The Abernathy Group II
Family Office

Second Half 2022 Market Outlook

Quarterly Market Review
Second Half 2022

Market Outlook
Second Half, 2022
"Houston, we have a problem"

The above quote (slightly mis-quoted actually) originated from an astronaut during the Apollo Space Mission in 1970. Since that time, the quote has been used repeatedly, always indicating an *unseen or unplanned* problem. The U.S. is facing the uncomfortable headwinds of high inflation, with the certainty of a slowing economy. The global economy is also experiencing similar challenges which may compound matters. The probability of *unseen* or *unplanned economic and geopolitical problems* have risen to the point that each investor must begin to factor these events into their outlook.

"Economics" is a social science. It is not governed by the laws of physics. Economics offers no mathematically fixed relationships between events and outcomes. There are only event-related historical analogies which, at best, provide the future's directional hints, leaving the timing and magnitude of outcomes an uncertainty at best.

Economic science attempts to explain the relationships between societies and the capital markets. The difficulty of forecasting the direction of any nation's economic pathway is difficult because the internal make-up of every country's society is constantly changing. Social attitudes change as demographics and political narratives change. As the internal variables of each nation's "economics" change, the external variables (supply, demand, expanding and contracting economies) are also in flux.

The constant change of internal and external variables means the pace of change constantly shifts, rendering predictions reliable *only* at significant inflection points.

The idea I am hoping to communicate, is that most economists deal with "first-order" effects on the direction of an economy. These are the effects in plain sight. The problem: "first-order" effects are most often priced into current market prices, thus offering little true benefit. The real value of an economic forecast comes from its ability to highlight the economic consequences of the secondary and tertiary domino effects created by "first-order" effects. These unforeseen <u>*consequences*</u> of the 1st order effects *are NOT priced into the market*, and must be identified and priced into your assessment of possible risks ahead.

Frederic Bastiat, the French economist, wrote in his famous piece *Economic Sophisms*: "the entire difference between a bad and a good economist – a bad one relies on the visible effects, while the good one takes account of both the effect one can see, and of those one must foresee." This is another way of saying the "first-order" effects of the vast majority of economic events are already priced into the market. It is the domino effect, the "second" or "third-order" effect(s) which create value for the intelligent investor.

In a recent paper, Jeremy Grantham described it a bit differently, yet with the same consequence, when he wrote:

> "Most of the time (85% or thereabouts) markets behave quite normally. In these periods, investors (managers, clients, and individuals) are happy enough, but alas these periods do not truly matter. It is only the other 15% of the time that matters, when investors get carried away and become irrational. Mostly (about 12% of the time), this irrationality is excessive optimism, when you see meme stock squeezes and IPO frenzies, such as in the last 2 years; and just now and then (about 3% of the time), investors panic and sell regardless of value, as they did at 666 on the S&P in 2009 and with many stocks trading at a 2.5 P/E in 1974. These times of euphoria and panic are the most important for portfolios and the most dangerous for careers."

We believe we are entering a potentially difficult period. U.S. and global market volatility will increase. Investors depending upon the appreciation of their financial assets will be disappointed. Future returns will be far below those experienced over the last 5 years. Upside is unlikely from current valuation levels. This future is easy to foresee. It's the possibility of 2nd and 3rd order effects which scare us.

As the capital markets continue to move through the 2nd half of 2022, a confluence of conflicting data has become routine rather than eventful. This increases uncertainty and unintended consequences.

For instance, in July it was widely reported that the U.S. unemployment rate was at a 50 year low. There were 2 job openings for every person seeking employment. Journalists authored articles proclaiming it to be a "job seeker's" market and telling the currently employed "now is the time to demand a raise."

Approximately one week later, a survey of 700 senior executives by PwC revealed that "half said *they were terminating workers*, 52% said they had implemented *hiring freezes,*" and more than 40% said they were rescinding job offers.

In another example, the U.S. Federal Reserve is raising interest rates into a slowing economy, while China is reducing rates into a weakening economy.

In June, the University of Michigan Consumer Sentiment Index registered *the lowest level ever recorded*. Lower than the aftermath of the dot-com bubble, and the 2001 terrorist attacks in NY. Lower than the 2007 – 2009 Great Financial Crisis (which almost brought the world into a depression), and lower than the recent COVID shutdown. Yet consumers are approximately *$2 trillion richer today* than they were at the beginning of the pandemic. Conflicting data is almost everywhere.

With an ever-increasing abundance of directly conflicting information, the future of the U.S. economy becomes increasingly uncertain. With such limited visibility, allocating valuable assets becomes increasingly difficult. What is clear? **The current environment is not one which supports excessive risk taking.**

We have had many discussions with the families we serve over the last 3 months. While there are far more questions to answer than space allows, we decided to focus on the 3 questions most asked in this 2nd Half Market Outlook. Additionally, we will plan to sponsor a Town Hall format webinar for all Family Office members in October to answer additional questions. We plan to sponsor this public forum each month going forward on the first Tuesday of each month (at 4:30 eastern/ 1:30 pacific), which will detail the current data we believe to be most indicative of 2nd and 3rd order "domino" implications for the markets over the coming economic downturn.

The questions most asked for this Market Outlook were:

- Is inflation here to stay? If yes, is it time to add an allocation to the commodity index?

- U.S. Federal Reserve's policy. Is it accommodative or restrictive? Does this offer a predictive signal regarding what is to come from the financial markets?

- Is our U.S. economy on the verge of a recession? Does a recession mean a collapse in stock and bond prices is imminent? If so, how should our assets be allocated to avoid the downturn?

- The standard question: a) What is being missed by the U.S. capital markets?

Is inflation here to stay? If yes, is it time to add an allocation to the commodity index?

The first question is easy to answer. The simple answer is that this inflationary bout will most likely prove to be a cyclical inflationary period. During the next 2-3 years inflation will decline to the more normal range of 2% - 4%, with a tendency toward the lower end of the range. Longer-term, _deflation is the true villain_, as demographics and technology continue their never-ending influence on our economy. (This is a topic briefly discussed below and will be covered in the October webinar.)

Answering the second question is much more difficult. Reason: most commodities are just that. They are physical goods. This means there is no current income associated with the ownership of these goods. This means investors don't get paid while waiting. The price swings from day-to-day are dependent on both immediate and projected supply vs demand. So, _commodity investors must be right about both timing and direction to justify a well-timed, directionally intelligent investment_.

That said, an investment into a commodity represents a more speculative asset best left to businesses which actually use the commodity in their value creation process.

Unless we can source incontrovertible proof of a directional movement into a specific commodity, or unless a portfolio needs gold as a hedge for a certain currency devaluation, we believe commodity investments are speculative. We do not have an informational advantage, thus are unlikely to recommend investing in the commodity complex at this time.

U.S. Federal Reserve's policy. Is it accommodative or restrictive?

As we write this Market Outlook, in late July, the U.S. Federal Reserve remains accommodative.   The U.S. Federal Reserve (and the current U.S. administration) continues to add liquidity to our U.S. economy – in direct conflict with its most recently stated goal - to reduce inflation.

This accommodative stance is slated to change in September when the U.S. Federal Reserve will begin to reduce its balance sheet by approximately $95 billion per month. If the Fed follows through with their plan, it will reduce their balance sheet by over $1 trillion per year, while reducing the amount of dollars in the U.S. economy by the same amount. Keep in mind that the effects of changes in the U.S. Federal Reserve's monetary policy, often take 12 months or more to affect the U.S. economy.

The combination of increasing interest rates at the fastest relative level in history, combined with withdrawing money from our U.S. economy at almost 5% per year, will create a significantly restrictive U.S. Federal Reserve.

Don't Fight the Fed

U.S. investors have benefited from an unusually accommodative Fed policy since 2009. For many younger investors, this has been a lifetime. It is all they have known.

The markets have come to believe they are protected by an omniscient U.S. Federal Reserve which will come to their rescue every time the markets run into a rough patch.

The manipulation of significantly below-market interest rates since 2009 created a false sense of security for companies and investors alike. Borrowing money at below-market interest rates created economic distortions. It allowed weak companies to survive. History clearly demonstrates that below market interest rates (or cheap money) encourages irresponsible, speculative activities and investments. Companies formed under these "artificial" conditions are unlikely to remain solvent when rates normalize.

Henry Hazlitt wrote: "*Schumpeter's idea of "creative-destruction" must be allowed to operate unhindered. It is as important for the health of an economy, that dying industries be allowed to die, as it is for growing industries be allowed to grow*." Today, it is rumored that over 20% of the public companies making up the NASDAQ index are zombie companies, unable to exist with higher interest rates. This is a "second-order" effect which could spell trouble.

In early 2022, the U.S. Federal Reserve began increasing interest rates. In September 2022, as we publish this "Outlook," the Fed plans to effectively withdraw $*90 billion* per month from our U.S. economy. All of this is taking place as our U.S. economy is slowing, virtually assuring the U.S. economy will be unable to avoid a recession. The only question is whether it's a mild, moderate, or a severe recession.

The combination of higher interest rates and less money in the system, amidst a slowing economy, will undoubtedly expose those companies operating at a loss, and kept alive by foolish lenders. Higher interest rates will double interest expense, while the removal of liquidity from our U.S. economy will likely lessen consumer demand for almost everything. Less demand with higher interest expense is devastating to companies operating at a loss. *Current* corporate bankruptcy rates are at the lowest level since recording began in the 1980s. History indicates approximately 12 months after the Fed's tightening, bankruptcies increase. Remember: **"Don't Fight the Fed" works both ways.**

Is our U.S. economy on the verge of a recession? Does a recession mean a collapse in stock and bond prices is imminent? If so, how should our assets be allocated to avoid the downturn?

The short answer is Yes. The U.S. economy is *definitionally* in a recession and has been since the beginning of 2022. Unfortunately, this definition (2 quarters or more of negative GDP), has become a political matter.

While we will not become involved in the politics surrounding this definition, it is clear our U.S. economy (along with much of the rest of the developed world), is slowing. To make matters worse, interest rates – the lifeblood of our leveraged economy – are rising. Current inflation rates have become deadly to the lower income segments of the U.S. economy. This inflation is likely to be more ingrained than the U.S. Federal Reserve would like to admit. Thus, the Fed's almost singular focus on raising rates, and withdrawing money from the U.S. economy to lower inflation.

Lowering inflation overshadows the risks of entering a more significant recession. This increases the odds of a nasty recession, and consequently, second-order effects becoming more likely.

It is our belief that inflation has either peaked or is near its peak. However, it is also our belief - *this current inflationary bout will linger longer than most expect.* This will make it more difficult for the Fed to achieve its 2% inflation target. In fact, *we strongly believe the Fed will have to increase their near-term inflation target to 3%.* If we are right, it is inflation's lingering effect that will force rates higher than needed. This could become the match that lights the fire of a financial crisis. The cascading domino effect of a financial crisis could create a forest fire of bankruptcies in the U.S., and untold damage to the rest of the world. *I am not trying to become an alarmist, nor am I certain this will happen. Yet this outcome is more likely today than it was 6 months ago, or even 3 months ago. The longer inflation lingers, the higher the probability of a more serious recession.

Does Recession = Lower Stock and Bond Prices?

Yes and no. All else equal, recessions typically mean lower stock prices. However, recessions usually mean HIGHER bond prices. Here's why.

During recessions, the consumer spends less, and corporate earnings *decline*. *Corporate earnings define the value of a financial asset.* A company earning $2 is twice as valuable as a company earning $1, all else equal. Lower earnings create lower financial asset values. *During a recession, the average decline in earnings is between 20% – 30% (yet could be more).

For example, during the 1999 – 2003 recession S&P 500 earnings declined by almost 50%. In the 2007 – 2009 downturn S&P 500 earnings declined by over 60%.

To make matters worse, leveraged economies magnify recessionary downturns. Today, the U.S. economy is more leveraged than it has ever been. If the combination of increasing rates, collapsing corporate profits, increasing bankruptcies, or unplanned geopolitical events cause something in our economic system to break, the decline is likely to become much worse than the markets expect.

Recessions typically create higher bond prices as investors seek the safety of bonds during equity market downturns. Also adding to the probability of higher bond prices – the U.S. Federal Reserve has historically come to the rescue of the capital markets by a) lowering interest rates and, b) quantitative easing (QE). Both actions are meant to increase economic activity and increase bond prices. While we do expect the investing public to seek the safety of the bond market during the economic downturn to come, we believe the U.S. Federal Reserve will be less prone to come to the rescue of the capital markets. The fear of creating more inflation is likely to keep the Fed on the sidelines unless a severe collapse in the capital markets takes place.

Second Order Effects

It is equally important for investors to remember that recessions are a potential "on-ramp" to deflation. Deflationary economic environments make *debt repayments* MORE difficult and can become an incredibly negative economic framework for the U.S. (along with other indebted "developed" and "emerging" economies). The Fed will be intensely focused on avoiding a deflationary environment, and for this reason, it is our strong belief the U.S. Federal Reserve will at least pause its tightening policy at the first inference of a financial crisis. If the financial crisis is serious enough, the U.S. Federal Reserve will ease rates, cease draining liquidity from our economy, and possibly start to inject more money into the system.

How Should I Invest With The Current Uncertainties?

This is the correct question to ask, however, the answer often depends on your investment time frame, the size of your asset base relative to your lifestyle's financial demands, and your internal emotional framework regarding the increased volatility involved in an economic downturn. So, the short answer is "it depends."

As always, your future expectations will influence your investment allocation, and your investment allocation will define your portfolio's risks.

Since it is impossible to know what the future has in store, we will do our best to outline one construct of risk determination as an attempt to begin the "how should I invest" conversation.

Below, you will find our "scenario-analysis" which is an expression of our perspectives for the current set of "known" uncertainties in a "best-case" (hopeful outcome), "base-case" (most likely), and "worst-case" (regrettable) framework. We do not believe that any of the 3 views will unfold exactly as delineated below. However, scenario analysis instigates intelligent discussion by creating a fixed future assumption (in writing) from which you can begin discussions around the many futures possible.

Best case: light recession, corporate earnings fall by <10%. Stock market down another 20% from recent highs. U.S. Federal Reserve allows inflation to remain higher than its current declarations. Global tensions continue to increase yet do not boil-over. Mercantilism re-awakens, which creates short-term headwinds for financial assets, yet creates long-term benefits. Stocks tread water over the next few years, bonds likewise.

Base case: textbook recession, corporate earnings fall by 30% or slightly more. Stock market down by 30-50% (or 3-5 years of no returns). Inflation stays in the 3.5-5% range through 2023, and the U.S. Federal Reserve either continues increasing rates (which will take us to the "worst case"), or the Fed changes its outlook and prepares to live with 3%+ inflation. The Fed will keep interest rates elevated for longer than the capital markets currently believe, as the base rates of inflation are a bit stickier than believed. *Elevated inflation will create a lower valuation framework for financial assets. This increases the probabilities of unplanned negative events. Depending on which portions of our economy break, the U.S. Federal Reserve will pause its tightening policy and come to the U.S. economy's rescue (again). Bonds perform better from current levels with less volatility.

Worst case: meaningful to severe recession, corporate earnings fall by more than 30%. Speculative behavior is unwound. This punishes the capital markets, and risk assets decline by 50% or more. Overleveraged companies which are losing money collapse under the weight of higher interest rates. Bankruptcy rates increase from < 3.5% today to 10-15%+. The narrative changes from "buying market dips" to "selling market bounces." This scenario causes any number of "domino effects," including increased crime, and the possibility of geographic revolts. It also increases the likelihood of a geopolitically negative event and could create a severe downturn which must be avoided. Bonds appreciate as investors seek safety. The U.S. Federal Reserve pivots and starts lowering interest rates. If needed, the Fed could start to increase its balance sheet again. This downturn will set the scene for attractive investment opportunities for those who have protected capital, remained patient, and have created intelligent expectations about the future. Significant downturns eventually create highly attractive asset prices; however, the worst case could bring a level of pain only a Navy Seal could endure.

What is Being Missed by Mr. Market?

All intelligent analysis must include both a discussion of what our analysis may be missing, and the consequences of our analysis being wrong.

Short-Term – the capital markets are wholly focused on the most current inflation data combined with a solid dose of political narrative which says the U.S. economy is NOT in a recession based on the incredibly low unemployment rate. Definitionally, the U.S. has been in a recession since Q4 2021 and continues today.

Historically, the unemployment rate increases meaningfully during a recession. A 10% unemployment rate is not rare during a difficult recession. Today, the U.S. economy has an unemployment rate of 3.5%, which rivals the lowest rate in the last 50 years. However, America's economy is more fragile than most believe. Why? Debt and leverage (corporate and sovereign), rampant speculation, tightening economic conditions, an inverted yield curve, the possibility of serious geopolitical turmoil, and most importantly Michigan Consumer Sentiment levels have created a level of risk the capital markets are ignoring.

While there are always more risks possible than will eventually take place, when well-known risks are stacked upon one another, the *variability* of future outcomes becomes significantly larger than most expect. The possibility of 2nd order effects, and the chain reactions or domino effects from one risk triggering another, are being ignored by current U.S. market valuations. This is a short-term risk we hope to avoid.

Long-term – the U.S. Federal Reserve is currently fighting *inflation* when the true villain is *deflation*. Consequently, the U.S. Federal Reserve will have to engineer an economy which slows yet *avoids recession*. This is an incredibly difficult outcome to achieve. If the U.S. enters a recession, the long-term deflationary forces of shrinking demographics and technological innovation may become dominant.

Ageing population demographics with reduced birthrates in the U.S., indicate the U.S. is shrinking. U.S. demographics are difficult to refute and clearly support U.S. deflation.

Technology ignores economic cycles by offering better products and services at consistently lower costs. Technological innovation enhances U.S. productivity yet imposes a substantial deflationary force.

There is a high probability that S&P 500 earnings decline by at least 10% or more during a recession. This is in contrast to the current market's expectations for an *increase of 10% during* 2022.

U.S. demographics and technological innovation are likely to be the most dominant influences of our U.S. economy over the next decade and clearly support a deflationary future. Deflation presents a conundrum of challenges which, due to current U.S. debt levels, will be difficult to reverse. This makes it increasingly important for the U.S. Federal Reserve to engineer lower inflation, while avoiding deflation at all costs.

As the U.S. Federal Reserve commits itself to an almost singular fight to lower inflation, it is fighting what some would say is the last war. The problem: fighting inflation calls for the Fed to increase interest rates, and decrease liquidity, both of which are likely to push our U.S. economy into a recession. A recession is the entryway into deflation. Deflation is a demon we must avoid at all costs. Will the U.S. administration and the Fed be able to reduce inflation to the stated 2% level while avoiding the potentially debilitating effects of a deflationary spiral? This is a question only the future can answer. One certainty - the harder the fight to tame inflation becomes the higher the probability of a significant downturn.

"Houston, we have a problem."

Quarterly Market Review

Second 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:

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: Three Crucial Lessons for Weathering the Stock Market's Storm

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
Q2 2022	**STOCKS**					**BONDS**	
	-16.70%	**-14.66%**	**-11.45%**	**-17.22%**		**-4.69%**	**-4.01%**

Since Jan. 2001							
Average Quarterly Return	2.2%	1.4%	2.6%	2.3%		1.0%	0.9%
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**

Long-Term Market Summary

Index Returns as of June 30, 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	
	-13.87%	**-16.76%**	**-25.28%**	**-10.61%**		**-10.29%**	**-7.75%**
5 Years							
	10.60%	**2.66%**	**2.18%**	**2.79%**		**0.88%**	**1.30%**
10 Years							
	12.57%	**5.37%**	**3.06%**	**5.15%**		**1.54%**	**2.66%**

World Stock Market Performance

MSCI All Country World Index with selected headlines from Q2 2022

1 YEAR (Q3 2021–Q2 2022)

Q2 2022

Headlines (from left to right):

"Eurozone Inflation Soars to 7.5%, Raising Pressure on European Central Bank"

"US Mortgage Rates Hit 5% for First Time Since 2011"

"Dow Tumbles Nearly 1,000 Points as Stocks Extend Selloff"

"US GDP Drops 1.4% as Economy Shrinks for First Time since Early in Pandemic"

"US Inflation Hits Four-Decade High; Energy, Food Costs Rose Sharply"

"Stocks Extend Losing Streak to 5 Weeks"

"Fed Lifts Interest Rates by Half Point in Biggest Hike Since 2000"

"Europe Moves to Sanction Russia Again, Closing In on Oil Embargo"

"Stock Market Rises as S&P 500, Nasdaq Add More Than 6% for Week"

"CBO Projects Inflation, Economic Growth to Cool This Year and Next"

"Small Businesses Lose Confidence in US Economy"

"US Retail Sales Grew 0.9% in April; Spending Rose for Fourth Straight Month"

"Markets Post Worst First Half of a Year in Decades"

"Fed Raises Rates by 0.75 Percentage Point, Largest Increase Since 1994"

"Bond Slide Deepens; 10-Year US Treasury Yield Settles at Highest Level since 2011"

"Tech Sector Has Worst Start to a Year since 2002"

"Mortgage-Application Index Falls to Lowest Level in 22 Years"

"World Bank Warns of Stagflation Risk"

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.

World Stock Market Performance

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

LONG TERM (2000–Q2 2022)

400
300
200
100
0
2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020 2022

Last 12 months
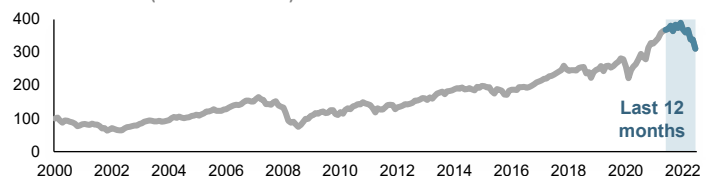
SHORT TERM (Q3 2021–Q2 2022)
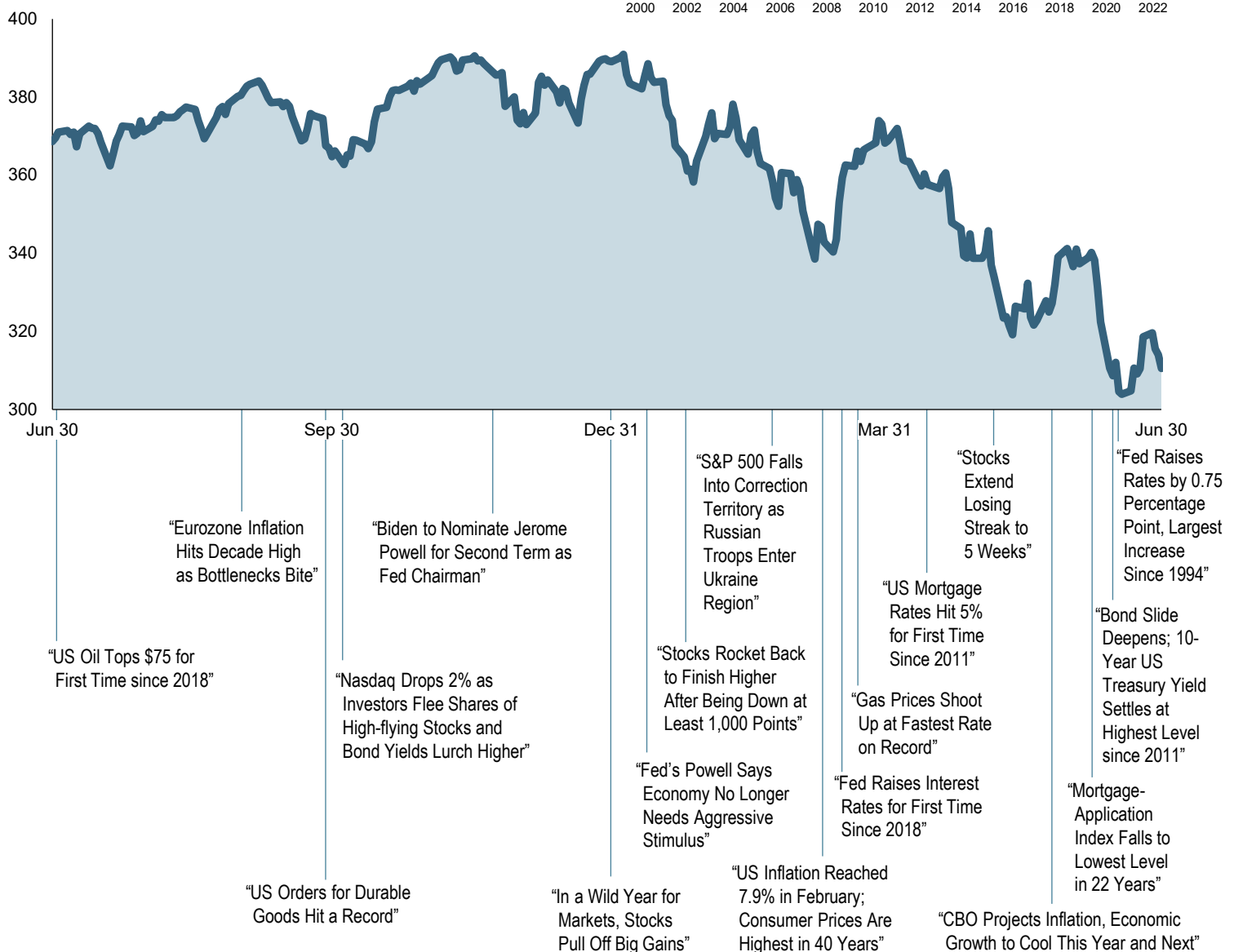
400
380
360
340
320
300

Jun 30   Sep 30   Dec 31   Mar 31   Jun 30

"US Oil Tops $75 for First Time since 2018"

"Eurozone Inflation Hits Decade High as Bottlenecks Bite"

"Biden to Nominate Jerome Powell for Second Term as Fed Chairman"

"Nasdaq Drops 2% as Investors Flee Shares of High-flying Stocks and Bond Yields Lurch Higher"

"US Orders for Durable Goods Hit a Record"

"S&P 500 Falls Into Correction Territory as Russian Troops Enter Ukraine Region"

"Stocks Rocket Back to Finish Higher After Being Down at Least 1,000 Points"

"Fed's Powell Says Economy No Longer Needs Aggressive Stimulus"

"In a Wild Year for Markets, Stocks Pull Off Big Gains"

"US Inflation Reached 7.9% in February; Consumer Prices Are Highest in 40 Years"

"US Mortgage Rates Hit 5% for First Time Since 2011"

"Gas Prices Shoot Up at Fastest Rate on Record"

"Fed Raises Interest Rates for First Time Since 2018"

"Stocks Extend Losing Streak to 5 Weeks"

"CBO Projects Inflation, Economic Growth to Cool This Year and Next"

"Fed Raises Rates by 0.75 Percentage Point, Largest Increase Since 1994"

"Bond Slide Deepens; 10-Year US Treasury Yield Settles at Highest Level since 2011"

"Mortgage-Application Index Falls to Lowest Level in 22 Years"

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US Stocks

Second quarter 2022 index returns

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

Value outperformed growth.

Small caps underperformed large caps.

REIT indices underperformed equity market indices.

Ranked Returns (%)

Asset Class	Return
Large Value	-12.21
Small Value	-15.28
Large Cap	-16.67
Marketwide	-16.70
Small Cap	-17.20
Small Growth	-19.25
Large Growth	-20.92

World Market Capitalization—US

60%

US Market
$37.6 trillion
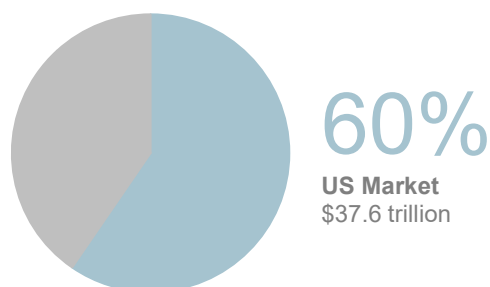
Period Returns (%)

* Annualized

Asset Class	QTR	YTD	1 Year	3 Years*	5 Years*	10 Years*
Large Value	-12.21	-12.86	-6.82	6.87	7.17	10.50
Small Value	-15.28	-17.31	-16.28	6.18	4.89	9.05
Large Cap	-16.67	-20.94	-13.04	10.17	11.00	12.82
Marketwide	-16.70	-21.10	-13.87	9.77	10.60	12.57
Small Cap	-17.20	-23.43	-25.20	4.21	5.17	9.35
Small Growth	-19.25	-29.45	-33.43	1.40	4.80	9.30
Large Growth	-20.92	-28.07	-18.77	12.58	14.29	14.80

International Developed Stocks

Second quarter 2022 index returns

Developed markets outside of the US posted negative returns for the quarter, outperforming the US and underperforming emerging markets.

Value outperformed growth.

Small caps underperformed large caps.

Ranked Returns (%)

■ Local currency ■ US currency

Value
-5.86
-12.36

Large Cap
-8.45
-14.66

Growth
-11.37
-17.25

Small Cap
-11.28
-17.94
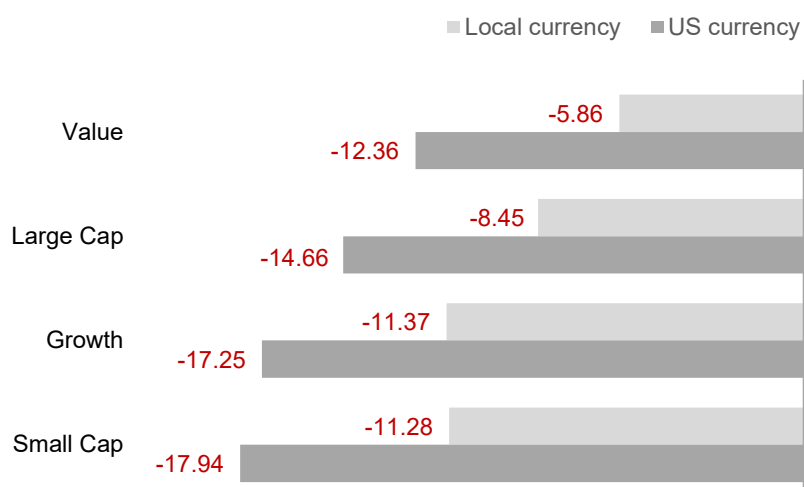
World Market Capitalization—International Developed

29%

International Developed Market
$18.1 trillion
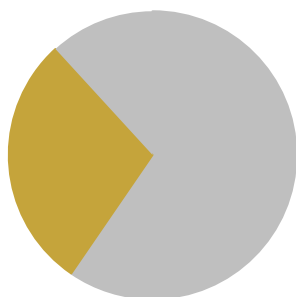
Period Returns (%)   *Annualized*

Asset Class	QTR	YTD	1 Year	3 Years*	5 Years*	10 Years*
Value	-12.36	-11.00	-10.28	1.13	1.26	4.42
Large Cap	-14.66	-18.76	-16.76	1.70	2.66	5.37
Grow th	-17.25	-26.33	-23.37	1.55	3.61	6.04
Small Cap	-17.94	-23.87	-23.02	1.97	2.16	6.70

Emerging Markets Stocks

Second quarter 2022 index returns

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

Value outperformed growth.

Small caps underperformed large caps.

Ranked Returns (%)

Legend: ▇ Local currency ▇ US currency

Category	Local currency	US currency
Value	-7.38	-10.83
Large Cap	-8.07	-11.45
Growth	-8.74	-12.04
Small Cap	-12.30	-16.41
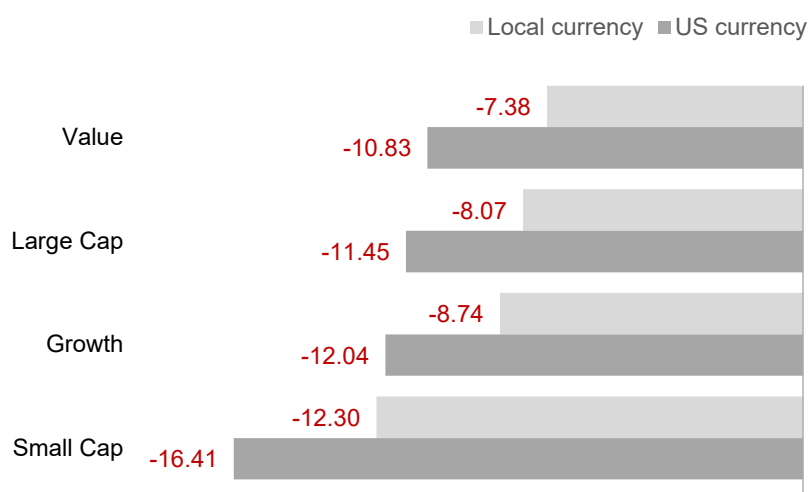
World Market Capitalization—Emerging Markets

12%
Emerging Markets
$7.4 trillion
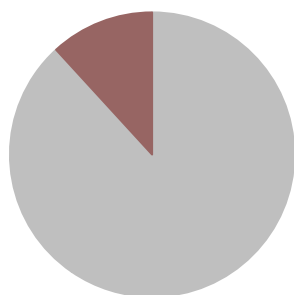
Period Returns (%)   *Annualized*

Asset Class	QTR	YTD	1 Year	3 Years*	5 Years*	10 Years*
Value	-10.83	-13.89	-18.59	-0.97	1.25	1.46
Large Cap	-11.45	-17.63	-25.28	0.57	2.18	3.06
Growth	-12.04	-21.07	-31.18	1.88	2.92	4.54
Small Cap	-16.41	-20.03	-20.72	5.78	3.48	4.31

Country Returns

Second quarter 2022 index returns

Real Estate Investment Trusts (REITs)

Second quarter 2022 index returns

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

Ranked Returns (%)

Global ex US REITS   -17.50

US REITS   -18.10

Total Value of REIT Stocks

32%
World ex US
$453 billion
298 REITs
(25 other countries)

68%
US
$960 billion
116 REITs
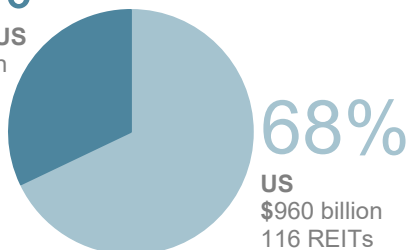
Period Returns (%)   *Annualized*

Asset Class	QTR	YTD	1 Year	3 Years*	5 Years*	10 Years*
Global ex US REITS	-17.50	-19.93	-17.73	-4.38	0.20	3.47
US REITS	-18.10	-21.14	-6.41	2.54	4.28	6.61

Commodities

Second quarter 2022 index returns

The Bloomberg Commodity Index Total Return returned -5.66% for the second quarter of 2022.

Aluminum and Nickel were the worst performers, returning -30.58% and -29.47% during the quarter, respectively. Heating Oil and Low Sulphur Gas Oil were the best performers, returning +24.89% and +22.15% during the quarter, respectively.

Ranked Returns (%)

Commodity	Return
Heating Oil	24.89
Low Sulphur Gas Oil	22.15
Unleaded Gas	20.14
Brent Crude Oil	9.25
WTI Crude Oil	8.69
Coffee	1.60
Soybean	1.26
Soybean Oil	-0.58
Live Cattle	-4.52
Sugar	-5.73
Natural Gas	-6.28
Soybean Meal	-7.16
Gold	-7.87
Kansas Wheat	-8.42
Corn	-10.92
Wheat	-13.82
Cotton	-13.98
Lean Hogs	-15.11
Silver	-19.63
Copper	-22.39
Zinc	-24.33
Nickel	-29.47
Aluminum	-30.58
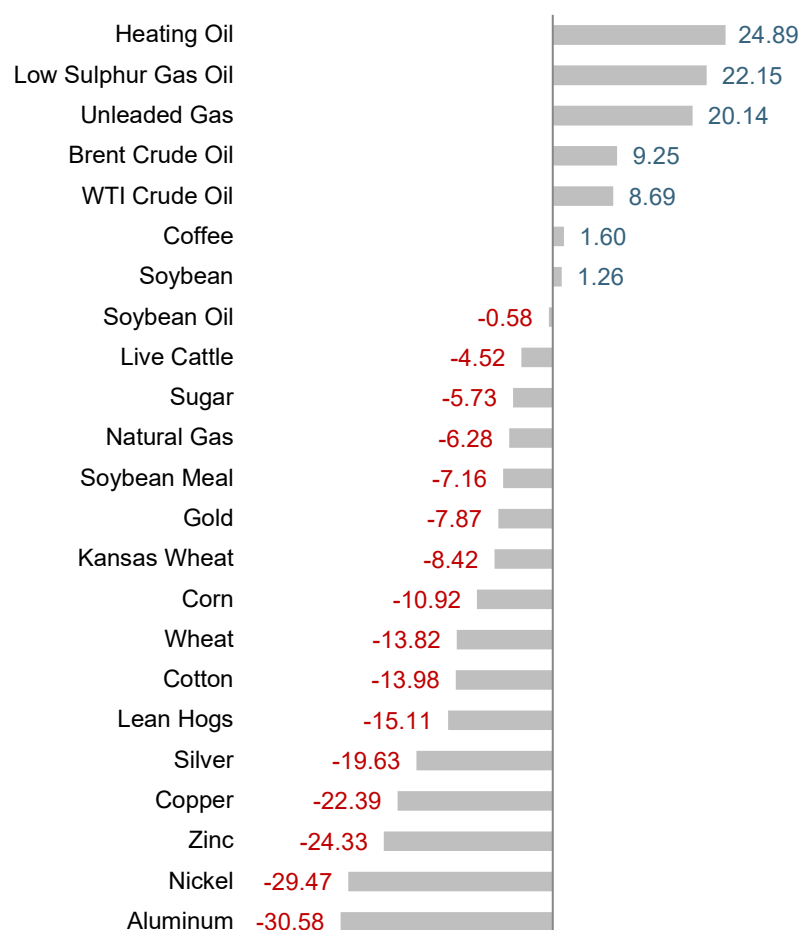
Period Returns (%)   *Annualized*

Asset Class	QTR	YTD	1 Year	3 Years*	5 Years*	10 Years*
Commodities	-5.66	18.44	24.27	14.34	8.39	-0.82

Fixed Income

Second 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 59 basis points (bps) to 3.01%. The yield on the 10-Year US Treasury Note increased 66 bps to 2.98%. The yield on the 30-Year US Treasury Bond increased 70 bps to 3.14%.

On the short end of the yield curve, the 1-Month US Treasury Bill yield increased 111 bps to 1.28%, while the 1-Year US Treasury Bill yield increased 117 bps to 2.80%. The yield on the 2-Year US Treasury Note increased 64 bps to 2.92%.

In terms of total returns, short-term corporate bonds returned -1.94% and intermediate-term corporate bonds returned -3.92%.[1]

The total return for short-term municipal bonds was +0.08% and -1.30% for intermediate-term municipal bonds. Within the municipal fixed income market, general obligation bonds outperformed revenue bonds, returning -2.51% vs. -3.37%, respectively.[2]

US Treasury Yield Curve (%)
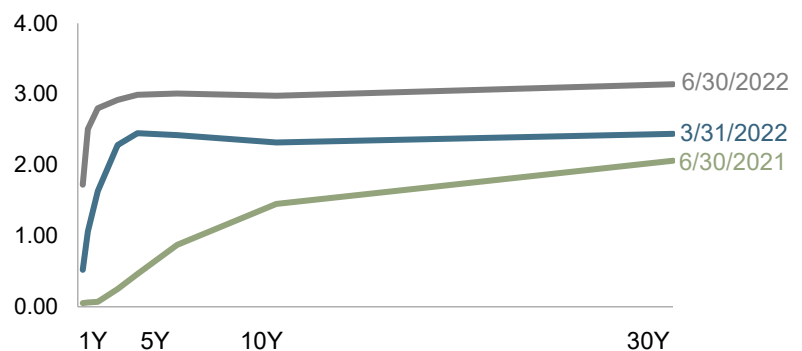
Bond Yields Across Issuers (%)
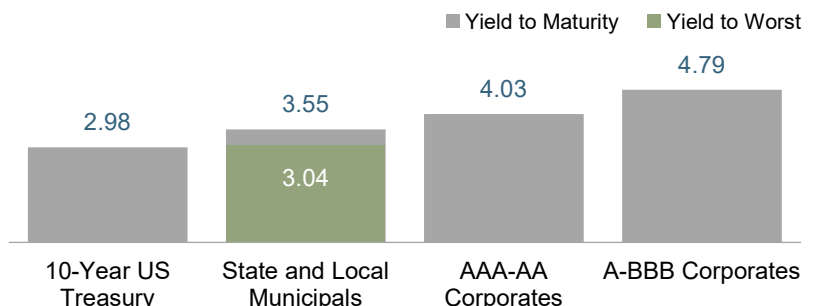
Period Returns (%)

*Annualized

Asset Class	QTR	YTD	1 Year	3 Years*	5 Years*	10 Years*
ICE BofA US 3-Month Treasury Bill Index	0.10	0.14	0.17	0.63	1.11	0.64
ICE BofA 1-Year US Treasury Note Index	-0.48	-1.27	-1.44	0.53	1.10	0.73
FTSE World Government Bond Index 1-5 Years (hedged to USD)	-0.95	-3.30	-3.79	0.04	1.08	1.22
Bloomberg Municipal Bond Index	-2.94	-8.98	-8.57	-0.18	1.51	2.38
FTSE World Government Bond Index 1-5 Years	-4.28	-7.69	-9.90	-2.02	-0.57	-1.05
Bloomberg U.S. Aggregate Bond Index	-4.69	-10.35	-10.29	-0.93	0.88	1.54
Bloomberg U.S. TIPS Index	-6.08	-8.92	-5.14	3.04	3.21	1.73
Bloomberg U.S. High Yield Corporate Bond Index	-9.83	-14.19	-12.81	0.21	2.10	4.47
Bloomberg U.S. Government Bond Index Long	-11.89	-21.20	-18.42	-2.94	0.50	1.65

1. Bloomberg US Corporate Bond Index.
2. Bloomberg Municipal Bond Index.

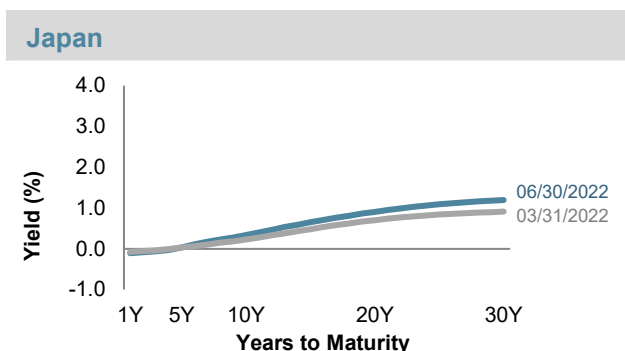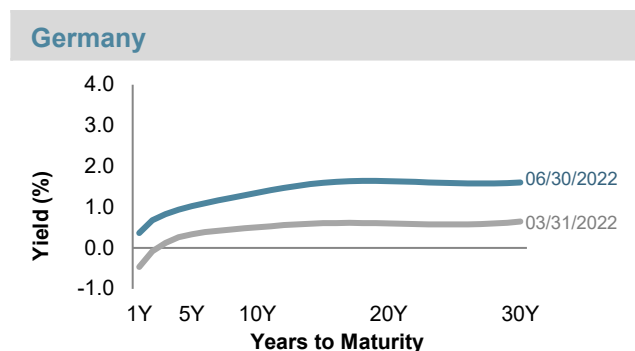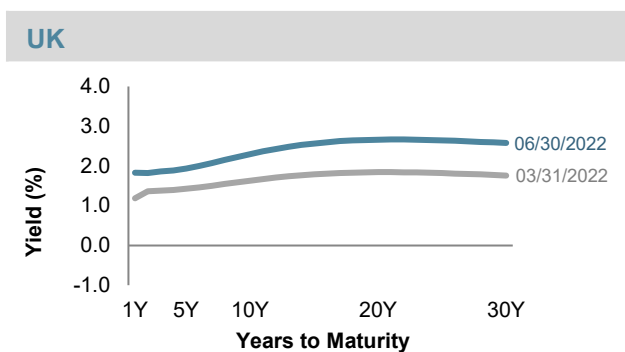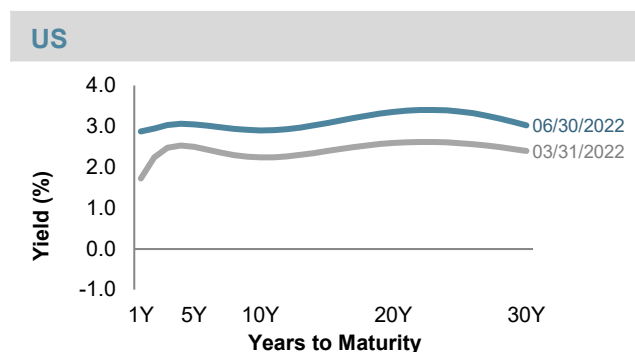# Global Fixed Income

Second quarter 2022 yield curves

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

Realized term premiums were negative in global developed markets.

In Germany, short-term nominal interest rates increased to become positive during the quarter. In Japan, short-term nominal interest rates remained negative.

Changes in Yields (bps) since 3/31/2022

	1Y	5Y	10Y	20Y	30Y
US	115.5	55.1	66.3	76.0	62.3
UK	64.5	50.6	66.7	81.9	81.6
Germany	83.1	68.9	84.9	103.8	95.7
Japan	-3.0	0.2	11.0	20.4	28.2
Canada	116.2	74.7	83.5	76.4	77.0
Australia	146.4	78.0	81.7	68.5	61.2

US

UK

Germany

Japan

Canada

Australia

One basis point (bps) equals 0.01%. Source: ICE BofA government yield. ICE BofA index data © 2022 ICE Data Indices, LLC.
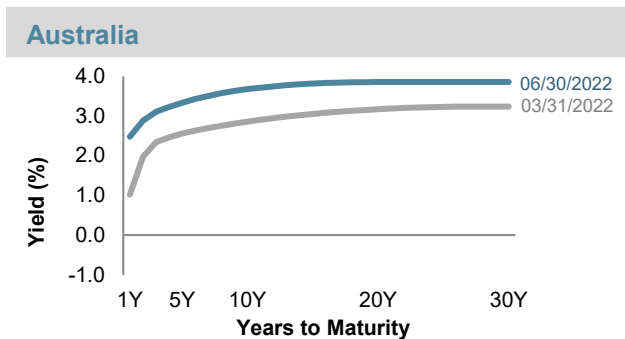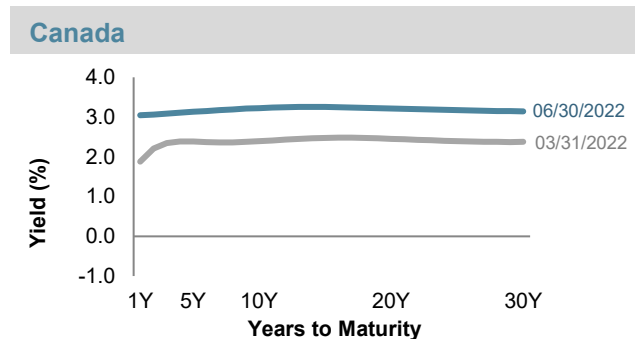
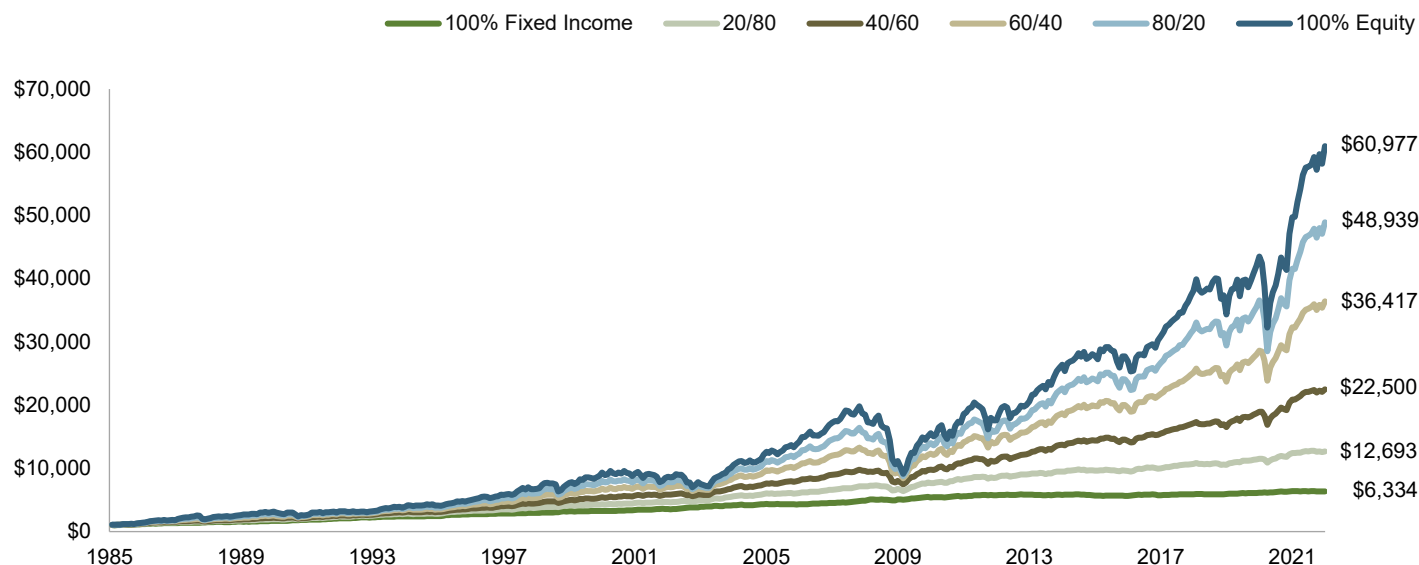# Impact of Diversification

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.

Three Crucial Lessons for Weathering the Stock Market's Storm

Second Quarter 2022

Marlena Lee, PhD
Global Head of Investment Solutions

Alternative Market Outlook

Investors can always expect uncertainty. While volatile periods like the one we're experiencing now can be intense, investors who learn to embrace uncertainty may often triumph in the long run. Reacting to down markets is a good way to derail progress made toward reaching your financial goals.

Here are three lessons to keep in mind during periods of volatility that can help you stick to your well-built plan. And if you don't have a plan, there's a suggestion for that too.

1. A recession is not a reason to sell

Are we headed into a recession? A century of economic cycles teaches us we may well be in one before economists make that call.

But one of the best predictors of the economy is the stock market itself. Markets tend to fall in advance of recessions and start climbing earlier than the economy does. As the below shows, returns have often been positive while in a recession.

Growth of $100, 1926–2021
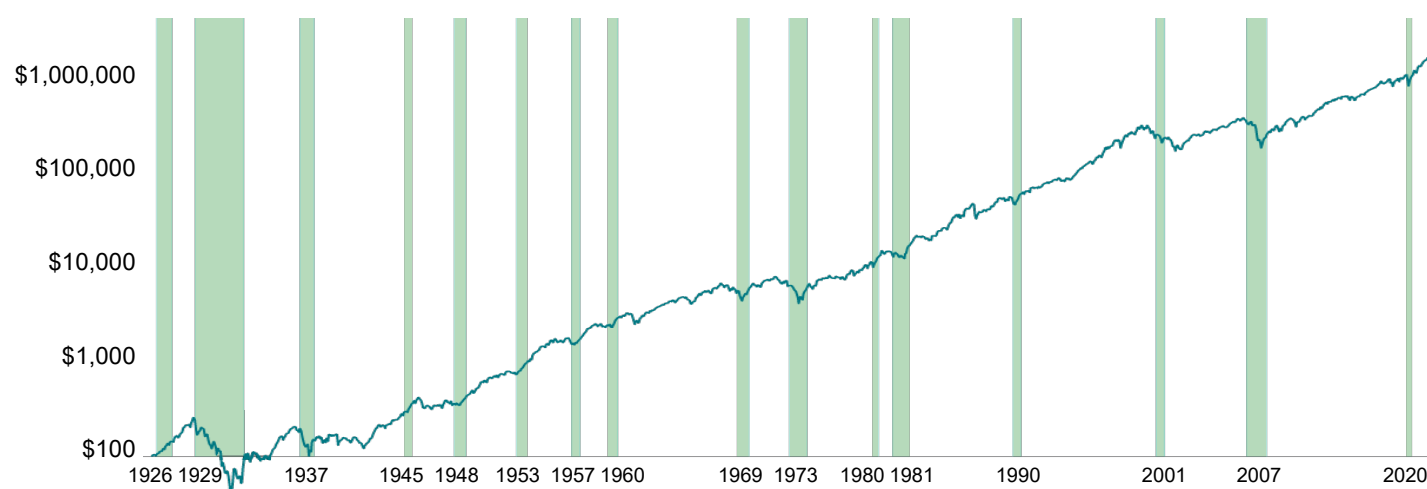
Past performance is no guarantee of future results.

In US dollars. Recessions shaded in green. Stock returns represented by Fama/French Total US Market Research Index, provided by Ken French and available at mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html. This value-weighed US market index is constructed every month, using all issues listed on the NYSE, AMEX, or Nasdaq with available outstanding shares and valid prices for that month and the month before. Exclusions: American depositary receipts.

Sources: CRSP for value-weighted US market return. Rebalancing: Monthly. Dividends: Reinvested in the paying company until the portfolio is rebalanced. Growth of wealth shows the growth of a hypothetical investment of $100 in the securities in the Fama/French US Total Market Research Index from July 1926 through December 2021.

Three Crucial Lessons for Weathering the Stock Market's Storm

All the dots in the upper left quadrant in the chart below are years where the US economy contracted but US stocks still outperformed less-risky Treasury bills. It's a great illustration of the forward-looking nature of markets. If you're worried, other investors are too, and that uncertainty is reflected in stock prices.

Annual Real GDP Growth
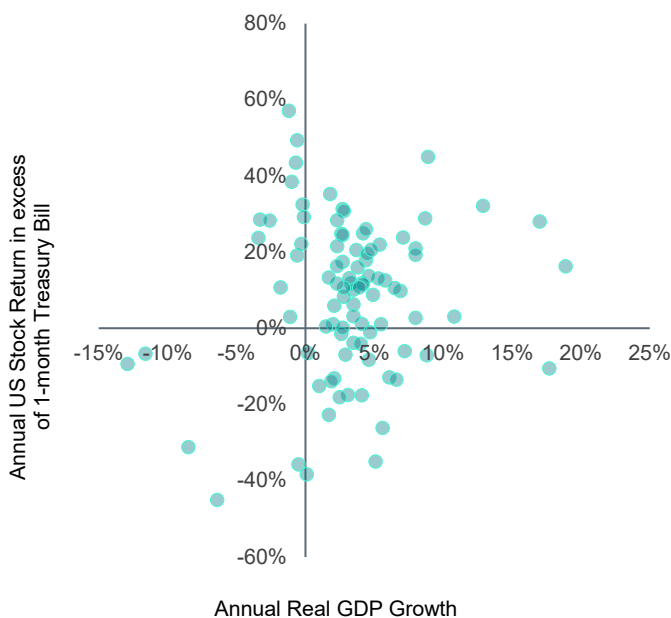
Past performance is no guarantee of future results.

Indices are not available for direct investment. Their performance does not reflect the expenses associated with the management of an actual portfolio. In USD. Annual GDP growth rates obtained from the US Bureau of Economic Analysis. GDP growth numbers are adjusted to 2012 USD terms to remove the effects of inflation. Data provided by Fama/French. Eugene Fama and Ken French are members of the Board of Directors of the general partner of and provide consulting services to, Dimensional Fund Advisors LP. Please see "Appendix Descriptions" for a description of the Fama/French index data.

Results shown during periods prior to each index's index inception date do not represent actual returns of the respective index. Other periods selected may have different results, including losses. Backtested index performance is hypothetical and is provided for informational purposes only to indicate historical performance had the index been calculated over the relevant time periods. Backtested performance results assume the reinvestment of dividends and capital gains.

Whether accompanied by recessions or not, market downturns can be unsettling. But over the past century, US stocks have averaged positive returns over one-year, three-year, and five-year periods following a steep decline.

A year after the S&P 500 crossed into bear market territory (a 20% fall from the market's previous peak), it rebounded by about 20% on average. And after five years, the S&P 500 averaged returns over 70%.[1]

Fama/French Total US Market Research Index Returns
July 1, 1926–December 31, 2021
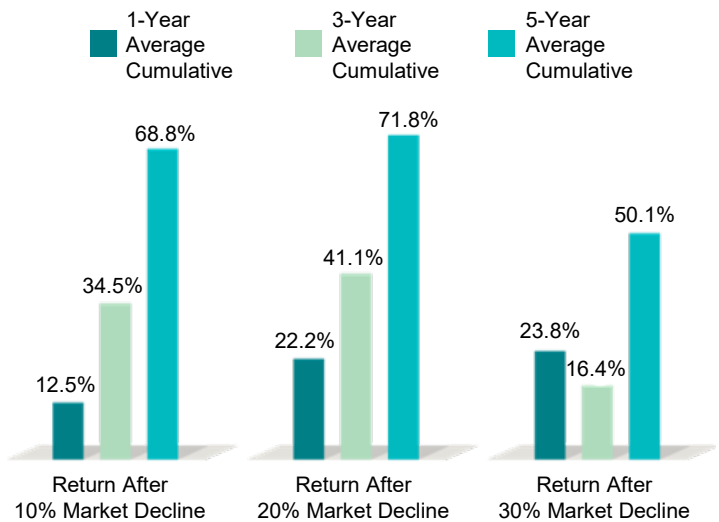
Past performance is no guarantee of future results.

Market declines or downturns are defined as periods in which the cumulative return from a peak is -10%, -20%, or -30% or lower. Returns are calculated for the 1-, 3-, and 5-year look-ahead periods beginning the day after the respective downturn thresholds of -10%, -20%, or -30% are exceeded. The bar chart shows the average returns for the 1-, 3-, and 5-year periods following the 10%, 20%, and 30% thresholds. For the 10% threshold, there are 29 observations for 1-year look-ahead, 28 observations for 3-year look-ahead, and 27 observations for 5-year look-ahead. For the 20% threshold, there are 15 observations for 1-year look-ahead, 14 observations for 3-year look-ahead, and 13 observations for 5-year look-ahead. For the 30% threshold, there are 7 observations for 1-year look-ahead, 6 observations for 3-year look-ahead, and 6 observations for 5-year look-ahead. Peak is a new all-time high prior to a downturn. Data provided by Fama/French and available at mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html. Fama/French Total US Market Research Index: 1926–present: Fama/French Total US Market Research Factor and One-Month US Treasury Bills. Source: Ken French website.

We believe that staying invested puts you in the best position to capture the recovery. If you take risk out of your portfolio, it should be a strategic, not tactical, choice. We believe the only good reason to sell out of a stock portfolio now—so long as it's diversified and low-cost—is because you learned something about your risk tolerance or your investment goals have changed.

Three Crucial Lessons for Weathering the Stock Market's Storm

(continued from page 33)

2. Time the market at your peril

When stocks have declined, it might be tempting to sell to stem further losses. You might think, "I'll sit out until things get a bit better." But by the time markets are less volatile, you'll have often missed part of the recovery. Yes, it stings to watch your portfolio shrink, but imagine how you'll feel when it's stuck while the market rebounds.

Big return days are hard to predict, and you really don't want to miss them. If you invested $1,000 in the S&P 500 continuously from the beginning of 1990 through the end of 2020, you would have $20,451. If you missed the single best day, you'd only have $18,329—and only $12,917 if you missed the best five days.[2]

History shows the stock market tends to rebound quickly. The same can't be said for individual stocks or even entire sectors. (How many railroad stocks do you own?) So, while investing means taking on some risk for expected reward, investors should mitigate risks where they can. Diversification is a top risk mitigation tool, along with investing in fixed income and having a financial plan.

3. It may be a good time to reassess your portfolio and your plan

We saw many fads crop up through the pandemic, from baking to puppy adoption. Did you experiment with one of the pandemic investment fads—FAANGs or meme stocks or dogecoin? If so, it may be time to put those fads in the rearview.

Do you know the names of all the stocks you own? Then you probably own too few. How much of your portfolio sits outside the US? Because about half the global market is comprised of foreign stocks. If you only invest in the S&P 500, you're missing half of the investment opportunity set. A market-cap-weighted global portfolio is a better starting point than chasing segments of the market that have outperformed in the past few years.

And if you want to outperform the market, allow decades of academic research to light the way. Portfolios focused on small caps, value stocks, and more profitable companies have had higher returns over the long run. The portfolio I use is invested across more than 10,000 global equities in over 40 countries.

Beyond a well-designed portfolio, one of the best ways to deal with volatile markets and disappointing returns is to have planned for them. A financial advisor can help you develop a plan that bakes in the chances you'll experience some market lows. And they can help you find the confidence to weather the current storm and get to the other side.

A sound approach to investing—through a plan, a well-designed portfolio, and an advisor—is the ultimate self-care during these rough markets. Your future self will thank you.

This piece first appeared in MarketWatch with the title "Follow these 3 crucial lessons for weathering the stock market's storm."

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

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

Sources and Descriptions of Data

DIMENSIONAL CORE PLUS 100/0 WEALTH INDEX MODEL
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
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 the 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
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 the 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
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 the 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 the 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 the 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.

Sources and Descriptions of Data

DIMENSIONAL US ADJUSTED MARKET 2 INDEX
January 1975–present: Compiled by Dimensional from CRSP and Compustat data. Targets all the securities in the eligible 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 eligible market is composed of securities of US companies traded on the NYSE, NYSE MKT (formerly AMEX), and Nasdaq Global Market. Exclusions: non-US companies, REITs, UITs, and investment companies. The index has been retrospectively calculated by Dimensional and did not exist prior to March 2007. Accordingly, the results shown during the periods prior to March 2007 do not represent actual returns of the index. Other periods selected may have different results, including losses. The calculation methodology for the index was amended in January 2014 to include profitability as a factor in selecting securities for inclusion in the index. The calculation methodology for the index was amended in December 2019 to include asset growth as a factor in selecting securities for inclusion in the index. Prior to January 1975: Compiled by Dimensional from CRSP and Compustat data. Targets all the securities in the eligible market with an emphasis on companies with smaller capitalization and lower relative price. The eligible market is composed of securities of US companies traded on the NYSE, NYSE MKT (formerly AMEX), and Nasdaq Global Market. Exclusions: non-US companies, REITs, UITs, and investment companies.

DIMENSIONAL US LARGE CAP HIGH PROFITABILITY INDEX
Compiled by Dimensional from CRSP and Compustat data. Consists of 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. The eligible market is composed of securities of US companies traded on the NYSE, NYSE MKT (formerly AMEX), and Nasdaq Global Market. 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. Accordingly, the results shown during the periods prior to December 2016 do not represent actual returns of the index. Other periods selected may have different results, including losses.

DIMENSIONAL US ADJUSTED MARKET VALUE INDEX
January 1975–present: Compiled by Dimensional from CRSP and Compustat data. Targets all the securities in the eligible market, excluding securities of companies with the largest market capitalizations and highest relative price. The index emphasizes 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 eligible market is composed of securities of US companies traded on the NYSE, NYSE MKT (formerly AMEX), and Nasdaq Global Market. Exclusions: non-US companies, REITs, UITs, and investment companies. The index has been retrospectively calculated by Dimensional and did not exist prior to March 2007. Accordingly, the results shown during the periods prior to March 2007 do not represent actual returns of the index. Other periods selected may have different results, including losses. The calculation methodology for the index was amended in January 2014 to include profitability as a factor in selecting securities for inclusion in the index. The calculation methodology for the index was amended in December 2019 to include asset growth as a factor in selecting securities for inclusion in the index. Prior to January 1975: Compiled by Dimensional from CRSP and Compustat data. Targets all the securities in the eligible market with an emphasis on securities with smaller capitalization and lower relative price, excluding securities with the largest market capitalizations and highest relative price. The eligible market is composed of securities of US companies traded on the NYSE, NYSE MKT (formerly AMEX), and Nasdaq Global Market. Exclusions: non-US companies, REITs, UITs, and investment companies.

DIMENSIONAL INTERNATIONAL ADJUSTED MARKET INDEX
Compiled by Dimensional from Bloomberg securities data. Targets all of the securities in the eligible markets 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 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 monthly returns are computed as the simple average of the monthly returns of four subindices, each one reconstituted once a year at the end of each quarter of the year. Maximum index weight of any one company is capped at 5%. Countries currently included are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, the Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, and the UK. Exclusions: REITs and investment companies. The index has been retrospectively calculated by Dimensional and did not exist prior to April 2008. Accordingly, the results shown during the periods prior to April 2008 do not represent actual returns of the index. The calculation methodology for the index was amended in January 2014 to include profitability as a factor in selecting securities for inclusion in the index. The calculation methodology for the index was amended in November 2019 to include asset growth as a factor in selecting securities for inclusion in the index.

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 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 monthly returns are computed as the simple average of the monthly returns of four sub-indices, each one reconstituted once a year at the end of each quarter of the year. Maximum index weight of any one company is capped at 5%. Countries currently included are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, the Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, and the UK. Exclusions: REITs and investment companies. The index has been retrospectively calculated by Dimensional and did not exist prior to April 2008. Accordingly, the results shown during the periods prior to April 2008 do not represent actual returns of the index. The calculation methodology for the index was amended in January 2014 to include profitability as a factor in selecting securities for inclusion in the index. The calculation methodology for the index 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. Consists of large cap companies with high relative price in eligible markets whose profitability is in the top 35% of their country's large cap universe, 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. The index monthly returns are computed as the simple average of the monthly returns of four sub-indices, each one reconstituted once a year at the end of each quarter of the year. Maximum index weight of any one company is capped at 5%. Countries currently included are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Shown in gItaly, Japan, the Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, and the UK. Exclusions: REITs and investment companies. The index has been retrospectively calculated by Dimensional and did not exist prior to December 2016. Accordingly, the results shown during the periods prior to December 2016 do not represent actual returns of the index.

DIMENSIONAL EMERGING MARKETS 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 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 monthly returns are computed as the simple average of the monthly returns of four sub-indices, each one reconstituted once a year at the end of each quarter of the year. Maximum index weight of any one company is capped at 5%. Countries currently included are Brazil, Chile, China, Colombia, the Czech Republic, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Peru, the Philippines, Poland, Russia, South Africa, Taiwan, Thailand, and Turkey. Exclusions: REITs and investment companies. The index has been retrospectively calculated by Dimensional and did not exist prior to April 2008. Accordingly, the results shown during the periods prior to April 2008 do not represent actual returns of the index. The calculation methodology for the index was amended in January 2014 to include profitability as a factor in selecting securities for inclusion in the index. The calculation methodology for the index 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

Compiled by Dimensional from Bloomberg securities data. Consists of companies whose relative price is in the bottom 33% of their country's respective constituents, 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. The index monthly returns are computed as the simple average of the monthly returns of four sub-indices, each one reconstituted once a year at the end of each quarter of the year. Maximum index weight of any one company is capped at 5%. Countries currently included are Brazil, Chile, China, Colombia, the Czech Republic, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Peru, the Philippines, Poland, Russia, South Africa, Taiwan, Thailand, and Turkey. Exclusions: REITs and investment companies. The index has been retrospectively calculated by Dimensional and did not exist prior to April 2008. Accordingly, the results shown during the periods prior to April 2008 do not represent actual returns of the index. The calculation methodology for the index was amended in January 2014 to include profitability as a factor in selecting securities for inclusion in the index. The calculation methodology for the index 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
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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 retrospectively calculated by Dimensional and did not exist prior to January 2020. Accordingly, results shown during the periods prior to January 2020 do not represent actual returns of the index. Other periods selected may have different results, including losses.

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. Rebalanced monthly. The index has been retrospectively calculated by Dimensional and did not exist prior to November 2016. Accordingly, results shown during the periods prior to November 2016 do not represent actual returns of the index. Other periods selected may have different results, including losses.

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. Eligible currencies: AUD, CAD, CHF, EUR, GBP, JPY, and USD. Within the eligible universe, we apply market weights to construct the index. Rebalanced monthly. The index has been retroactively calculated by Dimensional and did not exist prior to March 2020. Accordingly, results shown during the periods prior to March 2020 do not represent actual returns of the index. Other periods selected may have different results, including losses.

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: Australia, Austria, 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. Rebalanced monthly. The index has been retrospectively calculated by Dimensional and did not exist prior to January 2019. Accordingly, results shown during the periods prior to January 2019 do not represent actual returns of the index. Other periods selected may have different results, including losses.

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. Eligible currencies: AUD, CAD, CHF, EUR, GBP, JPY, and USD. 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. Rebalanced monthly. The index has been retrospectively calculated by Dimensional and did not exist prior to January 2020. Accordingly, results shown during the periods prior to January 2020 do not represent actual returns of the index. Other periods selected may have different results, including losses. 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: Australia, Austria, Belgium, Canada, France, Germany, Japan, the Netherlands, New Zealand, Norway, Spain, Sweden, Switzerland, the UK, and the US as data becomes available. Rebalanced monthly based on market weights.

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, and USD. 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. Rebalanced monthly. The index has been retrospectively calculated by Dimensional and did not exist prior to November 2017. Accordingly, results shown during the periods prior to November 2017 do not represent actual returns of the index. Other periods selected may have different results, including losses.

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. Eligible currencies: AUD, CAD, CHF, EUR, GBP, JPY, and USD. 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. Rebalanced monthly. The index has been retrospectively calculated by Dimensional and did not exist prior to January 2020. Accordingly, results shown during the periods prior to January 2020 do not represent actual returns of the index. Other periods selected may have different results, including losses.