

CHIEF INVESTMENT OFFICE

## Educational Series

**Inflation ABCs and Portfolio Strategy**

April 2022

Following the coronavirus shock and massive injections of liquidity into the market by global central banks, many investors have raised questions about the path of inflation going forward and what it may mean for their portfolios. In this report, we look to address the fundamentals of inflation, its structural and cyclical causes, and provide guidance on how to approach portfolio strategy given global reflationary forces.

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**WHAT IS INFLATION?**

Inflation is a broad increase in goods and services prices in the economy over time.<sup>1</sup> Inflation does not change easily or quickly and should therefore not be confused with temporary increases in prices for a single product, asset class, commodity, etc. This is an important distinction, as the link between inflation and asset class performance is through the monetary policy cycle (which looks at broad measures of inflation) and the broader business cycle.

**HOW IS INFLATION MEASURED?**

Policymakers and investors have a large and growing set of indexes and sub-indexes to leverage to gauge broad trends in inflation. The Federal Reserve (Fed) monitors a significant number of these available price indexes, but its preferred measure is the personal consumer expenditures (PCE) deflator. Relative to the Consumer Price Index (CPI), the PCE deflator is heralded for being a broad measure with fewer biases and measurement issues. Because the Fed monitors the PCE Index, and given the business cycle's relationship to inflation and the monetary cycle, this index is a key indicator for investors to watch.

**WHAT IS THE ROLE OF THE FED?**

Monetary policy regimes, including the Fed, operate in part to govern trends in inflation. By law, the Fed has an explicit dual mandate to pursue low and stable inflation and maximum employment, and since 2012 the Fed has explicitly targeted 2% inflation growth. In 2020, the Fed announced the rollout of an additional framework known as Average Inflation Targeting, whereby it will manage inflation policy with the goal of averaging 2% over time. If inflation runs below 2% for an extended period, for example, it will aim to run inflation over 2% for an extended period so that over longer time frames inflation averages 2%.

**WHY 2%?**

While 2% is somewhat arbitrary, the logic behind it is that low and stable inflation makes it easier for consumers and businesses to operate efficiently. If inflation growth gets too low, deflation<sup>2</sup> becomes a risk. A shock to aggregate demand that generates deflation

<sup>1</sup> Federalreserve.gov; "What is inflation and how does the Federal Reserve evaluate changes in the rate of inflation?".

<sup>2</sup> "Deflation" describes a fall in the general price levels in a country.

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can push inflation expectations lower and lead to a deflationary spiral characterized by falling prices that lead to consumers and businesses delaying purchases, and then to a further fall in prices. The cycle “spirals” from here. For this reason the Fed was aggressive in responding to deflationary shocks from the 2008 Great Financial Crisis (GFC) and the coronavirus crisis.

Importantly, there are costs to high and volatile inflation as well. High inflation creates a lot of noise in prices and interest rates. It also makes it difficult to gauge after-tax returns and encourages low cash balances, as the incentive to earn interest is higher. All of this may make long-run planning very difficult for businesses, consumers and investors.<sup>3</sup>

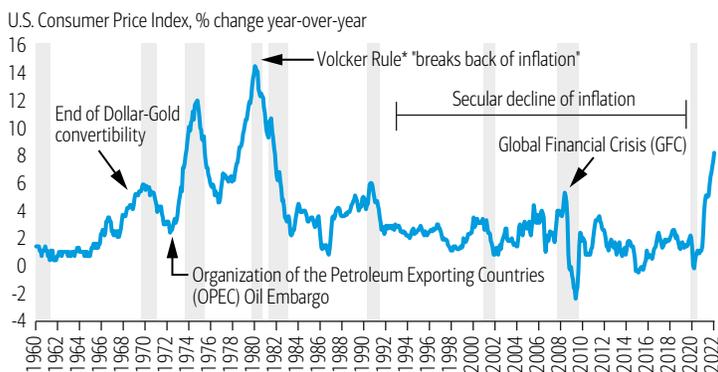
### WHAT IS THE ROLE OF INFLATION EXPECTATIONS?

The description above highlights the important role that inflation expectations play. In short, the Fed aims to avoid deflation by maintaining its credibility and keeping long-term inflation expectations at a low, stable level. If market participants believe the Fed is a credible actor that will succeed in keeping inflation growth around 2% over time, expectations will play a role in driving future inflation close to that target. Many economists believe inflation expectations are as important as or even more important than other factors driving inflation trends.

### WHAT ARE INFLATION TRENDS AND CAUSES?

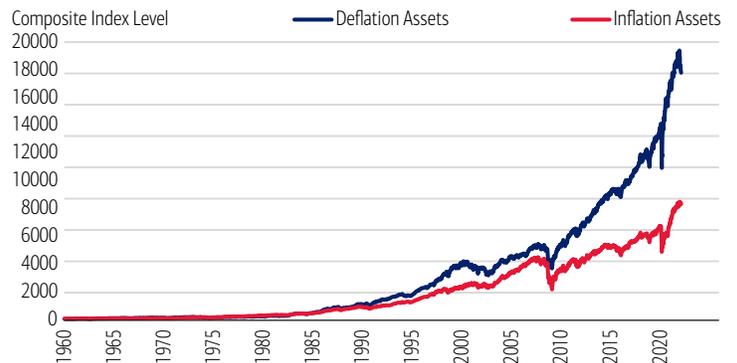
Inflation growth in the U.S. trended higher from the 1960s to early 1980, but leading up to the pandemic had been in an overall downtrend (Exhibit 1). This long-term trend has been a key contributor to the 40-year bull market in bonds. From this perspective, reflation efforts<sup>4</sup> during the GFC and the coronavirus crisis have been that much more important. Since the mid-1990s to 2020, inflation in the U.S. had been relatively stable, averaging between 1.0% and 2.5%. During the business cycle expansion leading up to the coronavirus, inflation as measured by the core PCE deflator averaged around 1.6%. Thus, for the last few decades, inflation’s response to shocks over time dampened, and it remained firmly anchored at low levels. As a result, assets favored during periods of heightened deflation outperformed inflation assets (Exhibit 2). That said, in the last year, the inflation trends of the last several decades have reversed with the U.S. economy now experiencing the largest inflationary shock since the 1970s.

**Exhibit 1: CPI Inflation Peaked in Early 1980 and Entered a Period of Secular Decline for Decades.**



\*The Volcker Rule refers to § 619 of the Dodd–Frank Wall Street Reform and Consumer Protection Act. Gray shaded area represents market inflection points. Sources: Chief Investment Office; Bureau of Labor Statistics; Bloomberg. Data as of April 7, 2022.

**Exhibit 2: Secular Decline In inflation Has Led To The Outperformance Of Deflation Assets.**



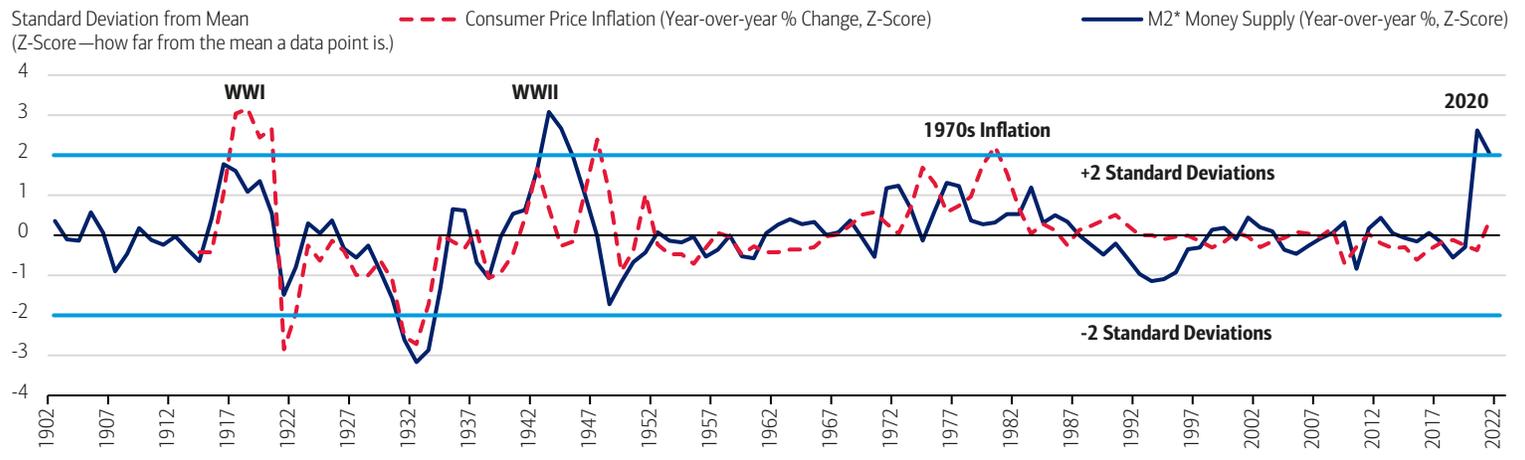
Sources: BofA Global Investment Strategy; Global Financial Data; Bloomberg. Note: Inflation assets = Commodities, real estate, Treasury Inflation-Protected Securities, Europe, Australasia, and the Far East, U.S. Banks, Value and Cash; Deflation assets = Government bonds, U.S. Investment-grade, S&P 500, U.S. Consumer Discretionary, Growth and U.S. High Yield. Data as of March 4, 2022. **Past performance is no guarantee of future results. Please refer to index definitions and important disclosures at the end of this report.**

<sup>3</sup> Ben Bernanke’s Fed: The Federal Reserve After Greenspan by Ethan Harris, 2008.

<sup>4</sup> “Reflation efforts” describes fiscal or monetary policies designed to target deflation by increasing output and spending.

The causes of inflation are dynamic and often debated, but monetarists believe monetary policy is the main driver of inflation trends. As Milton Friedman—American economist and statistician—says: “Inflation is always and everywhere a monetary phenomenon.” In every past instance of significantly high inflation, money supply growth breached a few standard deviations above its 120-year average (Exhibit 3). In 2020, money supply growth surged again as a result of the fiscal and monetary policy response, which amounted to a size only comparable to that of the response during World War II (WWII). In both periods, large fiscal stimulus measures led to an increase in government debt. The Fed ultimately stepped in to finance the massive fiscal stimulus by purchasing the government debt issued and expanding its balance sheet. During WWI and the great inflation of 1970s, money supply similarly surged, which ultimately led to inflation accelerating. Similar inflation dynamics are playing out again today.

### Exhibit 3: Money Supply Growth Is Now Similar To Other Periods Of High Inflation.



\*M2=a calculation of the money supply that includes all elements of M1 (a narrow measure of the money supply that includes physical currency, demand deposits, traveler’s checks and other checkable deposits) as well as “near money.” Sources: Bureau of Labor Statistics; Federal Reserve Board. Data as of March 31, 2022. **Past performance is no guarantee of future results.**

Other factors such as wage growth have historically also played a role in inflation. Specifically, the Phillips Curve<sup>5</sup> is renowned for highlighting the relationship between wage inflation and the unemployment rate (a tighter labor market is expected to push wage growth and inflation higher). This relationship was tested during the last cyclical expansion as inflation struggled to gain momentum even as the labor market tightened. Some believe this is because inflation expectations remained depressed and muted the transmission from wage inflation to price inflation.

With low inflation over the last few decades, economists have also looked at the influence of structural changes in the economy on inflation trends.

**Technology:** The evolution of computers, telecommunication and network technologies as well as the advancement of automation, robotics and artificial intelligence has helped to improve the quality and speed with which workers perform tasks or produce products and services. Boosting productivity helps to eliminate certain jobs, reduce the cost of production and ultimately contain inflationary pressures. Technology-related changes to consumption behaviors and business models have also helped to support lower prices. As businesses face more competition, the shift in various tools and applications allows consumers greater selection and price transparency.

**Demographics:** Some economists have suggested that demographic shifts could be a factor contributing to low inflation over the last few decades. Life expectancy has rapidly increased as a result of technology and better health and lifestyles. According to BofA Global Research,

<sup>5</sup> Phillips curve is a single-equation economic model, named after William Phillips, describing an inverse relationship between rates of unemployment and corresponding rates of rises in wages that result within an economy.

the fastest increase in life expectancy since the 1960s happened during the period between 2000 and 2016. As people live longer, they may work longer, which may place limits on wage growth. The labor force participation rate of workers aged 55 and older has increased from roughly 32% in 2000 to roughly 40% at the start of 2020 before the pandemic.

## INFLATION AND PORTFOLIO STRATEGY

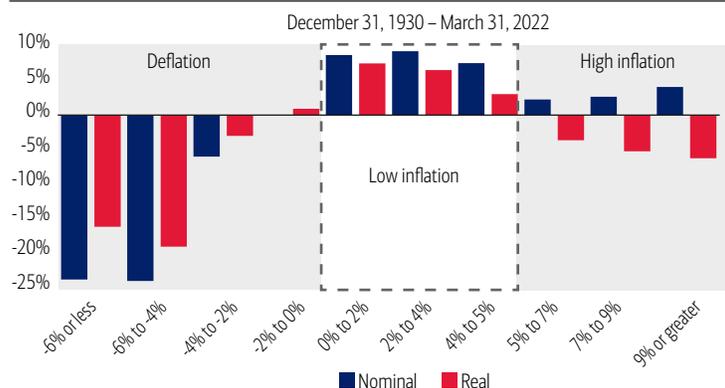
Fundamentally, the intrinsic value of an asset is tied back to the present value of its cash flows. The level of those cash flows can be directly influenced by inflation which effects revenues along with costs. Equities, for example, produce cash flows tied to the corporate earning streams that may increase alongside inflation. Alternatively, bonds typically offer fixed payments that would experience a deterioration of purchasing power during periods of higher inflation but may benefit during periods of deflation. The process of then discounting cash flows back to present time is also linked to inflation through the risk-free rate. A persistently higher level of inflation would argue for higher interest rates, ultimately depressing the present value of cash flows, to the detriment of both Equities and bond prices.

### Equities

While not a direct hedge against inflation, over the long term, a well-diversified portfolio of Equities can help offset the erosion of purchasing power from inflation, as historically Equities have produced better long-term returns than other asset classes. Over a business cycle, equity returns are affected by the level of inflation and the market's perception of where it is headed (Exhibit 4).

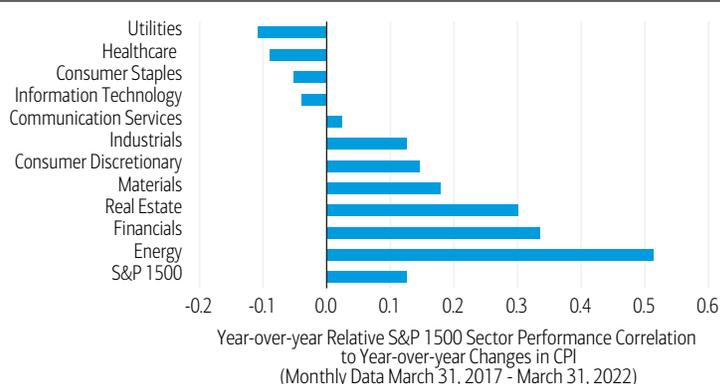
Moderate levels of inflation along with a growing economy can translate into higher earnings and cash flows, a potential tailwind for equity returns. Higher cash flows also enable companies to reinvest for future growth and increase buybacks and dividends, all shareholder-friendly actions. A mitigating factor at much higher inflation levels is that investors start to apply a higher discount rate to those cash flows. Also, as inflation gets above the comfort zone of central bankers, valuations and cash flows may come under pressure from tighter monetary policy, negatively affecting equity performance. Stable inflation levels that are not "too hot or too cold" generally provide for the most accommodative backdrop for Equities. Certain sectors within the equity markets like Energy, Materials and Industrials may offer a better hedge against inflation.

**Exhibit 4: Low Inflation Tends To Be a Sweet Spot For The S&P 500.**



Source: Chief Investment Office, Bloomberg. 3-year average Consumer Price Index level referenced for inflation. 3-year average real and nominal returns referenced for the S&P 500 Index. Performance date range December 31, 1930 – March 31, 2022. **Past performance is no guarantee of future results.**

**Exhibit 5: Cyclical Sectors Tend To Have The Strongest Correlations to CPI.**



Source: Chief Investment Office, Piper Sandler Macro Research. Data as of March 31, 2022. **Past performance is no guarantee of future results. Please refer to index definitions and important disclosures at the end of this report.**

### Fixed Income

Generally, Fixed Income securities may offer little insulation against the erosion of purchasing power in an inflationary environment. With most Fixed Income securities, the

nominal amount of cash flow stays consistent in periods of inflation, so the real value is reduced by higher price levels. Alternatively, bonds may offer attractive returns during periods when inflation levels and interest rates decline. In addition, bonds may potentially offer positive total returns during inflationary periods, as the income they generate can help offset their decline in price. This is especially pertinent in periods of higher yield levels or when inflation is less pronounced. As such, bonds could be viewed as a source of reliable income and a necessary diversifier against assets with more immediate inflation exposure like Equities, rather than a source against rising inflation.

A few Fixed Income instruments, however, do exhibit a positive exposure to inflation. Treasury Inflation Protected Securities (TIPS) have coupon income and principal amount linked directly to CPI, and therefore can provide an adequate hedge against inflation and a U.S.-government guaranteed real return when held to term. Currently, however, that real return is negative. Fixed income securities like high yield bonds and floating-rate loans also have some positive inflation correlation, but they exhibit Equity-like volatility and significant credit risk, and are therefore not considered classic high-quality fixed income assets.

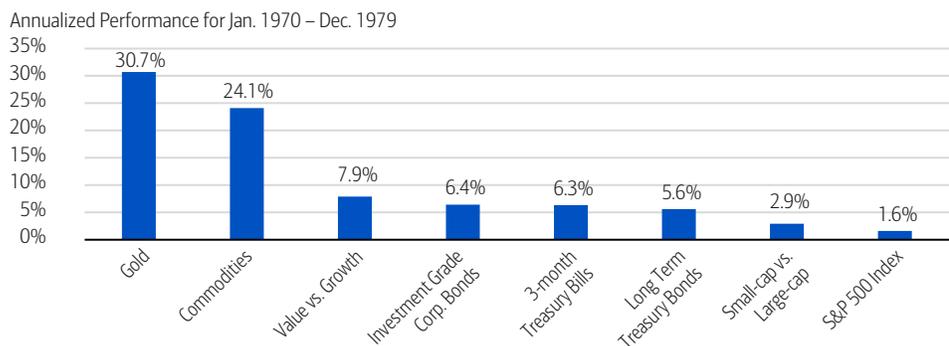
## Commodities

Commodities typically perform better than fixed income assets as inflation rises. This intuitively makes sense—as demand for goods increases, the price of those goods usually rises as well, as do the prices of the commodities used to produce them.

Commodities have also shown to provide some diversification benefits to traditional assets; however, Commodity investing comes with its unique challenges. The asset class tends to be quite volatile and throughout history has been subject to various permanent and transitory shocks, affecting supply and demand dynamics.<sup>6</sup> For example, a permanent shock like the shale energy revolution, led to a supply glut in oil, leading to a lower range for oil prices. In the long term, improving technology and productivity gains tend to erode commodity prices, while substitution and innovation tend to limit scarcity gains. Transitory shocks can be related to recessions, political interference and weather-based disruptions. Additionally, Commodity investing through futures is risky due to leverage, while investing in stocks of companies involved in commodities may not always offer the similar returns.

On gold specifically, while investors have looked to the precious metal as a potential inflation hedge, making tactical investment calls can be challenging, given gold's limited use as an industrial metal, absence of cash flows and its historical use as a less risky asset. However, gold can provide some diversification benefits against equity drawdowns and unexpected changes in inflation dynamics and hence could be considered as a strategic holding for long-term portfolios. Gold and Commodities were the best performing asset classes by far during the hyper-inflation era of the 1970s (Exhibit 6).

### Exhibit 6: During The High-inflation Era Of 1970s, Gold and Commodities Did Best.



Source: BofA Global Research. March 2021. **Past performance is no guarantee of future results. Please refer to index definitions and important disclosures at the end of this report.**

<sup>6</sup> Persistence Commodity Shocks; John Baffes & Alain Kabundi; World Bank Blogs; November 12, 2020.

## Real Assets

In our definition, Real Assets broadly include real estate, farmland and timberland—three property types that have historically demonstrated an ability to hedge against inflation. This hedge may be strengthened by direct exposure to the underlying hard asset, leasing structures and often a link to certain commodities sensitive to increasing inflationary pressures. Commercial and residential real estate are leased to a range of tenants leveraged to the broader economy. Farmland and timberland share that exposure and may also be leveraged to longer-term commodity cycles. Rising global commodity prices resulting from increased demand drive revenue increases accruing to farmland and timberland, which in turn could help drive increases in underlying land values.

A hedge against inflation can also be found in the structure and term of leases, along with the ability to pass along increases in construction costs due to higher component costs (land, labor and materials). All else equal, shorter leases respond to increasing inflationary pressures faster than longer-term leases; and, in this regard, Real Assets can offer a range of diversifying inflation alternatives from short-term residential, storage and farm lease structures to medium- and longer-term warehouse, office and retail leases.

## Cash

Inflation causes cash to lose purchasing power. Alternatively, cash would be expected to gain relative value in deflationary periods, as its purchasing power increases while the cash flows of other assets might deteriorate. As there have seldom been prolonged periods of deflation in the post-WWII era, cash returns have generally been outstripped by those from other asset classes over time. One feature that cash does have in its favor is downside risk. While the return on cash in a positive rate environment is often negative after accounting for inflation, for some investors the guaranteed prospects of a slight negative return with minimal volatility is still an overall positive contributor.

## Portfolio consideration

Portfolio performance can be heavily influenced by inflation outcomes. A slow rise in inflation accompanied by a cyclical rise in economic growth and corporate cash flows is often considered a positive for risk assets like Equities and Commodities while creating moderate headwinds for cash and Fixed Income. Accelerating, unexpected, runaway inflation caused by resource shocks is potentially positive for Commodities but detrimental for equity and bond markets.

The volatility and uncertainty of inflationary regimes argues for diversification of assets. An appropriately balanced portfolio is more likely to lead to long-term financial success. Investors with a longer time horizon, such as for retirement portfolios, should emphasize a predominant allocation to diversified Equities, given their history of producing positive real rates of return.

With an inflationary boom underway and rates on the rise as the Fed moves to tighten policy, tactical tilts toward cyclical areas of the equity market such as Energy, Financials, Industrials, Materials and Value may be appropriate. Commodity exposure through natural resource stocks or thematic areas such as infrastructure build-up and renewable energy may also be considered.

Please see appendix for a contextual account of historical episodes of rising inflation.

APPENDIX

**A Contextual Account of Historical Episodes of Rising Inflation**

It is hard to form a general view of inflation and its effect on asset prices in isolation. Other factors such as economic growth, level and trajectory of interest rates and monetary policy and credit spreads, among others, also play a role as shown in Exhibit 7. Equities have generally outperformed fixed income during periods of rising inflation, especially during times when pricing pressures rapidly spike or amidst an otherwise benign macro backdrop. International and Emerging Market Equities have fared well during periods of rising inflation, although they underperformed U.S. Equities after the GFC, due to relatively lackluster economic and earnings recovery. During times when bonds have provided higher yields, that has helped to insulate against price declines. Gold exhibits a high degree of volatility through inflationary episodes. Likewise, broader commodities also exhibit volatility but generally fare better.

**Exhibit 7: Previous Episodes of Consumer Price Index Increasing Over 2% Year-over-Year And Current Backdrop.**

												Current Backdrop
Trough to Peak		6/30/1972 12/31/1974	12/31/1976 3/31/1980	7/31/1983 3/31/1984	12/31/1986 10/31/1990	3/31/1998 3/31/2000	1/31/2002 9/30/2005	10/31/2006 7/31/2008	7/31/2009 9/30/2011	4/30/2015 7/31/2018	5/31/2020 3/31/2022	Average Annualized Returns
Percentage Point Change	Consumer Price Index (YoY)	9.6%	9.9%	2.3%	5.2%	2.4%	3.6%	4.3%	6.0%	3.1%	8.4%	
	10-year Treasury (Start Yield)	6.2%	6.8%	11.8%	7.2%	5.7%	5.0%	4.6%	3.5%	2.0%	0.7%	
	10-year Treasury (End Yield)	7.4%	12.6%	12.5%	8.6%	6.0%	4.3%	3.9%	1.9%	3.0%	2.3%	
	10-year Treasury Yield	1.3%	5.8%	0.7%	1.4%	0.4%	-0.7%	-0.7%	-1.6%	0.9%	1.7%	
	Real 10-year Yield	-8.4%	-4.1%	-1.6%	-3.8%	-2.0%	-4.3%	-4.9%	-7.5%	-2.2%	-6.7%	
	Effective Fed Funds Rate	-0.6%	15.7%	0.7%	-4.8%	0.3%	2.1%	-3.2%	-0.1%	1.8%	0.3%	
	Credit Spreads	1.2%	0.9%	-0.1%	-0.4%	0.7%	-1.1%	1.7%	0.2%	-0.8%	-0.8%	
Total Return Performance	S&P 500	-29.9%	12.5%	0.8%	43.0%	39.7%	15.9%	-4.8%	19.8%	44.5%	53.0%	6.8%
	Large Cap	—	—	-1.9%	37.0%	41.4%	19.5%	-4.0%	20.5%	43.1%	52.6%	9.3%
	Large-Cap Growth*	—	—	-9.4%	43.7%	71.8%	3.5%	2.1%	24.4%	55.9%	52.7%	10.1%
	Large-Cap Value*	—	—	5.5%	29.9%	11.7%	36.3%	-10.1%	16.8%	30.8%	51.5%	8.3%
	Small Cap*	—	—	-12.2%	-4.6%	15.0%	44.7%	-4.7%	19.0%	43.2%	51.5%	5.3%
	International Developed	-25.3%	52.5%	25.3%	41.5%	32.7%	61.4%	1.8%	2.5%	14.3%	31.6%	10.5%
	Emerging Markets**	—	—	—	—	—	122.0%	32.9%	9.6%	12.5%	27.6%	13.0%
	Gold	196.1%	267.7%	-7.9%	-5.9%	-7.3%	66.1%	50.7%	70.2%	3.4%	12.0%	16.5%
	Commodities	326.4%	130.7%	6.2%	99.6%	2.0%	114.6%	31.2%	11.1%	-15.7%	96.2%	22.3%
	U.S. Aggregate Bond***	—	-2.8%	6.2%	33.3%	8.5%	21.0%	8.7%	16.2%	3.9%	-5.6%	4.1%
	Months	30	39	8	46	24	43	21	25	39	22	

\*Style and Small Cap total returns data begins December 29, 1978. \*\*Emerging Markets total returns data begins December 29, 2000. \*\*\*Bloomberg U.S. Aggregate Bond Index data begins January 30, 1976. Note: Shaded area represents economic indicators; pink shaded area represents negative performance; and green shaded area represents positive performance. Credit spreads represent Moody's Seasoned Baa Corporate Bond Yield Relative to the 10-year Treasury Yield. Indexes Represented: S&P 500 Total Return (TR), Russell 1000 TR, Russell 1000 Growth TR, Russell 1000 Value TR, Russell 2000 TR, MSCI EAFE Net TR, MSCI Emerging Markets Net TR, Gold Spot Price \$USD per Troy Ounce, Bloomberg Commodities TR, Bloomberg Barclays U.S. Aggregate TR Unhedged. Sources: Chief Investment Office; Bloomberg. Data as of March 31, 2022. **Past performance is no guarantee of future results. Please refer to index definitions and important disclosures at the end of this report.**

1972 – 1974: Energy prices surged and the dollar weakened as double-digit growth in money supply helped push up inflation. Equities fell into a bear market.

1977 – 1980: Inflation increased gradually before spiking in 1978 with energy costs jumping. Gold enjoyed a strong advance, while fixed income trailed as macro conditions deteriorated. Equities exhibited positive total return.

1983 – 1984: After a major rally in previous years, equity performance was mixed as inflation increased at a slightly elevated pace. Relatively stable Fed policy, benign credit conditions and high nominal yields boosted fixed income.

1987 – 1990: Consumer prices rapidly increased in 1987, and stocks were significantly higher along with commodities. Credit conditions improved and inflation then began to settle, also helping bond performance.

1998 – 2000: Equities surged beyond fixed income and commodities as pricing pressures accelerated in 1999, with Growth and technology stocks benefiting in particular.

2002 – 2005: Global nominal activity advanced as China joined the World Trade Organization and crude prices tripled, prompting a monetary tightening cycle with emerging market equities surging higher. Small-caps led Large-caps on rising economic growth.

2006 – 2008: U.S. equities initially performed well as inflationary pressures began, but deteriorating credit conditions and strains to the broader financial system prompted significant global policy easing, which benefited fixed income and real assets.

2009 – 2011: A large move lower for real yields from extremely elevated levels benefited fixed income and commodities; however, growing momentum for the post-GFC recovery led U.S. equities to outperform.

2015 – 2018: The slow pivot away from “secular stagnation” coupled with low yields propelled equities, especially across pockets of growth, even as a cyclical pickup in nominal activity prompted monetary tightening.

Current Period (2020 – 3/2022): Equities soared on the back of massive stimulus filtering through the economy. With inflation on the rise, commodity prices have surged and Fixed Income has struggled.

# Index Definitions

**Securities indexes assume reinvestment of all distributions and interest payments. Indexes are unmanaged and do not take into account fees or expenses. It is not possible to invest directly in an index. Indexes are all based in dollars.**

**U.S. Banks:** Dow Jones U.S. Banks Index is designed to measure the performance of U.S. companies in the banks sector.

**S&P 500 Total Return Index** includes a representative sample of 500 leading companies in leading industries of the U.S. economy. Although the index focuses on the large-cap segment of the market, with approximately 75% coverage of U.S. equities, it is also an ideal proxy for the total market.

**Cash:** Cash IA SBBI US 30 Day TBill TR USD & BofA U.S. Treasury Bills 3 months For the IA SBBI U.S. Treasury Bill Index, the CRSP U.S. Government The ICE BofA US 3-Month Treasury Bill Index is comprised of a single issue purchased at the beginning of the month and held for a full month.

**Commodities: Bloomberg Commodity Index** is made up of 22 exchange-traded futures on physical commodities, which are weighted to account for economic significance and market liquidity.

**Bonds: Bloomberg Barclays US Aggregate Bond Index** is a broad base, market capitalization-weighted bond market index representing intermediate term investment grade bonds traded in the United States.

**Treasuries: Bloomberg Barclays Long-Term Treasury Index** is an unmanaged index comprised of fixed-income securities with various maturities greater than 10 years.

**Consumer Discretionary; Food & Beverage; Utilities; Materials: Healthcare: Communications; Industrials: MSCI USA Defensive Sectors Index** is based on MSCI USA Index, its parent index and captures large and mid-cap segments of the US market. The index is designed to reflect the performance of the opportunity set of global defensive companies across various GICS® sectors. All constituent securities from Consumer Staples, Energy, Healthcare, Telecommunication Services and Utilities are included in the Index.

**MSCI USA Defensive Sectors Index** is based on MSCI USA Index, its parent index and captures large and mid-cap segments of the US market. The index is designed to reflect the performance of the opportunity set of global defensive companies across various GICS® sectors. All constituent securities from Consumer Staples, Energy, Healthcare, Telecommunication Services and Utilities are included in the Index.

**S&P 500 Cyclical ex-financials** is designed to reflect the performance of the opportunity set of U.S. cyclical companies across various GICS® sectors. All constituent securities from Consumer Discretionary, Industrials, Information Technology and Materials are included in the index.

**Consumer Price Index** is an index of the variation in prices paid by typical consumers for retail goods and other items.

**Gold** reflects the gold spot price and is quoted in U.S. dollars per Troy Ounce.

**High Yield: ICE BofA US High Yield Index** value, which tracks the performance of US dollar denominated below investment grade rated corporate debt publicly issued in the US domestic market.

**Inflation and Treasuries: ICE BofA US Inflation-Linked Treasury Index** tracks the performance of US dollar denominated inflation linked sovereign debt publicly issued by the US government in its domestic market. The ICE BofA Global Research US 3-Month Treasury Bill Index is comprised of a single issue purchased at the beginning of the month and held for a full month. At the end of the month that issue is sold and rolled into a newly selected issue. The issue selected at each month-end rebalancing is the outstanding Treasury Bill that matures closest to, but not beyond, three months from the rebalancing date. To qualify for selection, an issue must have settled on or before the month-end rebalancing date.

**Investment Grade: ICE BofA investment-grade Corporate Bond Index** is an unmanaged index comprised of U.S. dollar denominated investment grade corporate debt securities publicly issued in the U.S. domestic market with at least one year remaining term to final maturity.

**International Equity:** MSCI Daily TR Net World Ex USA USD captures large and mid cap representation across 22 of 23 Developed Markets (DM) countries – excluding the United States. The index covers approximately 85% of the free float-adjusted market capitalization in each country.

**Large Cap: MSCI USA Large Cap Index** is designed to measure the performance of the large cap segments of the US market. With 292 constituents, the index covers approximately 70% of the free float-adjusted market capitalization in the US.

**Europe, Australia, Far East: MSCI EAFE Index** is a stock market index that is designed to measure the equity market performance of developed markets outside of the U.S. & Canada.

**Emerging Markets: MSCI Emerging Markets Total Return Index** is an index used to measure equity market performance in global emerging markets.

**Personal Consumption Expenditure (deflator) Index** measure is the component statistic for consumption in gross domestic product collected by the United States Bureau of Economic Analysis.

**Real Estate/REITs: FTSE NAREIT U.S. Real Estate Index** is a performance index based on publicly traded real estate investment trusts (REITs) that span commercial real estate space across the U.S. economy. The index series provides investors with exposure to all investment and property sectors. A REIT is a company that owns and, in most cases, operates income-producing real estate such as apartments, shopping centers, offices, hotels and warehouses. Some REITs also engage in financing real estate. To qualify as a REIT, a company must distribute at least 90% of its taxable income to its shareholders annually. A company that qualifies as a REIT is permitted to deduct dividends paid to its shareholders from its corporate taxable income.

**Growth: Russell Growth Index** measures the performance of those Russell 3000 Index companies with higher price-to-book ratios and higher forecasted growth values.

**Value: Russell Value Index** measures the performance of those Russell 3000 Index companies with lower price-to-book ratios and lower forecasted growth values.

**Russell 1000 Growth Total Return Index** measures the performance of the large- cap growth segment of the US equity universe.

**Russell 1000 Value Total Return Index** represents the top 1000 companies by market capitalization in the United States.

**Small Cap: Russell 2000 Index** is a small-cap stock market index of the smallest 2,000 stocks in the Russell 3000 Index.

**MSCI USA Small Cap Index** is designed to measure the performance of the small cap segment of the US equity market.

**S&P 500 Total Return (“TR”) Index** is a type of equity index that tracks both the capital gains as well as any cash distributions, such as dividends or interest, attributed to the components of the index.

**Treasury Bill: U.S. Treasury Bill 3-month Index** is designed to measure the performance of U.S. Treasury Bills maturing 0-3months.

**All S&P Sectors Indexes** measure segments of the U.S. stock market as defined by GICS®. GICS enables market participants to identify and analyze companies at four levels of granularity using a common global standard.

**S&P 1500 Index** is a stock market index of US stocks made by Standard & Poor's. It includes all stocks in the S&P 500, S&P 400, and S&P 600.

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