500 EPS Around Labelled US Recessions Since 1960* (%)



The other key point is that, based on the nine U.S. recessions since 1960, the plunge in the stock market that took place around them typically only finished shortly before they ended. (See Chart 6.) The notable exception is the drawdown that finished *after* the conclusion of the 2001 recession, probably because the initial valuation of the stock market was so high and hadn't been fully unwound by then.

Chart 6: Drawdowns & Timings Of Peaks & Troughs In S&P 500 Around Last Nine US Recessions Since 1960



As far as the other recessions are concerned, the median time between the S&P 500's trough and their end was roughly four months. It is conceivable investors have become so forward looking that the cyclical end-of-day low in the S&P 500 was already reached back in October, when it had dropped by just over 25% from its peak. But this would have been about eleven months before we expect [this] year's recession to end - an unprecedented gap since 1960. Our best guess is that we will revisit that closing trough and break a bit below it.

With that in mind, we now forecast that the S&P 500 will make a new end-of-day low of 3,500 in the spring of 2023. The implied peak-to-trough decline of ~28% would be slightly less than the median drop of just over 30% in bear markets around recessions since 1960 (if the drawdown around the 2001 recession is excluded).

How far might the S&P 500 then rebound? In every case since 1960, the turnaround from the cyclical low was significant, with a median gain across all nine episodes of ~38% in the following twelve months. Accordingly, another big rebound in the S&P 500 could be on the cards from the spring of next year. **Our revised end-2023 forecast is 4,200, which would be a conservative 20% jump from our revised forecast for its cyclical end-of-day low.** 4,200 would be consistent, for example, with a multiple of 16.8 (the ~average for the second half of the 2010s) applied to forward 12m EPS of ~$250 (nearly 5% above [last] year's high).

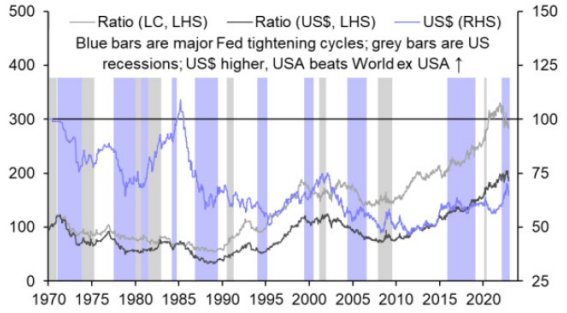
This would still, however, leave the index well below its end-2021 peak of ~4,800, which also happens to be higher than our revised end-2024 forecast of 4,500. It is not unusual for the S&P 500 to still be below its previous peak two years after it bottomed out - this happened, for example, after the dot com bubble burst. We think it is plausible this time around, given

that the valuation of the S&P 500 was rather high at the outset of its slump in 2022, if not as much as it was - especially relative to Treasuries - in 2000. Margins are also particularly stretched now, adding to the downside risk for earnings relative to economic output.

Other DM equity markets tend to take their directional cue from developments in the U.S. We therefore expect them to behave in a similar fashion and will revise our forecasts for major ones in due course. **Although we believe the economic outlook is gloomier for many other DMs than it is for the U.S., we doubt this will translate into a period of equity market underperformance beyond next spring.** As noted here, we have identified myriad reasons why the opposite might happen - at least in the longer run.

One of those reasons is a faltering U.S. dollar, which has sometimes coincided with U.S. equity underperformance despite being positive for U.S. exports and the dollar value of U.S. multinationals' foreign earnings. (See Chart 7.) As it happens, we don't think the ~9% drop in the DXY index from its peak in September is the start of a sustained decline, because we expect it to get a boost in coming months from aversion to risk. Although we no longer expect it to break well above its prior high, we think it may reach a similar level again at some point in H1 2023. Thereafter, though, we see tougher times for the greenback.

Chart 7: MSCI USA/World ex USA Total Returns Vs. US$ (Indices, Start Of 1970 = 100)

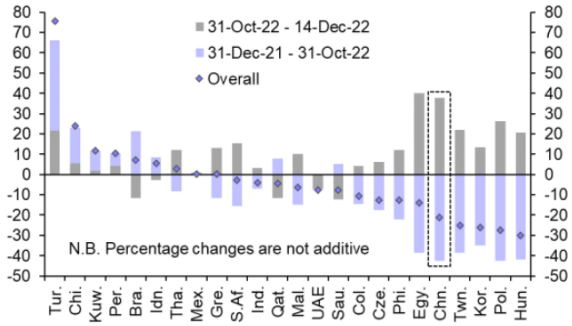


We are therefore revising our projections for its value against some other DM majors. We now forecast that the EUR/USD and GBP/USD rates will hit 0.95 and 1.10, respectively, in the first half of 2023, before rebounding a bit to 1.00 and 1.15 by the end of 2023, and to 1.10 and 1.25 by the end of 2024.

In most cases we expect emerging market assets to reach a similar turning point in the first half of [this] year. Thereafter, we expect bond yields to fall and currencies and equity markets to rally. Given the recent shift in China's zero-COVID policy, we think there are a few key points to note on its markets in particular.

Despite being surprised by how quickly China seems to have moved towards re-opening its economy, we suspect investors are underestimating how disruptive the transition will prove for the country. This has been reflected in the partial unwinding since late October of the huge underperformance of its equity market in much of 2021 and 2022. (See Chart 8 for [last] year.) We have already seen a bit of the momentum come out of onshore equities and would not be surprised if they fell back further over the next few months.

Chart 8: MSCI Emerging Markets Constituents, Index Returns (US$, 2022 YTD, %)



But China should be past the worst by the middle of [this] year, and transitioning away from zero-COVID could set its economy up for a recovery over H2 2023 and into 2024. That could give the stock market another lift, especially as its still-low valuation - in both absolute and relative terms - suggests that a lot of bad news on China's "common-prosperity" agenda and U.S.-China decoupling remains in the market. We have revised up our end-2023 forecast for the CSI 300 Index to 4,100, which is a bit above its current level.

As China's economy rebounds, its government bonds may start to struggle. While we don't expect the PBOC to begin to raise its benchmark rates by the end of 2023, it may allow (or encourage) "market" rates to rise a little in order to tighten financial conditions. We have revised up our end-2023 and end-2024 forecasts for China's 10-year government bond yield to 2.8% and 3.1%, respectively, from previous projections of 2.5% in both cases. For context, its current level is ~2.9%.

Finally, while the renminbi may come under renewed pressure in the near term, we now forecast it will strengthen to 6.8 per U.S. dollar by end-2023 from ~6.97 today (compared to a previous forecast of 7.3 for mid-2022 and 7.0 for end-2023), buoyed by a favorable shift in yield differentials vis-à-vis the U.S.

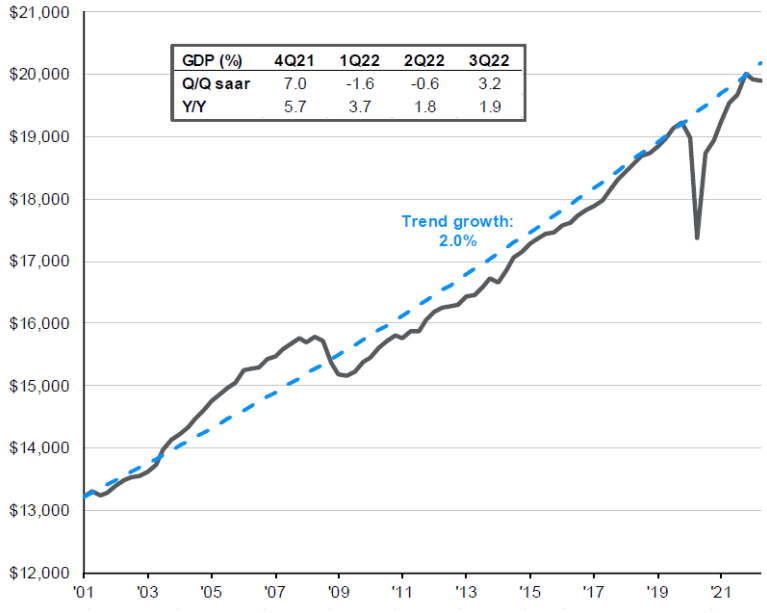
The sources of the information found in this commentary are the SSW Research Department, Bloomberg, and "The World in 2023: What to look for in financial markets" article by John Higgins, Capital Economics.

Economy

Economic growth and the composition of GDP

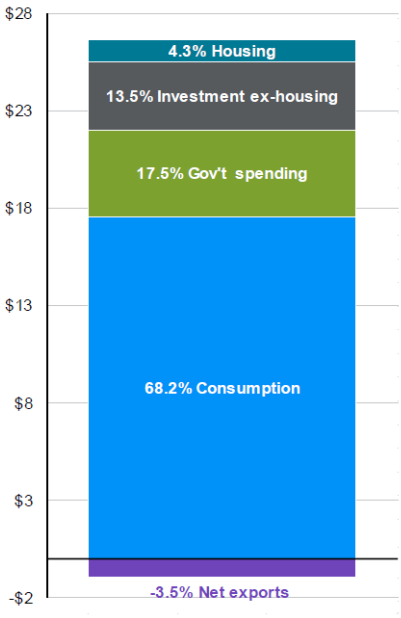
Real GDP

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



Components of GDP

3Q22 nominal GDP, USD trillions



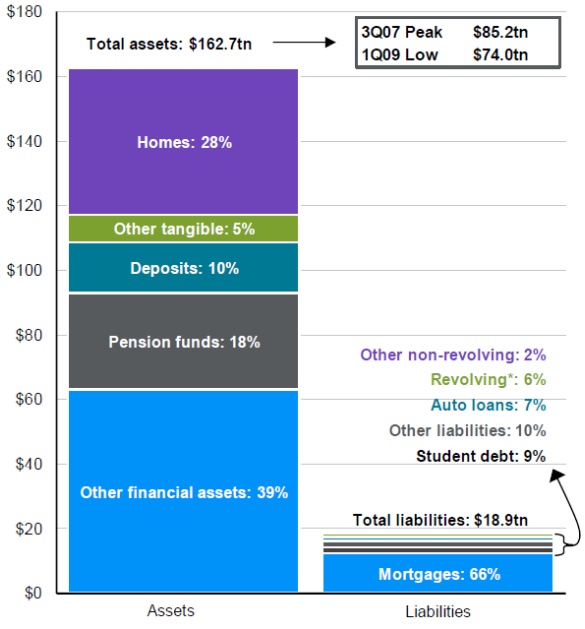
Source: BEA, FactSet, J.P. Morgan Asset Management. Values may not sum to 100% due to rounding. Trend growth is measured as the average annual growth rate from business cycle peak 1Q01 to business cycle peak 4Q19. *Guide to the Markets – U.S.* Data are as of December 22, 2022.

Economy

Consumer finances

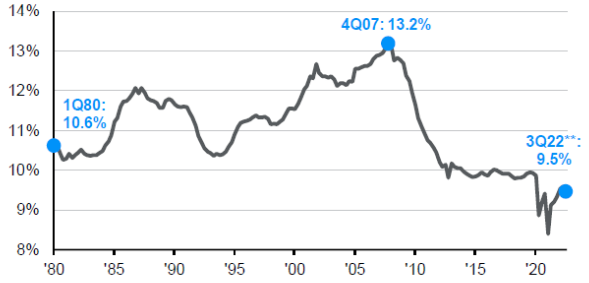
Consumer balance sheet

2Q22, trillions of dollars outstanding, not seasonally adjusted



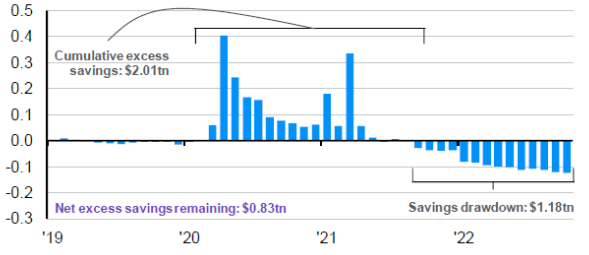
Household debt service ratio

Debt payments as % of disposable personal income, SA



Excess personal savings during the pandemic

Disposable personal income less consumer outlays, minus pre-pandemic trend growth***, $ trillions, monthly



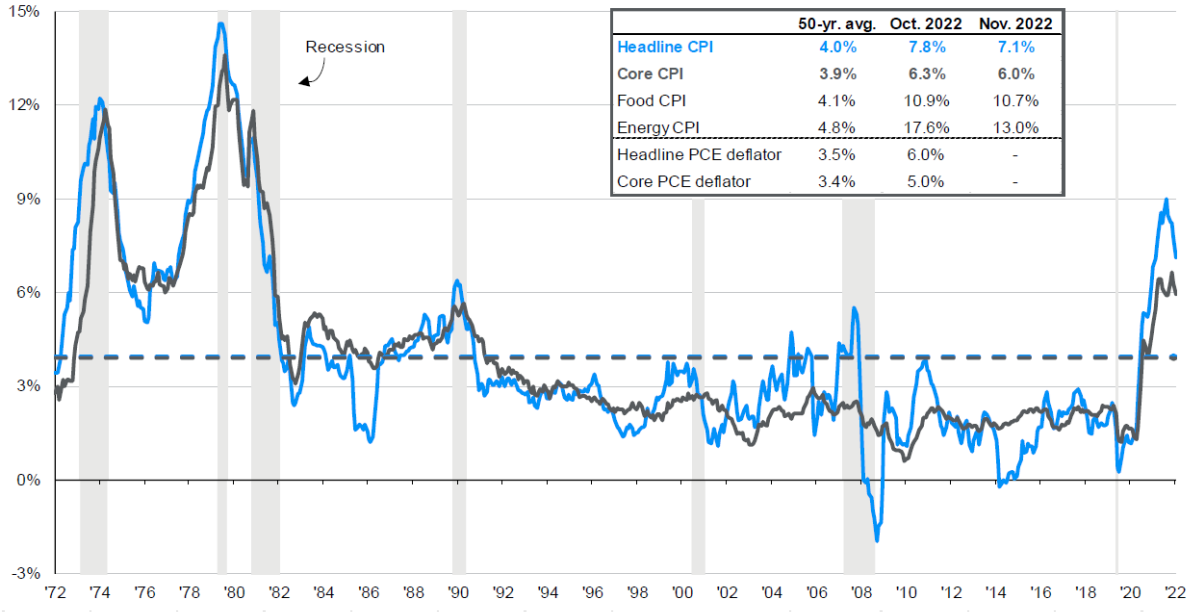
Source: FactSet, FRB, J.P. Morgan Asset Management; (Top and bottom right) BEA.
Data include households and nonprofit organizations. SA – seasonally adjusted. *Revolving includes credit cards. Values may not sum to 100% due to rounding. **3Q22 figures for debt service ratio are J.P. Morgan Asset Management estimates. ***Figures reflect the difference in monthly realized savings vs. pre-pandemic trend savings. From March 2020 to August 2021, consumers amassed $2.0 trillion in excess savings. Since August 2021, consumers have begun to draw down on those excess savings, with the remaining reflected in the chart annotation.
Guide to the Markets – U.S. Data are as of December 22, 2022.

Economy

Inflation

CPI and core CPI

% change vs. prior year, seasonally adjusted



	50-yr. avg.	Oct. 2022	Nov. 2022
Headline CPI	4.0%	7.8%	7.1%
Core CPI	3.9%	6.3%	6.0%
Food CPI	4.1%	10.9%	10.7%
Energy CPI	4.8%	17.6%	13.0%
Headline PCE deflator	3.5%	6.0%	-
Core PCE deflator	3.4%	5.0%	-

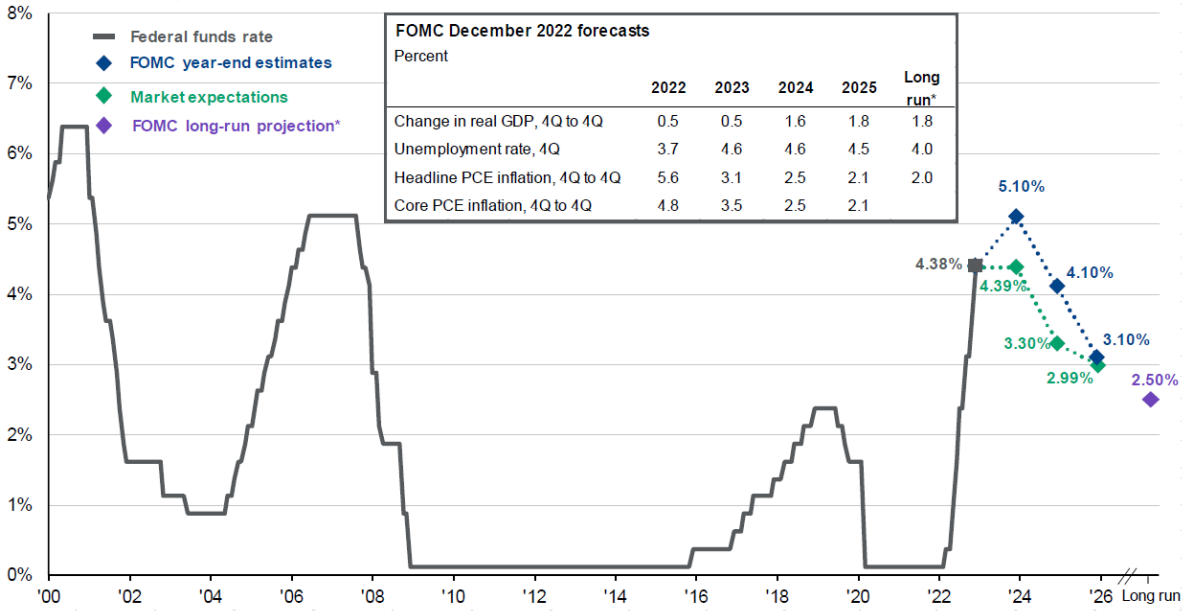
Source: BLS, FactSet, J.P. Morgan Asset Management.
CPI used is CPI-U and values shown are % change vs. one year ago. Core CPI is defined as CPI excluding food and energy prices. The Personal Consumption Expenditure (PCE) deflator employs an evolving chain-weighted basket of consumer expenditures instead of the fixed-weight basket used in CPI calculations. *Guide to the Markets – U.S.* Data are as of December 22, 2022.

Fixed Income

The Fed and interest rates

Federal funds rate expectations

FOMC and market expectations for the federal funds rate



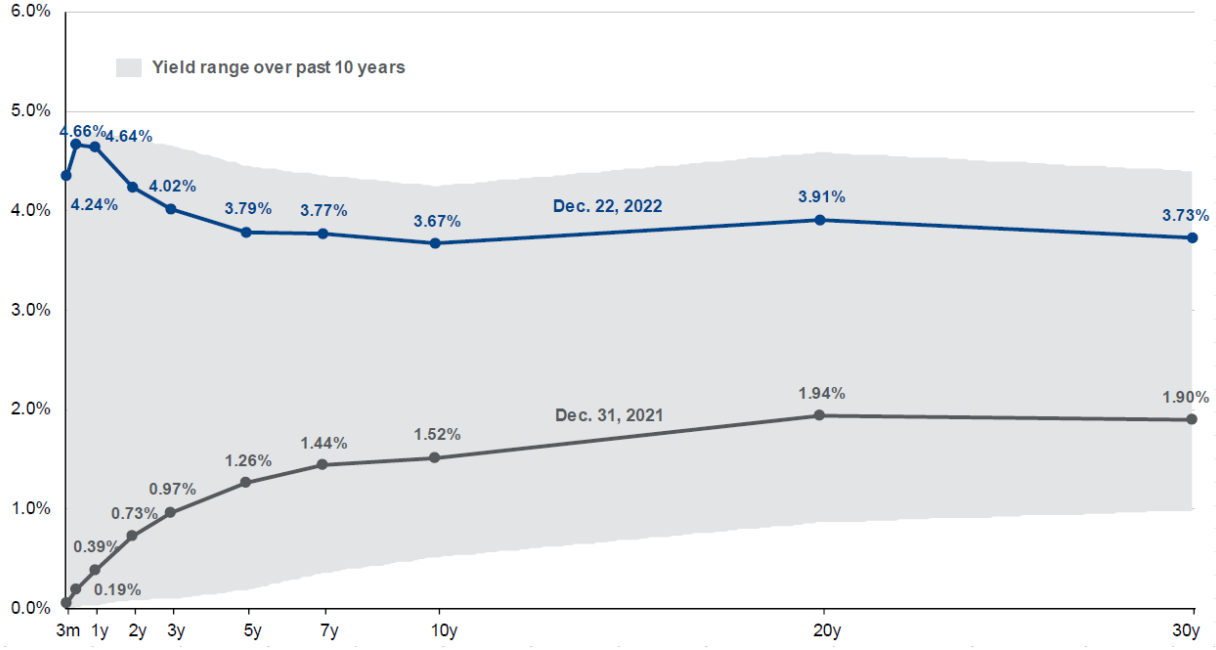
FOMC December 2022 forecasts Percent	2022	2023	2024	2025	Long run*
Change in real GDP, 4Q to 4Q	0.5	0.5	1.6	1.8	1.8
Unemployment rate, 4Q	3.7	4.6	4.6	4.5	4.0
Headline PCE inflation, 4Q to 4Q	5.6	3.1	2.5	2.1	2.0
Core PCE inflation, 4Q to 4Q	4.8	3.5	2.5	2.1	

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 22, 2022.

Fixed Income

Yield curve

U.S. Treasury yield curve

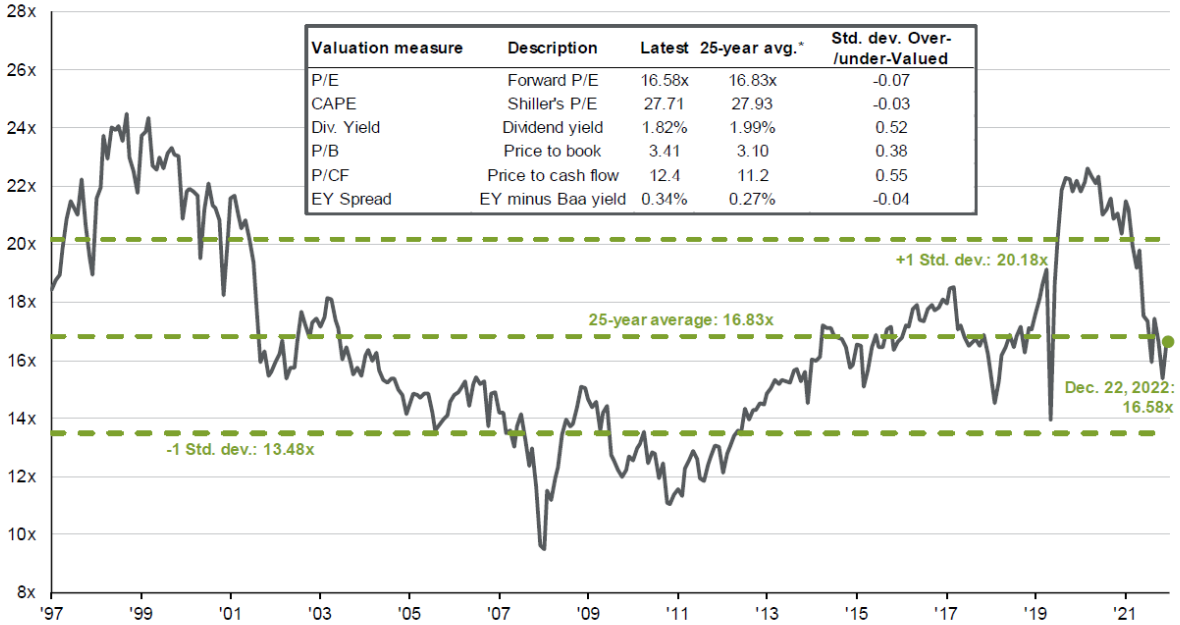


Source: FactSet, Federal Reserve, J.P. Morgan Asset Management. *Guide to the Markets – U.S.* Data are as of December 22, 2022.

Equities

S&P 500 valuation measures

S&P 500 Index: Forward P/E ratio



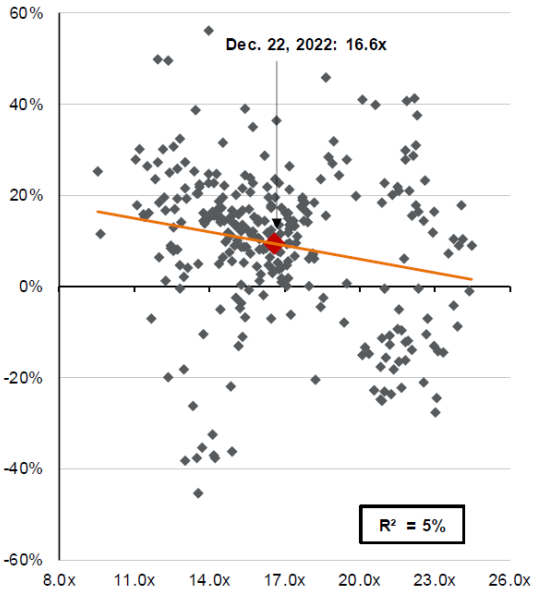
Valuation measure	Description	Latest	25-year avg.*	Std. dev. Over-/under-Valued
P/E	Forward P/E	16.58x	16.83x	-0.07
CAPE	Shiller's P/E	27.71	27.93	-0.03
Div. Yield	Dividend yield	1.82%	1.99%	0.52
P/B	Price to book	3.41	3.10	0.38
P/CF	Price to cash flow	12.4	11.2	0.55
EY Spread	EY minus Baa yield	0.34%	0.27%	-0.04

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 $232. 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 22, 2022.

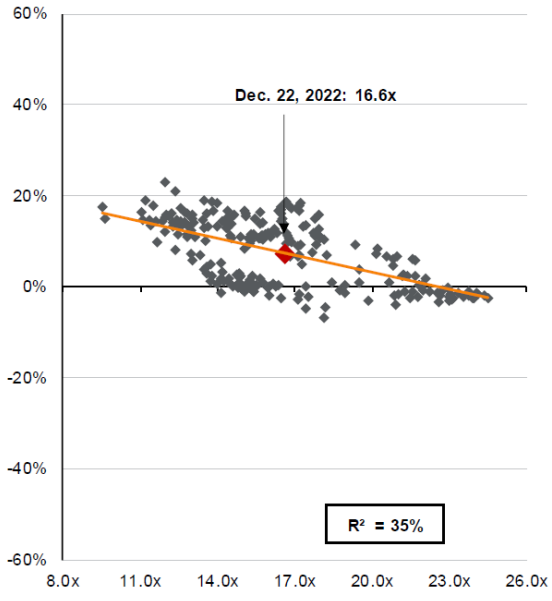
P/E ratios and equity returns

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

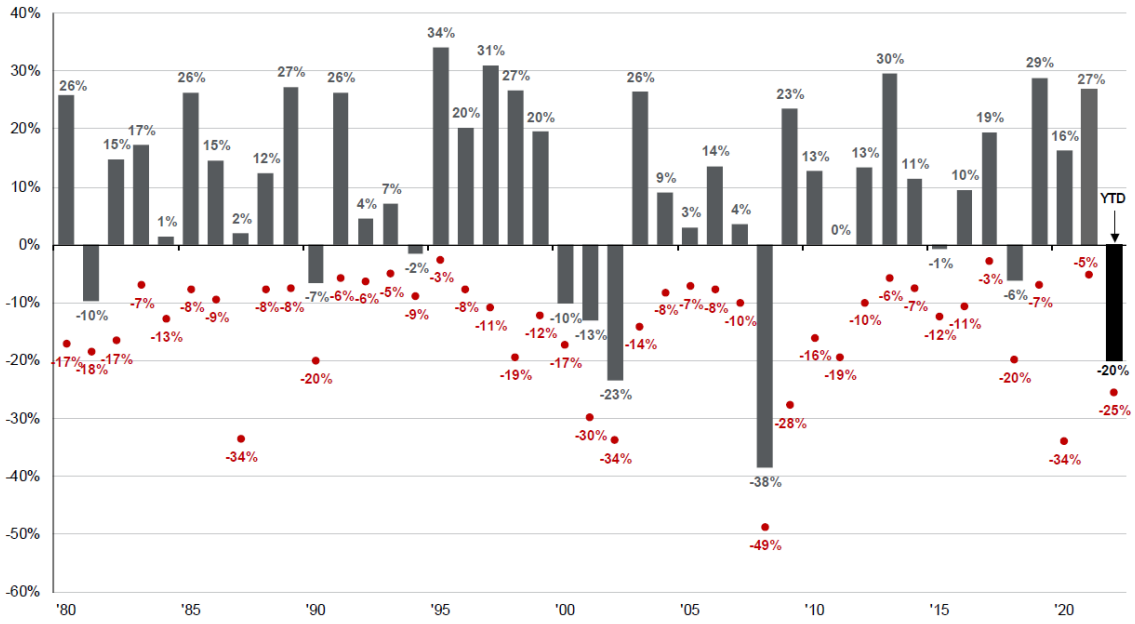


Source: FactSet, Refinitiv Datastream, Standard & Poor's, Thomson Reuters, J.P. Morgan Asset Management.
Returns are 12-month and 60-month annualized total returns, measured monthly, beginning 11/30/97. R^2 represents the percent of total variation in total returns that can be explained by forward price-to-earnings 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 22, 2022.

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

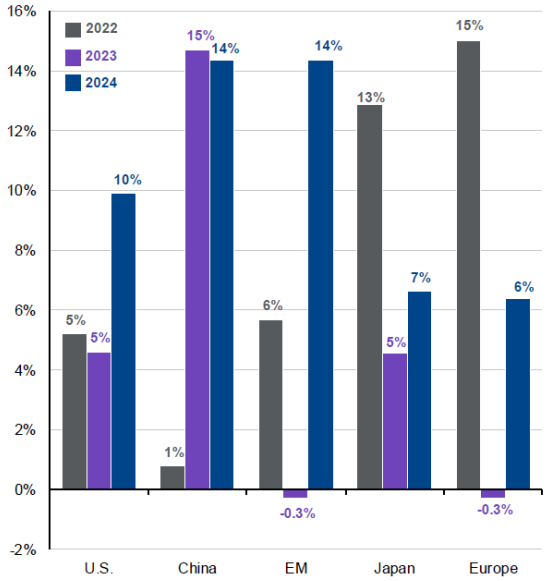


Source: FactSet, Standard & Poor's, J.P. Morgan Asset Management.
Returns are based on price index only and do not include dividends. Intra-year drops refers to the largest market drops from a peak to a trough during the year. For illustrative purposes only. Returns shown are calendar year returns from 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 22, 2022.

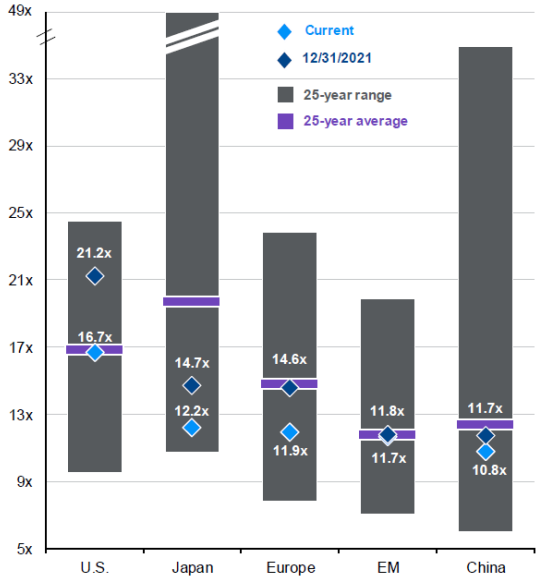
International

International equity earnings and valuations

Global earnings growth
Calendar year consensus estimates



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



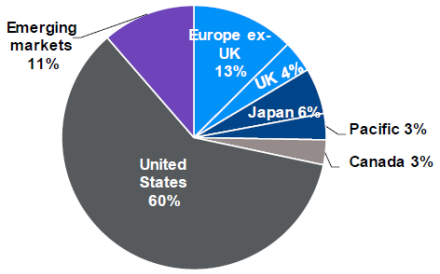
Source: FactSet, MSCI, Standard & Poor's, Thomson Reuters, J.P. Morgan Asset Management.
Calendar year consensus estimates are based on pro-forma earnings. MSCI Europe includes the eurozone as well as countries not in the currency bloc, such as Norway, Sweden, Switzerland and the UK (which collectively 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

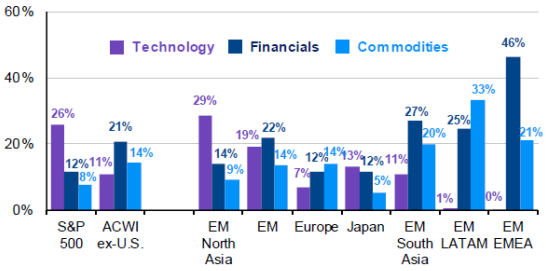
Global equity markets

Returns	2022 YTD		2021		15-years	
	Local	USD	Local	USD	Ann.	Beta
Regions						
U.S. (S&P 500)	-	-18.5	-	28.7	10.7	0.90
AC World ex-U.S.	-8.7	-15.4	13.5	8.3	4.2	1.07
EAFE	-6.0	-13.9	19.2	11.8	4.1	1.04
Europe ex-UK	-11.9	-17.4	24.4	16.5	4.8	1.18
Emerging markets	-14.6	-19.2	0.1	-2.2	4.8	1.18
Selected Countries						
United Kingdom	7.4	-4.6	19.6	18.5	2.3	1.02
France	-6.3	-12.7	29.7	20.6	4.7	1.22
Germany	-16.6	-22.3	13.9	5.9	4.7	1.31
Japan	-3.1	-15.6	13.8	2.0	3.4	0.72
China	-20.7	-22.0	-21.6	-21.6	5.8	1.10
India	3.2	-7.3	28.9	26.7	6.7	1.26
Brazil	6.6	14.7	-11.2	-17.2	0.9	1.50
Korea	-21.0	-26.4	0.8	-7.9	5.9	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 12/31/2006 to 12/31/2021. 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 22, 2022.