ECONOMIC AND MARKET COMMENTARY

2nd Quarter 2023

SMITH SHELLNUT WILSON
AN AFFILIATE OF b1BANK

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SSW Research Department
chad.mckeithen@ssw1776.com
Office: (601) 315-8134
Website: www.ssw1776.com

I. SECOND-QUARTER 2023 EQUITY MARKET RECAP

Equities continued their 2023 positive return in the second quarter with most of the major tracked indices all higher (the lone exception being the Chinese Hang Seng down 6.06%). In the second quarter, the rally was broader than we saw in the first quarter. Leading sectors included Technology, Consumer Discretionary and Communications. The Technology sector was up 15.37% for the quarter, and is now up 40.32% for the year. As we noted in the first quarter, the Technology sector continues to be dominated by just a few very strong performers. In the second quarter, Nvidia was +52.31%, Microsoft +18.38%, and Apple +17.79%. While Consumer Discretionary was up 13.78% for the quarter, nearly the entire rally came in the month of June (+15.37%) after the first quarter announcements did not see significant projections for earnings decline for the rest of the year. The Communications sector was also a big performer, +12.45% for the quarter. The sector is dominated by three names – Meta Platforms "Facebook" +35.41%, Netflix +27.50% and Alphabet "Google" +15.40%.

As we noted in the first quarter, the U.S. equity rally continues to be carried on the back of just a handful of large, powerful companies. The disparity can be seen in the variance between the S&P 500 Index (a market capitalization index) and an equal-weighted version of the S&P 500 Index. For the quarter the S&P 500 Index was +8.68%, but because the index is more weighted to larger market value companies, it was significantly higher than the index of 500 equally-weighted names, only +3.48%.

As professional money managers, this disparity continues to give us pause as we see both the macro environment of a declining U.S. (and world) economy and the Federal Reserve continuing to increase short-term interest rates. This current equity market reminds us more of 1999 when the internet ".com" rally turned into a disappointing bear market. During the second quarter, we heard companies use the term "AI" or artificial intelligence to excite analysts and investors. We can understand why Nvidia was +52% on the AI mania, but we cannot understand why Ford Motor was +22% and Whirlpool +14% at the same time.

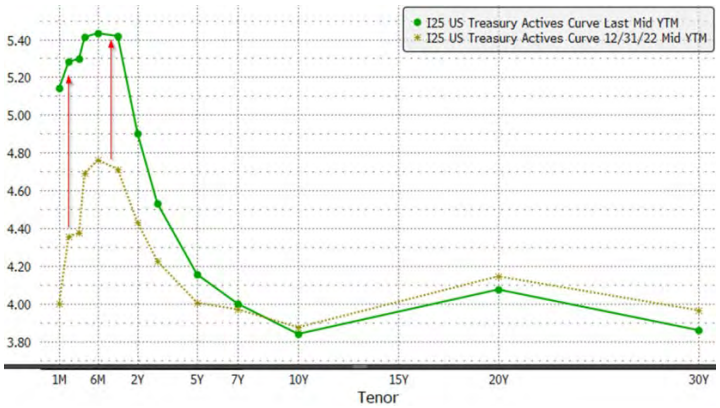
On the international front, Japan was a strong performer, +18.48%, as measured by the Nikkei 225 Index. Europe was +3.89% (MSCI Euro Index) and as previously mentioned, China was -6.06% (Hang Seng Index).

II. SECOND-QUARTER 2023 BOND MARKET RECAP

Banking uncertainty and FOMC commentary impacted the bond market and especially short-term rates. In April, credit spreads spiked on regional banking uncertainty; however, by the end of the quarter, credit spreads fell. In fact, the spread between 10-year BAA corporate yields and 10-year Treasury yields tightened by 15% from start to finish. Municipal credit also performed well, with Municipal-to-Treasury ratios flat or slightly lower for the quarter.

Domestic and global central bankers continued to strike a hawkish, higher-for-longer tone. As a result, short-term rates/yields are up aggressively for the year. The impact is evident by looking at the year-to-date shift in the Treasury curve (Chart 1). The 3-month T-Bill is up 94 basis points while the 10-year Treasury is down 3 points. Longer-duration rates have remained low due to strong demand and a consensus that the worst of inflation is in the past.

Chart 1: Year-to-Date Treasury Yield Curve



The short rate pressure (Chart 2 - Prime, Fed Funds, 3m T bill, 2yr UST) has inverted the curve even more than it was already.

The benchmark 2-to 10-year Treasury curve spread started the quarter at -55 basis points but ended the second quarter at -106 basis points (Chart 2 in green). It is the most negatively inverted the curve has been since 1980.

Chart 2: Year-to-Date Yields

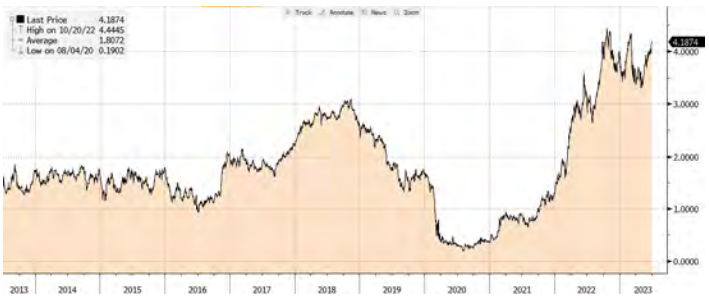
	06/30/23	03/31/23	12/31/22	YTD, Change
Prime	8.25	8.00	7.50	0.75
Fed Funds Rate	5.25	5.00	4.50	0.75
3m Tbill	5.28	4.69	4.34	0.94
2yr UST	4.90	4.03	4.43	0.47
5yr UST	4.16	3.57	4.00	0.16
10yr UST	3.84	3.47	3.87	-0.03
2-10yr UST Spread	-1.06	-0.55	-0.56	-0.50
2y AAA Muni/10y UST	59%	60%	60%	-1%
10y AAA Muni/10y UST	66%	66%	68%	-2%
30y AAA Muni/10y UST	92%	92%	91%	1%

The extreme increase in short rates has pushed investors (both institutional and individual) to invest short where money market returns provide yields of around 5.30%.

While there is a draw to the returns from overnight/money market yields, given market projections, this bond strategy is becoming riskier. The curve is extremely inverted, indicating market belief that rates will fall. In fact, the Fed's preferred gauge of near-term rate direction is the spread between the current 3M T-bill and the 3M T-bill 18 months forward. The spread is currently -86 basis points, indicating that rates may drop soon. While overnight rates are attractive, some duration extension makes sense especially given how high the yields are in longer bonds. For example, even a modest duration extension into a 5-year Treasury bond produces a yield of 4.19% (Chart 3) compared to the 1.81% average yield that the 5-year Treasury has yielded over the past decade.

Chart 3: Ten-Year History of 5-Year UST

(Current: 4.19%, Avg. 1.81%)

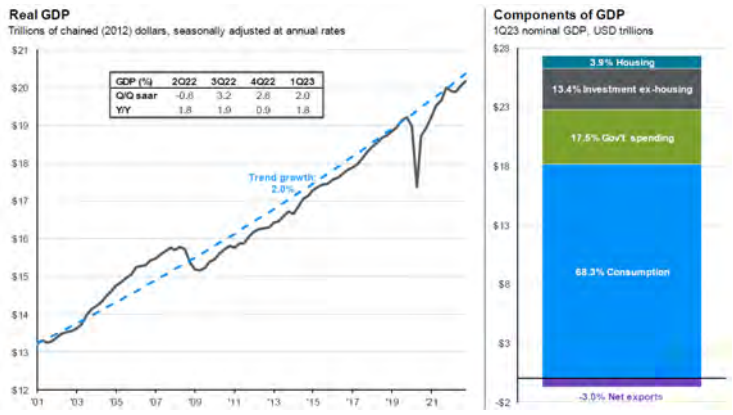


If market projections are correct and rates fall, longer-duration bonds should perform well and layer in protection for bond investors.

III. ECONOMY REMAINS RESILIENT IN THE FACE OF FED RATE HIKES

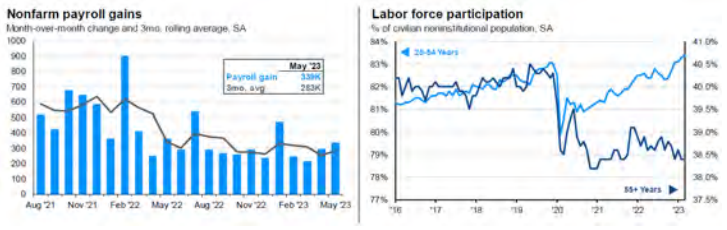
The U.S. economy has surpassed expectations in the first half of 2023, leading to a delay in recession concerns until 2024. However, future growth prospects are hampered by tightening credit conditions, potentially affecting consumer spending. The Federal Reserve maintains a hawkish stance but may ease monetary policy next year due to economic pressures. Despite twists and turns, certain market sectors have seen positive gains, and valuations remain attractive compared to historical levels. Investors face challenges in determining the right time to take advantage of favorable valuations and how to allocate investments in a complex macro environment.

Economic Growth and the Composition of GDP

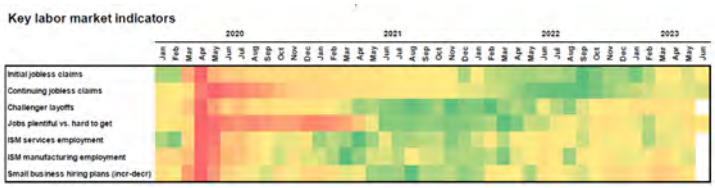


The U.S. economy has shown resilience in the second quarter of 2023, increasing the likelihood of a soft landing. However, economic momentum is slowing across various sectors. Business spending is at risk due to tech sector layoffs, cautious lenders, and slowing corporate profits. Construction spending may be affected by high office and retail vacancies, but demand for warehousing and data centers could offset this. Consumers are experiencing reduced fiscal stimulus and higher inflation, depleting savings, and taking on more debt. The resumption of student loan payments may also impact consumer spending. The housing market is stabilizing, albeit at low levels, thanks to tight supply and steady mortgage rates. Trade could be a mild drag on the economy due to the delayed effects of a strong dollar.

Labor Market Dashboard – Part I



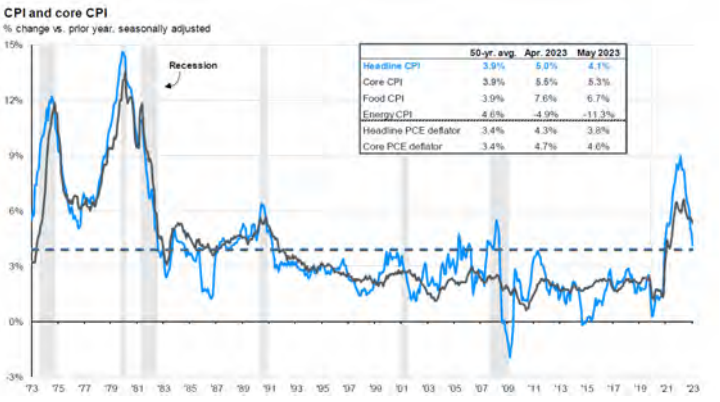
Labor Market Dashboard – Part II



The labor market, although a positive aspect of the economic expansion, shows signs of cracks. Job growth has been slowing and labor force participation may have peaked. Other labor market indicators also suggest a normalization trend, with weekly initial claims for unemployment increasing slightly and employees becoming less confident about their job prospects. The cooling demand for labor indicates that job growth is likely to decelerate and potentially turn negative, signaling a potential recession.

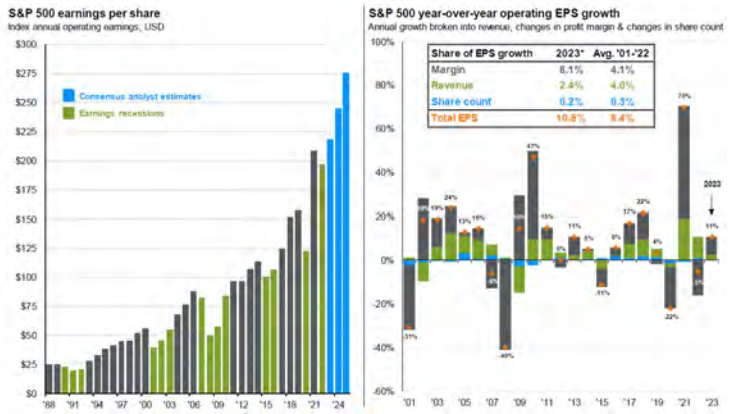
Unemployment remains relatively low, but wage growth is moderating due to cooling demand in the labor market. The labor force faces structural limitations, such as diminished legal immigration and the retirement of baby boomers. The smaller labor force limits how much the unemployment rate could rise. Businesses adjusting their hiring efforts may lead to a modest increase in unemployment. Still, wage growth is expected to continue decelerating, providing the Federal Reserve with confidence that inflation is trending downward.

Inflation



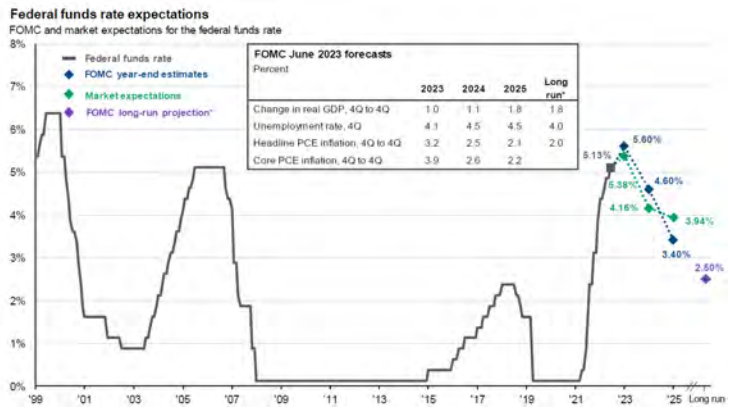
After a period of high inflation, it is now steadily declining. Major sources of inflation have reversed, contributing to disinflation. Energy prices have declined, and supply chain improvements have eased inflation in core goods categories. Shelter inflation remains persistent but is expected to decline gradually. Core services prices outside of housing remain elevated due to supply chain issues, but they should decrease as supply chains improve and the labor market loosens.

Corporate Earnings and Sources of Earnings Growth



Equity markets have performed well in 2023, driven by better-than-expected earnings and the anticipation of the Federal Reserve ending its tightening cycle. However, earnings have downside risks, especially with the increased risk of a recession. Companies indicate plans to reduce investment, but cuts will vary across sectors. Manufacturing and mining sectors are likely to experience the most significant pullback, while investment in technology is expected to continue rising. The challenging environment for equities calls for a defensive stance focusing on quality and cash flow generation.

The Fed and Interest Rates



The Federal Reserve has raised interest rates but has now paused, maintaining a hawkish stance. The Fed's updated projections indicate a temporary pause and expectations of a resilient U.S. economy. Market expectations have aligned more closely with the guidance provided by the Fed, with no rate cuts expected this year and year-end rate expectations rising above 5%.

Global Economy

Globally, the global economy has increased in 2023, with positive developments in Europe and China. Energy prices have fallen in Europe, and fiscal stimulus is boosting Eurozone economies. China's recovery is benefiting its trading partners.

In Conclusion

The U.S. economy has demonstrated resilience and surpassed expectations in the first half of 2023, temporarily allaying concerns of an immediate recession. However, the future growth outlook remains sluggish, with persistent challenges such as tightening credit conditions and potential constraints on consumer spending. The Federal Reserve may adjust its hawkish stance in response to economic headwinds while investors navigate a complex macro environment. Although certain market sectors have experienced notable gains and valuations remain appealing, the global economy is witnessing divergent growth trajectories, with the U.S. decelerating while Europe, China, and broader Asia accelerate. Whether the U.S. economy can sustain its robustness in these current headwinds remains uncertain, and only time will reveal the answer.

IV. THE HISTORY OF ARTIFICIAL INTELLIGENCE

Article written by Rockwell Anyoha, Harvard University
Date: August 28, 2017

Can Machines Think?

In the first half of the 20th century, science fiction familiarized the world with the concept of artificially intelligent robots. It began with the "heartless" Tin man from the Wizard of Oz and continued with the humanoid robot that impersonated Maria in Metropolis. By the 1950s, we had a generation of scientists, mathematicians, and philosophers with the concept of artificial intelligence (or AI) culturally assimilated in their minds. One such person was Alan Turing, a young British polymath who explored the mathematical possibility of artificial intelligence. Turing suggested that humans use available information as well as reason in order to solve problems and make decisions, so why can't machines do the same thing? This was the logical framework of his 1950 paper, Computing Machinery and Intelligence in which he discussed how to build intelligent machines and how to test their intelligence.

Making the Pursuit Possible

Unfortunately, talk is cheap. What stopped Turing from getting to work right then and there? First, computers needed to fundamentally change. Before 1949 computers lacked a key prerequisite for intelligence: they couldn't store commands, only execute them. In other words, computers could be told what to do but couldn't remember what they did. Second, computing was extremely expensive. In the early 1950s, the cost of leasing a computer ran up to $200,000 a month. Only prestigious universities and big technology companies could afford to dillydally in these uncharted waters. A proof of concept as well as advocacy from high profile people were needed to persuade funding sources that machine intelligence was worth pursuing.

The Conference that Started it All

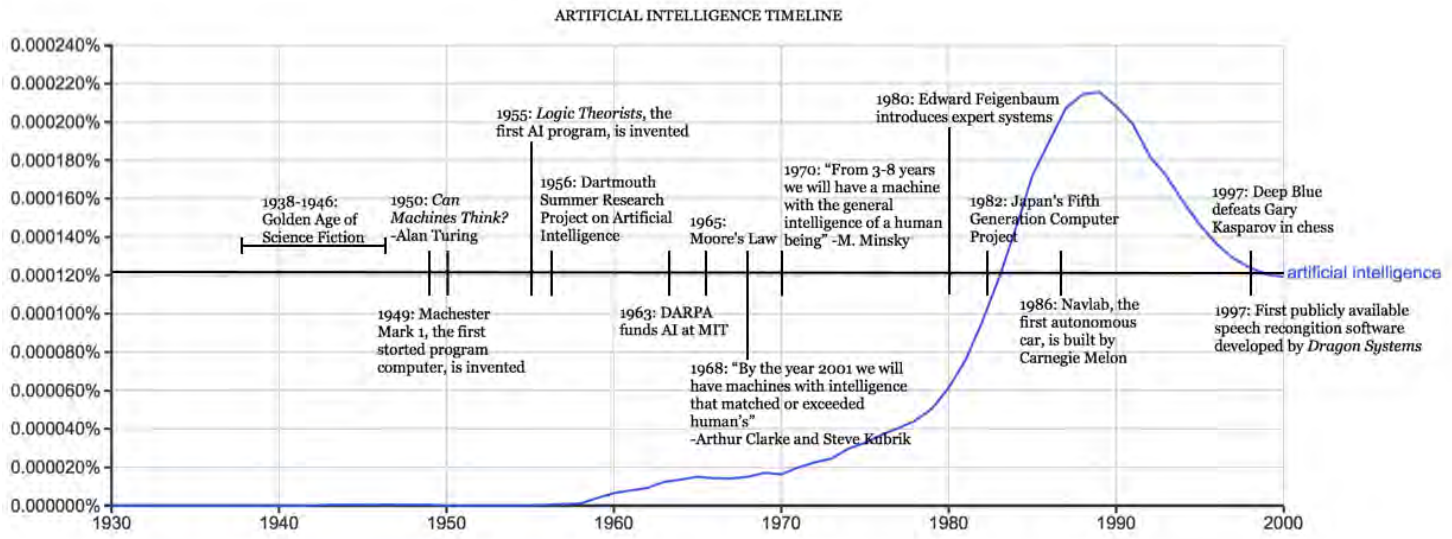
Five years later, the proof of concept was initialized through Allen Newell, Cliff Shaw, and Herbert Simon's, Logic Theorist. The Logic Theorist was a program designed to mimic the problem solving skills of a human and was funded by Research and Development (RAND) Corporation. It's considered by many to be the first artificial intelligence program and was presented at the Dartmouth Summer Research Project on Artificial Intelligence (DSRPAI) hosted by John McCarthy and Marvin Minsky in 1956. In this historic conference, McCarthy, imagining a great collaborative effort, brought together top researchers from various fields for an open ended discussion on artificial intelligence, the term which he coined at the very event. Sadly, the conference fell short of McCarthy's expectations; people came and went as they pleased, and there was failure to agree on standard methods for the field. Despite this, everyone whole-heartedly aligned with the sentiment that AI was achievable. The significance of this event cannot be undermined as it catalyzed the next twenty years of AI research.

Roller Coaster of Success and Setbacks

From 1957 to 1974, AI flourished. Computers could store more information and became faster, cheaper, and more accessible. Machine learning algorithms also improved and people got better at knowing which algorithm to apply to their problem. Early demonstrations such as Newell and Simon's General Problem Solver and Joseph Weizenbaum's ELIZA showed promise toward the goals of problem solving and the interpretation of spoken language respectively. These successes, as well as the advocacy of leading researchers (namely the attendees of the DSRPAI) convinced government agencies such as the Defense Advanced Research Projects Agency (DARPA) to fund AI research at several institutions. The government was particularly interested in a machine that could transcribe and translate spoken language as well as high throughput data processing. Optimism was high and expectations were even higher. In 1970 Marvin Minsky told Life Magazine, "from three to eight years we will have a machine with the general intelligence of an average human being." However, while the basic proof of principle was there, there was still a long way to go before the end goals of natural language processing, abstract thinking, and self-recognition could be achieved.

Anyoha SITN Figure 2 AI timeline

Breaching the initial fog of AI revealed a mountain of obstacles. The biggest was the lack of computational power to do anything substantial: computers simply couldn't store enough information or process it fast enough. In order to communicate, for example, one needs to know the meanings of many words and understand them in many combinations. Hans Moravec, a doctoral student of McCarthy at the time,



stated that "computers were still millions of times too weak to exhibit intelligence." As patience dwindled so did the funding, and research came to a slow roll for ten years.

In the 1980's, AI was reignited by two sources: an expansion of the algorithmic toolkit, and a boost of funds. John Hopfield and David Rumelhart popularized "deep learning" techniques which allowed computers to learn using experience. On the other hand Edward Feigenbaum introduced expert systems which mimicked the decision making process of a human expert. The program would ask an expert in a field how to respond in a given situation, and once this was learned for virtually every situation, non-experts could receive advice from that program. Expert systems were widely used in industries. The Japanese government heavily funded expert systems and other AI related endeavors as part of their Fifth Generation Computer Project (FGCP). From 1982-1990, they invested $400 million dollars with the goals of revolutionizing computer processing, implementing logic programming, and improving artificial intelligence. Unfortunately, most of the ambitious goals were not met. However, it could be argued that the indirect effects of the FGCP inspired a talented young generation of engineers and scientists. Regardless, funding of the FGCP ceased, and AI fell out of the limelight.

Ironically, in the absence of government funding and public hype, AI thrived. During the 1990s and 2000s, many of the landmark goals of artificial intelligence had been achieved. In 1997, reigning world chess champion and grand master Gary Kasparov was defeated by IBM's Deep Blue, a chess playing computer program. This highly publicized match was the first time a reigning world chess champion loss to a computer and served as a huge step towards an artificially intelligent decision making program. In the same year, speech recognition software, developed by Dragon Systems, was implemented on Windows. This was another great step forward but in the direction of the spoken language interpretation endeavor. It seemed that there wasn't a problem machines couldn't handle. Even human emotion was fair game as evidenced by Kismet, a robot developed by Cynthia Breazeal that could recognize and display emotions.

Time Heals all Wounds

We haven't gotten any smarter about how we are coding artificial intelligence, so what changed? It turns out, the fundamental limit of computer storage that was holding us back 30 years ago was no longer a problem. Moore's Law, which estimates that the memory and speed of computers doubles every year, has finally caught up and in many cases, surpassed our needs. This is precisely how Deep Blue was able to defeat Gary Kasparov in 1997, and how Google's Alpha Go was able to defeat Chinese Go champion, Ke Jie, only a few months ago. It offers a bit of an explanation to the roller coaster of AI research; we saturate the capabilities of AI to the level of our current computational power (computer storage and processing speed), and then wait for Moore's Law to catch up again.

Artificial Intelligence is Everywhere

We now live in the age of "big data," an age in which we have the capacity to collect huge sums of information too cumbersome for a person to process. The application of artificial intelligence in this regard has already been quite fruitful in several industries such as technology, banking, marketing, and entertainment. We've seen that even if algorithms don't improve much, big data and massive computing simply allow artificial intelligence to learn through brute force. There may be evidence that Moore's law is slowing down a tad, but the increase in data certainly hasn't lost any momentum. Breakthroughs in computer science, mathematics, or neuroscience all serve as potential outs through the ceiling of Moore's Law.

The Future

So what is in store for the future? In the immediate future, AI language is looking like the next big thing. In fact, it's already underway. I can't remember the last time I called a company and directly spoke with a human. These days, machines are even calling me! One could imagine interacting with an expert system in a fluid conversation, or having a conversation in two different languages being translated in real time. We can also expect to see driverless cars on the road in the next twenty years (and that is conservative). In the long term, the goal is general intelligence, that is a machine that surpasses human cognitive abilities in all tasks. This is along the lines of the sentient robot we are used to seeing in movies. To me, it seems inconceivable that this would be accomplished in the next 50 years. Even if the capability is there, the ethical questions would serve as a strong barrier against fruition. When that time comes (but better even before the time comes), we will need to have a serious conversation about machine policy and ethics (ironically both fundamentally human subjects), but for now, we'll allow AI to steadily improve and run amok in society.

[About the Author] Rockwell Anyoha is a graduate student in the department of molecular biology with a background in physics and genetics. His current project employs the use of machine learning to model animal behavior. In his free time, Rockwell enjoys playing soccer and debating mundane topics.

This article is part of a Special Edition on Artificial Intelligence.

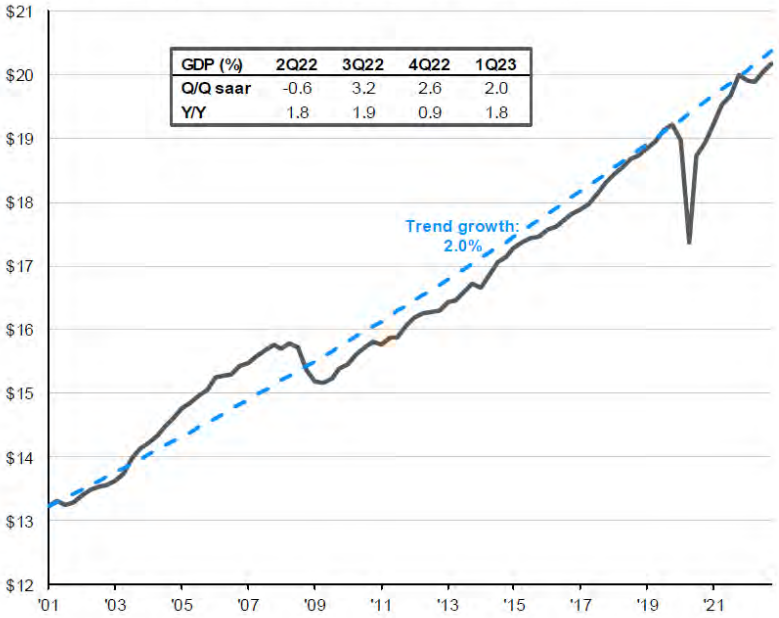
The sources of the information found in this commentary are the SSW Research Department, Bloomberg, and "The History of Artificial Intelligence" by Rockwell Anyoha.

Economy

Economic growth and the composition of GDP

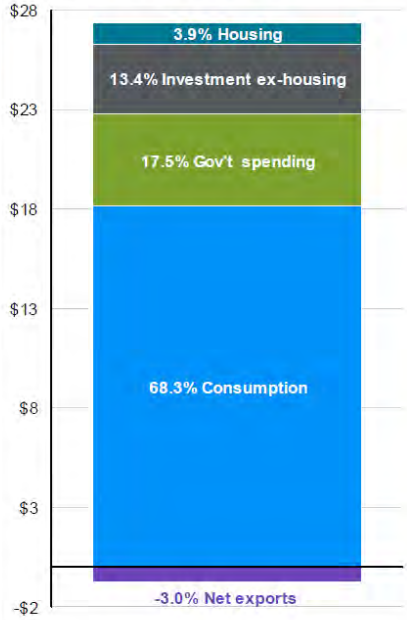
Real GDP

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



Components of GDP

1Q23 nominal GDP, USD trillions



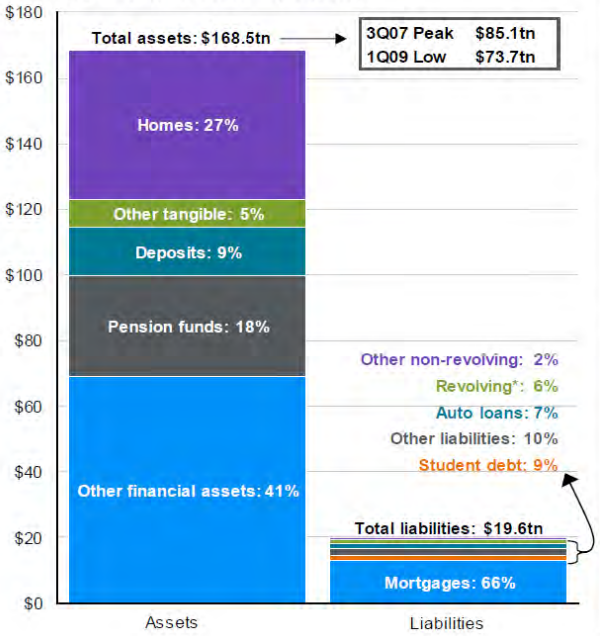
Source: BEA, FactSet, J.P. Morgan Asset Management. Values may not sum to 100% due to rounding. Trend growth is measured as the average annual growth rate from business cycle peak 1Q01 to business cycle peak 4Q19. *Guide to the Markets – U.S.* Data are as of June 30, 2023.

Economy

Consumer finances

Consumer balance sheet

1Q23, USD trillions, not seasonally adjusted



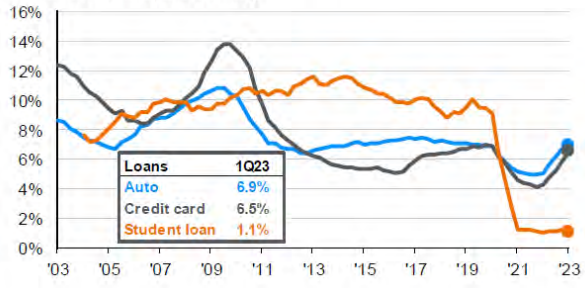
Household debt service ratio

Debt payments as % of disposable personal income, SA



Flows into early delinquencies

% of balance delinquent 30+ days



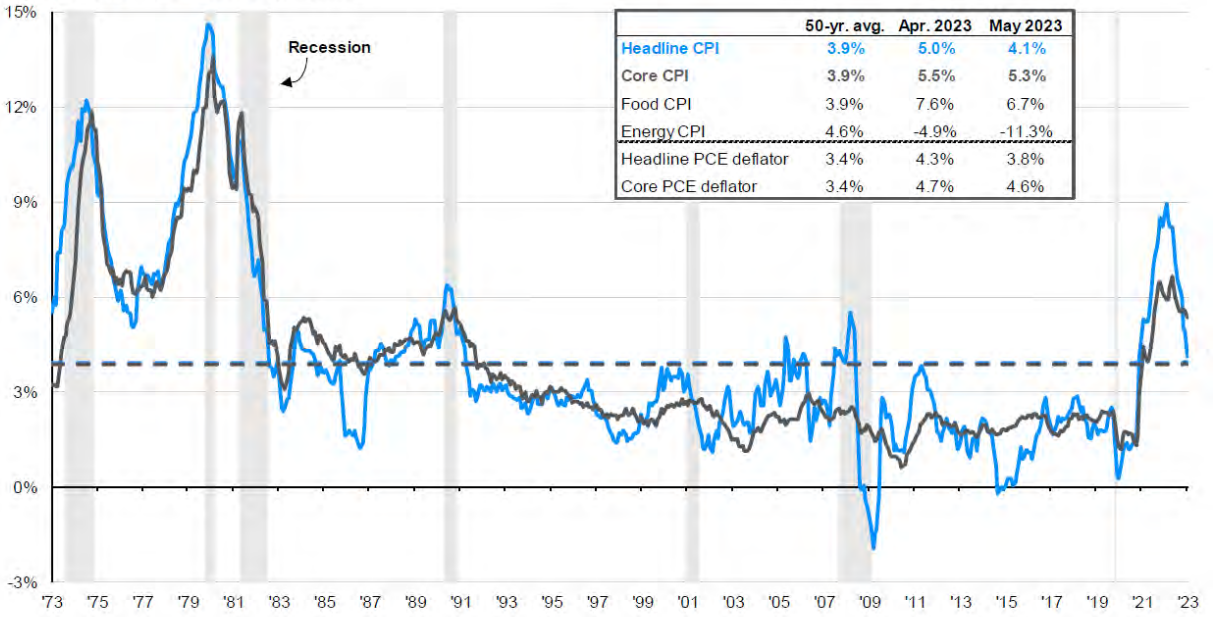
Source: FactSet, FRB, J.P. Morgan Asset Management; (Top and bottom right) BEA. Data include households and nonprofit organizations. SA – seasonally adjusted. *Revolving includes credit cards. Values may not sum to 100% due to rounding. **2Q23 figures for debt service ratio are J.P. Morgan Asset Management estimates. *Guide to the Markets – U.S.* Data are as of June 30, 2023.

Economy

Inflation

CPI and core CPI

% change vs. prior year, seasonally adjusted



	50-yr. avg.	Apr. 2023	May 2023
Headline CPI	3.9%	5.0%	4.1%
Core CPI	3.9%	5.5%	5.3%
Food CPI	3.9%	7.6%	6.7%
Energy CPI	4.6%	-4.9%	-11.3%
Headline PCE deflator	3.4%	4.3%	3.8%
Core PCE deflator	3.4%	4.7%	4.6%

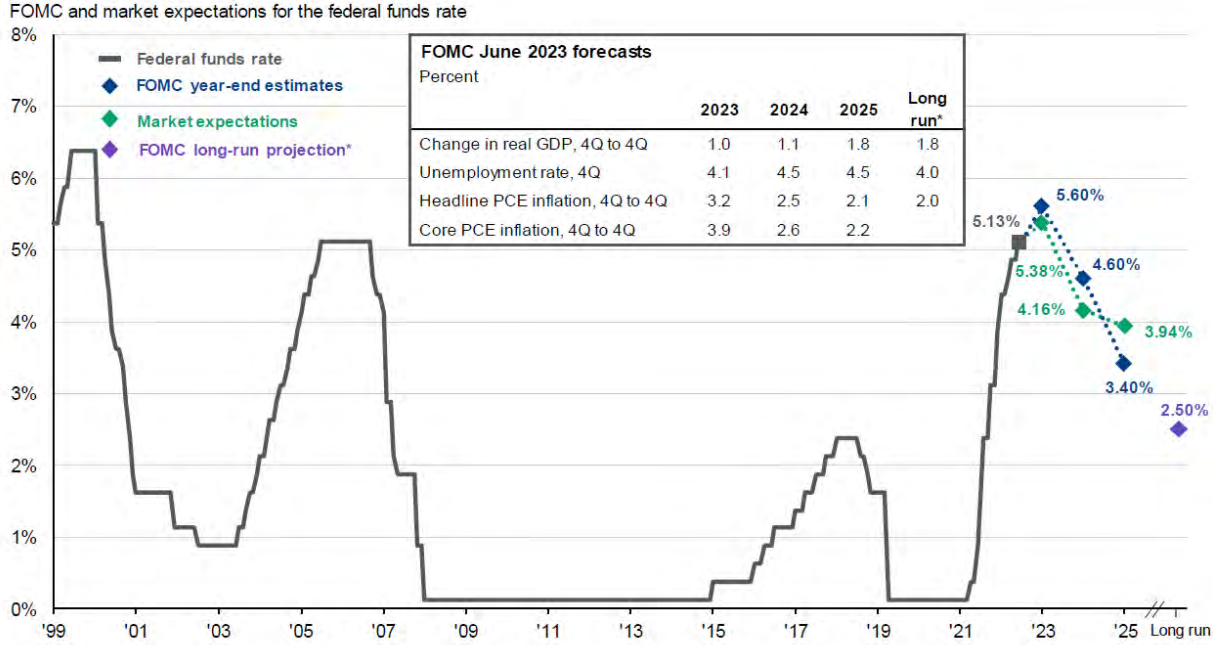
Source: BLS, FactSet, J.P. Morgan Asset Management. CPI used is CPI-U and values shown are % change vs. one year ago. Core CPI is defined as CPI excluding food and energy prices. The Personal Consumption Expenditure (PCE) deflator employs an evolving chain-weighted basket of consumer expenditures instead of the fixed-weight basket used in CPI calculations. *Guide to the Markets – U.S.* Data are as of June 30, 2023.

Fixed Income

The Fed and interest rates

Federal funds rate expectations

FOMC and market expectations for the federal funds rate



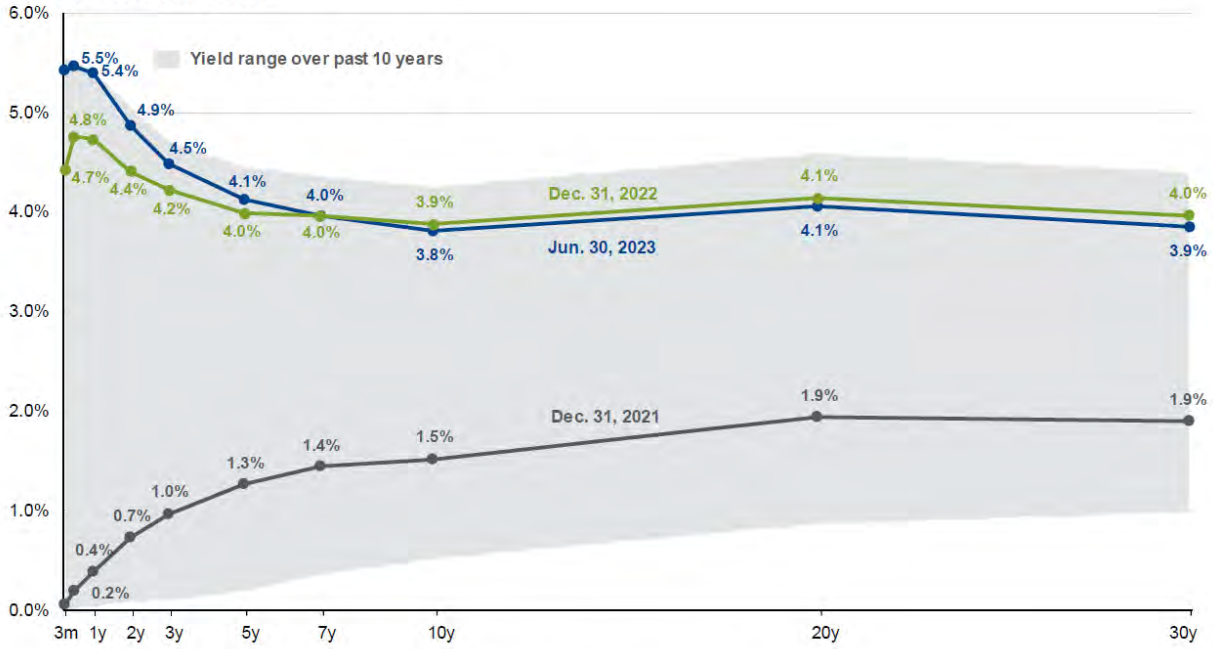
FOMC June 2023 forecasts Percent	2023	2024	2025	Long run*
Change in real GDP, 4Q to 4Q	1.0	1.1	1.8	1.8
Unemployment rate, 4Q	4.1	4.5	4.5	4.0
Headline PCE inflation, 4Q to 4Q	3.2	2.5	2.1	2.0
Core PCE inflation, 4Q to 4Q	3.9	2.6	2.2	

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 June 30, 2023.

Fixed Income

Yield curve

U.S. Treasury yield curve



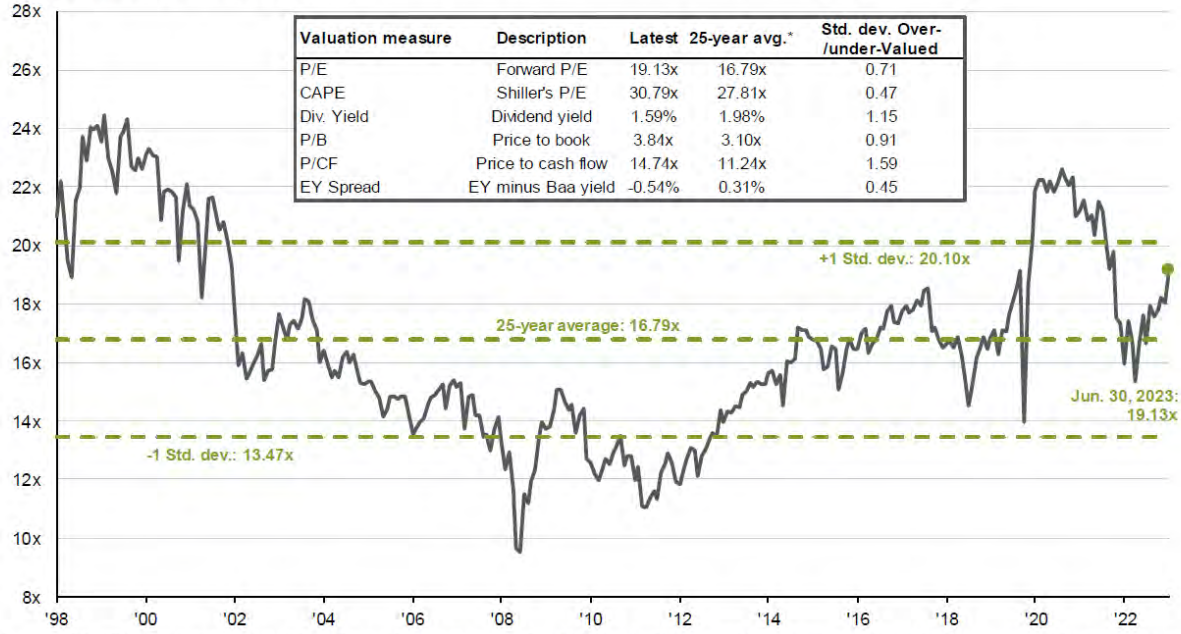
Source: FactSet, Federal Reserve, J.P. Morgan Asset Management. *Guide to the Markets – U.S.* Data are as of June 30, 2023.

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	19.13x	16.79x	0.71
CAPE	Shiller's P/E	30.79x	27.81x	0.47
Div. Yield	Dividend yield	1.59%	1.98%	1.15
P/B	Price to book	3.84x	3.10x	0.91
P/CF	Price to cash flow	14.74x	11.24x	1.59
EY Spread	EY minus Baa yield	-0.54%	0.31%	0.45

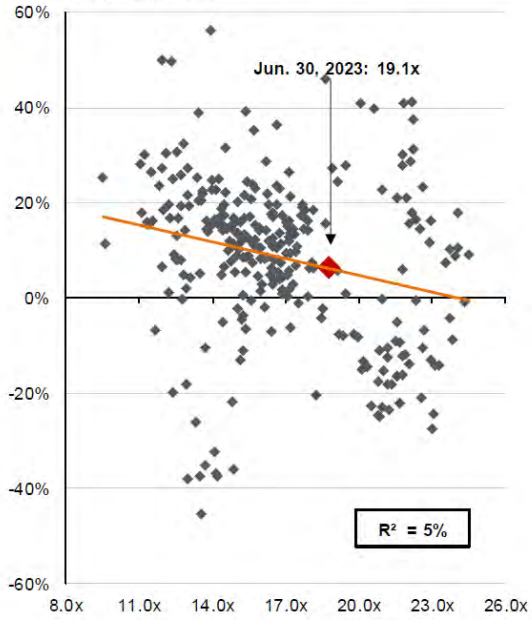


Source: FactSet, FRB, Refinitiv Datastream, Robert Shiller, Standard & Poor's, Thomson Reuters, J.P. Morgan Asset Management. Price-to-earnings is price divided by consensus analyst estimates of earnings per share for the next 12 months as provided by IBES since June 1998 and by FactSet since January 2022. Current next 12-months consensus earnings estimates are $233. 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 June 30, 2023.

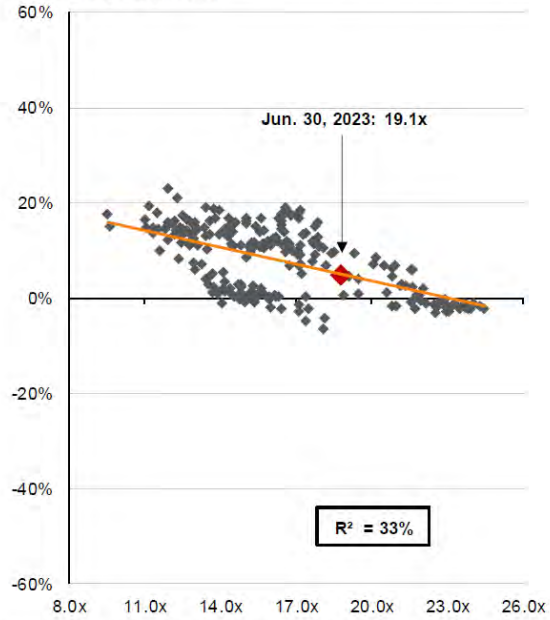
P/E ratios and equity returns

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

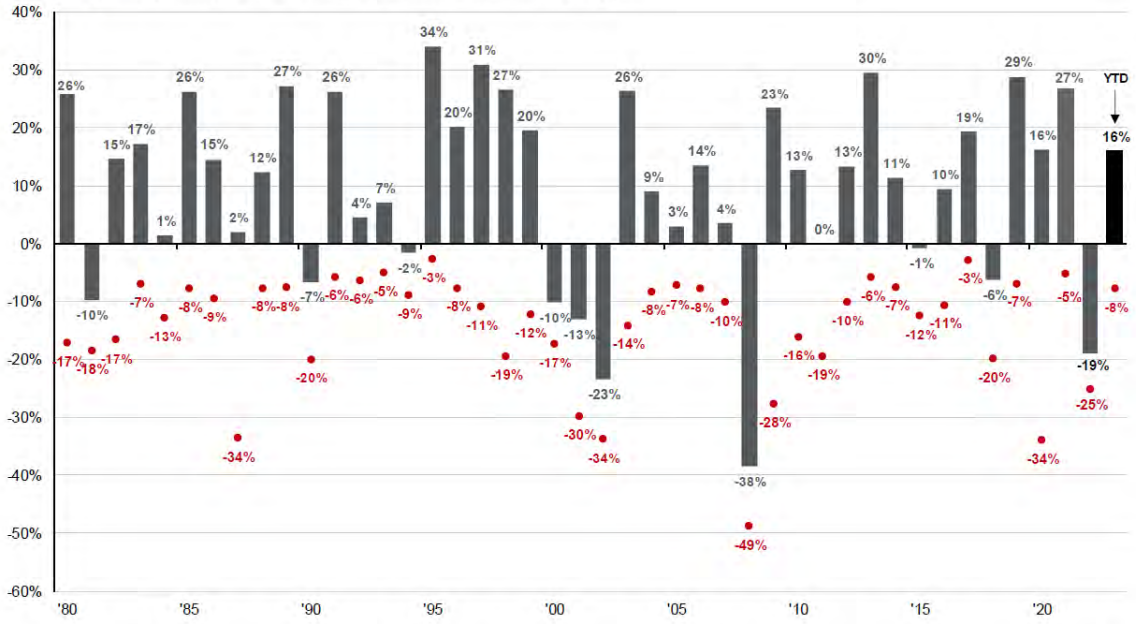


Source: FactSet, Refinitiv Datastream, Standard & Poor's, Thomson Reuters, J.P. Morgan Asset Management. Returns are 12-month and 60-month annualized total returns, measured monthly, beginning 5/31/1998. R^2 represents the percent of total variation in total returns that can be explained by forward price-to-earnings 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 February 1998 and by FactSet since January 2022. *Guide to the Markets – U.S.* Data are as of June 30, 2023.

Annual returns and intra-year declines

Equities

S&P intra-year declines vs. calendar year returns
Despite average intra-year drops of 14.3%, annual returns were positive in 32 of 43 years



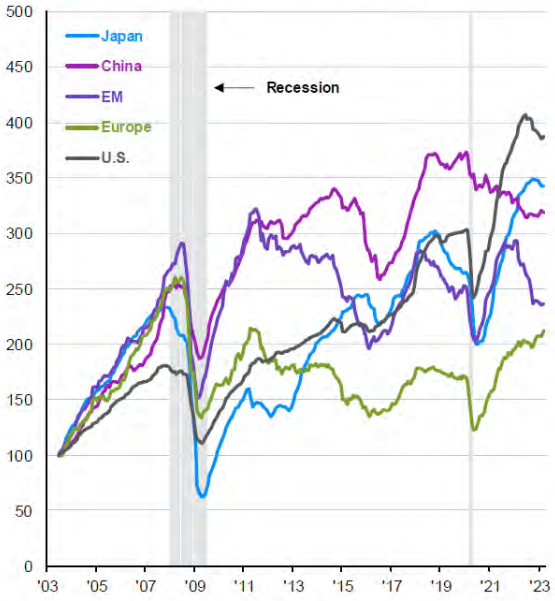
Source: FactSet, Standard & Poor's, J.P. Morgan Asset Management. Returns are based on price index only and do not include dividends. Intra-year drops refers to the largest market drops from a peak to a trough during the year. For illustrative purposes only. Returns shown are calendar year returns from 1980 to 2022, over which time period the average annual return was 8.7%. *Guide to the Markets – U.S.* Data are as of June 30, 2023.

International

International equity earnings and valuations

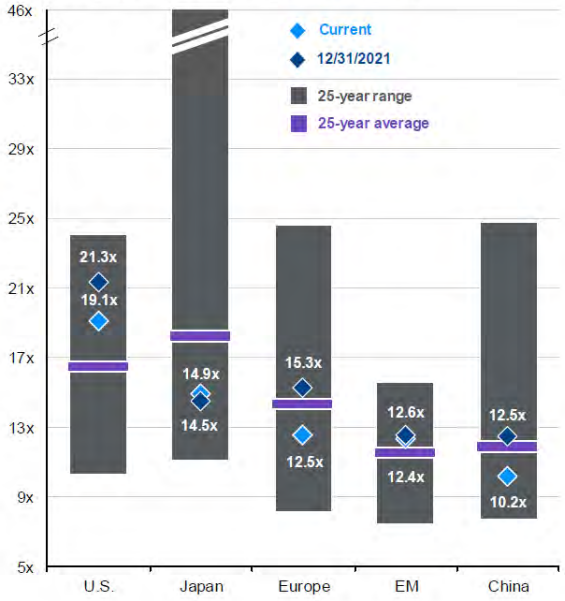
Global earnings estimates

Jun. 2003 = 100, next 12 months consensus estimates, U.S. dollars



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. Next 12 months consensus estimates are based on pro-forma earnings and are in U.S. dollars. 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). The purple lines for EM and China show 20-year averages due to a lack of available data. Past performance is not a reliable indicator of current and future results. *Guide to the Markets – U.S.* Data are as of June 30, 2023.

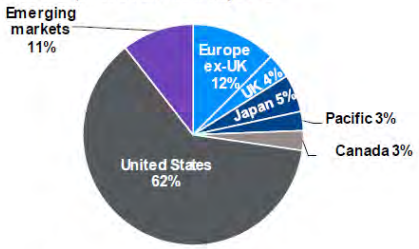
International

Global equity markets

Returns	2023		2022		15-years	
	Local	USD	Local	USD	Ann.	Beta
Regions						
U.S. (S&P 500)	-	16.9	-	-18.1	8.8	0.9
AC World ex-U.S.	10.1	9.9	-9.2	-15.6	2.0	1.0
EAFE	12.6	12.1	-6.5	-14.0	2.3	1.0
Europe ex-UK	13.8	16.0	-12.2	-17.3	2.4	1.2
Emerging markets	5.8	5.1	-15.2	-19.7	1.0	1.1
Selected Countries						
Japan	24.0	13.2	-4.1	-16.3	2.5	0.7
United Kingdom	2.6	8.4	7.2	-4.8	1.4	1.0
France	16.5	19.1	-6.9	-12.7	2.8	1.2
Canada	6.1	8.6	-5.8	-12.2	3.0	0.7
Germany	16.2	18.8	-16.5	-21.6	0.9	1.3
China	-4.3	-5.4	-20.6	-21.8	0.6	1.0
India	4.4	5.3	3.0	-7.5	2.4	1.2
Korea	19.4	14.6	-24.4	-28.9	1.6	1.3
Brazil	7.0	17.1	8.6	14.6	-2.1	1.4

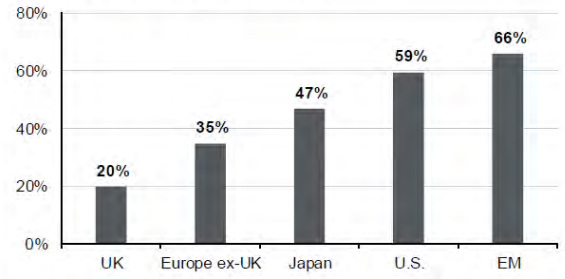
Weights in MSCI All Country World Index

% global market capitalization, float adjusted



Revenue exposure vs. country of listing

% of total revenue from home countries



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. Revenue exposure vs. country of listing is as of 3/31/2023. *Guide to the Markets – U.S.* Data are as of June 30, 2023.