

The Abernathy Group II

Family Office

2022 Market Outlook

First Quarter 2022 Review

Summary

The Abernathy Group Family Office 2022 Market Outlook

In the following pages you will find a brief introduction, followed by a summary of our expectations for:

- a) Interest Rates;
- b) Bond Market;
- c) Stock Market;

This will be followed by a General Summary describing our expectations for the rest of the 2022 year, based on current data.

Please keep in mind that this Market Outlook began in January 2022. It has evolved to include the latest data through the end of Q 1 2022.

For those interested in the bottom line only, you may skip to the sections listed above on Interest Rates, or Bonds, or Stocks.

In an attempt to keep our letter shorter and to the point, we have reduced our comments to “Summary” form.

For those of you interested in the supporting data, charts, and statistics, feel free to let us know and we can go through the data with you.

Summary

- Geopolitical risks in Europe, combined with pandemic impacts in China are weighing on global economic growth expectations, while elevated inflation proves to be more persistent than planned in the U.S. during 2021. This combination, combined with an overabundance of speculation in the capital markets, creates an investment framework with more risk than the vast majority of investors have considered/embraced.
- A decade of cheap capital¹ stimulated (and supported) unintelligent investments and reckless behavior. Unreasonable asset prices have become embedded in our capital markets.
- Since the Great Financial Crisis in 2008, each minor economic stumble has been ameliorated by the Fed's money printing. (Wall Street calls it the "Fed Put," meaning the Fed is guaranteed to bail the capital markets out whenever trouble materializes). This prevented both "cleansing cycles" and "price discovery" which refresh our economic resiliency.
- Naturally, inflation has followed. (How could the printing of almost \$10 TRILLION in *new dollars in 2 years*, not create an inflationary environment?).
- Investors believe the "Fed-Put" will continue indefinitely. Risk avoidance has evaporated while the list of *serious risks* has increased.
- Now the Fed is tightening financial conditions² while the U.S. economy is slowing (*not a welcoming combination*). The European Union will likely enter a recession within the next year. China's economy is also slowing, while Russia's economy may already be in recession/default.

- The consensus expects the U.S. Federal Reserve to increase rates from 0.25% to 3% plus in 2022.
- **Our belief** - the Fed will NOT be able to raise rates to the above-mentioned levels while reducing its balance sheet³ without throwing our economy into a recession (or worse). Our base case is that the Fed will continue to raise rates until something in our economy breaks.
 - The Fed will stop, or more likely, reverse course – and lower rates – depending upon the magnitude of the downturn.
 - We expect the U.S. 10-year bond to yield 0.05% - 1% during the next recession.
- However, if we are wrong, and the Fed becomes solely focused on crushing inflation with little consideration to the global capital markets (a-la Paul Volcker in the early 1980's), economic tightening is likely to create a downturn much worse than expected⁴. The case for unintended consequences becomes more probable in this scenario.

Shareholder Letter Q1 2022

Price is what you pay. Value is what you get.⁵

As Warren Buffett said in his 2008 Shareholder Letter, this quote is as true today as it was then.

Unfortunately, today, price and value have become unrelated. The Federal Reserve's interest rate control has pushed most investors into riskier assets. *Many investors do not understand the risks they are taking.* Active, speculative, "retail" trading has increased to record levels. Most speculative traders don't understand that asset valuations matter. This most often leads to tragic results.

When the above statement was made in Berkshire's 2008 Shareholder Letter, the U.S. economy was in the throes of a violent downturn. Unfortunately, the vast majority of investors didn't know it.

The systemic fraud in the U.S. real estate market had leaked into the global real estate marketplace. Losses from fraudulent and mispriced loans literally threatened the global financial system. Some of the world's largest banks, brokerage firms, and insurance companies filed for bankruptcy protection. While most were unaware of the potential devastation this downturn posed, I can tell you, and Hank Paulson will agree (the former and residing Secretary of the U.S. Treasury at the time of the crisis), the systemic losses due to massive loans made to speculators purchasing property at prices which were 2 – 3 times their true value, endangered the U.S. and global financial system. I was part of the meeting with Hank Paulson in NY. Within 10 days of this meeting, access to capital froze globally.

Investors didn't know who was hiding losses and who was solvent. Trust evaporated. In reality, some CEOs didn't actually know they were literally insolvent. Bear Stearns, Lehman Brothers, and AIG were but a few of the companies worth \$0.00 yet were trading for billions in value. Price and value had decoupled. The Great Financial Crisis (GFC⁶) ensued.

For those who were aware of the details, it was a truly frightening 6-month period.

What went wrong? Why does it matter to The Abernathy Group Family Office members today?

Historical events are educational. *When access to capital overwhelms intelligence, mistakes are made.* Investors forget to determine the **value** of a financial asset BEFORE considering the price of an asset. When investors purchase assets just because they think the price will increase tomorrow, without determining "true value" first, they are not investing. They are "speculating."

Today, we have come full circle. Unfortunately, we have seemingly learned little since the GFC. The liquidity forced into our U.S. economy since 2020 approaches 50% of U.S. GDP, yet our GDP is growing at less than 7%. Asset prices are at or near record levels in almost all categories. Debt levels with "covenant-lite" loan documents are at record levels. Speculation is at record levels as you will see.

The Difference Between Stupidity and Genius?

Genius Has Its Limits⁷

Speculation is always and everywhere⁸. Yet, it is infrequently a dominating theme. Today is different. There are two kinds of speculation. Intelligent speculation (Higher risks for higher *expected* returns), and unintelligent speculation (higher risks for *lower* expected returns). *Today, we see unintelligent speculation on a daily basis along with record levels of leverage.*

When speculation distorts the market's natural price discovery⁹, investing becomes increasingly dangerous. While no one knows what event will eventually impose realistic asset prices on the investing public, unintelligent speculative behavior could be the match that lights the nearly uncontrollable forest fire of significantly lower asset prices along with a U.S. recession - or worse.

Many investors do not understand the risks they are taking. Active, speculative, "retail" trading has increased to record levels. Most speculative traders don't understand that asset valuations matter. Short-term speculative profits over the last 5 years created a "confidence bubble." This most often leads to tragic results.

Why concern ourselves with speculative activity? Speculative activity increases the probability of a negative event taking place. Today, all 4 of the major asset categories are severely overvalued, with 3 of the 4 categories at or near record levels of historic overvaluation, called "super-bubbles."¹⁰

Speculative activity combined with extremely overvalued assets often delivers negative outcomes.

The 4 major asset categories are:

- 1) Bonds (“super-bubble” status).
- 2) Equities (“super-bubble” status).
- 3) Commodities (“bubble” status).
- 4) Real-estate (“super-bubble” status).

“Super-bubbles” in any single asset category are rare. They have occurred only 4 times during the last 100+ years. Each “super-bubble” preceded an incredibly painful outcome for the investing public.

- The U.S. in 1929 (stock market, leverage, speculation),
- Japan in 1989 (Japanese stock market, global real estate, speculation),
- The U.S. in 2000 (U.S. stock market, leverage, speculation),
- The U.S. in 2007-09 (real estate market, extreme leverage, speculation, fraud).

Every “super-bubble” in history has corrected back to its average valuation level. There are no exceptions.¹²

The reason we are concerned about today's financial markets: history has NEVER dealt with a financial market structure where all 4 major asset categories are in "bubble,¹" or "super-bubble" status. Today investors have 4 times the probability of a significant correction. The potential for one bubble to burst, then causing another bubble to burst is alarming. Reason: one bubble affecting another becomes the most likely effect when speculative activity is at record levels. Unintelligent speculative activity magnifies the odds that something will go wrong. It is quite similar to a huge overly dry forest, with the prospects of high winds, and vast amounts of campers recklessly starting campfires without intelligent safeguards... it's almost natural to have a wildfire of significant proportions.

Today, each asset category's "average" valuation level, implies a downturn of 50%+ will follow at some point before the revaluation is over. Few categories of financial assets will be spared, and history reminds us - *severe downturns almost always overshoot fair value.*

"Don't Fight the Fed"

Investors have benefited from the last 12 years of largess from both our administration in Washington and from the accommodative money-printing by the U.S. Federal Reserve.

Unfortunately, many investors tend to forget that "Don't Fight the Fed" works in reverse also.

Today, the U.S. Federal Reserve is faced with meaningful inflation created by over a decade of money printing and artificially low interest rates. The U.S. Federal Reserve has committed to raising interest rates and reducing its balance sheet until inflation is reduced to tolerable levels of 2-3%.

In short, the U.S. Federal Reserve has pledged to reduce liquidity and slow our economy. What has been a tailwind for investors over the last 12 years, has become a headwind... and that “relative” change is likely to become meaningful.

Interest Rates:

Interest rates are the lifeblood of capitalistic economies. All else equal, higher interest rates lower profits. Lower interest rates increase profits.

The U.S. Federal Reserve began raising short-term interest rates in March 2022. Market expectations based on all available information, are for the U.S. Federal Reserve (Fed) to increase interest rates at each meeting during 2022, until they get to a “neutral”¹³ rate.

In addition to significant rate increases, the Fed minutes show their willingness to reduce their balance sheet simultaneously. Both actions reduce liquidity, which slows our economy, creating significant headwinds for investors as higher interest rates/less liquidity = lower financial asset values.

The relative change of this policy supports the fact that the Fed understands it has been *far too accommodative for far too long*. For almost 2 years, the Fed has been purchasing \$120 billion each month into our economy by purchasing \$80 billion in government and corporate bonds, and \$40 billion in U.S. mortgages from the U.S. Treasury. The Fed stopped its purchases in March 2022.

Who Will Replace the Fed's Purchases From the U.S. Treasury?

We don't know the answer to this question. We do know that the absence of a buyer for approximately 25% of U.S. debt each month¹⁴ will increase the probability of trouble. At the very least, over the near term, U.S. interest rates will increase. Short-term rates are expected to rise from 0% to 3%. Long-term rates (U.S. 10-year note) should be 3-4% if the bond market remains orderly. However, a "relative" change of this magnitude, after over a decade of artificially low rates, is unlikely to go without mishap.

What Does A Mishap Look Like?

Best Case: Interest rates rise much less than the Fed is promising today while overseeing an orderly decline in the Fed balance sheet. This will create the *best* outcome - an "orderly" recession or no recession. 2-3 quarters of slightly negative U.S. GDP, a small yet manageable number of businesses defaulting on an overabundance of debt, and no meaningful job losses would be a winning combination. This is possible, yet a bit optimistic given the expected Fed interest rate increases and planned balance sheet reductions. The *best case* could be powered by a consumer which is flush with cash due to the stimulus programs serially instituted over the last 2 years.

We hope this is our outcome. It would allow for an orderly repricing of our equity markets, our housing market, our commodity markets, and our bond markets.

Base Case (most likely): The Fed will continue to increase rates and reduce its balance sheet until something in the world or our U.S. economy breaks. What will break? The list of known possibilities is too long to list. However, once an economic downturn starts, we believe our Fed will slam on the brakes and stop raising rates as a first step (keep in mind this is dependent upon inflation declining to the manageable 2.5-3.5% level, which we believe the Fed views as tolerable). The unemployment rate will likely determine if/when the U.S. Federal Reserve steps in to rescue the economic downturn created by tighter financial conditions. If the downturn continues to worsen, the Fed will once again come to the rescue with a reduction in rates, acting as an opioid painkiller for the economy, until employment stabilizes. *Note: this is our internal expectation based on hundreds of meetings, articles, and interviews with those we consider to be unbiased economic experts and an equal amount of historical event analysis. The number of uncertainties is as high as I can remember, including the strength of the U.S. dollar vs the weakness in competing currencies, the stickiness of inflation, geopolitical uncertainty, the record amount of corporate and U.S. national debt as well as global debt - and of course “speculative” activity - which remains at record levels.

Worst Case: The U.S. is raising rates and tightening economic conditions into an economy which is already teetering on recession. *The Fed focuses on killing inflation only* and will gladly tolerate a U.S. economic recession in order to whip inflation (Paul Volcker style).

The U.S. Federal Reserve believes, after years of economic tranquility, an economic downturn is the price which must be paid to rid our economy of serious inflation. This triggers a significant economic downturn. Corporate bond defaults ensue, and we have a real, categorical mess on our hands. (Keep in mind it is likely to be easier for the Fed to control inflation than to control a severe recession/depression. We believe the Fed knows this and we believe this is the reason our “worse case” will be avoided.)

Implications for Intelligent Investors: Interest rates have moved from a tailwind to a headwind. The interest rate bias will be FIRMLY to the upside. Investors will be reminded that *changes in the interest rate structure take 12 – 18 months to fully affect our U.S. economy, yet the stock and bond market will adjust more rapidly*. Increased rates have historically caused *downturns* in the U.S. marketplace and could strengthen our dollar against many of the other currencies in the world. An *orderly increase* in the U.S. 10-year notes may allow the U.S. to avoid recession. Conversely, a *rapid increase* in rates or an increase above current expectations is likely to cause a U.S. economic recession, or worse.

Bond Market:

The U.S. Federal Reserve’s stated goal is a) to foster maximum employment and, b) to ensure stable prices. Inflation is the Fed’s primary enemy today. To quell inflation, the Fed will increase interest rates and withdraw liquidity to slow the economy.

Increasing interest rates mean bond prices will decrease. We must be prepared for 1980's-like outcomes, yet hope inflation is largely "supply-side¹⁶" which will create more supply, eventually satisfying demand and controlling inflation. Most investment professionals have not experienced an inflationary environment similar to today's environment. This creates unintended risks.

Best Case: *U.S. government bond prices decrease, (as interest rates rise, current bond prices fall), and future prices will largely depend upon a combination of 1) unemployment and 2) inflation. (Unemployment under 4% is likely to be tolerable, and inflation under 3% likewise.) The Fed will continue to increase rates and decrease its balance sheet until something breaks.* Best case – nothing breaks. Yet if it does, and a downturn begins, the Fed will quickly *stop* raising rates, and *stop* reducing its balance sheet until our economy regains its natural growth trajectory of 2% plus. Bonds increase in price as the Fed decreases rates to stimulate our economy. Inflation recedes to its long-term rate of 2-3% during 2004.

Base case (most likely): The Fed will continue its course of increasing interest rates and balance sheet reduction as planned. It will not be sensitive to an equity market downturn unless the downturn becomes extremely serious, OR, unless unemployment increases above 6% *and* inflation recedes. Over the short-term, bringing inflation under approximately 3% is the Fed's primary focus and other variables will likely take a back seat. The rising interest rate environment will slow our already slowing U.S. economy, sending us into a recession (or worse). The wild card is what happens with the rest of the world. If the rest of the world enters a recession, our chances of something worse increase. If the rest of the world bounces and finds a way to avoid a recession, it may allow the U.S. to embrace an orderly and controlled recession.

Worst Case: The Fed increases rates faster than expected, ignoring the economic data, with a singular focus of breaking the back of inflation. Inflation proves to be stickier than expected. The Fed continues to raise rates despite deteriorating economic conditions. This combination sends our economy into a recession which is more intense than expected. Asset prices enter a downward spiral as each overvalued category deflates based on the new “negative narrative” which creates emotional reactions and eventually, panicked selling.

Implications for Intelligent Investors: Investors must keep in mind - *the stock market takes direction from the bond market, and the bond market takes direction from the U.S. economy. Bonds will likely outperform stocks until the stock market undergoes a significant correction.* Unfortunately, the bond market will outperform *by declining less in value than the stock market.*

As mentioned above, there is a laundry list a mile long of prevailing uncertainties. If a negative global economic event takes place, U.S. bonds will likely *outperform* stocks to a *significant degree over the short-term*, as investors historically have flocked to U.S. bonds for safety, and the U.S. bond market is the largest, safest, liquid market in the world.

Non-U.S. bonds offer higher interest rates than U.S. bonds, and their economies are collectively 6 – 12 months behind the U.S. in dealing with the COVID crisis. The recovery period coming out of the crisis will be less robust, yet similar to the U.S. recovery. The war in Ukraine has created a new measure of uncertainty and has increased the certainty of recession in the EU and UK over the next 12 months. The longer the war persists, and/or the more intense it gets, *the higher the likelihood of a global recession.*

If the war in Ukraine persists, or worsens, non-U.S. bonds will likely *underperform* U.S. bonds until the dust clears and certainty becomes evident.

“Emerging Markets” will continue growing much faster than the U.S. and will continue to do so into the future. Emerging Market bonds pay higher yields than U.S. bonds. Some Emerging Markets will be negatively impacted by the war-induced commodity shortage (and consequent inflation), and some will be advantaged. Investors with a *long-term investment horizon* should remain in a diversified overweight position in Emerging Markets.

Taxable accounts forced into owning U.S. bonds or seeking a “safe-haven,” should consider owning municipal bonds (the credit quality is outstanding) and/or floating rate bonds (floating-rate bond coupons increase as interest rates rise).

U.S. bond investors will eventually experience appreciation if/when (as we believe) the U.S. Federal Reserve is forced to lower rates to rescue our U.S. economy from the recession. Until then, when an investor buys a bond today, the expected return should be the coupon rate – no more.

Stock Market:

The specific pathway forward for the stock market is beyond anyone’s forecasting ability. Expectations for all investors should be for significantly higher volatility and lower future returns than historical averages would imply. This is a toxic combination, offering an inferior return with heightened risk.

Best Case: Equity markets are in a super-bubble (defined as 3 standard deviations above the mean value). The liquidity forced into our economy during 2020 – 2022 allows the equity market to decline to an average multiple of earnings (15-16.5 X 2023 earnings). Corporate earnings fall by less than 10% and corporate bond defaults are largely avoided, as most companies refinanced their debt when rates were at the lows of 2021-2022. Investors expecting asset price increases will be upset until the downturn resets asset prices. Intelligent investors will offset poor/negative asset price performance with dividends and interest payments which tend to remain stable or increase over time and will better protect capital during downturns.

Base Case (most likely): Equity markets respond negatively to the Fed’s interest rate hikes and balance sheet reduction. As the Fed increases rates, equity values decline. If inflation is stickier than currently indicated, rate increases will be more severe. The U.S. economy will slow as interest rates increase and as liquidity is lessened. History shows Fed monetary tightening has resulted in recessions *in over 8 of 10 cases*. A recession is more likely than not. Corporate earnings will decline. The multiple of earnings also declines. The likelihood of a negative event is magnified by record debt, poor demographics, a synchronized global slowdown, overpriced assets of almost every category, and rampant speculative activity. A severe negative event becomes more likely, yet not assured.

While we hope this does not happen, if a recession occurs, growth stocks will be *more* negatively impacted than value stocks. Companies with no earnings will be the most negatively impacted. Dividend producing companies will provide a valuable “quality” factor. They are likely to decrease in value less when the downturn comes and may recover more quickly when the dust clears

Worst Case: The Fed becomes singularly intent on quashing inflation with higher rates/less liquidity. Higher rates prove to be incapable of reducing inflationary forces, yet the Fed continues raising rates. The combination of currently slowing economic growth, with higher interest rates, and lower earnings creates a new, decidedly negative narrative and creates a more significant economic downturn.

Corporate earnings decline more than 10%. This negative outlook feeds on itself, ending with valuations significantly lower than average. (Of course, this will create a tremendous opportunity for intelligent investors, yet is a discussion for a future date). The “Fed Put,” which has come to the capital market’s rescue with increased force at every downturn since 2000, evaporates. This leaves the global market to find its own footing. S&P 500 valuations decline to 6 - 10 X earnings based on the negative future outlook. Global recession in the EU, China, and in most countries creates havoc on a global basis. The probability of geopolitically negative conflagrations increases. In this scenario financial asset prices decline until the market’s reset, and a new - more positive narrative is embraced.

Implications for Intelligent Investors: Historical data clearly demonstrates U.S. equities to be significantly overvalued. The risk/reward offering today for equity investors counting on “price appreciation” is unattractive.

When asset values become overvalued, lower than average returns, or negative returns, follow. Thus, investors counting on price appreciation for their equity market portfolio will most likely receive little return during the remainder of 2022 and should NOT count on reasonable price appreciation until a downturn resets equity valuations to reasonable levels.



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U.S. Equity Allocations: Peak growth is likely to be behind the U.S. in the current cycle. Equity market investors should consider reducing their investment allocations dependent on appreciation, and rotate to value-based, quality, companies paying dividends and increasing dividends¹⁷.

Non-U.S. Equity Allocations: International Developed Markets (DM) are less expensive than U.S. markets, as are Emerging Markets (EM). Consequently, both are likely to be less risky and offer higher long-term returns (yet will also have higher volatility). Both DM and EM are facing the possibility/likelihood of recession due to the Ukraine war. The EU may already be in recession. Both domains are also facing Central Bank policy leaning toward raising rates to slow their respective economies and quell inflation. While the war in Ukraine will impact the pace of economic growth in each respective geography (and the attendant volatility), long-term investors should maintain their allocations to Non-U.S. equities. Diversification across asset classes, geographies, and holding times will be key to increasing safety and ultimately, performance. Value-based companies will outperform growth-based companies. Smaller companies will outperform larger companies yet will have higher volatility. Companies paying dividends and increasing dividends will outperform companies without dividends.

“The Test of First-Rate Intelligence is the Ability to Hold Two Opposed Ideas in the Mind at the Same Time, and Still Retain the Ability to Function¹⁸”

As we publish this letter, the official inflation measurement (CPI) is over 7%. However, most economists will tell you the true inflation rate is much higher, due to several variables’ lagging effects (real inflation is likely to be double digits). With wage increases in the 4-5% range, our U.S. economy has entered a period defined as stagflation¹⁹.

The U.S. Federal Reserve is at a crossroads. It will have to decide whether it wants to crush inflation or send our economy into a recession. Lisa Beilfuss stated recently “Looking ahead, the most consequential question for investors is whether the Fed will allow higher prices for longer in order to protect growth, or combat inflation at the expense of growth.” Our concern is that both outcomes offer negative consequences.

We hope the Fed decides the risks associated with a recession are more serious than living with an inflation rate above their comfort zone for the short-term. Remember the “cure for high prices - is high prices” as higher prices eventually depress consumer demand.

The unintended domino effects of a Fed promising to tighten liquidity at the fastest pace in over 20 years, into an already slowing global economy, combined with an egregiously overvalued bond and stock market, record amounts of leverage and unintelligent speculation - create serious risks. While we hope and pray these risks can be avoided, if not, investors should prepare for a difficult economic period.

History warns intelligent investors that the asset value reset may include significant periods of strong, violent moves upward, which may seem to counter the downturn and signal the downturn's end. For example, during the 1929 – 1935 Great Depression²⁰, there were more than 8 strong bull-market like upturns only to revert to the vicious bear-market it truly was.

Intelligent investors should *consider waiting until the U.S. Federal Reserve begins to increase liquidity again* by either lowering interest rates or adding liquidity to the economy directly as in 2020.

When asset prices are significantly lower, “price” and “value” will again become reasonable bedfellows.

At that point, investors will be able to return to our opening quote, “**Price is what you pay, Value is what you get**”.



Endnotes -

- 1) Over \$5 TRILLION of direct stimulus to the citizenry, combined with the U.S. Federal Reserve (Fed) infusing over \$4 TRILLION into our economy may have created a false sense of prosperity. This, along with a narrative of “Don’t Fight The Fed” encouraged the investing public to lose sight of “value”, instead opting for speculative activity.
- 2) Tightening financial conditions = withdrawing money from the economy and raising interest rates, both increase the cost of capital which is the most important lubricant to the U.S. economic system. In short, this will slow or restrain our economy.
- 3) Shrinking the U.S. Federal Reserve’s balance sheet - rumored reduction is \$95 billion per month, or over \$1 Trillion/yr. This will likely stop the housing market boom, while pushing our U.S. economy into a recession.
- 4) Higher leverage in an economic system, all else equal, creates fragility. Fragility increases the probability of triggering unintended consequences in a domino-like effect. At some point, the Fed could lose control of the global interest rate environment along with the U.S. dollar’s global dominance. *while this seems like a dire outcome, leverage combined with geopolitical uncertainties make this a possibility. Hopefully, an avoidable one.
- 5) Warren Buffett 2008 Shareholder Letter (<https://www.berkshirehathaway.com/letters/2008ltr.pdf>)
- 6) GFC = Great Financial Crisis.
- 7) Attributed to Albert Einstein – yet true or not, it’s a potentially informative quote. <https://checkyourfact.com/2019/11/07/fact-check-albert-einstein-difference-stupidity-genius-limits/>
- 8) The speculative activity in bonds today is at record levels as corporate debt and governmental debt is at heights never seen before. The speculative activity in the stock market is blaring at every investor when “meme” stocks increase in value by hundreds of percentage points based on a series of tweets with no fundamental rationale for any increase in valuation. The levels of buying on “margin” are also at levels never seen previously and will likely presage “forced-selling” when current prices begin to revert to the mean. The speculative housing activity clearly demonstrates the percentages of homes purchased by investors (for investment purposes only) is nearly 25% of all home purchases today. So nearly 1 out every 4 home purchases today is likely to become a seller when the narrative changes or when mortgage rates increase to 6% plus.
- 9) Price discovery – the process in which many intelligent agents vote with their dollars in open market transactions, creating a “Wisdom of the Crowds” type exchange. This process often creates pricing closely related to the true current value of a financial security or market.

- 10) “Super-bubbles” are much less frequent and occur in 1 out of every 100 data samples. (in our example each data sample is equal to approximately 1 year).
- 11) Bubbles” are defined as a measure of overvaluation and indicate 2 or more standard deviations above the average price, occurring in one out of every 44 data samples. (In our discussion a data sample is 1 year.)
- 12) GMO – January 2022 “Let the Rumpus Begin”.
- 13) Neutral Interest Rate – the rate of interest charged for government debt that is neither accommodative nor restrictive – this rate is subjective and as such, may change as the supporting data change.
- 14) The U.S. Treasury must sell U.S. bonds constantly to satisfy our U.S. budget deficit (of course the U.S. spends much more than it earns each year). The Federal Reserve is often the buyer of a significant percentage of U.S. treasury debt. Now that the U.S. Federal Reserve has stopped buying 25%+ of the U.S. Treasury’s debt creation, new buyers must be found to finance our budget deficit
- 15) In our view, an unemployment rate of 6% or more is bad, an unemployment rate of under 5% may be tolerable depending upon the inflation rate.
- 16) Supply-side response – inflation increases prices. This incents producers to create more supply, which eventually meets demand and vanquishes inflation.
- 17) Similarly overvalued periods confronted investors in 2000, and before that in 1969. During the 10 years following 2000, the overall market return was -5% in total (and included 2 of the most vicious bear-markets on record), yet investors focused on dividends and income generated a positive return of +15%. During the 10 years defining the 1969 downturn, stocks ended the decade with a -7.5% return. Yet investors embracing a dividend and income framework saw portfolios increase over +35% as dividends added over 40% during the downturn.
- 18) F. Scott Fitzgerald
- 19) An economic condition where inflation is higher than economic output and increasing, while economic output is stagnant or decreasing. Stagflation precedes recessionary periods more often than not.
- 20) During the Great Depression there were more than 8 periods of violent 10% moves upward in market prices on the stock market’s march to a loss of almost 80% before trough valuations offered investors clear sailing.

Quarterly Market Review

First Quarter 2022

This report features world capital market performance and a timeline of events for the past quarter. It begins with a global overview, then features the returns of stock and bond asset classes in the US and international markets.

The report also illustrates the impact of globally diversified portfolios and features a quarterly topic.

Overview:

2022 Market Outlook

Market Summary

World Stock Market Performance

US Stocks

International Developed Stocks

Emerging Markets Stocks

Country Returns

Real Estate Investment Trusts (REITs)

Commodities

Fixed Income

Global Fixed Income

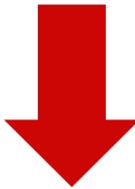
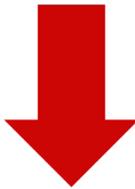
Impact of Diversification

Quarterly Topic: Is It Time to Sell Stocks?

Appendix

Quarterly Market Summary

Index Returns

	US Stock Market	International Developed Stocks	Emerging Markets Stocks	Global Real Estate		US Bond Market	Global Bond Market ex US
Q1 2022	STOCKS					BONDS	
	-5.28%	-4.81%	-6.97%	-3.81%		-5.93%	-4.05%
							
Since Jan. 2001							
Average Quarterly Return	2.4%	1.6%	2.8%	2.6%		1.0%	1.0%
Best Quarter	22.0% 2020 Q2	25.9% 2009 Q2	34.7% 2009 Q2	32.3% 2009 Q3		4.6% 2001 Q3	4.6% 2008 Q4
Worst Quarter	-22.8% 2008 Q4	-23.3% 2020 Q1	-27.6% 2008 Q4	-36.1% 2008 Q4		-5.9% 2022 Q1	-4.1% 2022 Q1

Past performance is not a guarantee of future results. Indices are not available for direct investment. Index performance does not reflect the expenses associated with the management of an actual portfolio. Market segment (index representation) as follows: US Stock Market (Russell 3000 Index), International Developed Stocks (MSCI World ex USA Index [net dividends]), Emerging Markets (MSCI Emerging Markets Index [net dividends]), Global Real Estate (S&P Global REIT Index [net dividends]), US Bond Market (Bloomberg US Aggregate Bond Index), and Global Bond Market ex US (Bloomberg Global Aggregate ex-USD Bond Index [hedged to USD]). S&P data © 2022 S&P Dow Jones Indices LLC, a division of S&P Global. All rights reserved. Frank Russell Company is the source and owner of the trademarks, service marks, and copyrights related to the Russell Indexes. MSCI data © MSCI 2022, all rights reserved. Bloomberg data provided by Bloomberg.

Long-Term Market Summary

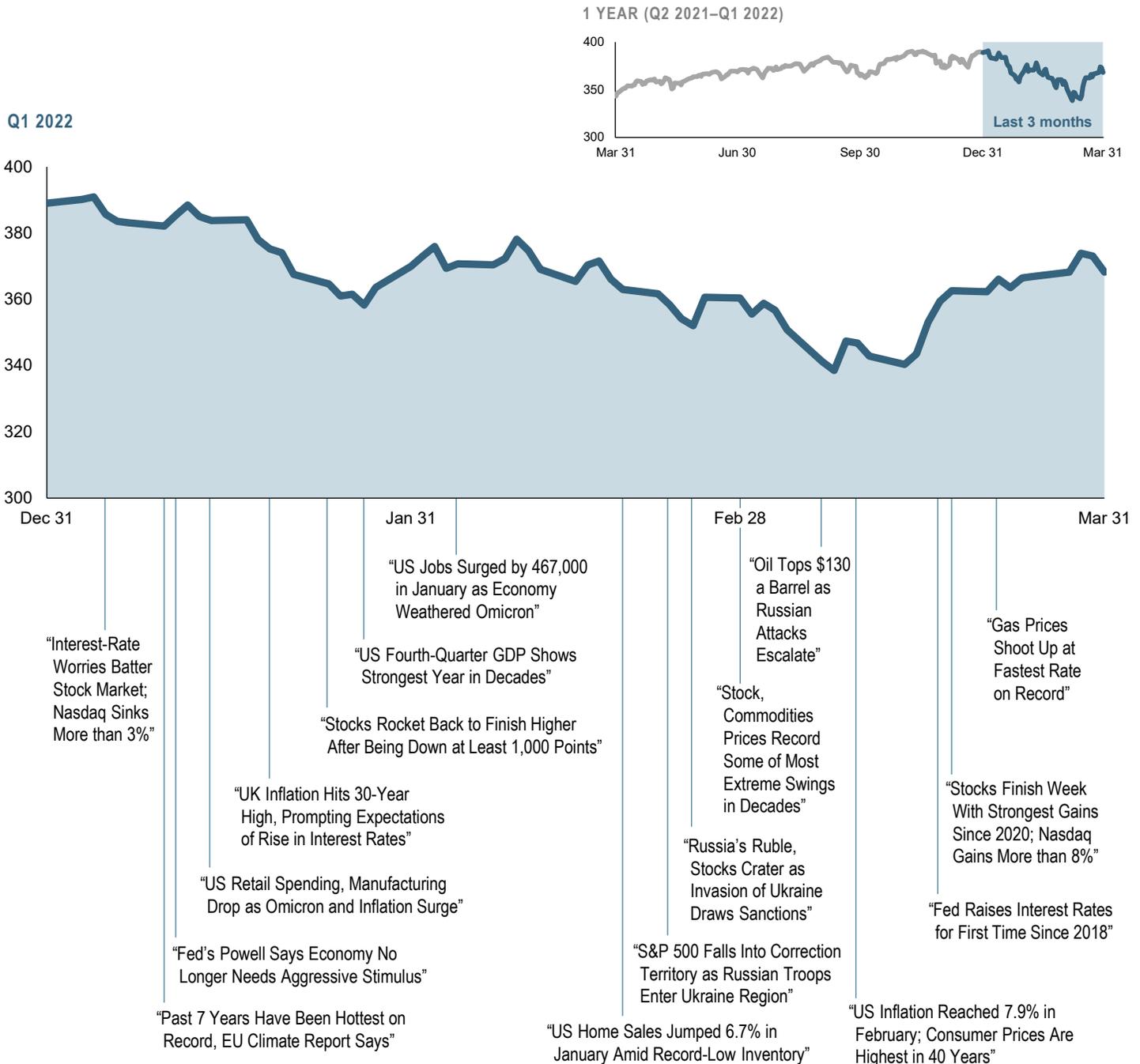
Index Returns as of March 31, 2022

	US Stock Market	International Developed Stocks	Emerging Markets Stocks	Global Real Estate		US Bond Market	Global Bond Market ex US
1 Year	STOCKS					BONDS	
	11.92%	3.04%	-11.37%	18.97%		-4.15%	-3.56%
							
5 Years							
	15.40%	7.14%	5.98%	7.10%		2.14%	2.25%
							
10 Years							
	14.28%	6.25%	3.36%	7.48%		2.24%	3.20%
							

Past performance is not a guarantee of future results. Indices are not available for direct investment. Index performance does not reflect the expenses associated with the management of an actual portfolio. Market segment (index representation) as follows: US Stock Market (Russell 3000 Index), International Developed Stocks (MSCI World ex USA Index [net dividends]), Emerging Markets (MSCI Emerging Markets Index [net dividends]), Global Real Estate (S&P Global REIT Index [net dividends]), US Bond Market (Bloomberg US Aggregate Bond Index), and Global Bond Market ex US (Bloomberg Global Aggregate ex-USD Bond Index [hedged to USD]). S&P data © 2022 S&P Dow Jones Indices LLC, a division of S&P Global. All rights reserved. Frank Russell Company is the source and owner of the trademarks, service marks, and copyrights related to the Russell Indexes. MSCI data © MSCI 2022, all rights reserved. Bloomberg data provided by Bloomberg.

World Stock Market Performance

MSCI All Country World Index with selected headlines from Q1 2022



These headlines are not offered to explain market returns. Instead, they serve as a reminder that investors should view daily events from a long-term perspective and avoid making investment decisions based solely on the news.

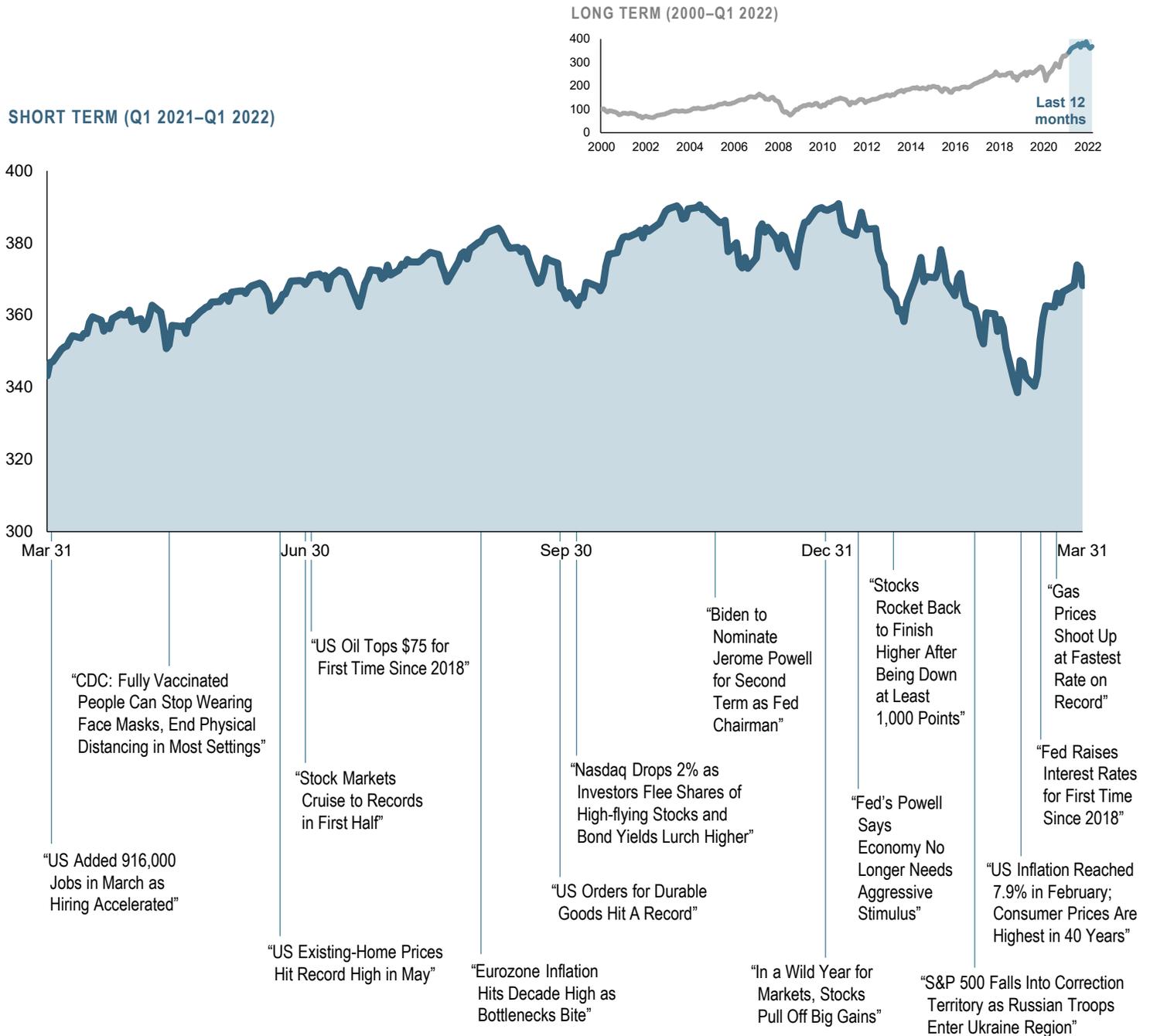
Graph Source: MSCI ACWI Index (net div.). MSCI data © MSCI 2022, all rights reserved.

It is not possible to invest directly in an index. Performance does not reflect the expenses associated with management of an actual portfolio.

Past performance is not a guarantee of future results.

World Stock Market Performance

MSCI All Country World Index with selected headlines from past 12 months



These headlines are not offered to explain market returns. Instead, they serve as a reminder that investors should view daily events from a long-term perspective and avoid making investment decisions based solely on the news.

Graph Source: MSCI ACWI Index (net div.). MSCI data © MSCI 2022, all rights reserved.
It is not possible to invest directly in an index. Performance does not reflect the expenses associated with management of an actual portfolio.
Past performance is not a guarantee of future results.

US Stocks

First quarter 2022 index returns

The US equity market posted negative returns for the quarter and underperformed non-US developed markets, but outperformed emerging markets.

Value outperformed growth.

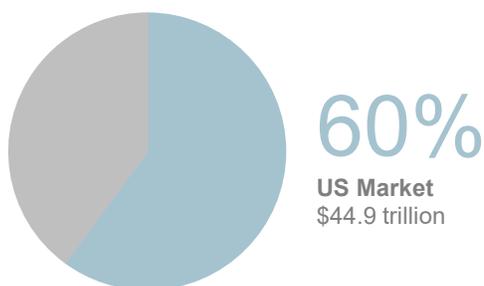
Small caps underperformed large caps.

REIT indices outperformed equity market indices.

Ranked Returns (%)



World Market Capitalization—US



Period Returns (%)

Asset Class	QTR	1 Year	3 Years*	* Annualized	
				5 Years*	10 Years*
Large Value	-0.74	11.67	13.02	10.29	11.70
Small Value	-2.40	3.32	12.73	8.57	10.54
Large Cap	-5.13	13.27	18.71	15.82	14.53
Marketwide	-5.28	11.92	18.24	15.40	14.28
Small Cap	-7.53	-5.79	11.74	9.74	11.04
Large Growth	-9.04	14.98	23.60	20.88	17.04
Small Growth	-12.63	-14.33	9.88	10.33	11.21

Past performance is not a guarantee of future results. Indices are not available for direct investment. Index performance does not reflect the expenses associated with the management of an actual portfolio. Market segment (index representation) as follows: Marketwide (Russell 3000 Index), Large Cap (Russell 1000 Index), Large Value (Russell 1000 Value Index), Large Growth (Russell 1000 Growth Index), Small Cap (Russell 2000 Index), Small Value (Russell 2000 Value Index), and Small Growth (Russell 2000 Growth Index). World Market Cap represented by Russell 3000 Index, MSCI World ex USA IMI Index, and MSCI Emerging Markets IMI Index. Russell 3000 Index is used as the proxy for the US market. Dow Jones US Select REIT Index used as proxy for the US REIT market. Frank Russell Company is the source and owner of the trademarks, service marks, and copyrights related to the Russell Indexes. MSCI data © MSCI 2022, all rights reserved.

International Developed Stocks

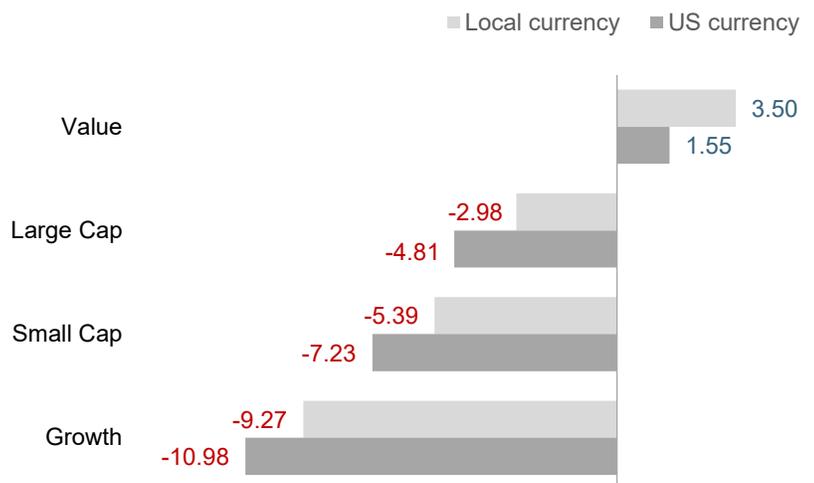
First quarter 2022 index returns

Developed markets outside of the US posted negative returns for the quarter and outperformed both US equities and emerging markets.

Value outperformed growth.

Small caps underperformed large caps.

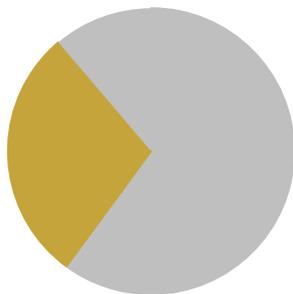
Ranked Returns (%)



World Market Capitalization— International Developed

29%

International
Developed Market
\$21.5 trillion



Period Returns (%)

Asset Class	QTR	1 Year	3 Years*	* Annualized	
				5 Years*	10 Years*
Value	1.55	6.18	6.29	4.86	5.02
Large Cap	-4.81	3.04	8.55	7.14	6.25
Small Cap	-7.23	-1.69	9.55	7.79	7.78
Growth	-10.98	-0.32	10.20	9.07	7.26

Past performance is not a guarantee of future results. Indices are not available for direct investment. Index performance does not reflect the expenses associated with the management of an actual portfolio. Market segment (index representation) as follows: Large Cap (MSCI World ex USA Index), Small Cap (MSCI World ex USA Small Cap Index), Value (MSCI World ex USA Value Index), and Growth (MSCI World ex USA Growth Index). All index returns are net of withholding tax on dividends. World Market Cap represented by Russell 3000 Index, MSCI World ex USA IMI Index, and MSCI Emerging Markets IMI Index. MSCI World ex USA IMI Index is used as the proxy for the International Developed market. MSCI data © MSCI 2022, all rights reserved. Frank Russell Company is the source and owner of the trademarks, service marks, and copyrights related to the Russell Indexes.

Emerging Markets Stocks

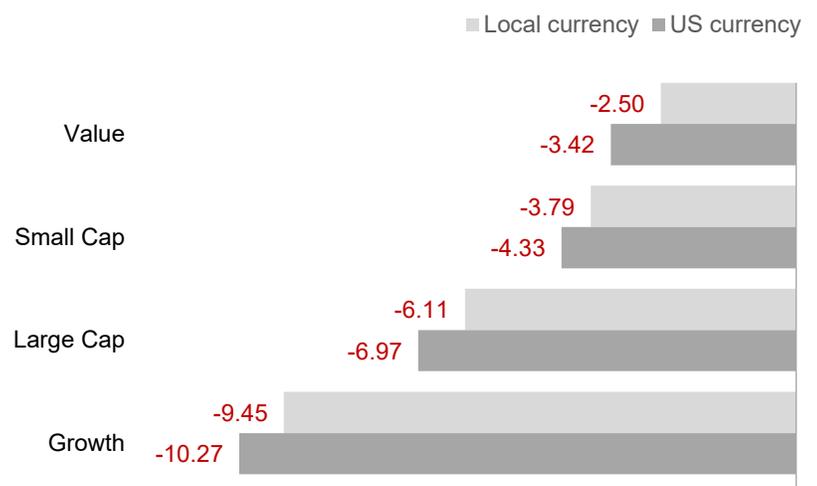
First quarter 2022 index returns

Emerging markets posted negative returns for the quarter, underperforming the US and non-US developed equity markets.

Value outperformed growth.

Small caps outperformed large caps.

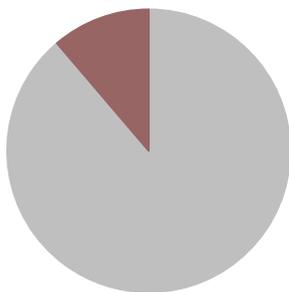
Ranked Returns (%)



World Market Capitalization— Emerging Markets

11%

Emerging
Markets
\$8.4 trillion



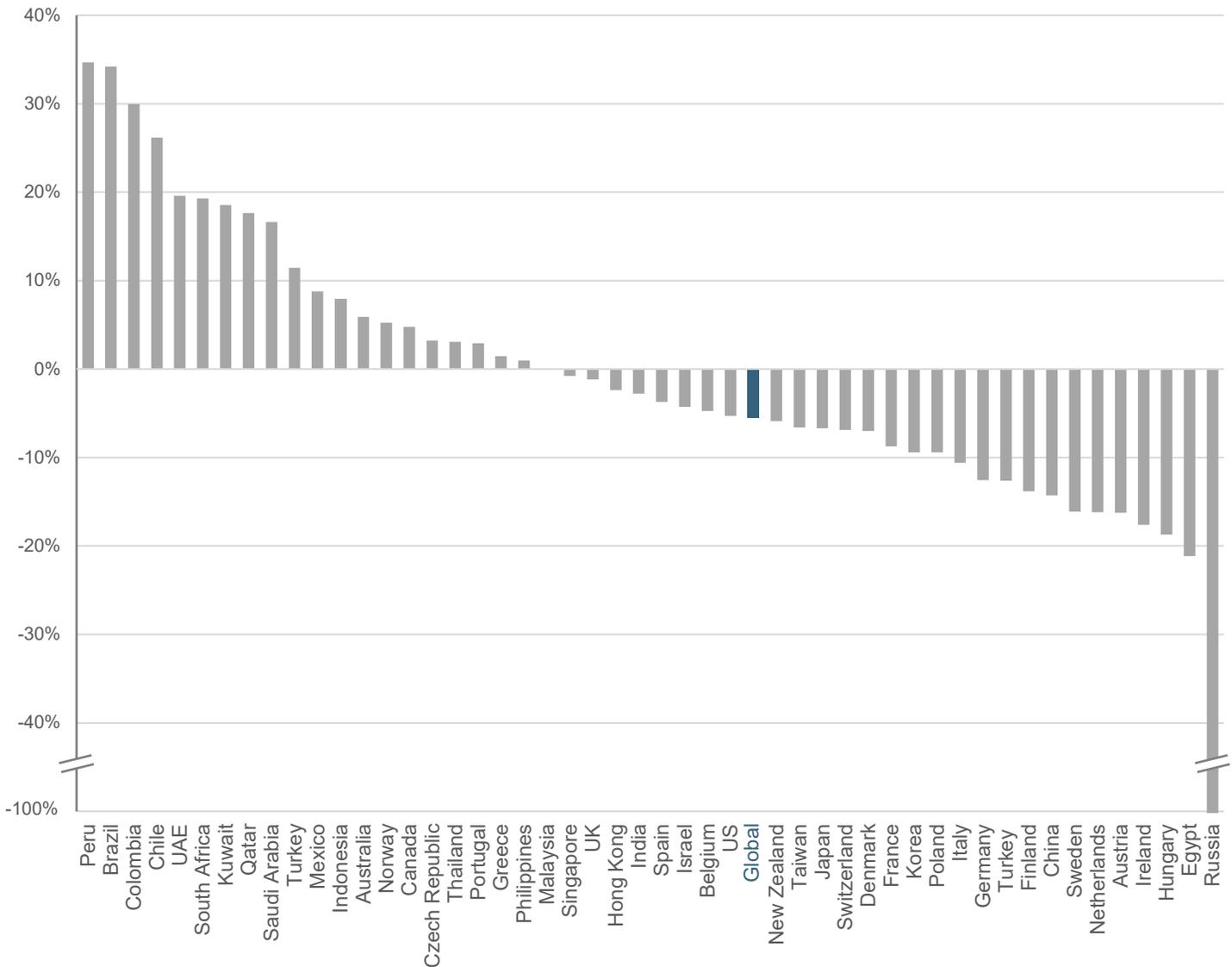
Period Returns (%)

Asset Class	QTR	1 Year	3 Years*	* Annualized	
				5 Years*	10 Years*
Value	-3.42	-3.53	3.22	4.24	1.58
Small Cap	-4.33	5.52	11.93	7.81	5.31
Large Cap	-6.97	-11.37	4.94	5.98	3.36
Growth	-10.27	-18.29	6.42	7.51	5.00

Past performance is not a guarantee of future results. Indices are not available for direct investment. Index performance does not reflect the expenses associated with the management of an actual portfolio. Market segment (index representation) as follows: Large Cap (MSCI Emerging Markets Index), Small Cap (MSCI Emerging Markets Small Cap Index), Value (MSCI Emerging Markets Value Index), and Growth (MSCI Emerging Markets Growth Index). All index returns are net of withholding tax on dividends. World Market Cap represented by Russell 3000 Index, MSCI World ex USA IMI Index, and MSCI Emerging Markets IMI Index. MSCI Emerging Markets IMI Index used as the proxy for the emerging market portion of the market. MSCI data © MSCI 2022, all rights reserved. Frank Russell Company is the source and owner of the trademarks, service marks, and copyrights related to the Russell Indexes.

Country Returns

First quarter 2022 index returns



Past performance is no guarantee of future results.

Country returns are the country component indices of the MSCI All Country World IMI Index for all countries except the United States, where the Russell 3000 Index is used instead. Global is the return of the MSCI All Country World IMI Index. MSCI index returns are net dividend. Indices are not available for direct investment. Their performance does not reflect the expenses associated with the management of an actual portfolio. Frank Russell Company is the source and owner of the trademarks, service marks and copyrights related to the Russell Indexes. MSCI data © MSCI 2022, all rights reserved.

Real Estate Investment Trusts (REITs)

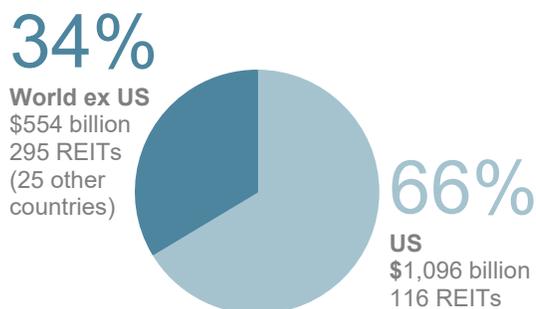
First quarter 2022 index returns

US real estate investment trusts underperformed non-US REITs during the quarter.

Ranked Returns (%)



Total Value of REIT Stocks



Period Returns (%)

Asset Class	QTR	1 Year	3 Years*	* Annualized	
				5 Years*	10 Years*
Global ex US REITs	-2.95	7.00	2.85	4.66	5.72
US REITs	-3.71	27.72	9.90	8.89	9.17

Past performance is not a guarantee of future results. Indices are not available for direct investment. Index performance does not reflect the expenses associated with the management of an actual portfolio. Number of REIT stocks and total value based on the two indices. All index returns are net of withholding tax on dividends. Total value of REIT stocks represented by Dow Jones US Select REIT Index and the S&P Global ex US REIT Index. Dow Jones US Select REIT Index used as proxy for the US market, and S&P Global ex US REIT Index used as proxy for the World ex US market. Dow Jones and S&P data © 2022 S&P Dow Jones Indices LLC, a division of S&P Global. All rights reserved.

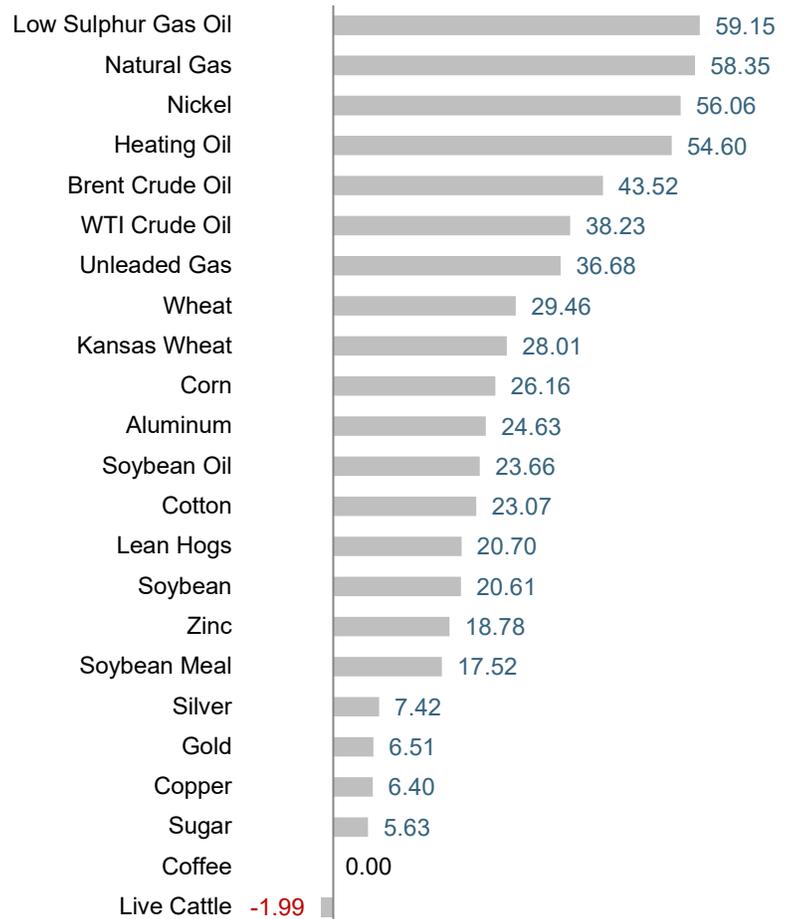
Commodities

First quarter 2022 index returns

The Bloomberg Commodity Index Total Return returned +25.55% for the first quarter of 2022.

Low Sulphur Gas Oil and Natural Gas were the best performers, returning +59.15% and +58.35% during the quarter, respectively. Live Cattle and Coffee were the worst performers, returning -1.99% and 0.00% during the quarter, respectively.

Ranked Returns (%)



Period Returns (%)

* Annualized

Asset Class	QTR	1 Year	3 Years*	5 Years*	10 Years*
Commodities	25.55	49.25	16.12	9.00	-0.70

Fixed Income

First quarter 2022 index returns

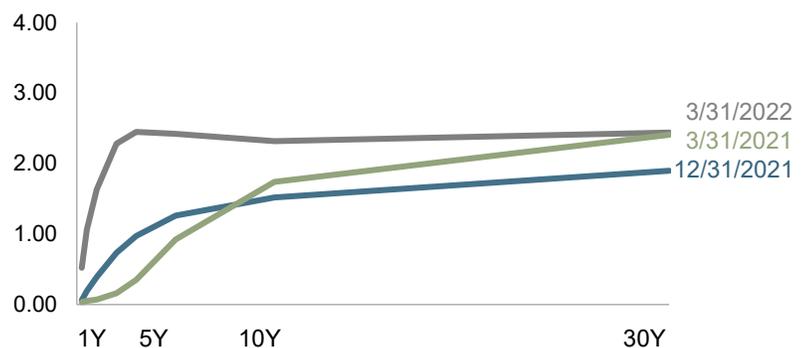
Interest rates increased across all maturities in the US Treasury market for the quarter.

The yield on the 5-Year US Treasury Note increased 116 basis points (bps) to 2.42%. The yield on the 10-Year US Treasury Note increased 80 bps to 2.32%. The yield on the 30-Year US Treasury Bond increased 54 bps to 2.44%. On the short end of the yield curve, the 1-Month US Treasury Bill yield increased 11 bps to 0.17%, while the 1-Year US Treasury Bill yield increased 124 bps to 1.63%. The yield on the 2-Year US Treasury Note increased 155 bps to 2.28%.

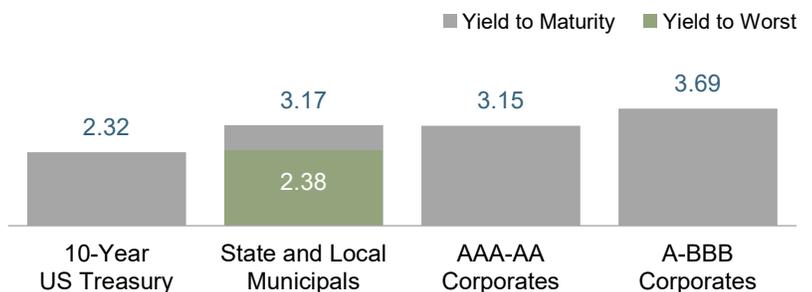
In terms of total returns, short-term corporate bonds returned -3.73% and intermediate-term corporate bonds returned -5.25%.¹

The total return for short-term municipal bonds was -3.33% and -5.77% for intermediate-term municipal bonds. Within the municipal fixed income market, general obligation bonds outperformed revenue bonds, returning -6.07% versus -6.54%, respectively.²

US Treasury Yield Curve (%)



Bond Yields Across Issuers (%)



Period Returns (%)

Asset Class	*Annualized				
	QTR	1 Year	3 Years*	5 Years*	10 Years*
ICE BofA US 3-Month Treasury Bill Index	0.04	0.06	0.81	1.13	0.63
ICE BofA 1-Year US Treasury Note Index	-0.80	-0.94	1.01	1.22	0.78
FTSE World Government Bond Index 1-5 Years (hedged to USD)	-2.38	-2.81	0.86	1.34	1.36
Bloomberg U.S. TIPS Index	-3.02	4.29	6.22	4.43	2.69
FTSE World Government Bond Index 1-5 Years	-3.56	-5.58	0.05	0.74	-0.64
Bloomberg U.S. High Yield Corporate Bond Index	-4.84	-0.66	4.58	4.69	5.75
Bloomberg U.S. Aggregate Bond Index	-5.93	-4.15	1.69	2.14	2.24
Bloomberg Municipal Bond Index	-6.23	-4.47	1.53	2.52	2.88
Bloomberg U.S. Government Bond Index Long	-10.57	-1.46	3.23	3.88	3.96

1. Bloomberg US Corporate Bond Index.

2. Bloomberg Municipal Bond Index.

One basis point (bps) equals 0.01%. Past performance is not a guarantee of future results. Indices are not available for direct investment. Index performance does not reflect the expenses associated with the management of an actual portfolio. Yield curve data from Federal Reserve. State and local bonds, and the Yield to Worst are from the S&P National AMT-Free Municipal Bond Index. AAA-AA Corporates represent the ICE BofA US Corporates, AA-AAA rated. A-BBB Corporates represent the ICE BofA Corporates, BBB-A rated. Bloomberg data provided by Bloomberg. US long-term bonds, bills, inflation, and fixed income factor data © Stocks, Bonds, Bills, and Inflation (SBBI) Yearbook™, Ibbotson Associates, Chicago (annually updated work by Roger G. Ibbotson and Rex A. Sinquefeld). FTSE fixed income indices © 2022 FTSE Fixed Income LLC, all rights reserved. ICE BofA index data © 2022 ICE Data Indices, LLC. S&P data © 2022 S&P Dow Jones Indices LLC, a division of S&P Global. All rights reserved.

Global Fixed Income

First quarter 2022 yield curves

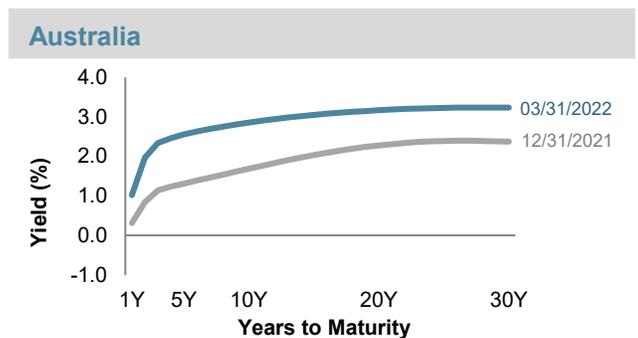
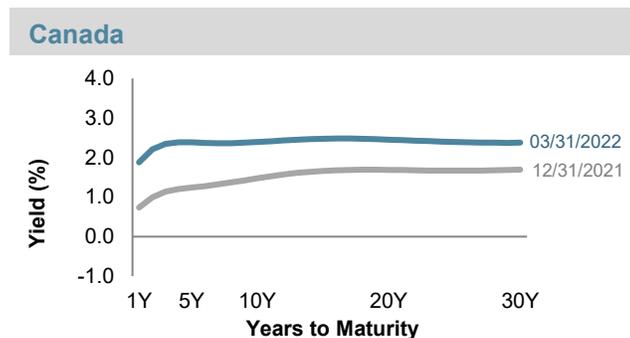
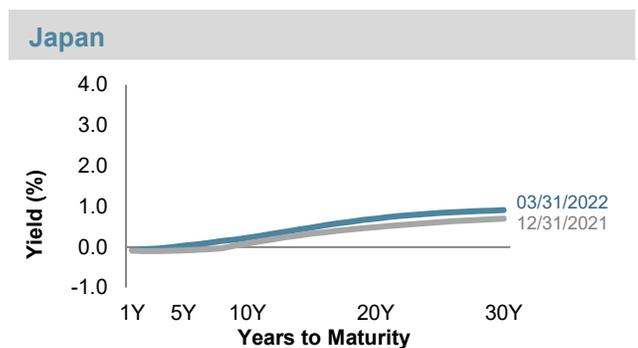
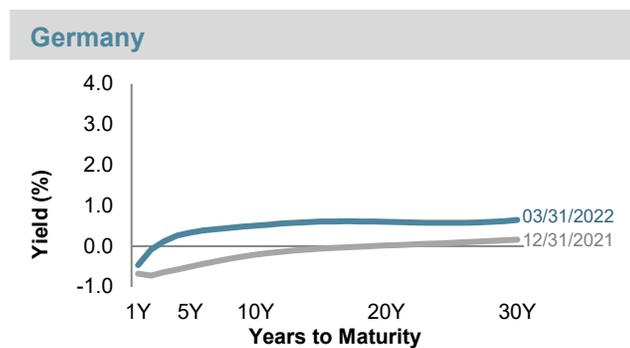
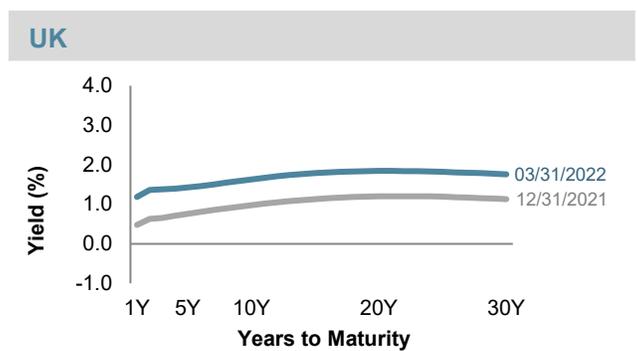
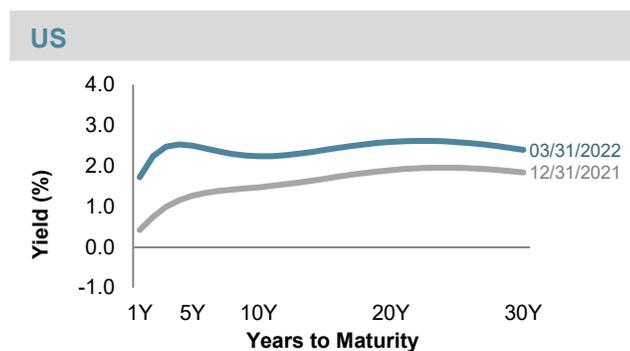
Interest rates increased across all maturities within the global developed markets for the quarter.

Realized term premiums were negative in the global developed markets.

In Japan and Germany, intermediate-term nominal interest rates became positive during the quarter. However, short-term nominal interest rates remained negative in these markets.

Changes in Yields (bps) since 12/31/2021

	1Y	5Y	10Y	20Y	30Y
US	130.0	123.0	76.4	69.5	55.5
UK	70.7	66.5	65.5	64.2	63.2
Germany	21.3	84.4	71.4	58.3	48.4
Japan	1.6	11.5	14.1	21.3	21.2
Canada	115.0	114.3	91.8	76.7	68.0
Australia	70.3	124.1	116.9	89.0	86.7



Impact of Diversification

As of December 31, 2021

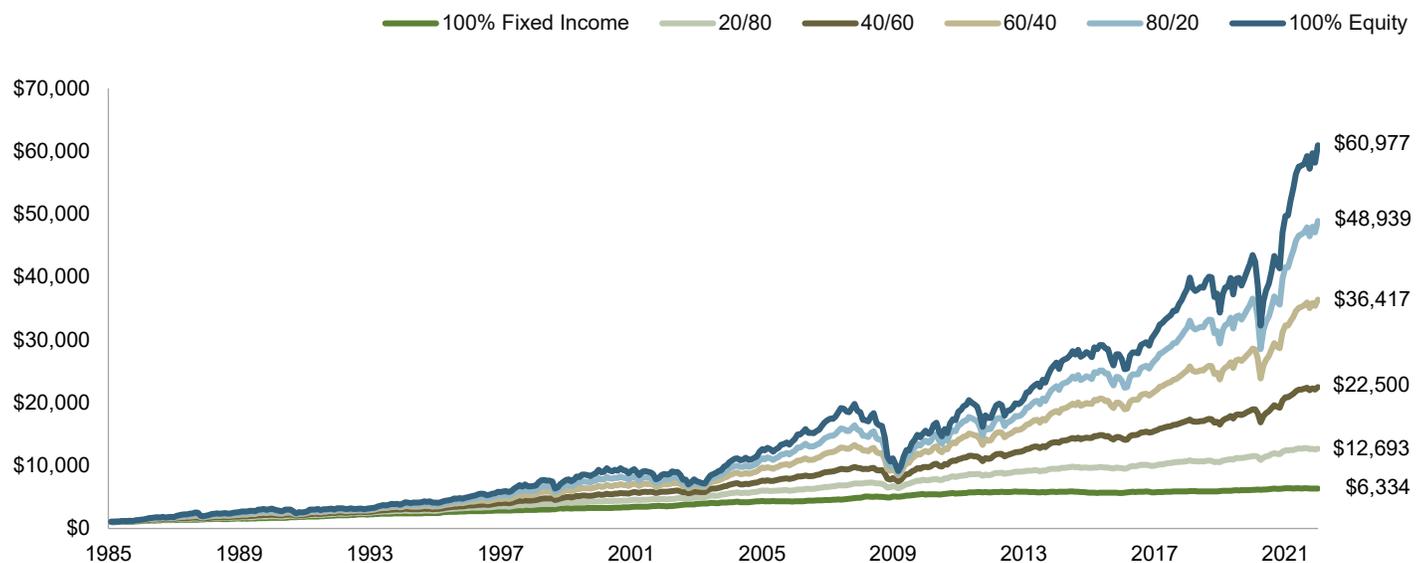
These portfolios illustrate the performance of different global stock/bond mixes and highlight the benefits of diversification. Mixes with larger allocations to stocks are considered riskier but have higher expected returns over time.

Period Returns (%)

* Annualized

Dimensional Core Plus Wealth Index Model	3 Months	1 Year	3 Years*	5 Years*	10 Years*	10-Year STDEV ¹
100% Equity	6.61	22.63	21.12	14.57	13.24	14.11
80/20	5.30	17.70	18.49	12.90	11.94	11.76
60/40	3.86	12.63	15.37	10.82	9.99	9.07
40/60	2.22	7.79	10.82	7.75	7.28	6.13
20/80	0.55	2.10	6.40	4.89	4.05	3.71
100% Fixed Income	-0.51	-0.93	2.20	1.98	0.97	1.73

Growth of Wealth: The Relationship Between Risk and Return



1. STDEV (standard deviation) is a measure of the variation or dispersion of a set of data points. Standard deviations are often used to quantify the historical return volatility of a security or portfolio.

Diversification does not eliminate the risk of market loss. For illustrative purposes only. Past performance is no guarantee of future results. The performance reflects the growth of a hypothetical \$10,000. Assumes all models have been rebalanced monthly. See appendix for allocation information. All performance results are based on performance of indexes with model/back-tested asset allocations; the performance was achieved with the benefit of hindsight; it does not represent actual investment strategies. The index models are unmanaged and the model's performance does not reflect advisory fees or other expenses associated with the management of an actual portfolio. In particular, Model performance may not reflect the impact that economic and market factors may have had on the advisor's decision making if the advisor were actually managing client money. The models are not recommendations for an actual allocation. Indices are not available for direct investment. Backtested performance results assume the reinvestment of dividends and capital gains. Sources: Dimensional Fund Advisors LP for Dimensional Indices. Copyright 2022 S&P Dow Jones Indices LLC, a division of S&P Global. All rights reserved.

Is It Time to Sell Stocks?

First Quarter 2022

Weston Wellington
Vice President

After touching record highs in early January, US stocks¹ have slumped, and investors have been confronted with worrisome headlines² in the financial press:

“Inflation Hits Fastest Clip Since ’82”

—Gwynn Guilford, *Wall Street Journal*, January 13, 2022

“Economists Cut Back Growth Forecasts as Threats Pile Up”

—Harriett Torry and Anthony DeBarros, *Wall Street Journal*, January 18, 2022

“Giant Stock Swings Send Some Into Bear Territory”

—Gunjan Banerji and Peter Santilli, *Wall Street Journal*, January 18, 2022

“Markets Drop as Turbulent Trading Persists”

—Gunjan Banerji and Will Horner, *Wall Street Journal*, January 26, 2022

“Fed Set to Start Increasing Rates by Mid-March”

—Nick Timiraos, *Wall Street Journal*, January 27, 2022

Some stocks that attracted intense interest last year have fallen sharply from their previous highs, as **Exhibit 1** shows.³ Is rising inflation a negative for equity investors? Do large losses in a handful of popular stocks signal a downturn ahead for the broad market?

Invariably, the question behind the question is, “Should I be doing something different in my portfolio?” This is just another version of the market timing question dressed in different clothes. Should I sell stocks and wait for a more favorable outlook to buy them back? More precisely, can we find clear trading rules that will tell us when to buy or hold stocks, when to sell, when to admit our mistakes, and so on?

1. As of January 31, the S&P 500 was down 5.17% for the year.

2. Headlines are sourced from publicly available news outlets and are provided for context, not to explain the market’s behavior.

3. While these stocks were selected based on newsworthiness and the high level of attention they received in the media in 2021, their returns may not be reflective of all high-profile stocks over the period.

EXHIBIT 1

Stock Slump

Name	Ticker	Return through 12/31	Return through 1/31
Robinhood Markets Inc. Class A	HOOD	-79.1%	-83.4%
AMC Entertainment Holdings Inc. Class A	AMC	-62.5%	-77.9%
GameStop Corp. Class A	GME	-69.3%	-77.4%
Tesla Inc.	TSLA	-15.0%	-24.7%

Past performance is no guarantee of future results. Performance may increase or decrease as a result of currency fluctuations.

Source: Bloomberg.

Named securities may be held in accounts managed by Dimensional. This information should not be considered a recommendation to buy or sell a particular security.

The lure of successful trading strategies is seductive. If only we could find them, our portfolios would do so much better.

Consider Felicity Foresight. She is gifted with the ability to identify patterns in the champagne bubbles floating to the top of her glass on New Year’s Eve, enabling her to predict the best performer between S&P 500 stocks and US Treasury bills over the subsequent 12 months. How would her hypothetical portfolio have performed over the past 50 years following this simple annual readjustment strategy?

Is It Time to Sell Stocks?

Rather well. Following a Perfect Timing strategy by investing in the best performer each year, she turned \$1,000 into \$1.8 million, nearly 10 times the wealth produced using a buy-and-hold strategy for the S&P 500 Index (see **Exhibit 2**).

But also consider Hapless Harry. He was never a fan of New Year's and manages to get it wrong each and every year. His

EXHIBIT 2

Past Perfect?

Growth of \$1,000, January 1972–December 2021	
Perfect Timing Strategy	\$1,811,565
S&P 500 Index	\$197,063
One-Month US Treasury Bills	\$8,727
Perfectly Awful Timing Strategy	\$949

Past performance is no guarantee of future results. Performance may increase or decrease as a result of currency fluctuations.

Source: One-Month US Treasury Bills is the IA SBBI US 30 Day TBill TR USD. S&P data © 2022 S&P Dow Jones Indices LLC, a division of S&P Global. All rights reserved. Treasury bills data provided by Ibbotson Associates via Morningstar Direct.

In USD. Data presented in the Growth of \$1,000 exhibit is for illustrative purposes only and is not indicative of any investment. The examples assume that the hypothetical portfolio fully divested its holdings of stocks (or bonds) at the end of the last trading day of any year when a switch was indicated, held the other asset for the subsequent year, and performed the exercise again at year's end. The examples are hypothetical and assume reinvestment of income and no transaction costs or taxes. There is no guarantee strategies will be successful. Indices are not available for direct investment. Their performance does not reflect the expenses associated with the management of an actual portfolio.

Perfectly Awful strategy winds up losing money over the same 50-year period.

Motivated by the substantial payoff associated with successful timing, researchers over the years have examined a wide range of strategies based on analysis of earnings, dividends, interest rates, economic growth, investor sentiment, stock price patterns, and so on.

One colorful example, known as the Hindenburg Omen, had a brief moment of fame in 2010. Developed by a blind mathematician and former physics teacher, this stock market indicator took its name from the German airship disaster of 1937. The Omen signaled a decline only when multiple measures of 52-week high/low prices and moving averages all turned negative. This indicator had correctly foreshadowed major downturns in 1987 and 2008. When it flashed a “sell” signal on Thursday, August 12, 2010, internet chat rooms and Wall Street trading desks were buzzing the next day, Friday the 13th, with talk of a looming crash, according to the *Wall Street Journal*.⁴ But no crash occurred, and the S&P 500 had its highest September return since 1939.⁵

The money management industry is highly competitive, with more stock mutual funds and ETFs available in the US than listed stocks.⁶ If someone could develop a profitable timing strategy, we would expect to see some funds employing it with successful results. But a recent Morningstar report suggests investors should be wary of those claiming to do so. The report examined the results of two types of funds⁷, each holding a mix of stocks and bonds:

- **Balanced:** Minimal change in allocation to stocks
- **Tactical Asset Allocation:** Periodic shifts in allocation to stocks

4. Steven Russolillo and Tomi Kilgore, “‘Hindenburg Omen’ Flashes,” *Wall Street Journal*, August 14, 2010.

5. Weston Wellington, “Hindenburg Omen Flames Out,” *Down to the Wire* (blog), Dimensional Fund Advisors, October 8, 2010.

6. The Russell 3000 Index contains the stocks of 3,000 US companies and represented about 97% of the investable US equity market as of Dec. 31, 2021. According to the Investment Company Institute, there were 2,997 domestic equity funds and 1,032 US equity exchange-traded funds at the end of 2020.

7. Morningstar described the risk profile of the Tactical Asset allocation as generally in line with that of Morningstar’s 50%–70% equity category. The narrower “balanced” category used here was a subset of Morningstar’s 50%–70% category that has a fairly static mix of about 60% stocks and 40% bonds.

Appendix

Dimensional Core Plus Wealth Index Models

Weights (%)



Equity Total	0%	20%	40%	60%	80%	100%
Dimensional US Adjusted Market 2 Index	0	9	18	27	36	45
Dimensional US Large Cap High Profitability Index	0	2	5	7	9	11
Dimensional US Adjusted Market Value Index	0	2	5	7	9	11
Dimensional International Adjusted Market Index	0	3	5	8	10	13
Dimensional International Large Cap High Profitability Index	0	1	2	3	3	4
Dimensional International Vector Index	0	1	2	3	3	4
Dimensional Emerging Markets Adjusted Market Index	0	1	2	3	4	5
Dimensional Emerging Markets Value Index	0	1	2	3	4	5
S&P Global REIT Index	0	0	1	1	2	2
Fixed Income Total	100%	80%	60%	40%	20%	0%
Dimensional Short-Duration Real Return Index	20	0	0	0	0	0
Dimensional US Adjusted Investment Grade Index	0	20	20	20	0	0
Dimensional Global Short-Term Government Index (Hedged to USD)	20	0	0	0	0	0
Dimensional Global Short-Term Government Variable Maturity Index (Hedged to USD)	20	20	20	0	0	0
Dimensional Global Government/Credit 1-3 Year Unhedged Index	40	30	0	0	0	0
Dimensional Global Adjusted Fixed Income Market Index (Hedged to USD)	0	0	0	20	20	0
Dimensional Targeted Credit Index (Hedged to USD)	0	10	20	0	0	0

Weights may not equal 100 due to rounding. Weights as of December 31, 2021. Rebalanced monthly. For illustrative purposes only. The index models are unmanaged and are not subject to fees and expenses typically associated with managed accounts or investment funds. Indices are not available for direct investment. Please see "Sources and Descriptions of Data" in the appendix for descriptions of the Dimensional index data.

Dimensional Core Plus Wealth Index Models

Period Returns as of December 31, 2021 (%)

	1 Year	3 Years	5 Years	10 Years
Equity				
Dimensional US Adjusted Market 2 Index	26.86	24.55	16.64	15.93
Dimensional US Large Cap High Profitability Index	26.17	30.94	22.18	18.03
Dimensional US Adjusted Market Value Index	29.62	20.90	12.42	14.23
Dimensional International Adjusted Market Index	14.05	14.97	10.39	9.22
Dimensional International Large Cap High Profitability Index	13.71	17.05	11.99	9.00
Dimensional International Vector Index	14.74	14.55	9.93	9.43
Dimensional Emerging Markets Adjusted Market Index	5.36	12.07	10.52	6.82
Dimensional Emerging Markets Value Index	12.84	8.42	8.77	5.38
S&P Global REIT Index (gross dividends)	32.50	14.87	9.41	10.17
Fixed Income				
Dimensional Short-Duration Real Return Index	6.26	5.75	3.75	2.53
Dimensional US Adjusted Investment Grade Index	-1.92	5.06	3.71	3.24
Dimensional Global Short-Term Government Index (Hedged to USD)	-0.07	1.57	1.57	1.21
Dimensional Global Short-Term Government Variable Maturity Index (Hedged to USD)	-1.94	1.36	1.30	1.63
Dimensional Global Government/Credit 1-3 Year Unhedged Index	-4.29	1.17	1.61	-0.28
Dimensional Global Adjusted Fixed Income Market Index (Hedged to USD)	-0.67	7.38	5.59	6.17
Dimensional Targeted Credit Index (Hedged to USD)	-0.19	4.69	3.66	4.35

Past performance is no guarantee of future results. Actual returns may be lower.

Indices are not available for direct investment. Index returns are not representative of actual portfolios and do not reflect costs and fees associated with an actual investment. See "Sources and Descriptions of Data" in the appendix for descriptions of Dimensional index data.

Sources and Descriptions of Data



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DIMENSIONAL CORE PLUS 100/0 WEALTH INDEX MODEL

January 1985–present Dimensional Wealth Index Model data compiled by Dimensional. The Dimensional Core Plus 100/0 Wealth Index Model combines the following indices: Dimensional US Adjusted Market 2 Index, Dimensional US Adjusted Market Value Index, Dimensional US Large Cap High Profitability Index, Dimensional International Adjusted Market Index, Dimensional International Vector Index, Dimensional International Large Cap High Profitability Index, Dimensional Emerging Markets Adjusted Market Index, Dimensional Emerging Markets Value Index, and the S&P Global REIT Index (gross dividends). The weight of the REIT index is based on the market capitalization weight of equity REITs within the global universe of eligible stocks and equity REITs, rounded to the nearest 1%. Within the remaining non-REIT allocation, US equities are overweight relative to their market capitalization weight. The weights of the US, developed ex US, and emerging markets equities are then rescaled to sum to the total non-REIT weight of the Wealth Index Model and are all rounded to the nearest 1%. Regional weights are rebalanced quarterly. Within the US equity allocation, each month the weights of the Dimensional US Adjusted Market 2 Index, Dimensional US Adjusted Market Value Index, and Dimensional US Large Cap High Profitability Index are 66.67%, 16.67%, and 16.67%, respectively. Within the developed ex US equity allocation, each month the weights of the Dimensional International Adjusted Market Index, Dimensional International Vector Index, and Dimensional International Large Cap High Profitability Index are 60%, 20%, and 20%, respectively. Within the emerging market equity allocation, each month the weights of the Dimensional Emerging Markets Adjusted Market Index and Dimensional Emerging Markets Value Index are equal. The Wealth Index Model returns are calculated monthly as a weighted average of the returns of the underlying indices. The Dimensional Core Plus 100/0 Wealth Index Model has been retrospectively calculated by Dimensional and did not exist prior to March 2020.

DIMENSIONAL CORE PLUS 80/20 WEALTH INDEX MODEL

January 1985–present Dimensional Wealth Index Model data compiled by Dimensional. 80% of the weight is allocated to the Dimensional Core Plus 100/0 Wealth Index Model and 20% of the weight is allocated to the Dimensional Global Adjusted Fixed Income Market Index (Hedged to USD). The Wealth Index Model returns are calculated monthly as a weighted average of the returns of the underlying indices. The Dimensional Global Adjusted Fixed Income Market Index (Hedged to USD) is represented by Bloomberg US Aggregate Bond Index from January 1985 to December 1989 and the Bloomberg Global Aggregate Bond Index (Hedged to USD) from January 1990 to January 1999. The Dimensional Core Plus 80/20 Wealth Index Model has been retrospectively calculated by Dimensional and did not exist prior to March 2020.

DIMENSIONAL CORE PLUS 60/40 WEALTH INDEX MODEL

January 1985–present Dimensional Wealth Index Model data compiled by Dimensional. 60% of the weight is allocated to the Dimensional Core Plus 100/0 Wealth Index Model and 40% of the weight is allocated to the following fixed income indices: Dimensional Global Adjusted Fixed Income Market Index (Hedged to USD) (20%) and Dimensional US Adjusted Investment Grade Index (20%). The Wealth Index Model returns are calculated monthly as a weighted average of the returns of the underlying indices. The Dimensional Global Adjusted Fixed Income Market Index (Hedged to USD) is represented by Bloomberg US Aggregate Bond Index from January 1985 to December 1989 and the Bloomberg Global Aggregate Bond Index (Hedged to USD) from January 1990 to January 1999. The Dimensional Core Plus 60/40 Wealth Index Model has been retrospectively calculated by Dimensional and did not exist prior to March 2020.

DIMENSIONAL CORE PLUS 40/60 WEALTH INDEX MODEL

January 1985–present Dimensional Wealth Index Model data compiled by Dimensional. 40% of the weight is allocated to the Dimensional Core Plus 100/0 Wealth Index Model and 60% of the weight is allocated to the following fixed income indices: Dimensional Targeted Credit Index (Hedged to USD) (20%), Dimensional Global Short-Term Government Variable Maturity Index (Hedged to USD) (20%), and Dimensional US Adjusted Investment Grade Index (20%). The Wealth Index Model returns are calculated monthly as a weighted average of the returns of the underlying indices. The Dimensional Targeted Credit Index is represented by the Bloomberg US Credit 1–3 Year Bond Index from January 1985 to January 1999. The Dimensional US Adjusted Investment Grade Index is represented by Bloomberg US Aggregate Bond Index from January 1985 to January 1989. The Dimensional Core Plus 40/60 Wealth Index Model has been retrospectively calculated by Dimensional and did not exist prior to March 2020.

DIMENSIONAL CORE PLUS 20/80 WEALTH INDEX MODEL

Dimensional Wealth Index Model data compiled by Dimensional. 20% of the weight is allocated to the Dimensional Core Plus 100/0 Wealth Index Model, and 80% of the weight is allocated to the following fixed income indices: Dimensional Global Government/Credit 1–3 Year Unhedged Index (30%), Dimensional Targeted Credit Index (Hedged to USD) (10%), Dimensional Global Short-Term Government Variable Maturity Index (Hedged to USD) (20%), and Dimensional US Adjusted Investment Grade Index (20%). The Wealth Index Model returns are calculated monthly as a weighted average of the returns of the underlying indices. The Dimensional Global Government/Credit 1–3 Year Unhedged Index is represented by the Bloomberg US Government/Credit 1–3 Year Bond Index from January 1985 to January 1999. The Dimensional Targeted Credit Index is represented by the Bloomberg US Credit 1–3 Year Bond Index from January 1985 to January 1999. The Dimensional US Adjusted Investment Grade Index is represented by Bloomberg US Aggregate Bond Index from January 1985 to January 1989. The Dimensional Core Plus 20/80 Wealth Index Model has been retrospectively calculated by Dimensional and did not exist prior to March 2020.

DIMENSIONAL CORE PLUS 0/100 WEALTH INDEX MODEL

Dimensional Wealth Index Model data compiled by Dimensional. The Dimensional Core Plus 0/100 Wealth Index Model combines the following indices: Dimensional Global Short-Term Government Index (Hedged to USD) (20%), Dimensional Global Government/Credit 1–3 Year Unhedged Index (40%), Dimensional Short-Duration Real Return Index (20%), and Dimensional Global Short-Term Government Variable Maturity Index (Hedged to USD) (20%). The Wealth Index Model returns are calculated monthly as a weighted average of the returns of the underlying indices. The Dimensional Global Short-Term Government Index (Hedged to USD) is represented by the Bloomberg US Government 1–3 Year Bond Index at 75% weight and the ICE BofA US 3-Month Treasury Bill Index at 25% weight from January 1985 to October 1992 and the Bloomberg US Government 1–2 Year Bond Index from November 1992 to January 1999. The Dimensional Global Government/Credit 1–3 Year Unhedged Index is represented by the Bloomberg US Government/Credit 1–3 Year Bond Index from January 1985 to January 1999. The Dimensional Short-Duration Real Return Index is not available back to 1985. The Dimensional Short-Duration Real Return Index is represented by Bloomberg US TIPS Index 1–5 Years from August 1997 to October 2006. Prior to August 1997, its weight is redistributed pro rata to the other fixed income indices. The Dimensional Core Plus 0/100 Wealth Index Model has been retrospectively calculated by Dimensional and did not exist prior to March 2020.

Indices are not available for direct investment; therefore, their performance does not reflect the expenses associated with the management of an actual portfolio. The returns of indices presented herein reflect hypothetical performance and do not represent returns that any investor actually attained. Changes in the assumptions upon which such performance is based may have a material impact on the hypothetical returns presented. Hypothetical backtested returns have many inherent limitations. Unlike actual performance, it does not represent actual trading. Since trades have not actually been executed, results may have under- or overcompensated for the impact, if any, of certain market factors, such as lack of liquidity, and may not reflect the impact that certain economic or market factors may have had on the decision-making process. Hypothetical backtested performance also is developed with the benefit of hindsight. Other periods selected may have different results, including losses. There can be no assurance that Dimensional Fund Advisors will achieve profits or avoid incurring substantial losses.

Sources and Descriptions of Data



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DIMENSIONAL US ADJUSTED MARKET 2 INDEX

January 1975–present Compiled by Dimensional from CRSP and Compustat data. Targets all securities of US companies traded on the NYSE, NYSE MKT (formerly AMEX), and Nasdaq Global Market with an emphasis on companies with smaller capitalization, lower relative price, and higher profitability, excluding those with the lowest profitability and highest relative price within the small cap universe. The index also excludes those companies with the highest asset growth within the small cap universe. Profitability is defined as operating income before depreciation and amortization minus interest expense divided by book equity. Asset growth is defined as change in total assets from the prior fiscal year to current fiscal year. The index overweights securities of companies with smaller capitalization and lower relative price to a greater degree than the Dimensional US Adjusted Market 1 Index. Exclusions: non-US companies, REITs, UITs, and investment companies. The index has been retroactively calculated by Dimensional and did not exist prior to March 2007. The calculation methodology was amended in January 2014 to include profitability as a factor in selecting securities for inclusion in the index. The calculation methodology was amended in December 2019 to include asset growth as a factor in selecting securities for inclusion in the index. Prior to January 1975 Targets all securities of US companies traded on the NYSE, NYSE MKT (formerly AMEX), and Nasdaq Global Market with an emphasis on companies with smaller capitalization and lower relative price.

DIMENSIONAL US LARGE CAP HIGH PROFITABILITY INDEX

Compiled by Dimensional from CRSP and Compustat data. Targets securities of US companies with market capitalizations above the 1,000th largest company whose profitability is in the top 35% of all large cap companies after the exclusion of utilities, companies lacking financial data, and companies with negative relative price. The index emphasizes companies with lower relative price, higher profitability, and lower market capitalization. Profitability is defined as operating income before depreciation and amortization minus interest expense divided by book equity. Exclusions: non-US companies, REITs, UITs, and investment companies. The index has been retroactively calculated by Dimensional and did not exist prior to December 2016.

DIMENSIONAL US ADJUSTED MARKET VALUE INDEX

January 1975–present Compiled by Dimensional from CRSP and Compustat data. Targets all securities of US companies traded on the NYSE, NYSE MKT (formerly AMEX), and Nasdaq Global Market with an emphasis on companies with smaller capitalization, lower relative price, and higher profitability, excluding those with the lowest profitability and highest relative price within the small cap universe. The index also excludes those companies with the highest asset growth within the small cap universe. Profitability is defined as operating income before depreciation and amortization minus interest expense divided by book equity. Asset growth is defined as change in total assets from the prior fiscal year to current fiscal year. The index overweights securities of companies with smaller capitalization and lower relative price to a greater degree than the Dimensional US Adjusted Market 2 Index. Exclusions: non-US companies, REITs, UITs, and investment companies. The index has been retroactively calculated by Dimensional and did not exist prior to March 2007. The calculation methodology was amended in January 2014 to include profitability as a factor in selecting

securities for inclusion in the index. The calculation methodology was amended in December 2019 to include asset growth as a factor in selecting securities for inclusion in the index.

DIMENSIONAL INTERNATIONAL ADJUSTED MARKET INDEX

Compiled by Dimensional from Bloomberg securities data. Targets all the securities in the eligible markets with an emphasis on companies with smaller market capitalization, lower relative price, and higher profitability, excluding those with the lowest profitability and highest relative price within their country's small cap universe. The index also excludes those companies with the highest asset growth within their country's small cap universe. Profitability is defined as operating income before depreciation and amortization minus interest expense divided by book equity. Asset growth is defined as change in total assets from the prior fiscal year to current fiscal year. Exclusions: REITs and investment companies. The index has been retroactively calculated by Dimensional and did not exist prior to April 2008. The calculation methodology was amended in January 2014 to include profitability as a factor in selecting securities for inclusion in the index. The calculation methodology was amended in November 2019 to include asset growth as a factor in selecting securities for inclusion in the index.

DIMENSIONAL INTERNATIONAL LARGE CAP HIGH PROFITABILITY INDEX

Compiled by Dimensional from Bloomberg securities data. Targets large cap securities in the eligible markets whose profitability is in the top 35% of their country's large cap securities, after the exclusion of utilities and companies with either negative or missing relative price data. The index emphasizes companies with lower relative price, higher profitability, and lower market capitalization. Profitability is defined as operating income before depreciation and amortization minus interest expense divided by book equity. Exclusions: REITs and investment companies. The index has been retroactively calculated by Dimensional and did not exist prior to December 2016.

DIMENSIONAL INTERNATIONAL VECTOR INDEX

Compiled by Dimensional from Bloomberg securities data. Targets all the securities in the eligible markets with an emphasis on companies with smaller market capitalization, lower relative price, and higher profitability, excluding those with the lowest profitability and highest relative price within their country's small cap universe. The index also excludes those companies with the highest asset growth within their country's small cap universe. Profitability is defined as operating income before depreciation and amortization minus interest expense divided by book equity. Asset growth is defined as change in total assets from the prior fiscal year to current fiscal year. The index overweights securities of companies with smaller capitalization and lower relative price to a greater degree than the Dimensional International Adjusted Market Index. Exclusions: REITs and investment companies. The index has been retroactively calculated by Dimensional and did not exist prior to April 2008. The calculation methodology was amended in January 2014 to include profitability as a factor in selecting securities for inclusion in the index. The calculation methodology was amended in November 2019 to include asset growth as a factor in selecting securities for inclusion in the index.

Indices are not available for direct investment; therefore, their performance does not reflect the expenses associated with the management of an actual portfolio. The returns of indices presented herein reflect hypothetical performance and do not represent returns that any investor actually attained. Changes in the assumptions upon which such performance is based may have a material impact on the hypothetical returns presented. Hypothetical backtested returns have many inherent limitations. Unlike actual performance, it does not represent actual trading. Since trades have not actually been executed, results may have under- or overcompensated for the impact, if any, of certain market factors, such as lack of liquidity, and may not reflect the impact that certain economic or market factors may have had on the decision-making process. Hypothetical backtested performance also is developed with the benefit of hindsight. Other periods selected may have different results, including losses. There can be no assurance that Dimensional Fund Advisors will achieve profits or avoid incurring substantial losses.

Sources and Descriptions of Data



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DIMENSIONAL EMERGING MARKETS ADJUSTED MARKET INDEX

Compiled by Dimensional from Bloomberg securities data. Targets all securities in the eligible markets with an emphasis on companies with smaller market capitalization, lower relative price, and higher profitability, excluding those with the lowest profitability and highest relative price within their country's small cap universe. The index also excludes those companies with the highest asset growth within their country's small cap universe. Profitability is defined as operating income before depreciation and amortization minus interest expense divided by book equity. Asset growth is defined as change in total assets from the prior fiscal year to current fiscal year. Exclusions: REITs and investment companies. The index has been retroactively calculated by Dimensional and did not exist prior to April 2008. The calculation methodology was amended in January 2014 to include profitability as a factor in selecting securities for inclusion in the index. The calculation methodology was amended in November 2019 to include asset growth as a factor in selecting securities for inclusion in the index.

DIMENSIONAL EMERGING MARKETS VALUE INDEX

January 1990–present Compiled by Dimensional from Bloomberg securities data. Targets securities of companies whose relative price is in the bottom 33% of their country's companies, after the exclusion of utilities and companies with either negative or missing relative price data. The index emphasizes companies with smaller capitalization, lower relative price, and higher profitability, excluding those with the lowest profitability within their country's small cap universe. The index also excludes those companies with the highest asset growth within their country's small cap universe. Profitability is defined as operating income before depreciation and amortization minus interest expense divided by book equity. Asset growth is defined as change in total assets from the prior fiscal year to current fiscal year. Exclusions: REITs and investment companies. The index has been retroactively calculated by Dimensional and did not exist prior to April 2008. The calculation methodology was amended in January 2014 to include profitability as a factor in selecting securities for inclusion in the index. The calculation methodology was amended in November 2019 to include asset growth as a factor in selecting securities for inclusion in the index.

S&P GLOBAL REIT INDEX

Shown in gross dividends. S&P data © 2022 S&P Dow Jones Indices LLC, a division of S&P Global. All rights reserved.

DIMENSIONAL SHORT-DURATION REAL RETURN INDEX

Compiled by Dimensional using data provided by Bloomberg. Includes securities in Bloomberg US 3–5 Year Government, Credit Aaa, Aa, A, Baa indices; Bloomberg US 1–3 Year Government, Credit Aaa, Aa, A, Baa indices; Bloomberg Inflation Swap USD 2YR Zero Coupon Index (Excess Return); and Bloomberg Inflation Swap USD 5YR Zero Coupon Index (Excess Return). For the fixed income component of the index, we do the following: (1) Securities can be over- or underweighted based on government/credit spreads. When the difference in yields between credit and government bonds is narrow, government bonds may be overweighted. When the difference in yields between credit and government bonds is wide, government bonds may be underweighted. (2) Securities can be over- or underweighted with respect to their market cap weight based on credit spreads. When the difference in yields between AAA+AA and A+BBB is narrow, AAA+AA bonds may be held

above market cap weight. When the difference in yields between AAA+AA and A+BBB is wide, AAA+AA bonds may be held below market cap weight. When the difference in yields between AAA+AA and BBB is narrow, BBB bonds may be held below market cap weight. When the difference in yields between AAA+AA and BBB is wide, BBB bonds may be held above market cap weight. (3) The duration of the index is based on the term spread (of real yields) between the real yields of the 3–5 year and 1–3 year credit bonds. Real yield is defined as nominal yield minus inflation swap rate. When the term spread is wide, the duration of the index can be longer than the duration of Bloomberg US Credit 1–5 Year Index. When the term spread is narrow, the duration of the index can be shorter than the duration of Bloomberg US Credit 1–5 Year Index. (4) The duration of the government component is based on the term spread (of real yields) between 3–5 year government bonds and 1–3 year government bonds. When the term spread is wide, the duration of the government component can be longer than the duration of Bloomberg US Government 1–5 Year Index. When the term spread is narrow, the duration of the index can be shorter than the duration of Bloomberg US Government 1–5 Year Index. We use the 2-year and 5-year inflation swap indices to construct an index to match the duration of the fixed income component. The Dimensional index return is the sum of the fixed income component and the inflation swap index return component. Rebalanced monthly. The index has been retroactively calculated by Dimensional and did not exist prior to January 2020.

DIMENSIONAL US ADJUSTED INVESTMENT GRADE INDEX

Compiled by Dimensional using data provided by Bloomberg. Includes securities in Bloomberg US 3–10 Year Government, Credit Aaa, Aa, A, Baa indices; and Bloomberg US 1–3 Year Government, Credit Aaa, Aa, A, Baa indices. Securities can be over- or underweighted based on government/credit spreads. When the difference in yields between credit and government bonds is narrow, government bonds may be held above 50%. When the difference in yields between credit and government bonds is wide, government bonds may be held below 50%. Securities can be over or underweighted with respect to their market cap weight based on credit spreads. When the difference in yields between AAA+AA and A+BBB is narrow, AAA+AA bonds may be held above market cap weight. When the difference in yields between AAA+AA and A+BBB is wide, AAA+AA bonds may be held below market cap weight. When the difference in yields between AAA+AA and BBB is narrow, BBB bonds may be held below market cap weight. When the difference in yields between AAA+AA and BBB is wide, BBB bonds may be held above market cap weight. The duration of the index is based on the term spread between 5–10 year government/credit bonds and 1–3 year government/credit bonds. When the term spread is wide, the duration of the index can be longer than the duration of Bloomberg US Aggregate Index. When the term spread is narrow, the duration of the index can be shorter than the duration of Bloomberg US Aggregate Index. The duration of the government component is based on the term spread between 5–10 year government bonds and 1–3 year government bonds. When the term spread is wide, the duration of the government component can be longer than the duration of Bloomberg US Government Index. When the term spread is narrow, the duration of the index can be shorter than the duration of Bloomberg US Government Index. The index has been retroactively calculated by Dimensional and did not exist prior to January 2017.

Indices are not available for direct investment; therefore, their performance does not reflect the expenses associated with the management of an actual portfolio. The returns of indices presented herein reflect hypothetical performance and do not represent returns that any investor actually attained. Changes in the assumptions upon which such performance is based may have a material impact on the hypothetical returns presented. Hypothetical backtested returns have many inherent limitations. Unlike actual performance, it does not represent actual trading. Since trades have not actually been executed, results may have under- or overcompensated for the impact, if any, of certain market factors, such as lack of liquidity, and may not reflect the impact that certain economic or market factors may have had on the decision-making process. Hypothetical backtested performance also is developed with the benefit of hindsight. Other periods selected may have different results, including losses. There can be no assurance that Dimensional Fund Advisors will achieve profits or avoid incurring substantial losses.



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DIMENSIONAL GLOBAL SHORT-TERM GOVERNMENT INDEX (HEDGED TO USD)

Compiled by Dimensional using data provided by Bloomberg. Based on securities in the universe of Bloomberg Global Aggregate 1–2 Year Index; includes global government bonds only. Within the eligible universe, we apply market weights to construct the index. Currency exposure is hedged to USD. Rebalanced monthly. The index has been retroactively calculated by Dimensional and did not exist prior to January 2020.

DIMENSIONAL GLOBAL SHORT-TERM GOVERNMENT VARIABLE MATURITY INDEX (HEDGED TO USD)

Compiled by Dimensional using FTSE data © 2022. Includes securities in the FTSE World Government Bond 1–3 Years and 3–5 Years indices. Countries: Austria, Australia, Belgium, Canada, France, Germany, Japan, the Netherlands, New Zealand, Norway, Spain, Sweden, Switzerland, the UK, and the US. Countries with the steepest yield curves are overweight with respect to their market cap weight. For countries included, duration corresponds to the steepest segment of that country's yield curve. Currency exposure is hedged to USD. Rebalanced monthly. The index has been retroactively calculated by Dimensional and did not exist prior to January 2019.

DIMENSIONAL GLOBAL GOVERNMENT/CREDIT 1–3 YEAR UNHEDGED INDEX

February 1999–present Compiled by Dimensional using data provided by Bloomberg. Based on securities in the universe of Bloomberg Global Aggregate Index, includes global government bonds and global investment grade corporate bonds. Within the universe, the index identifies the yield curves that offer higher expected returns, and the duration ranges on those yield curves offering higher expected returns, and assesses the increased expected returns associated with allocation to bonds with different credit qualities. It then overweights (with respect to their market cap weight) bonds of yield curves, duration ranges, and credit qualities that offer higher expected returns. It also employs credit quality, currency, and duration requirements relative to the eligible market. Returns are in USD, unhedged. Rebalanced monthly. Prior to February 1999 Compiled by Dimensional using data © 2022 by FTSE. Includes securities in the FTSE World Government Bond 1–3 Years Index. Countries: Austria, Australia, Belgium, Canada, France,

Germany, Japan, the Netherlands, New Zealand, Norway, Spain, Sweden, Switzerland, UK, and the US as data becomes available. Rebalanced monthly based on market weights. The index has been retroactively calculated by Dimensional and did not exist prior to January 2020.

DIMENSIONAL GLOBAL ADJUSTED FIXED INCOME MARKET INDEX (HEDGED TO USD)

Compiled by Dimensional using data provided by Bloomberg. Based on securities in the universe of the Bloomberg Global Aggregate Index and Global High Yield Index. Includes global government bonds, global investment grade corporate bonds, and global BB corporates. Eligible currencies: AUD, CAD, CHF, EUR, GBP, JPY, USD. Currency exposure is hedged to USD. Within the universe, the index identifies the yield curves that offer higher expected returns, the duration ranges on those yield curves offering higher expected returns, and assesses the increased expected returns associated with allocation to bonds with different credit qualities. It then overweights (with respect to their market cap weight) bonds of yield curves, duration ranges, and credit qualities that offer higher expected returns. It also employs credit quality, currency, and duration requirements relative to the eligible market. The index has been retroactively calculated by Dimensional and did not exist prior to January 2018.

DIMENSIONAL TARGETED CREDIT INDEX (HEDGED TO USD)

Compiled by Dimensional using data provided by Bloomberg. Based on securities in the universe of Bloomberg Global Aggregate Index and Global High Yield Index, includes global investment grade corporate bonds and global BB corporates only. Within the universe, the index identifies the yield curves that offer higher expected returns, and the duration ranges on those yield curves offering higher expected returns, and assesses the increased expected returns associated with allocation to bonds with different credit qualities. It then overweights (with respect to their market cap weight) bonds of yield curves, duration ranges, and credit qualities that offer higher expected returns. It also employs credit quality, currency, and duration requirements relative to the eligible market. Currency exposure is hedged to USD. Rebalanced monthly. The index has been retroactively calculated by Dimensional and did not exist prior to January 2020.

Indices are not available for direct investment; therefore, their performance does not reflect the expenses associated with the management of an actual portfolio. The returns of indices presented herein reflect hypothetical performance and do not represent returns that any investor actually attained. Changes in the assumptions upon which such performance is based may have a material impact on the hypothetical returns presented. Hypothetical backtested returns have many inherent limitations. Unlike actual performance, it does not represent actual trading. Since trades have not actually been executed, results may have under- or overcompensated for the impact, if any, of certain market factors, such as lack of liquidity, and may not reflect the impact that certain economic or market factors may have had on the decision-making process. Hypothetical backtested performance also is developed with the benefit of hindsight. Other periods selected may have different results, including losses. There can be no assurance that Dimensional Fund Advisors will achieve profits or avoid incurring substantial losses.