

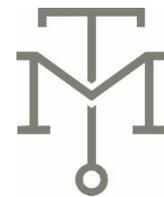
TIMONIER

Wealth Beyond Financial

# From the Engine Room

Quarterly Market Review

First Quarter 2022





# 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:

Market Summary

Focus and Perspective

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

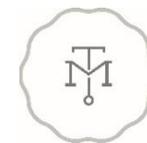
Quarterly Topic: Is It Time to Sell Stocks?

Appendix

# Focus and Perspective

Q1 2022

Nicholas Baker, AAMS®  
Wealth Planning Advisor



Investors faced historic challenges during the first quarter of the year as markets fell into correction territory. From red hot inflation to a Fed rate hike, Russia's invasion of Ukraine to rising oil prices, investors had to adjust to a rapidly changing environment. Year-to-date through March, the S&P 500 declined 5%, the Dow 4.6% and the Nasdaq 9.1%. Despite this, markets stabilized and bounced back during the final weeks of the quarter as more clarity emerged. Additionally, this period follows an exceptional two years of portfolio performance for diversified investors. How can long-term investors stay patient and focused throughout the rest of 2022 after a difficult start to the year?

As the old saying goes, "it ain't what you don't know that gets you into trouble, it's what you know for sure that just ain't so." After all, markets are designed to incorporate a constant flow of new information into asset prices. Whether dealing with unexpected economic data or destabilizing geopolitical news, investors can decide quickly how it might impact stocks, bonds and their portfolios.

However, what is problematic is when markets expect one thing and get another. Fortunately, in the case of the Fed, the situation played out exactly as many expected. Unfortunately, this wasn't the case with Russia and Ukraine. There are at least three key lessons that are applicable to Q2 and beyond.

First, markets widely expected the Fed to begin raising policy rates and to end its asset purchase program in response to rising inflation and strong economic growth. Not only did the Fed do exactly that, but they will likely accelerate their pace of tightening in the coming months. The Fed's last set of projections show that the fed funds rate will reach 1.75% by the end of the year whereas more recent statements by Fed officials and fed funds futures show that 2.5% is more likely. This means that 50 basis point rate hikes are possible at upcoming meetings.

The fact that the Fed avoided surprising the market is what allowed stocks to stabilize quickly. The S&P 500 rebounded 8.6% in the second half of March while the Nasdaq recovered 13%. Both are still negative on the year, and the Nasdaq is still in correction territory, but major stock indices have been much calmer.

This serves as a reminder that Fed rate hikes are not only normal during economic expansions, but they are justified today given the strong economy and higher prices. It also shows that markets can recover when investors least expect it, and often when the situation seems the worst.

# Focus and Perspective

Q1 2022



Second, perhaps the most persistent impact of the Fed's change in policy is its effect on interest rates. The 10-year Treasury yield has risen above 2% for the first time since before the pandemic. Much of the yield curve, from the 2-year on, has flattened completely. The yield curve even "inverted" briefly which many economists use as a predictor of recession, although there is often a long lead time before the economy truly decelerates.

This matters because interest rates both *affect* all parts of the economy and *reflect* underlying economic trends. The flattening of the curve is natural in a maturing business cycle as short-term rates catch up to long-term ones. This can slow growth and prevent an overheating economy by raising the cost of borrowing for businesses, borrowers, homebuyers, etc. However, rates at this level are still quite low by historical standards, especially with inflation at its highest level since the early 1980s. This trend will likely continue through the rest of the year.

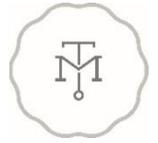
Finally, unlike the Fed, the conflict in Ukraine *was* a surprise for financial markets and impacted the perception of risk and energy prices. While the humanitarian consequences are still at the forefront and the situation is still evolving, the impact on markets has shifted. Initially, the invasion resulted in market swings and caused oil prices to spike, with Brent crude rising to \$128 per barrel. However, as Ukraine has stood its ground in many major cities, markets have stabilized, and oil prices have fallen into a range.

While every geopolitical crisis is different, history shows that markets are usually able to adjust and move forward. This was true during Russia's annexation of Crimea, the wars in Afghanistan and Iraq, after 9/11, and more. This was even the case during the Cold War and throughout other conflicts of the 20th century. Not overreacting to these events, regardless of the news coverage and headlines, has often been rewarded.

Thus, while we are not out of the woods yet, investors ought to remain focused and disciplined throughout challenging periods in the market. The first quarter underscores that much of investing requires taking the good with the bad. In fact, investors are rewarded in the long run exactly because they can stick it out in difficult times. Below are five charts that help provide insight and perspective throughout the rest of the year.

# 5 Key Investor Takeaways

Q1 2022



## 1. Markets have stabilized in recent weeks

Market and Economic Chartbook | April 7, 2022

### Stock Market Returns in Perspective

S&P 500 Index over different time periods, reindexed



Latest data point is Apr 6, 2022

The S&P 500 and other major stock indices have stabilized in recent weeks. Not only was the Fed announcement expected, but oil prices and other factors have calmed as well. Investors should also remember that the market has performed exceptionally well over the past several years, despite the volatility of the first quarter

Source: Clearnomics, Standard & Poor's, New York Times  
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U.S. Stock Market

# 5 Key Investor Takeaways

Q1 2022



## 2. Historically, markets recover from corrections in a matter of months

Market and Economic Chartbook | April 7, 2022

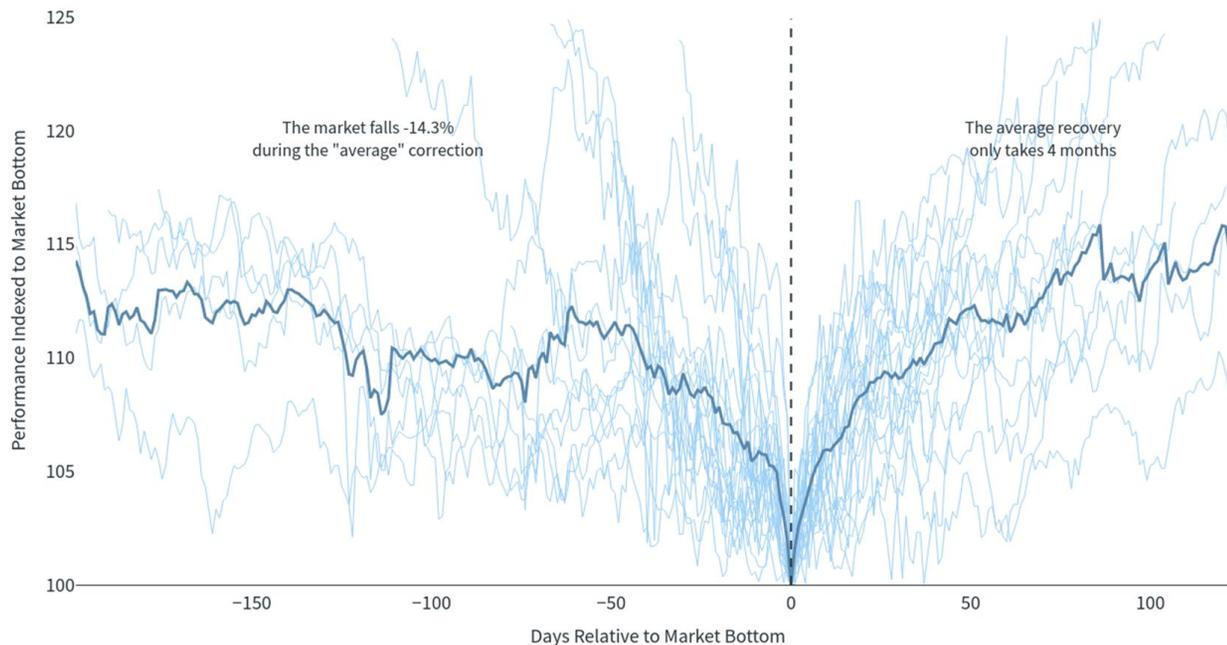
U.S. Stock Market

### Market Corrections and Recoveries

*S&P 500 total returns since World War II. Market corrections are peak-to-trough declines of 10% to 20%. The bold line is an average across all corrections.*



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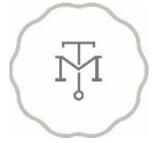


Corrections are not only normal for the stock market but are unavoidable. For long-term investors, markets can also begin to recover without notice - often when the situation seems the worst. Thus, it's important to stay invested and not overreact to short-term events.

Source: Clearnomics,  
Standard & Poor's  
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# 5 Key Investor Takeaways

Q1 2022



## 3. Markets can adjust to geopolitical events quickly

Market and Economic Chartbook | April 7, 2022

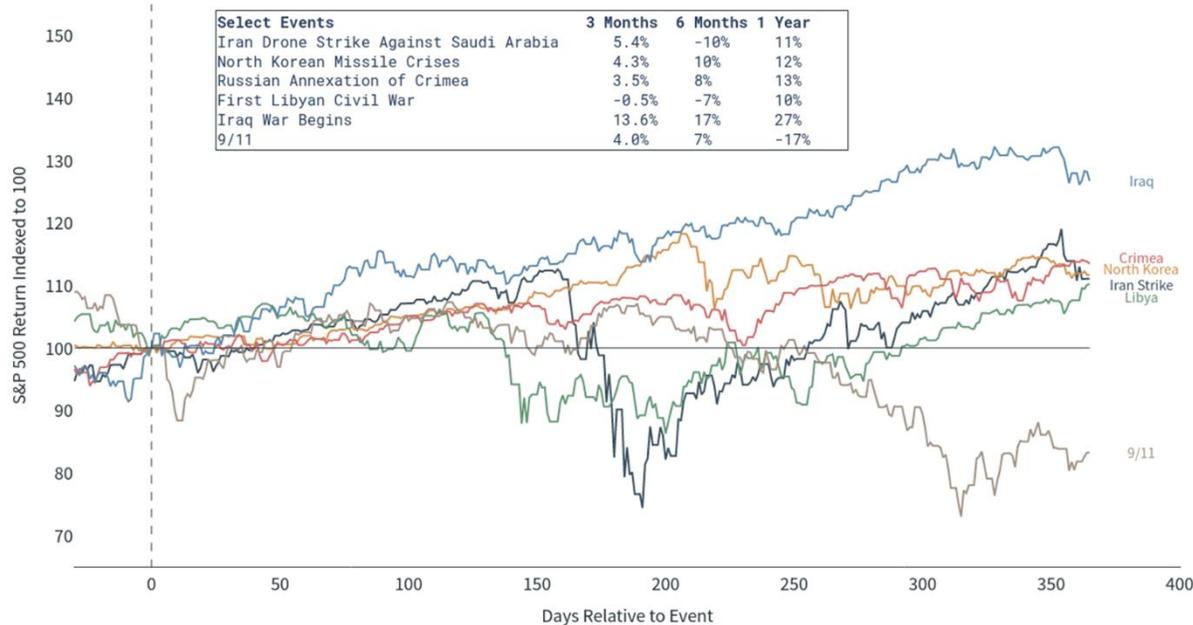
### Stocks and Geopolitical Events

Select events and S&P 500 total returns 3, 6 and 12 months after



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Geopolitics



Historically, geopolitical events have had a mixed effect on markets. In some cases, such as Russia's annexation of Crimea, markets brush these events aside. In other cases, they might make a bad situation worse, such as when 9/11 occurred during the dot-com bear market. However, in all cases, markets tend to adjust quickly.

Source: Clearnomics,  
Standard & Poor's  
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# 5 Key Investor Takeaways

## Q1 2022



### 4. The yield curve has flattened significantly

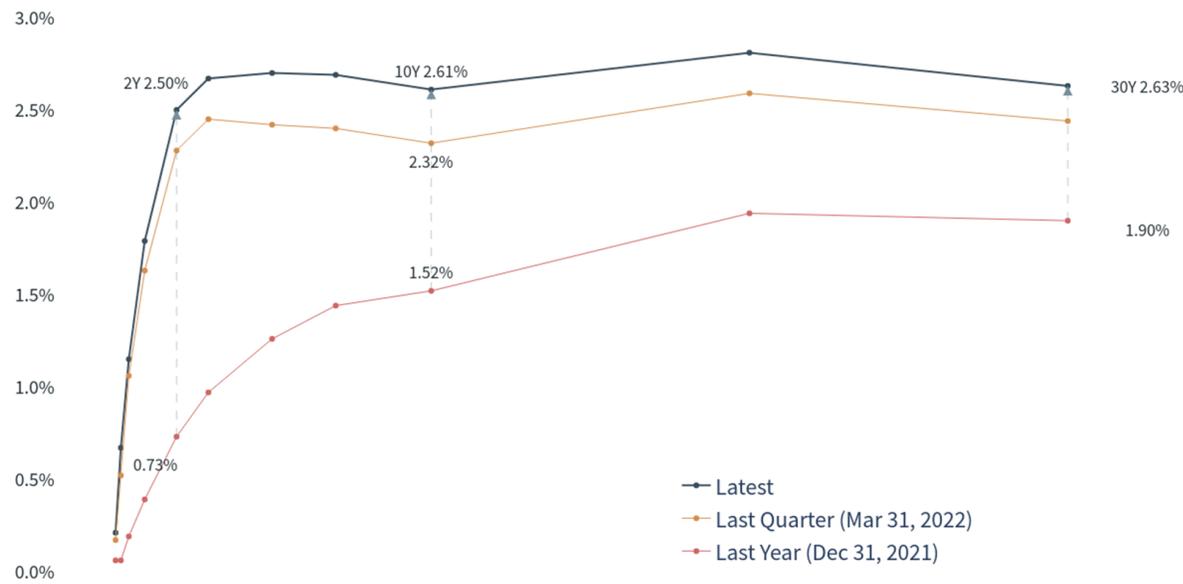
Market and Economic Chartbook | April 7, 2022

## Treasury Yield Curve

The shape of the U.S. Treasury curve last year versus today



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Latest data point is Apr 6, 2022

The yield curve has flattened with medium and long-term rates jumping in the past several weeks. The short end of the curve, which is heavily influenced by the Fed, should begin to increase as policy rates rise. A flattening curve is normal as the business cycle evolves.

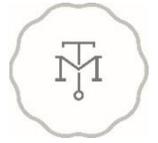
Interest Rates

Source: Federal Reserve

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# 5 Key Investor Takeaways

Q1 2022

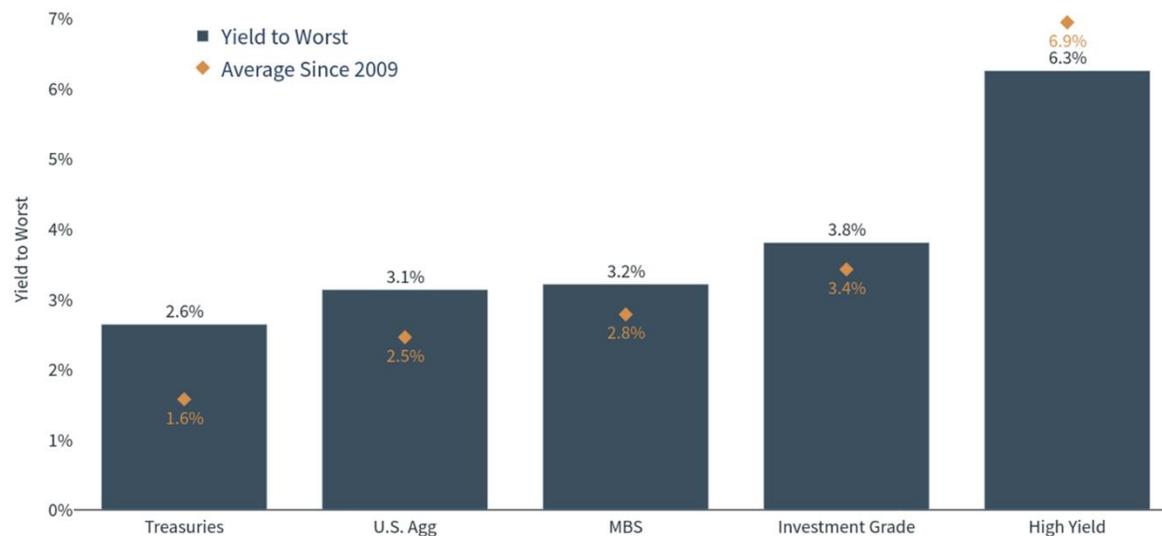


## 5. The silver lining is that it's easier to generate portfolio income

Market and Economic Chartbook | April 7, 2022

### Traditional Sources of Bond Yield

*Yield to worst and averages since 2009*



Latest data point is Apr 6, 2022

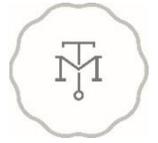


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Although this has been a challenging year so far for bonds, the silver lining is that yields are higher and, in many cases, above long run averages. This is an improvement for those investors who rely on portfolio income, especially for those in or near retirement.

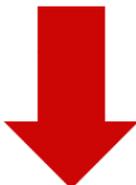
The bottom line? Despite the many shocks and unexpected events in the first quarter, investors should continue to stay patient and focused as markets stabilize in the second quarter and beyond.

Source: Clearnomics,  
Bloomberg  
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# 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
<b>Q1 2022</b>	<b>STOCKS</b>				<b>BONDS</b>	
	<b>-5.28%</b>	<b>-4.81%</b>	<b>-6.97%</b>	<b>-3.81%</b>	<b>-5.93%</b>	<b>-4.05%</b>
						
<b>Since Jan. 2001</b>						
Average Quarterly Return	2.4%	1.6%	2.8%	2.6%	1.0%	1.0%
Best Quarter	22.0%	25.9%	34.7%	32.3%	4.6%	4.6%
	<b>2020 Q2</b>	<b>2009 Q2</b>	<b>2009 Q2</b>	<b>2009 Q3</b>	<b>2001 Q3</b>	<b>2008 Q4</b>
Worst Quarter	-22.8%	-23.3%	-27.6%	-36.1%	-5.9%	-4.1%
	<b>2008 Q4</b>	<b>2020 Q1</b>	<b>2008 Q4</b>	<b>2008 Q4</b>	<b>2022 Q1</b>	<b>2022 Q1</b>

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

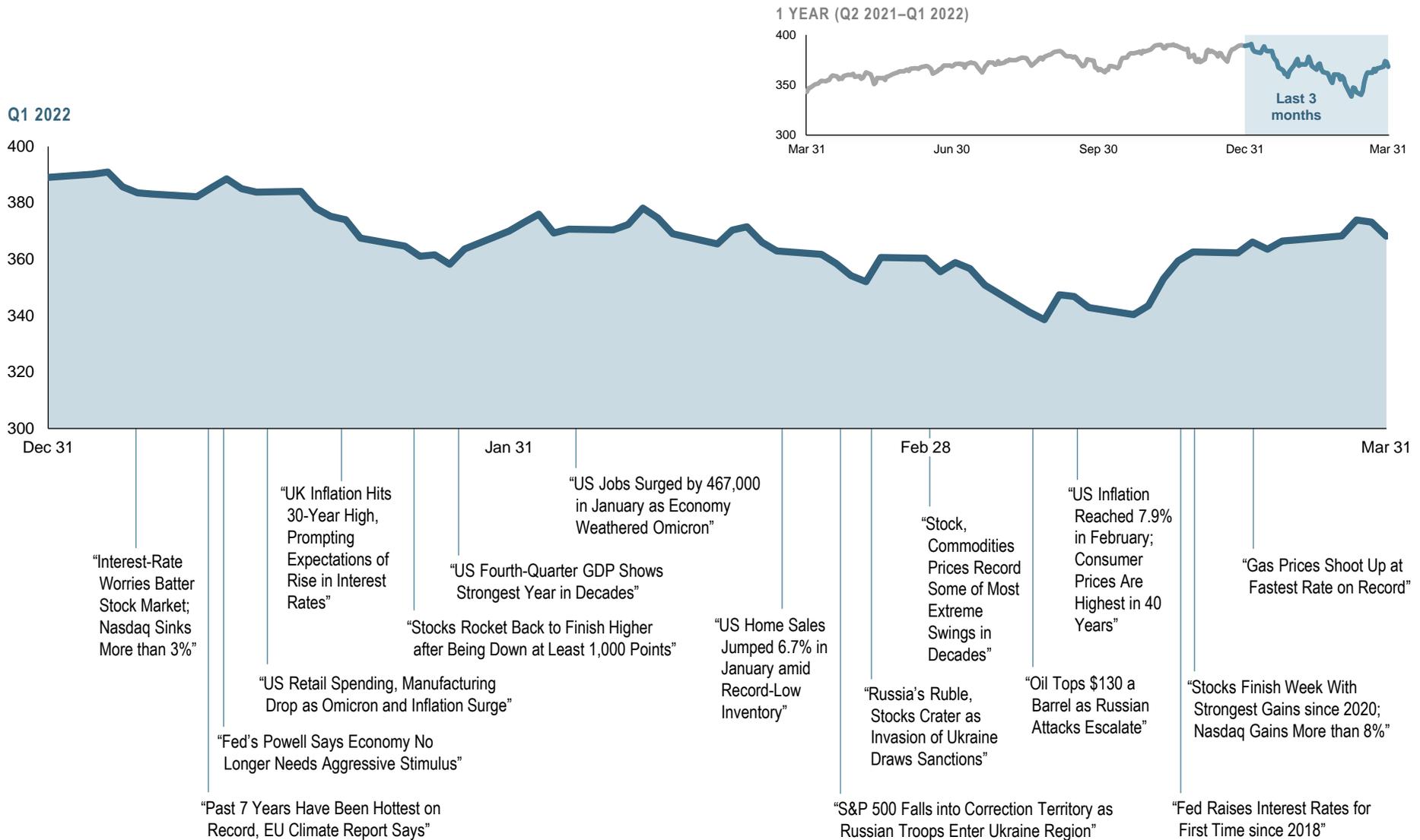
	US Stock Market	International Developed Stocks	Emerging Markets Stocks	Global Real Estate	US Bond Market	Global Bond Market ex US
1 Year	STOCKS				BONDS	
	11.92% 	3.04% 	-11.37% 	18.97% 	-4.15% 	-3.56% 
5 Years						
	15.40% 	7.14% 	5.98% 	7.10% 	2.14% 	2.25% 
10 Years						
	14.28% 	6.25% 	3.36% 	7.48%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

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# 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.*

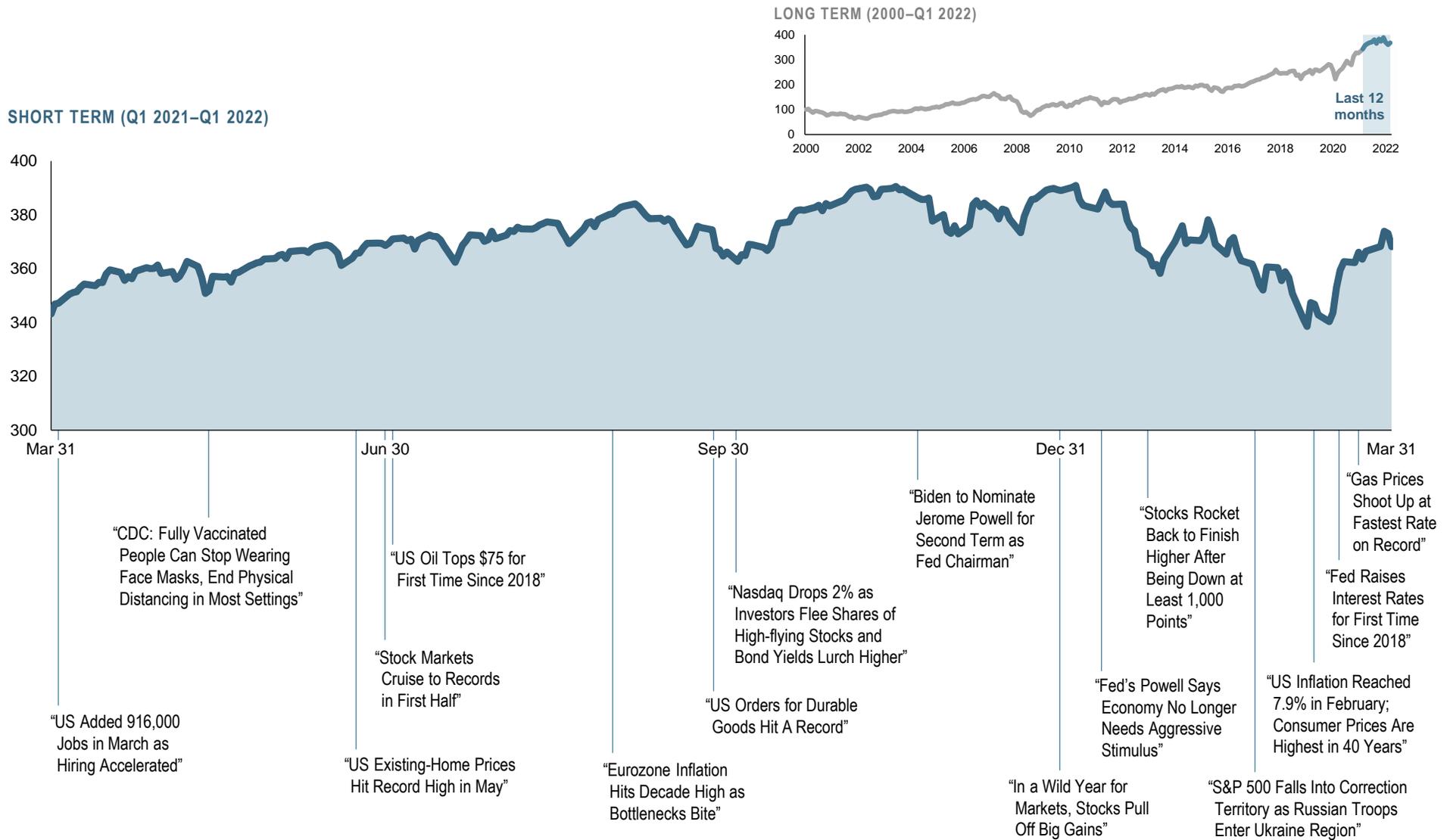
Graph Source: MSCI ACWI Index [net dividends], MSCI data © MSCI 2022, all rights reserved.

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

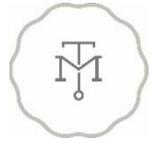
MSCI All Country World Index with selected headlines from past 12 months



*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 dividends], MSCI data © MSCI 2022, all rights reserved.

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# US Stocks

## First quarter 2022 index returns

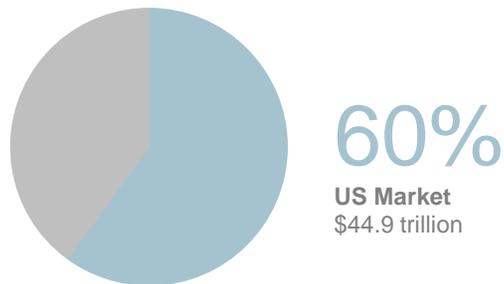
The US equity market posted negative returns for the quarter and underperformed non-US developed markets, but outperformed emerging markets.

Value outperformed growth.

Small caps underperformed large caps.

REIT indices outperformed equity market indices.

### World Market Capitalization—US



### Ranked Returns (%)



### Period Returns (%)

Asset Class	QTR	* Annualized			
		1 Year	3 Years*	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

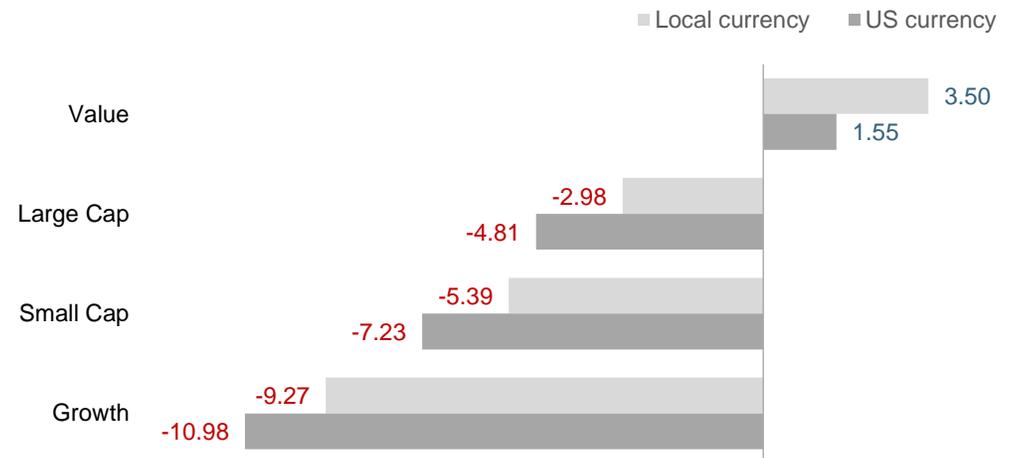
## First quarter 2022 index returns

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.

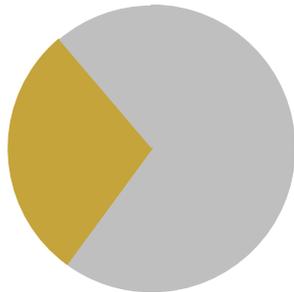
### Ranked Returns (%)



### World Market Capitalization—International Developed

29%

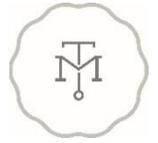
International  
Developed Market  
\$21.5 trillion



### Period Returns (%)

Asset Class	QTR	1 Year	* Annualized		
			3 Years*	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

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# 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.

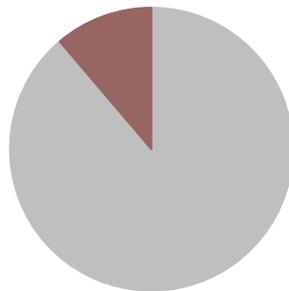
Value outperformed growth.

Small caps outperformed large caps.

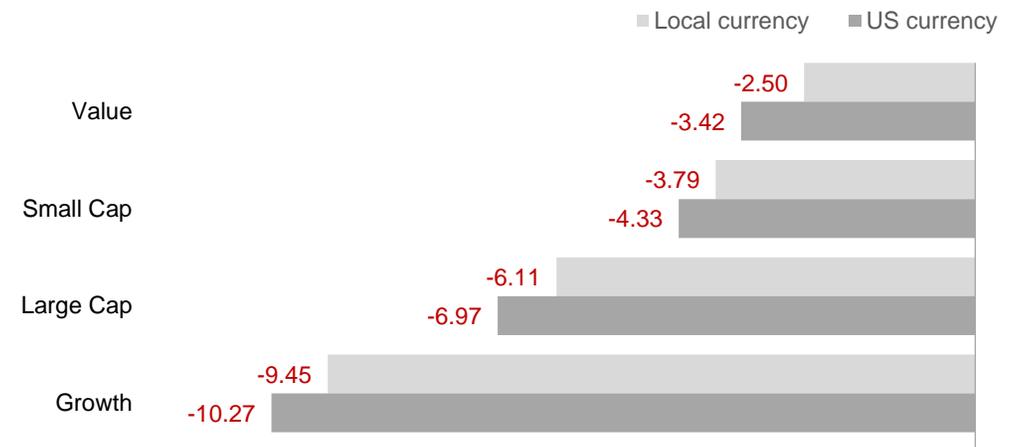
### World Market Capitalization—Emerging Markets

11%

Emerging Markets  
\$8.4 trillion



### Ranked Returns (%)



### Period Returns (%)

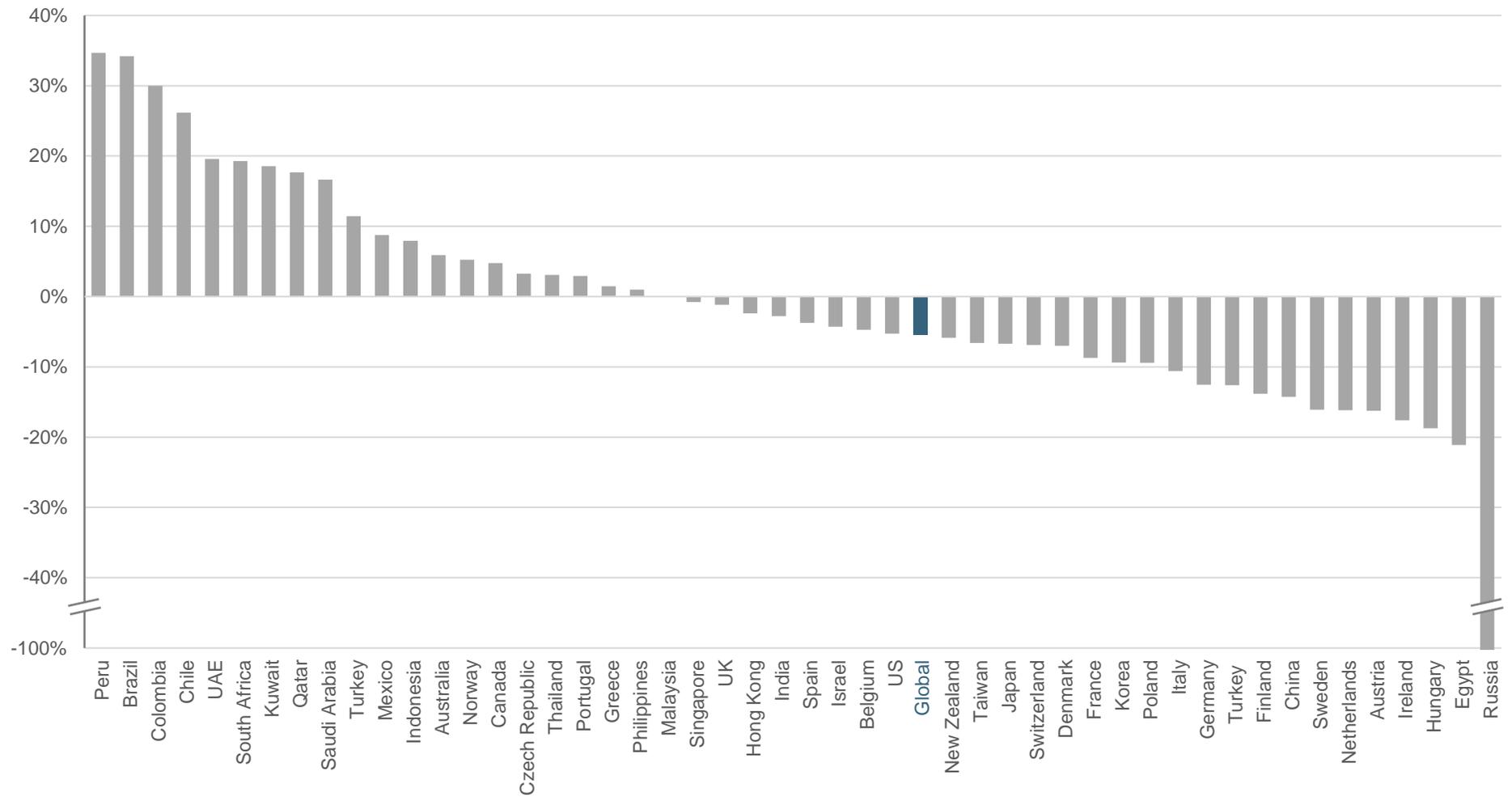
Asset Class	QTR	1 Year	* Annualized		
			3 Years*	5 Years*	10 Years*
Value	-3.42	-3.53	3.22	4.24	1.58
Small Cap	-4.33	5.52	11.93	7.81	5.31
Large Cap	-6.97	-11.37	4.94	5.98	3.36
Growth	-10.27	-18.29	6.42	7.51	5.00

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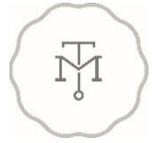
# Country Returns

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)

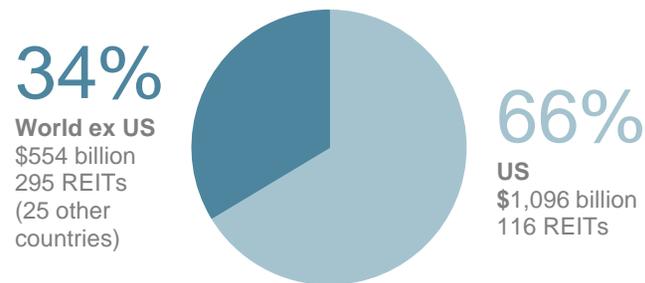
First quarter 2022 index returns

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	* Annualized		
			3 Years*	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.

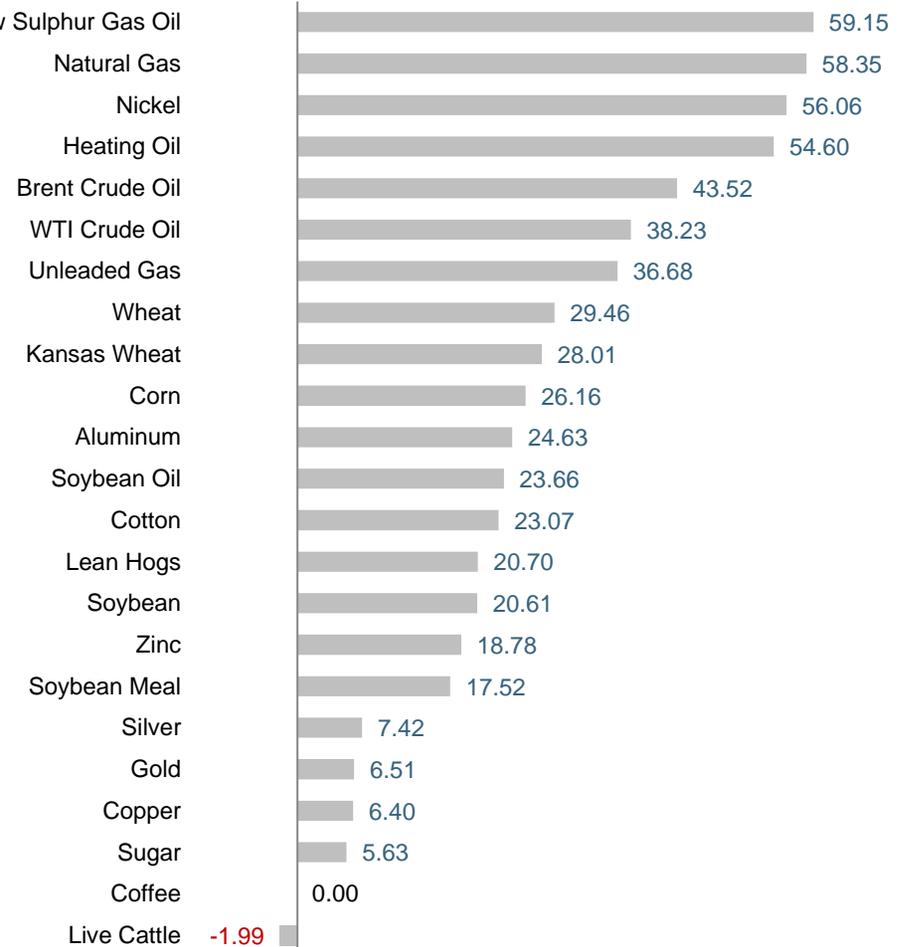
Low Sulphur Gas Oil and Natural Gas were the best performers, returning +59.15% and +58.35% during the quarter, respectively. Live Cattle and Coffee were the worst performers, returning -1.99% and 0.00% during the quarter, respectively.

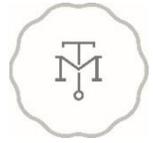
### Period Returns (%)

\* Annualized

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

### Ranked Returns (%)





# 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%.<sup>1</sup>

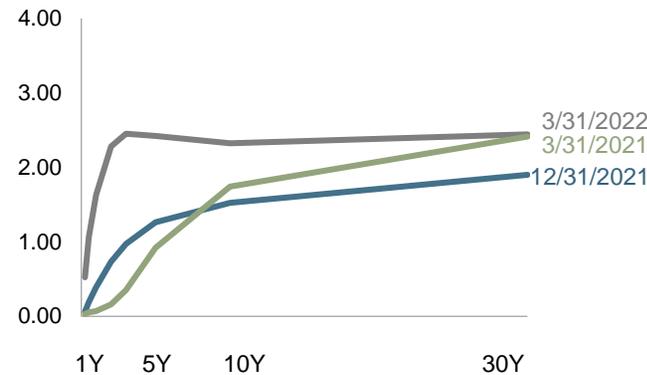
The total return for short-term municipal bonds was -3.33% and -5.77% for intermediate-term municipal bonds. Within the municipal fixed income market, general obligation bonds outperformed revenue bonds, returning -6.07% versus -6.54%, respectively.<sup>2</sup>

1. Bloomberg US Corporate Bond Index.

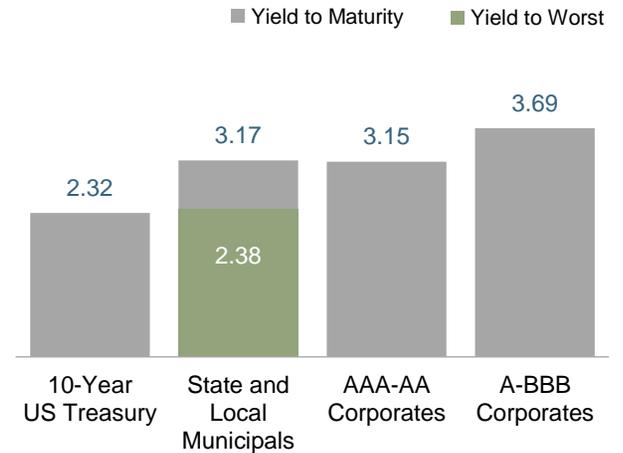
2. Bloomberg Municipal Bond Index.

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 (S&BBI) 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.

### US Treasury Yield Curve (%)



### Bond Yield Across Issuers (%)



### Period Returns (%)

Asset Class	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

\*Annualized



# Global Fixed Income

## First quarter 2022 yield curves

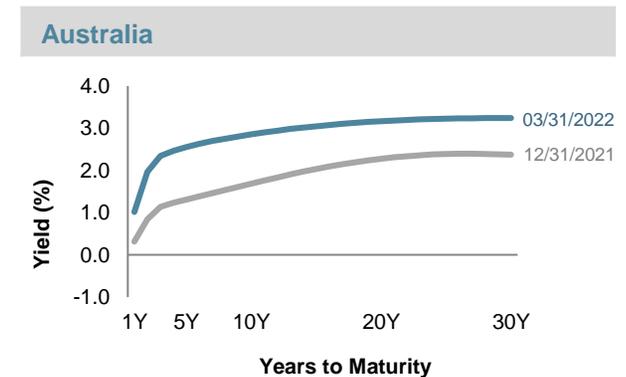
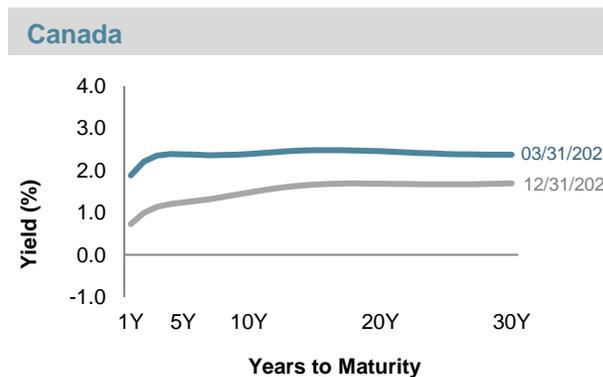
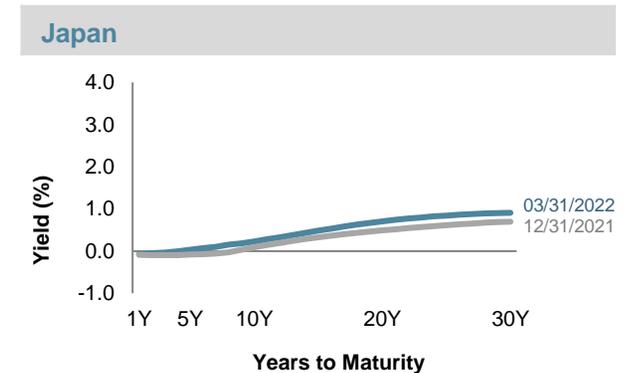
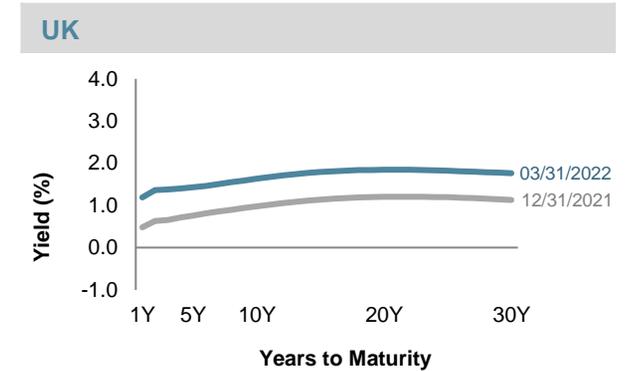
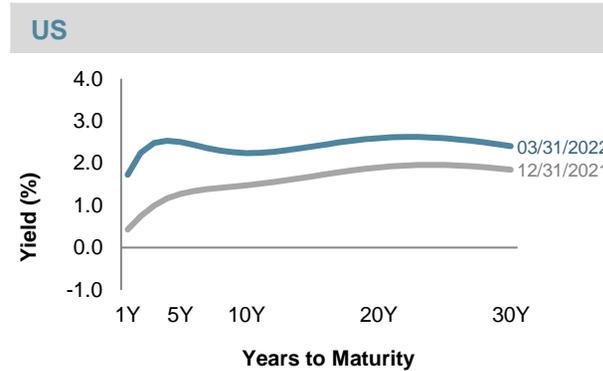
Interest rates increased across all maturities within the global developed markets for the quarter.

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

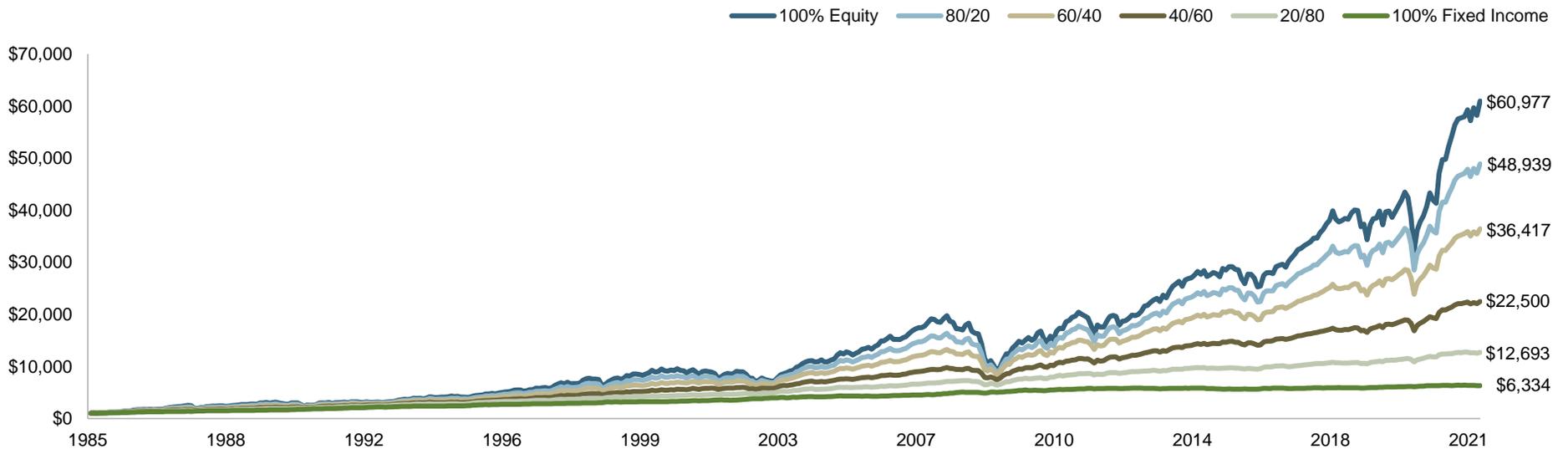
These indices illustrate the performance of different global stock/bond mixes and highlight the benefits of diversification. Mixes with larger allocations to stocks are considered riskier but have higher expected returns over time.

## Period Returns (%)

\* Annualized

Dimensional Core Plus Wealth Index Model	3 Month	1 Year	3 Years*	5 Years*	10 Years*	10-Year STDEV <sup>1</sup>
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 \$1,000. 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 stocks<sup>1</sup> have slumped, and investors have been confronted with worrisome headlines<sup>2</sup> 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.<sup>3</sup>

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%

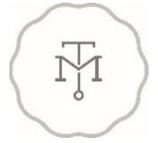
**Past performance is no guarantee of future results. Performance may increase or decrease as a result of currency fluctuations.**

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?

(continued from page 23)

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**).

## 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.

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 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*.<sup>4</sup> But no crash occurred, and the S&P 500 had its highest September return since 1939.<sup>5</sup>

The money management industry is highly competitive, with more stock mutual funds and ETFs available in the US than listed stocks.<sup>6</sup> 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 funds<sup>7</sup>, each holding a mix of stocks and bonds:

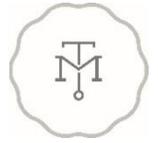
- **Balanced:** Minimal change in allocation to stocks
- **Tactical Asset Allocation:** Periodic shifts in allocation to stocks

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.



# Is It Time to Sell Stocks?

(continued from page 24)

As a group, funds that sought to enhance results by opportunistically shifting assets between stocks and fixed income underperformed funds that simply held a relatively static mix (see **Exhibit 3**). Morningstar further pointed out that if the performance of

## EXHIBIT 3

### Scare Tactics

% Annualized Return through August 31, 2021	3 Year	5 Year	10 Year
Tactical Asset Allocation	8.36	8.38	6.18
Balanced	10.49	9.89	8.93
Tactical Underperformance	-2.13	-1.51	-2.75

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

Source Morningstar. Morningstar defines Tactical Allocation portfolios as those that “seek to provide capital appreciation and income by actively shifting allocations across investments. These portfolios have material shifts across equity regions and bond sectors on a frequent basis. To qualify for the tactical allocation category, the fund must have minimum exposures of 10% in bonds and 20% in equity. Next, the fund must historically demonstrate material shifts in sector or regional allocations either through a gradual shift over three years or through a series of material shifts on a quarterly basis. Within a three-year period, typically the average quarterly changes between equity regions and bond sectors exceeds 15% or the difference between the maximum and minimum exposure to a single equity region or bond sector exceeds 50%.”

non-surviving tactical funds were included, the numbers would be even worse. Its conclusion: “The failure of tactical asset allocation funds suggests investors should not only stay away from funds that follow tactical strategies, but they should also avoid making short-term shifts between asset classes in their own portfolios.”<sup>8</sup>

We should not be surprised by these results. Successful timing requires two correct decisions: when to pare back the allocation to stocks and when to increase it again. Watching a portfolio shrink in value during a market downturn can be discomfoting. But investors seeking to avoid the pain by temporarily shifting away from their long-term strategy may wind up trading one source of anguish for another. The initial upsurge in prices from their lows often takes many investors by surprise, and they find it extraordinarily difficult to buy stocks that were available at sharply lower prices a few weeks earlier. The opportunity cost can be substantial: Over the 25-year period ending in 2021, a hypothetical \$100,000 invested in the stocks that make up the Russell 3000 Index would have grown to \$1,036,694.<sup>9</sup> But during this quarter-century, missing just the best consecutive 90-trading-day period (which ended June 22, 2020) shaved the ending wealth figure by an alarming 33%.<sup>10</sup>

Add to this the likelihood of increased transaction costs and the potential tax consequences of a short-term trading strategy, and the odds of adding value through market timing grow even slimmer.

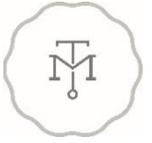
As a thoughtful financial advisor once observed, “A portfolio is like a bar of soap. The more you handle it, the less you have.”

8. Amy C. Arnott, “Tactical Asset Allocation: Don’t Try This at Home,” Morningstar, September 20, 2021.

9. Data presented in the use of the information contained herein. “Dimensional” refers to the Dimensional separate but affiliated entities generally, rather than to one particular entity. These entities are Dimensional Fund Advisors LP, Dimensional Fund Advisors Ltd., Dimensional Ireland Limited, DFA Australia Limited, Dimensional Fund Advisors Canada ULC, Dimensional Fund Advisors Pte. Ltd., Dimensional Japan Ltd., and Dimensional Hong Kong Limited. Dimensional Hong Kong Limited is licensed by the Securities and Futures Commission to conduct Type 1 (dealing in securities) regulated activities only and does not provide asset management services. Dimensional Fund Advisors LP is an investment advisor registered with the Securities and Exchange Commission. Investment products: • Not FDIC Insured • Not Bank Guaranteed • May Lose Value. Dimensional Fund Advisors does not have any bank affiliates.

10. Frank Russell Company is the source and owner of the trademarks, service marks, and copyrights related to the Russell Indexes. The example of an investor missing the best consecutive 90 trading days assumes that the hypothetical portfolio fully divested its holdings at the end of the day before the 90-day period began, held cash for the period, then reinvested the entire portfolio in the Russell 3000 Index at the end of the period.

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# Appendix



# Dimensional Core Plus Wealth Index Models

Weights (%)



<b>Equity Total</b>	<b>0%</b>	<b>20%</b>	<b>40%</b>	<b>60%</b>	<b>80%</b>	<b>100%</b>
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
<b>Fixed Income Total</b>	<b>100%</b>	<b>80%</b>	<b>60%</b>	<b>40%</b>	<b>20%</b>	<b>0%</b>
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
<b>Equity</b>				
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
<b>Fixed Income</b>				
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

## **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

## **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

## **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**

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## **DIMENSIONAL SHORT-DURATION REAL RETURN INDEX**

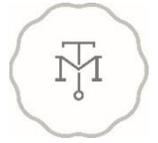
Compiled by Dimensional using data provided by Bloomberg. Includes securities in Bloomberg US 3–5 Year Government, Credit Aaa, Aa, A, Baa indices; Bloomberg US 1–3 Year Government, Credit Aaa, Aa, A, Baa indices; Bloomberg Inflation Swap USD 2YR Zero Coupon Index (Excess Return); and Bloomberg Inflation 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 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.



# Sources and Descriptions of Data

## **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.