Market Call

The Changing Investment Environment & Your Portfolio

April 20, 2022

JOHNSON FINANCIAL GROUP®

BANKING
WEALTH
INSURANCE

Featured Speakers

Brian Andrew
Chief Investment Officer, Johnson Financial Group

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SVP, Director of Wealth Strategy, Johnson Financial Group

Adam Schickling
Economist, Vanguard

What’s Your Story?

What’s Your Story?

Value (in order of importance)	Goal	Implement	On Track
One’s judgment of what is important in life; why you are planning ***Example:*** *Education*	Your purpose for planning; putting number(s) to the value. ***Example:*** *Children graduate with four-year degree from a respected university with no debt.*	Behaviors and assumptions required to achieve the goal. ***Example:*** *Save $500 per month in a college savings vehicle for 15 years with an assumed 6% rate of return.*	Yes/No

Vanguard

Striking a better balance

Vanguard Global Investment Strategy Group
Economy and Markets Research Team
2Q 2022

Macro policy takes center stage in 2022 and beyond

Growth | Inflation | Monetary policy

There is less unevenness in our cyclical growth outlook. Persistent above-trend growth is more likely in developed markets than in emerging markets.

Growth in 2022 is expected to slow but remain robust in China, the U.S., the U.K., Australia, and Europe. Emerging markets face more uncertainty.

Monetary and fiscal stimulus, pent-up demand, and global supply shortages all continue to push global inflation above trend.

Although inflation is a worldwide phenomenon, wage pressures—not CPI inflation—will dictate the pace of monetary tightening.

Policy has tightened some, but we expect it to remain easy. Local inflation and employment conditions will drive the timing and magnitude of decisions.

We expect monetary policy to tighten over the next 12–18 months. The BoE raised rates in Q4 2021; the Fed is expected to do so in the first half of 2022 and the ECB in Q4 2022.

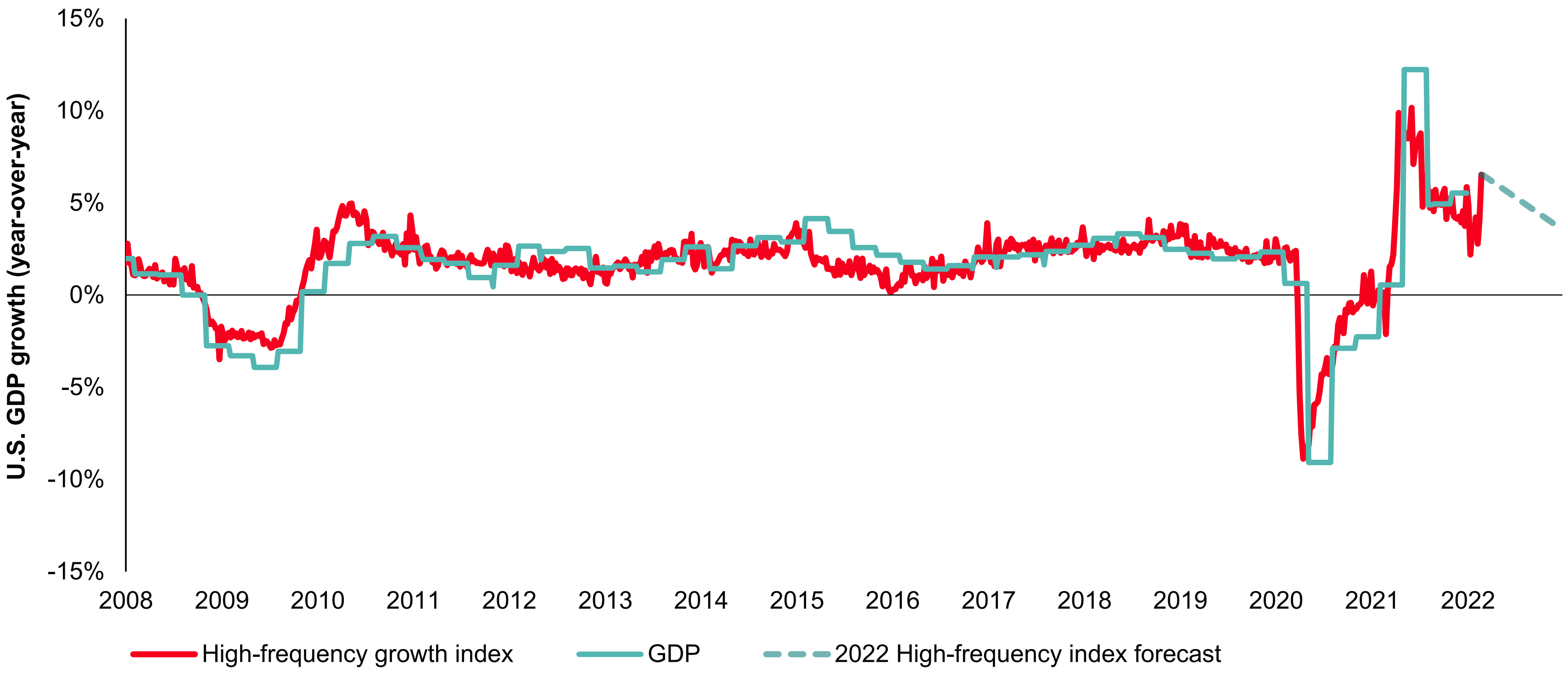
Source: Vanguard analysis as of December 31, 2021.

Growth in the U.S. is slowing but remains above trend

Robust, albeit slower, growth is ahead

- Growth is expected to moderate but remain well above trend.
- Strong household balance sheets, investment and inventory restocking, and further reopening of the economy will be key drivers.
- Lingering supply-side constraints, higher energy prices, and persistent inflation remain risk factors.

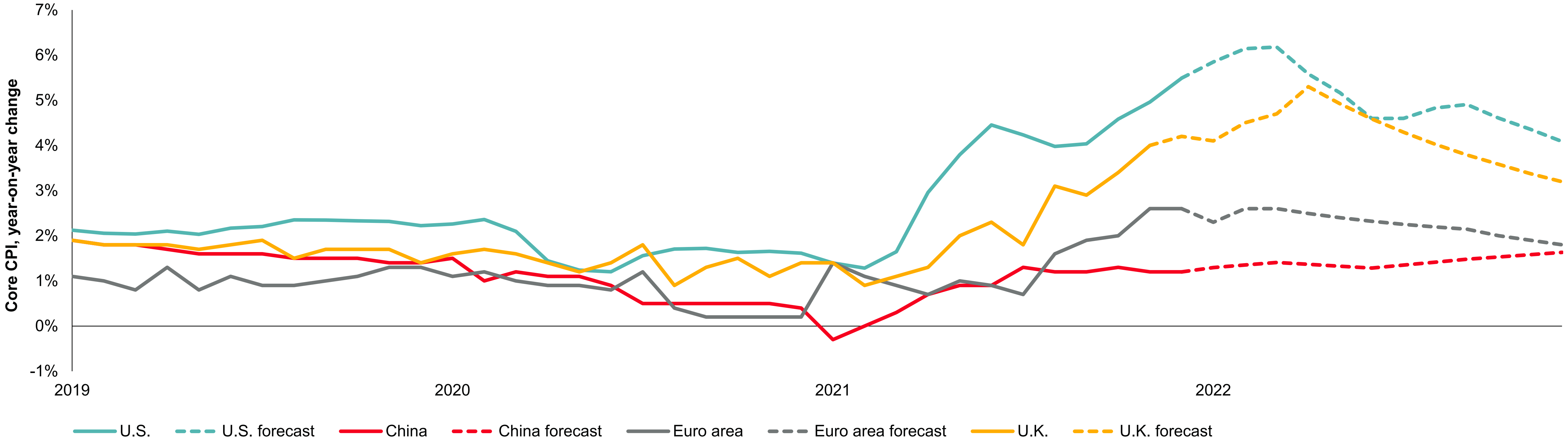
Vanguard high-frequency growth index has moderated since early 2021 surge



Notes: The high-frequency growth index uses weekly data to estimate current activity on a more timely basis than traditional economic releases. The data include weekly raw steel production, weekly energy consumption (motor vehicle, jet fuel, and diesel), weekly continuing unemployment claims, weekly retail sales, and biweekly consumer sentiment. GDP is year-over-year quarterly. Data and forecast as of February 21, 2022.
Sources: Vanguard and Refinitiv.

Broad-based demand and supply constraints are driving global inflation

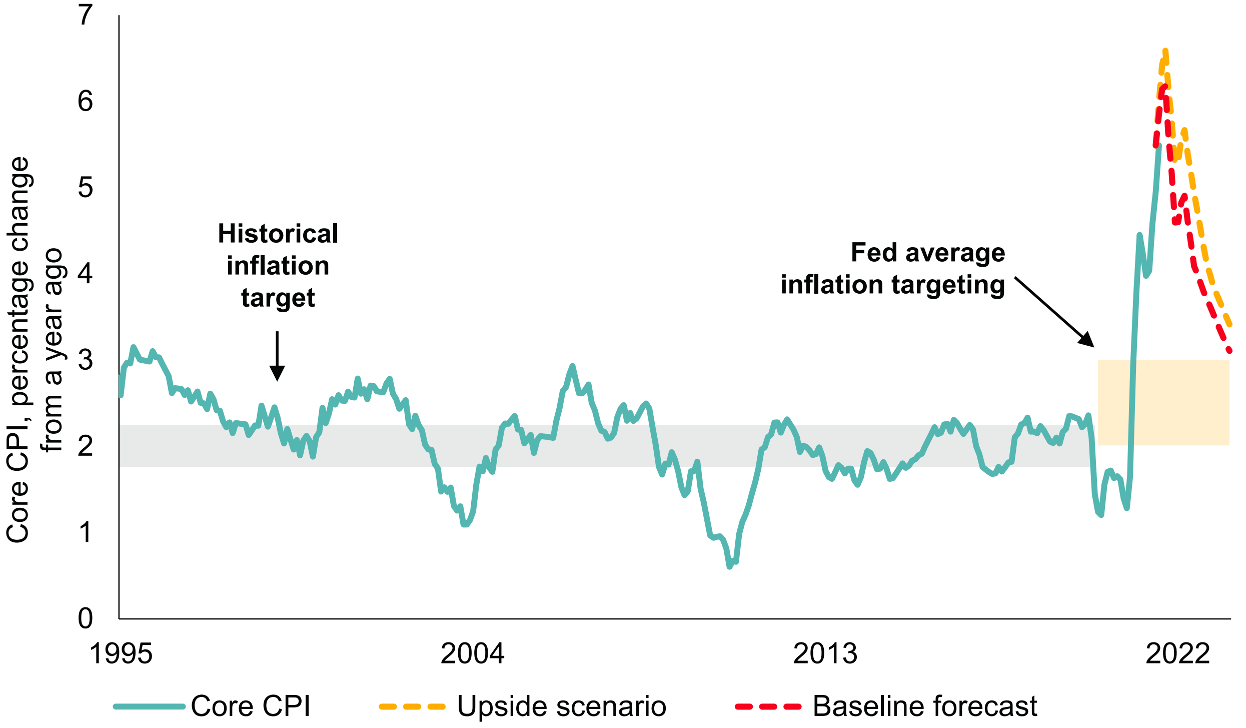
Global inflation is expected to moderate through 2022



Notes: Data and Vanguard forecasts are for year-on-year percentage changes in the Core Consumer Price Index, which excludes volatile food and energy prices. Actual inflation for all countries is through December 2021. Vanguard forecasts are presented thereafter.
Sources: Vanguard calculations, using data from Bloomberg and Refinitiv.

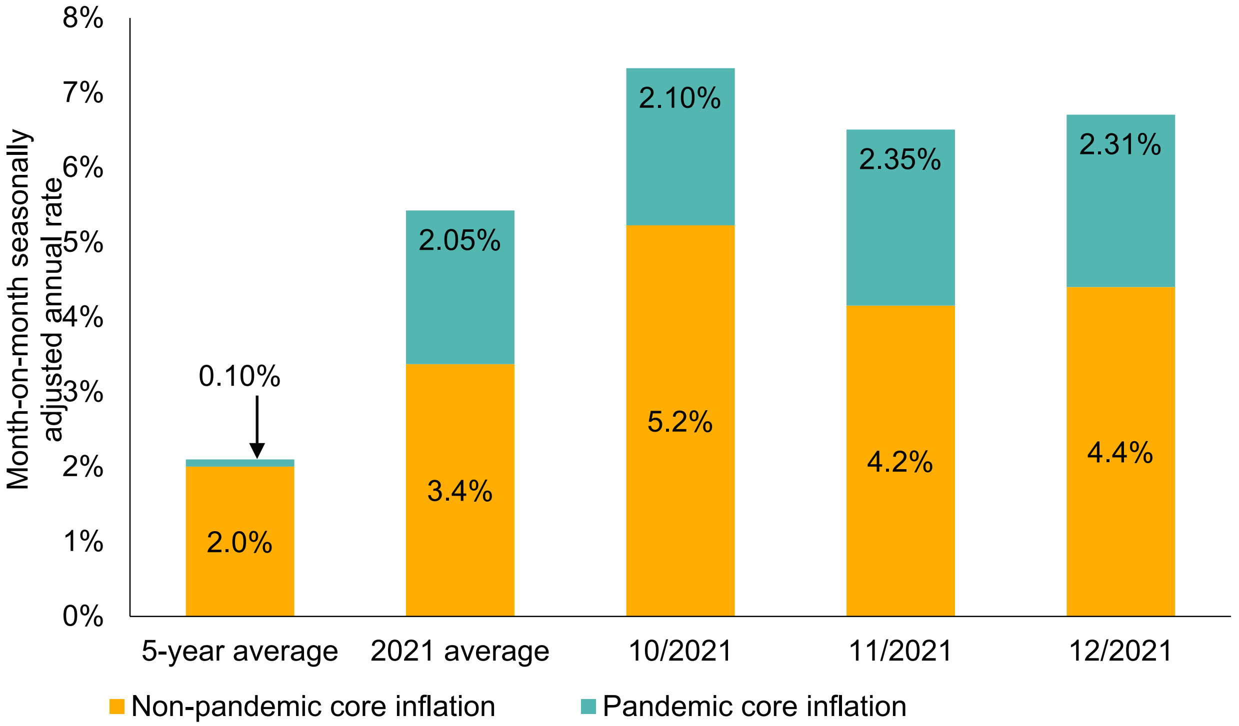
Transitory with a twist—inflation is likely to reset higher

Core CPI and a changing Fed



Notes: Data and Vanguard forecasts are for year-on-year percentage changes in the Core Consumer Price Index, which excludes volatile food and energy. Actual inflation is until December, and two scenarios for future inflation are shown.
Sources: Vanguard calculations, using data from Bloomberg and Refinitiv as of February 15, 2022.

Expanding non-pandemic core could keep inflation elevated even after transitory elements wash out



Notes: Pandemic core inflation includes categories such as vehicles, recreation, and travel that have been meaningfully impacted by pandemic-related supply/demand headwinds. Non-pandemic core inflation is all core inflation not included in pandemic core.
Source: Refinitiv DataStream, accessed as of January 19, 2022.

Commodities and inflation-linked bonds should provide a better defense against inflation

Probability of returning more than inflation over the next decade

Average inflation (next 10 years)	2030 inflation rate	20% stock/ 80% bond	60% stock/ 40% bond	80% stock/ 20% bond	Inflation-hedged portfolio
1.1%	1.3%	85%	86%	83%	84%
1.9%	2.1%	73%	79%	78%	83%
2.4%	2.4%	64%	75%	74%	83%
2.8%	2.9%	50%	70%	70%	84%
3.5%	3.4%	38%	63%	66%	84%
Expected volatility	—	4%	10%	13%	11%

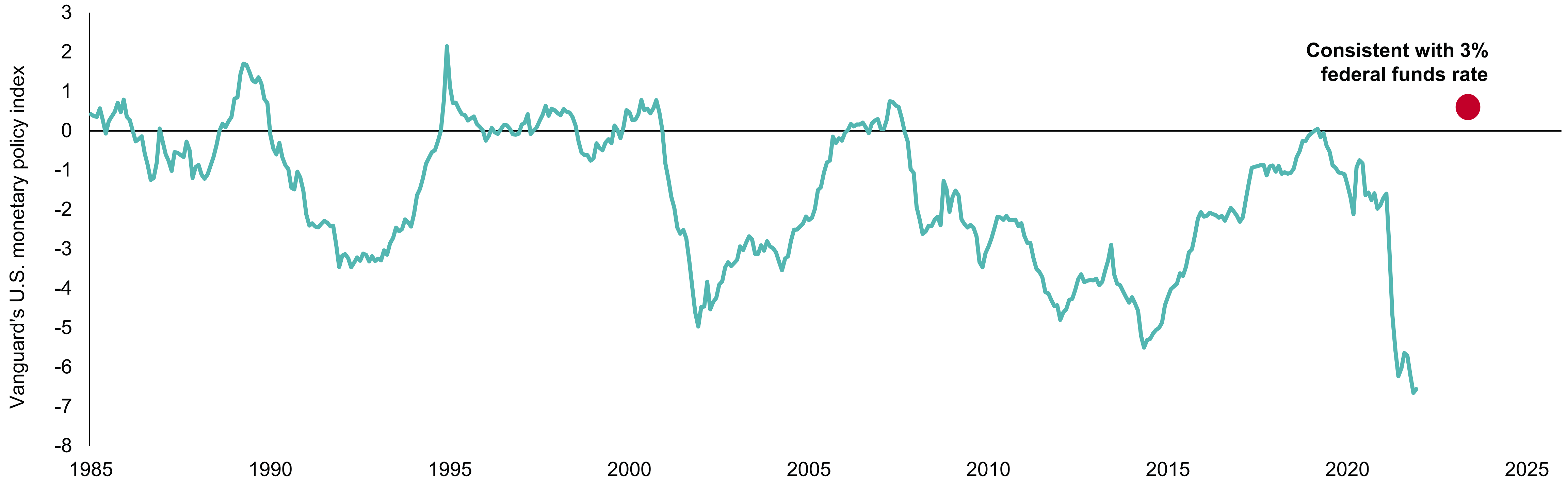
IMPORTANT: The projections and other information generated by the VCMM regarding the likelihood of various investment outcomes are hypothetical in nature, do not reflect actual investment results, and are not guarantees of future results. Distribution of return outcomes from VCMM are derived from 10,000 simulations for each modeled asset class. Simulations as of December 31, 2021. Results from the model may vary with each use and over time. For more information, please see the "Important information" section.

Notes: Percentages in the chart reflect the probability of the annualized return of the portfolio (columns) exceeding the average annualized inflation rate (rows) over a 10-year time horizon.

Source: Vanguard calculations. Data as December 31, 2021.

Rising real rates are the biggest risk and opportunity for investors

Fed policy is more accommodative than ever and must normalize



Notes: The chart shows Vanguard's proprietary monetary policy indicator, which uses a combination of the Laubach-Williams r-star, the Wu-Xia shadow federal funds rate, and year-over-year CPI to establish a proxy for the Federal Reserve's policy stance. R-star is estimated using 10-year TIPS after Q2 2020. The red dot represents our expectation of how the monetary policy index will evolve over this cycle. It is consistent with the 3% federal funds rate in our outlook.
Sources: Vanguard calculations, based on data from Bloomberg as of January 11, 2022.

Rising real rates are the biggest risk and opportunity for investors (continued)

Prolonged and persistent real rate increases favor some assets more than others

Start/end (month)	2/1/75–6/30/76	7/1/80–8/31/81	1/1/83–9/30/84	10/1/92–12/31/94	9/1/02–7/31/07	8/1/14–4/30/19	
Time period (in years)	1.4	1.2	1.7	2.3	4.9	4.7	
1-year UST minus year-over-year PCE increase (bps)	**482**	**850**	**512**	**448**	**364**	**232**	
Real interest rate peak (bps)	**59**	**798**	**784**	**496**	**292**	**73**	**Average**
High-quality value	39%	13%	36%	25%	27%	–12%	22%
International equities	—	—	16%	19%	24%	10%	17%
Emerging markets	—	—	—	1%	38%	9%	16%
Value stocks	34%	5%	19%	10%	18%	2%	15%
U.S. equities	25%	9%	12%	8%	16%	12%	14%
Small-cap stocks	—	19%	8%	13%	20%	8%	14%
High-quality growth	19%	9%	9%	1%	13%	13%	11%
Growth stocks	17%	6%	8%	4%	13%	1.6%	8%
High-yield bonds	—	—	5%	8%	12%	5%	8%
Home prices	7%	6%	5%	2%	8%	10%	6%
Commodities	19%	–17%	4%	6%	14%	5%	5%
Low-quality growth	18%	–4%	–15%	–4%	19%	2%	3%
U.S. aggregate bonds	4%	–6%	9%	4%	4%	–8%	1%

Notes: The table shows total returns for 13 major asset classes over six periods of rising real interest rates and is sorted based on the average return across the six cycles. The real interest rate is calculated as the monthly one-year U.S. Treasury nominal yield minus the year-over-year percent change in the Core Personal Consumption Expenditures Price Index. *Real interest rate peak* represents the maximum level of real interest rates expressed in basis points (bps). See the "Important information" section for definitions of each asset class.

Sources: Vanguard calculations, based on data from the U.S. Treasury, the U.S. Bureau of Economic Analysis, Bloomberg, CRSP, Kenneth R. French's website, at mba.tuck.dartmouth.edu/pages/faculty/ken.french/data library.html, Robert Shiller's website, at aida.wss.yale.edu/~shiller/data.htm, Standard & Poor's, MSCI, Dow Jones, and Russell, as of December 31, 2021.

Past performance is no guarantee of future returns. The performance of an index is not an exact representation of any particular investment, as you cannot invest directly in an index.

By calibrating their bond portfolio to their time horizon, investors could have less to fear from rising rates

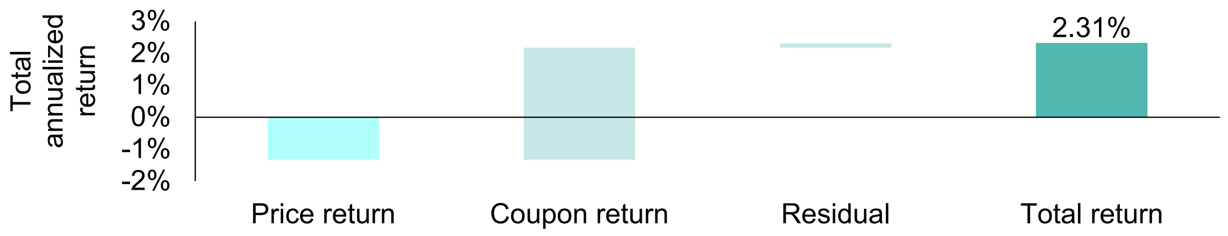
Total return for a hypothetical bond with a 14-year duration for a given change in the key interest rate

	Basis-point change in interest rates				
Time horizon (years)	**–200**	**–100**	**0**	**100**	**200**
5	3.7%	1.8%	0.0%	–1.8%	–3.5%
10	0.8	0.4	0.0	–0.4	–0.8
15	–0.1	–0.1	0.0	0.1	0.1
20	–0.4	–0.1	0.0	0.5	0.8
25	–0.6	–0.2	0.0	0.7	1.1

Notes: The hypothetical bond is a 15-year annual pay bond with a coupon of 0.9%, a yield to maturity of 2%, and a Macualay Duration of 14 years. (Macaulay Duration is the weighted average of time to receipt of coupon interest and principal payments such that the investor can recoup the bond's price from its cash flows.) The table shows that the bond produces positive returns for a given, one-time parallel increase in interest rates (columns) when the time horizon (rows) is greater than 14 years.
Source: Vanguard calculations.

Time horizon > duration

1.8-year duration bond fund when rates rose 307 bps over 4 years from 2003 to 2007



Time horizon < duration

18.5-year duration bond fund when rates rose 165 bps over 7 quarters from 2016 to 2018

Notes: The top chart shows the decomposition of actual return on the Bloomberg U.S. Treasury 1–3 Year Bond Index from May 1, 2003, to May 1, 2007. During this time, the 2-year U.S. Treasury constant maturity rate rose 307 bps. The bottom chart shows the decomposition of actual return on the Bloomberg U.S. Long Treasury Bond Index from July 1, 2016, to October 1, 2018. During this time, the 10-year U.S. Treasury constant maturity rate rose 165 bps. *Residual* reflects the unaccounted-for variance.
Sources: Barclays Live and the U.S. Treasury Department. Vanguard calculations as of July 30, 2021.
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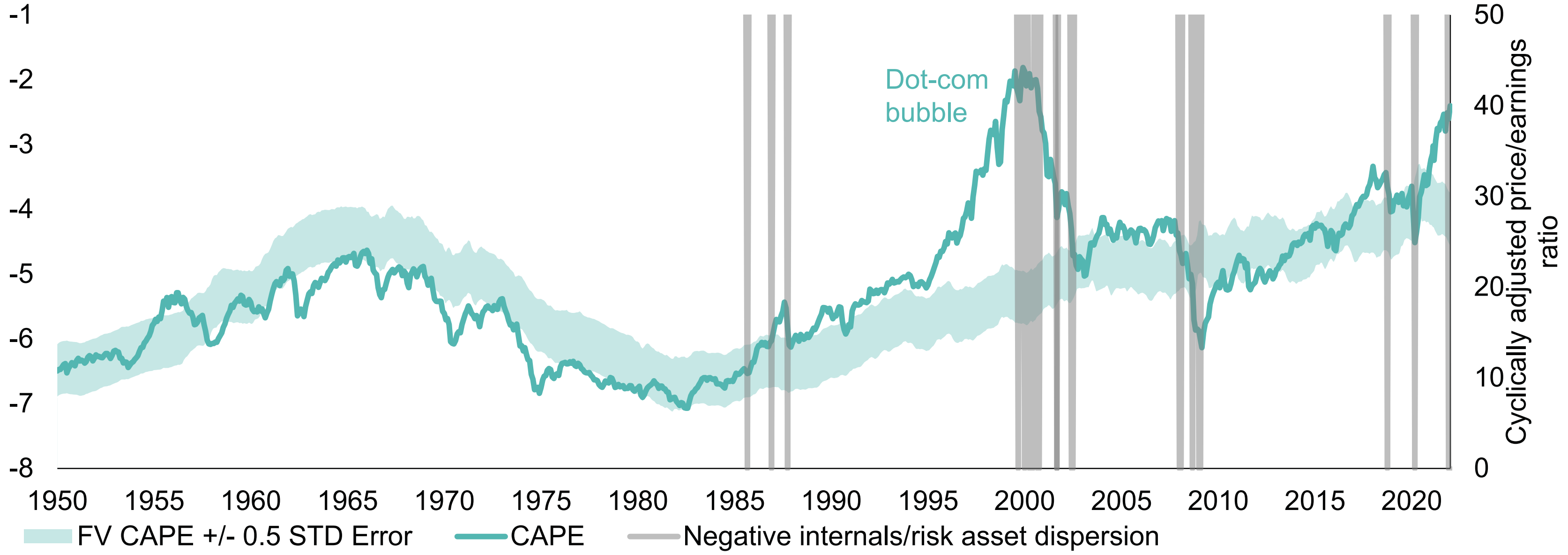
U.S. equities have not been this overvalued since the dot-com bubble

Correction risk rises when valuations get stretched

- Cyclically adjusted price/earnings ratio (CAPE) is a proxy for the equity risk premium that corrects for the level of interest rates and inflation.
- The December 2021 CAPE was 46% above our estimate of fair value.
- Inflation and interest rates do not limit how far valuations can deviate from fair value.
- High dispersion in risk asset performance tends to precede market corrections historically.

Stretched valuations and lopsided internals spell near-term risks for equities

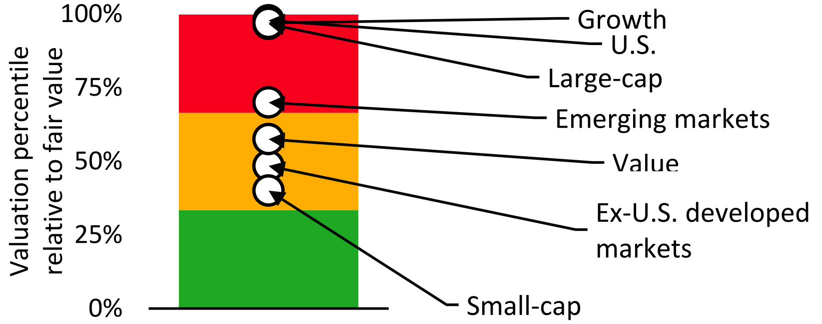


Notes: The U.S. fair-value CAPE is based on a statistical model that corrects CAPE measures for the level of inflation and interest rates. The statistical model specification is a three-variable vector error correction, including equity-earnings yields, 10-year trailing inflation, and 10-year U.S. Treasury yields estimated over the period January 1940 to December 31, 2021. Details were published in the 2017 Vanguard research paper *Global Macro Matters: As U.S. Stock Prices Rise, the Risk-Return Tradeoff Gets Tricky*. A declining fair-value CAPE suggests that higher equity-risk premium (ERP) compensation is required, whereas a rising fair-value CAPE suggests that the ERP is compressing.
Negative internals/risk asset dispersion is a proprietary metric that extracts a signal from the measurement of dispersion in risk asset price behavior across the broad equity market, equity subsectors and styles, credit spreads, and the price behavior of index securities that make up the broad U.S. equity market.
Sources: Vanguard calculations, based on data from Robert Shiller's website, at aida.wss.yale.edu/~shiller/data.htm, the U.S. Bureau of Labor Statistics, the Federal Reserve Board, Refinitiv, Russell indexes, FactSet, Barclays Live, and Global Financial Data.

Not all valuations are stretched; opportunities exist

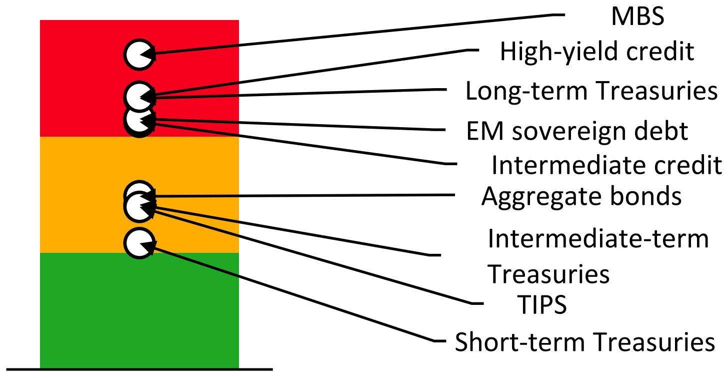
Investors must look beyond the winners of the last decade

Global equity markets



Notes: Developed-market equity valuation measures are the current CAPE percentile relative to the fair-value CAPE for the local MSCI index. The U.S. valuation measure is the current CAPE percentile relative to fair-value CAPE for the S&P Composite Index from 1940 to 1957 and the S&P 500 Index from 1957 through the end of 2021. The ex-U.S. developed markets valuation measure is the market-weighted average of each region's (Australia, U.K., euro area, Japan, and Canada) valuation percentile. The emerging markets, U.S. value, and U.S. small-cap relative valuations are based on the relative percentile rank to fair value estimated on pages 58, 51, and 53, respectively. The U.S. growth and large-cap valuations are composite valuation measures of the style factor to U.S relative valuations and the current U.S. CAPE percentile relative to its fair-value CAPE. The relative valuation is the current ratio of the style factor to U.S. price/book metrics relative to its historical average from January 1979 through September 2021. For corresponding indexes for the four style factor valuation measures, see "Indexes for VCMM simulations" in the "Important information" section. The estimates cover the period beginning January 1940 for the U.S., January 1970 for Australia and the U.K., January 1980 for other developed markets, and September 1998 for emerging markets, and ended December 31, 2021.
Sources: Vanguard calculations, based on Robert Shiller's website, at aida.wss.yale.edu/~shiller/data.htm, the U.S. Bureau of Labor Statistics, the Federal Reserve Board, and Refinitiv, as of December 31, 2021.

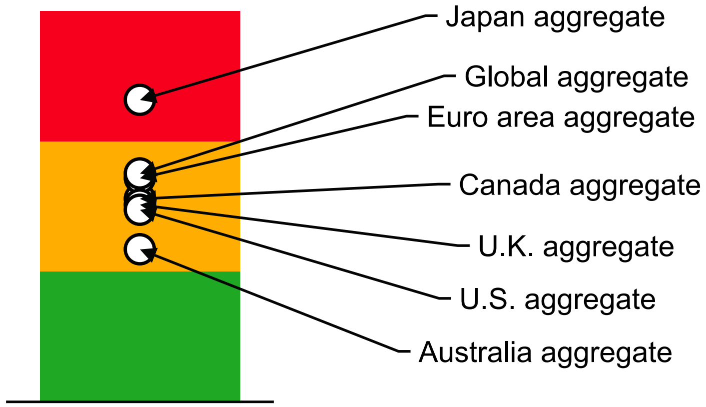
U.S. bond markets



Undervalued   Fairly valued   Overvalued

Notes: Valuation percentiles are relative to year-30 projections from the VCMM. Credit (emerging sovereign, high yield, and intermediate) and mortgage-backed securities (MBS) valuations are based on current spreads relative to year 30. Treasury valuation is the key rate duration weighted average of the fundamental fair value model outlined on page 31. U.S. aggregate bonds are the weighted average between intermediate-term credit and Treasury valuation percentiles. Treasury Inflation-Protected Securities (TIPS) valuation is the 10-year-ahead annualized inflation expectation relative to years 21–30.
Source: Vanguard calculations, using December 31, 2021, VCMM simulation.

Global bond markets



Notes: Valuation percentiles are relative to year-30 projections from the VCMM. Country aggregate bond valuations are a weighted average between long-term and short-term Treasury yield spread and the credit spread relative to year 30.
Source: Vanguard calculations, using December 31, 2021, VCMM simulation.

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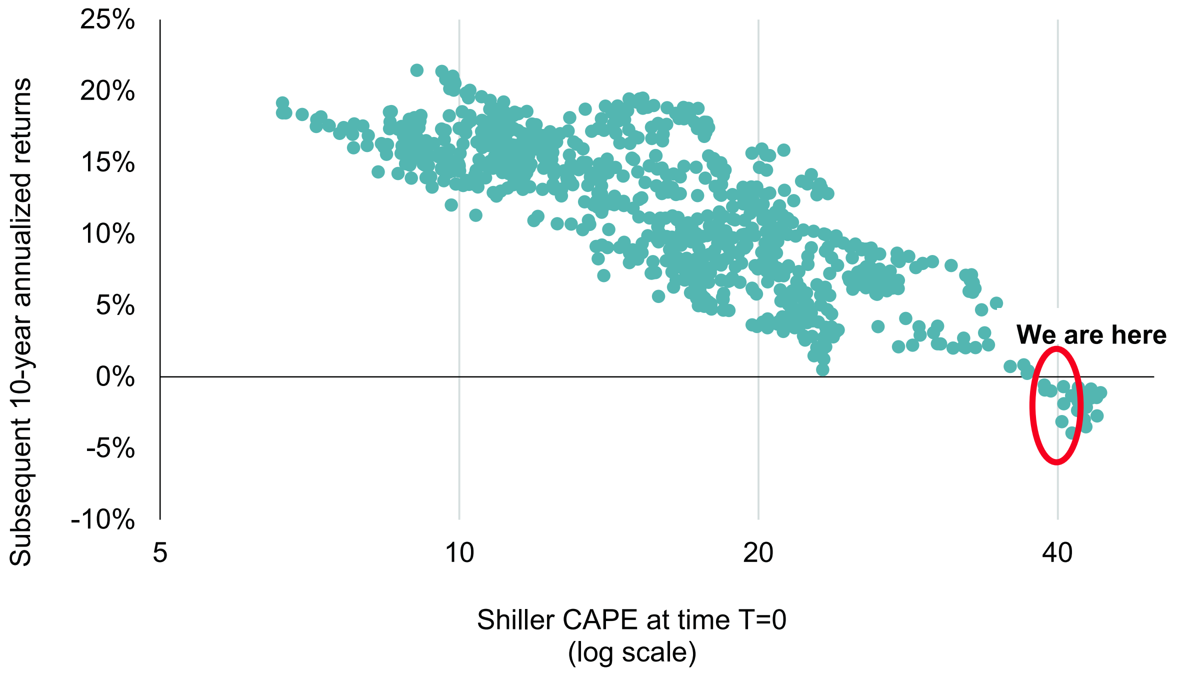
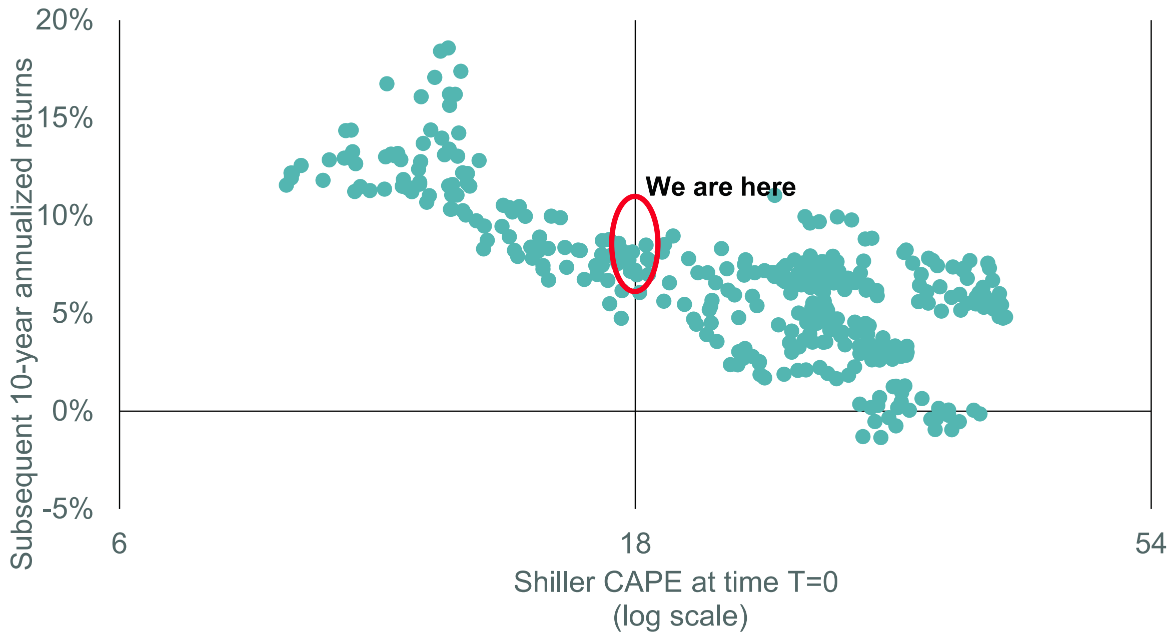
The relationship between valuations and returns supports our view on international and U.S. equities

U.S. equity valuations suggest the lowest returns



Notes: Data cover October 31, 1938, through December 31, 2021. Starting valuations are measured as the ratio of the broad U.S. equity market price to the 10-year rolling average of inflation-adjusted earnings (also known as the Shiller CAPE). "We are here" marks the valuation as of December 31, 2021, on the horizontal axis and the 10-year return for the decade ending December 31, 2031, on the vertical axis. U.S. equities are represented by the S&P Composite Index from 1938 to 1957 and the S&P 500 Index from 1957 through the end of 2021.
Sources: Vanguard calculations, based on data from Standard and Poor's and Robert Shiller's website, at aida.wss.yale.edu/~shiller/data.htm.

International developed markets are more fairly valued



Notes: Currency-adjusted returns are calculated by removing the effect of market-capitalization-weighted spot currency returns of USD relative to AUD, GBP, CAD, EUR, and JPY on MSCI World ex US Index returns through time. Market-capitalization weights are based on country composition of the MSCI World ex US index. "We are here" marks the valuation as of December 31, 2021, on the horizontal axis and the 10-year return for the decade ending December 31, 2031, on the vertical axis.
Sources: Vanguard calculations, based on MSCI ACWI ex US Index data, sourced through Refinitiv, and Robert Shiller's website, at aida.wss.yale.edu/~shiller/data.htm.

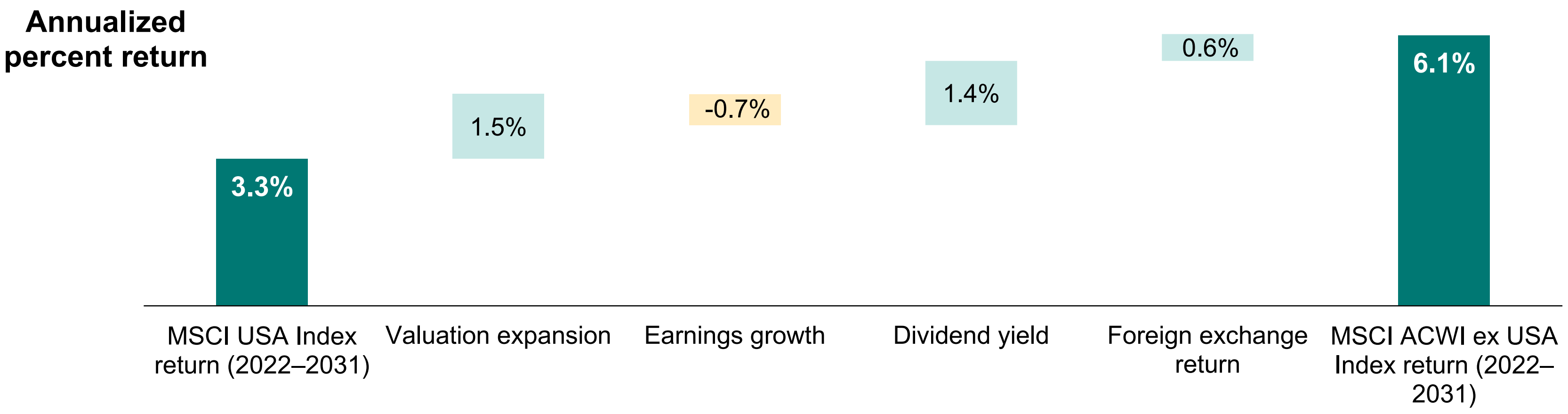
Past performance is no guarantee of future returns. The performance of an index is not an exact representation of any particular investment, as you cannot invest directly in an index.

We expect international equities to outperform U.S. equities by an average of 2.8 percentage points per year

International equities outperform in 8 of 10 simulations

- The U.S. should see a larger valuation reversal and a lower dividend yield.
- The earnings growth tailwind will be smaller for the U.S.
- Dollar weakness should make only a marginal contribution.

Valuation and dividends are expected to drive excess returns internationally over the next 10 years



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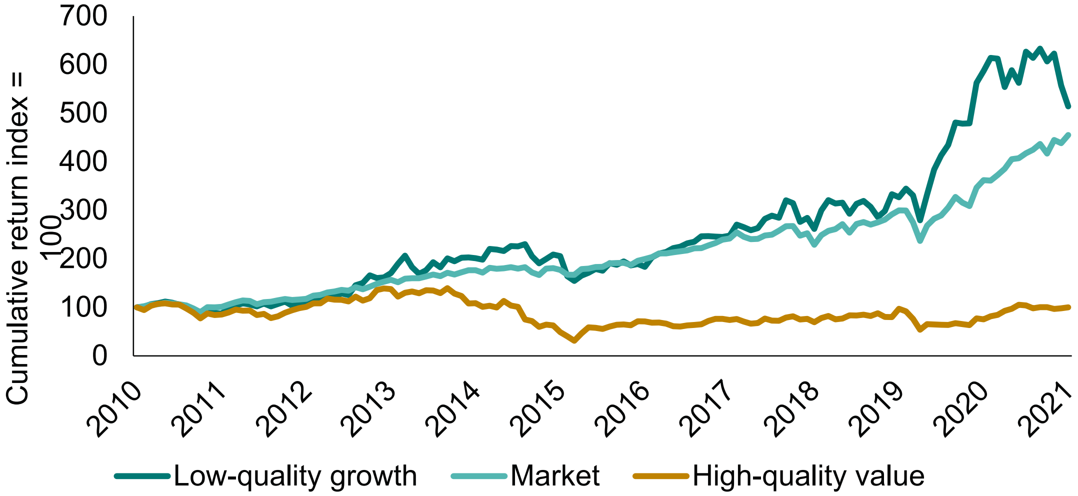
Notes: Forward-looking return estimates are from VCMM, as of December 31, 2021, for the period January 1, 2022, through December 31, 2031. The U.S. equity return is represented by the MSCI USA Index return; the international equity return is represented by the MSCI ACWI ex USA Index return. Returns do not take into account management fees and expenses, nor do they reflect the effect of taxes. Returns do reflect reinvestment of dividends and capital gains. The two end bars representing U.S. and international expected returns are median expectations. As a result, this comparison does not account for the correlation between U.S. and international equities. The sum of the individual bars in the middle may not equal the difference between the two end bars because of rounding.

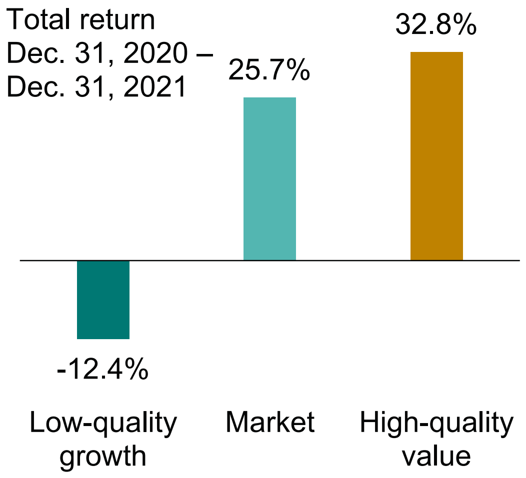
Sources: Vanguard calculations, based on data from Refinitiv and Global Financial Data. Forward-looking return estimates are from the VCMM, as of December 31, 2021.

Low-quality growth dominated the last decade but underperformed in 2021

The last decade did not favor value investors

- High-quality (high operating profits) value (high book/price) has underperformed the broad market for most of the past decade.
- Low-quality growth companies outperformed in 2020 but significantly lagged in 2021.
- Some companies in the low-quality growth cohort have negative operating profits.





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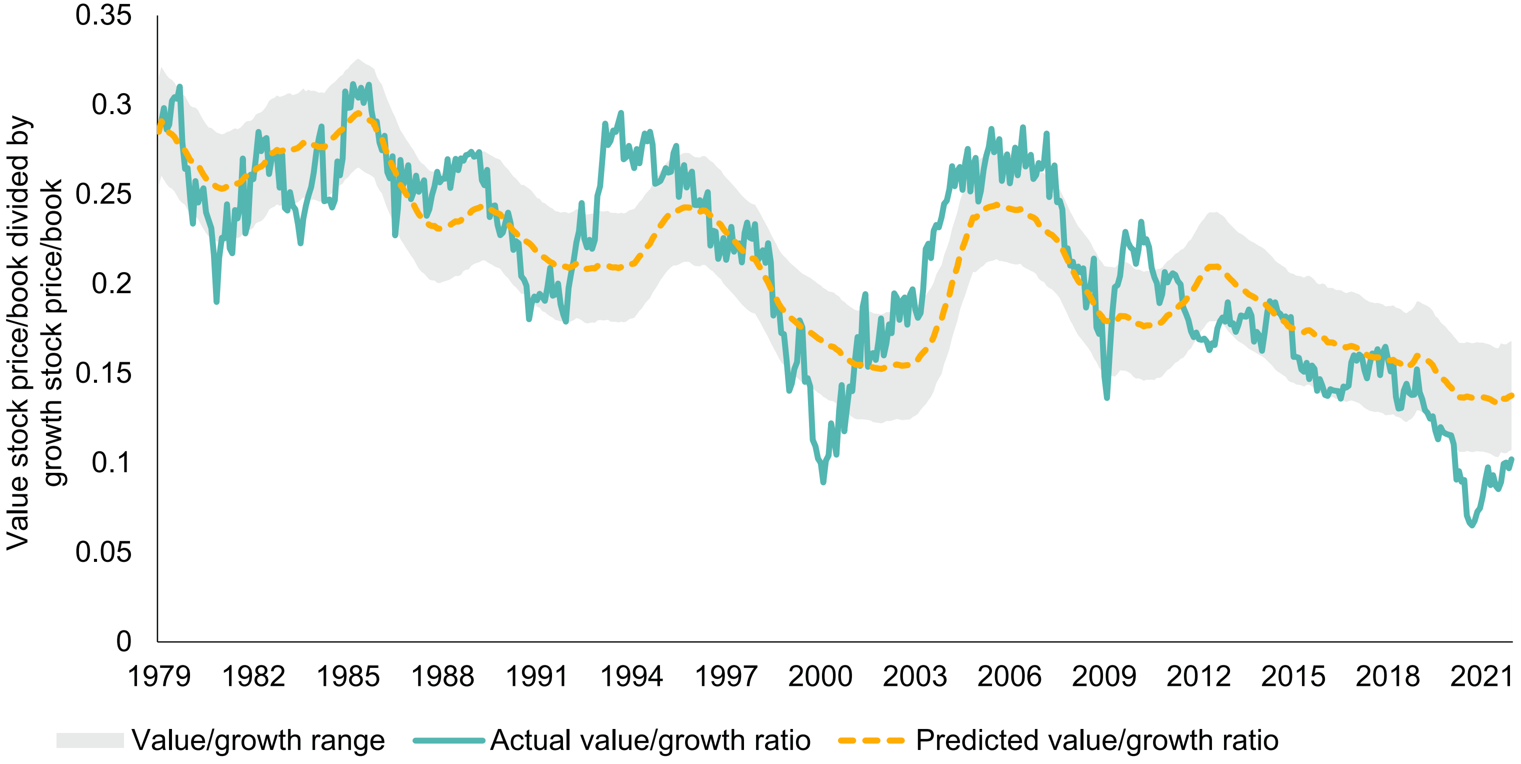
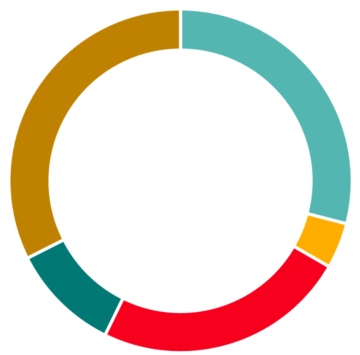
Notes: Data in both charts are as of December 31, 2021. Portfolios are indexed to 100 as of December 31, 2010. 2021 annual returns (right chart) are for the 12-month period between December 31, 2020, and December 31, 2021. Low-quality growth and high-quality value portfolios are constructed based on data from Kenneth R. French's website, using New York Stock Exchange-listed companies sorted in quintiles by operating profit and the ratio of book value to market value (B/P). The low-quality growth portfolio is represented by the lowest quintile operating profit (quality) and B/P companies. The low-quality growth portfolio is represented by the lowest quintile operating profit (quality) and B/P companies. The high-quality value portfolio is represented by the highest quintile operating profit and B/P companies. U.S. equities are represented by the Dow Jones U.S. Total Stock Market Index (formerly known as the Dow Jones Wilshire 5000) through April 22, 2005; the MSCI US Broad Market Index through June 2, 2013; and the CRSP US Total Market Index thereafter. Growth stocks are based on the S&P 500/Barra Growth Index through May 16, 2003; the MSCI US Prime Market Growth Index through April 16, 2013; and the CRSP US Large Cap Growth Index thereafter. Value stocks are based on the S&P 500/Barra Value Index through May 16, 2003; the MSCI US Prime Market Value Index through April 16, 2013; and the CRSP US Large Cap Value Index thereafter. Small-cap equities are based on the Russell 2000 Index through May 16, 2003; the MSCI US Small Cap 1750 Index through January 30, 2013; and the CRSP US Small Cap Index thereafter. Emerging-market equities are based on the Select Emerging Market Index through August 23, 2006; the MSCI Emerging Markets Index Net USD through January 9, 2013; the FTSE Emerging Transition Index through June 27, 2013; the FTSE Emerging Index through 11/1/2015; the FTSE Emerging Markets All Cap China A Transition Index through 9/18/2016; and the FTSE Emerging Markets All Cap China A Inclusion Index thereafter. High-yield bonds are based on the Bloomberg U.S. Corporate High-Yield Index. International equities are based on the MSCI EAFE Index through May 31, 2010, and the MSCI All Country World Index ex USA thereafter. Commodities are based on the Bloomberg Commodities Total Return Index. U.S. bonds are based on the Bloomberg U.S. Aggregate Bond Index through December 31, 2009, and the Bloomberg U.S. Aggregate Float Adjusted Index thereafter. U.S. home prices are obtained from the U.S. home price dataset published by Robert Shiller. College,mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html; MSCI; CRSP; and Dow Jones.

The value rotation has room to run

Macro factors help explain value's woes, but the trade is oversold



Factors accounting for growth outperformance versus value

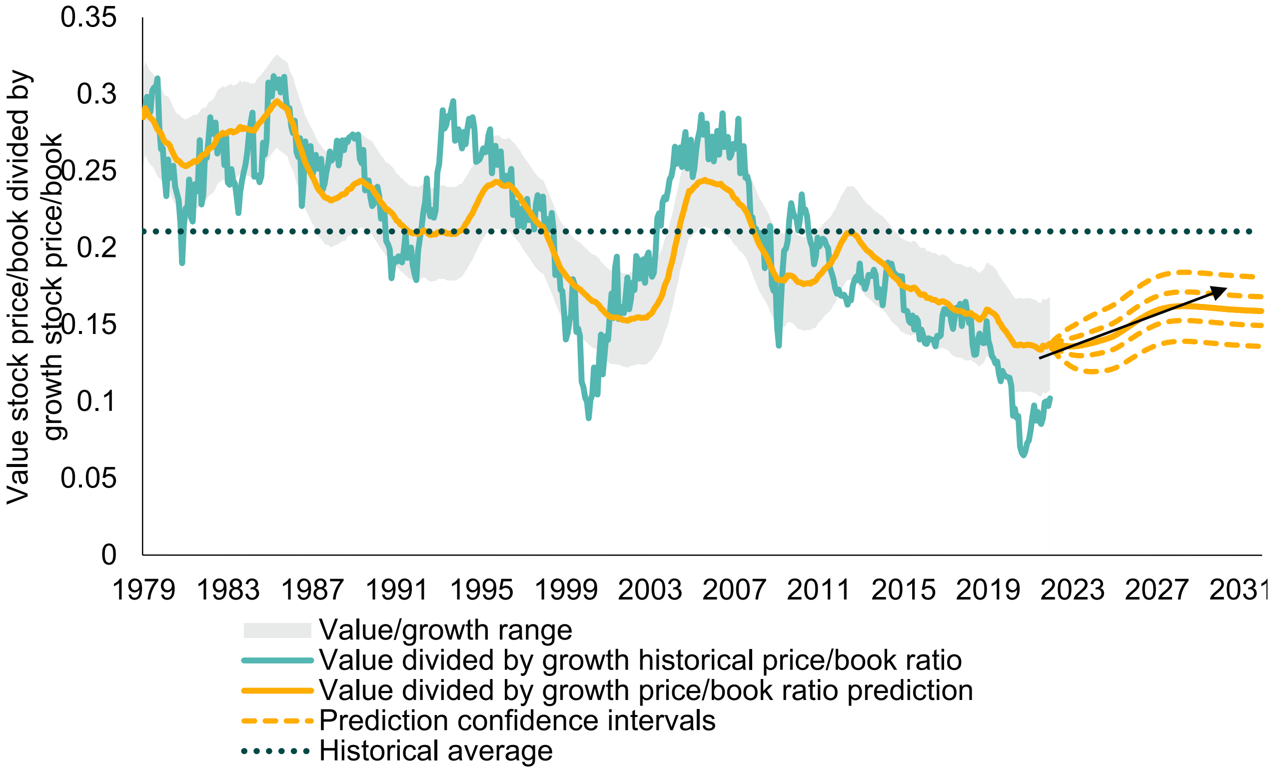


■	29.0%	10-year trailing inflation
■	4.3%	10-year real Treasury yield
■	23.9%	Equity volatility
■	10.3%	Growth of corporate profits
■	32.4%	Unexplained variance (behavior)

Notes: The statistical model specification is a six-variable vector error correction, including a respective ratio of price/book, 10-year trailing inflation, 10-year real Treasury yield, equity volatility, and growth of corporate profits estimated over the period January 1979–December 2021. Percentages do not total 100 because of rounding.
Sources: Vanguard calculations, based on data from FactSet, the U.S. Bureau of Labor Statistics, the Federal Reserve Board, Refinitiv, and Global Financial Data.

Value is likely to outperform growth over the next decade

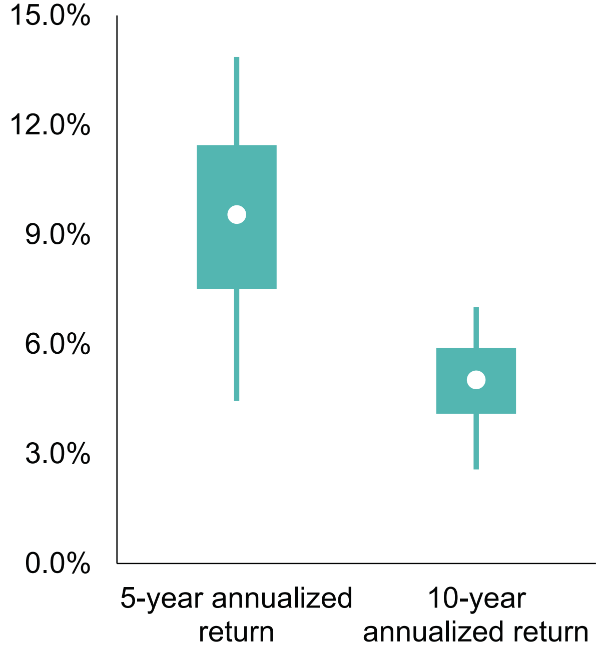
Value will benefit from an accelerating economic recovery, modestly higher inflation, and a reversion to fair value



Note: The valuation ratio is projected based on a vector error correction model and using a five-lag vector autoregression model to project the systematic drivers. The arrow signifies that we expect the actual ratio to converge to our estimate of fair value.

Sources: Vanguard calculations, based on data from FactSet, the U.S. Bureau of Labor Statistics, the Federal Reserve Board, Refinitiv, and Global Financial Data, as of December 31, 2021.

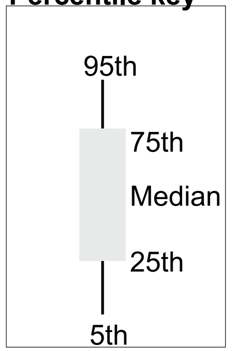
Total return forecast: US Value



5-year annualized total returns

Percentile	Return
95th	13.9%
75th	11.5%
Median	9.6%
25th	7.5%
5th	4.5%

Percentile key



10-year annualized total returns

Percentile	Return
95th	7.0%
75th	5.9%
Median	5.0%
25th	4.1%
5th	2.6%

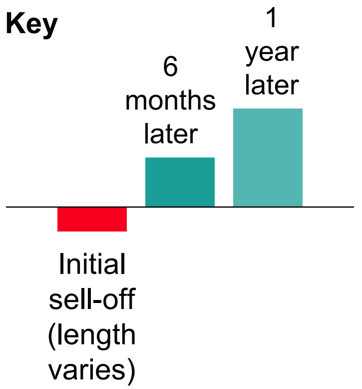
Note: Returns are calculated based on modeled reversion to fair value and projection of fair-value ratio of price/book.

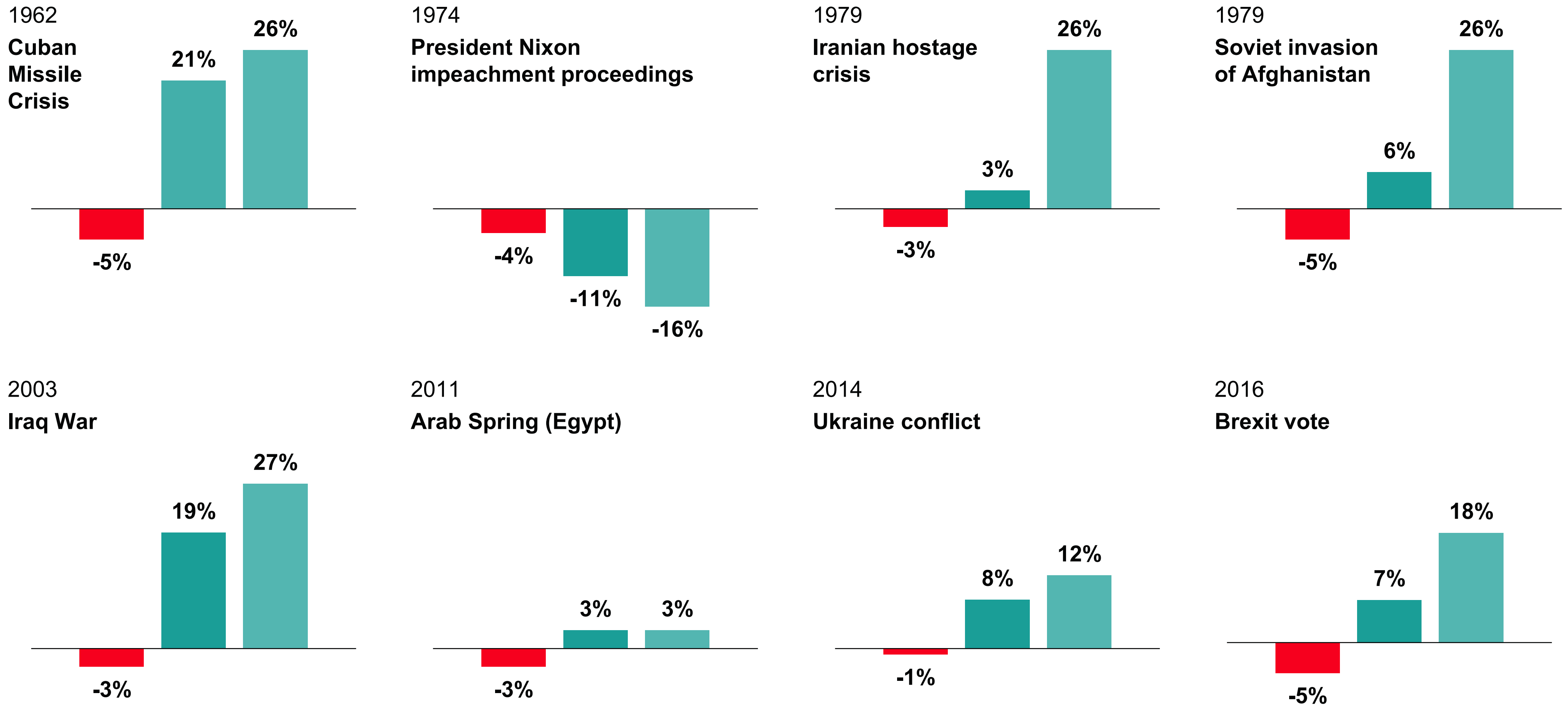
Sources: Vanguard calculations, based on data from FactSet, the U.S. Bureau of Labor Statistics, the Federal Reserve Board, Refinitiv, and Global Financial Data.

Geopolitical sell-offs are typically short-lived

5% Average total return **6 months** from event

9% Average total return **1 year** from event





Notes: Returns are based on the Dow Jones Industrial Average through 1963 and the Standard & Poor's 500 Index thereafter. All returns are price returns. Not shown in the above charts, but included in the averages, are returns after the following events: the Suez Crisis (1956), construction of the Berlin Wall (1961), assassination of President Kennedy (1963), authorization of military operations in Vietnam (1964), Israeli-Arab Six-Day War (1967), Israeli-Arab War/oil embargo (1973), Shah of Iran's exile (1979), U.S. invasion of Grenada (1983), U.S. bombing of Libya (1986), First Gulf War (1991), President Clinton impeachment proceedings (1998), Kosovo bombings (1999), September 11 attacks (2001), multi-force intervention in Libya (2011), U.S. anti-ISIS intervention in Syria (2014), and President Trump impeachment proceedings (2019 and 2021).

Sources: Vanguard calculations as of December 31, 2021, using data from Refinitiv.

Past performance is no guarantee of future returns. The performance of an index is not an exact representation of any particular investment, as you cannot invest directly in an index.

All investments are subject to risk, including the possible loss of the money you invest. Be aware that fluctuations in the financial markets and other factors may cause declines in the value of your account.

Important information

IMPORTANT: The projections or other information generated by the Vanguard Capital Markets Model® (VCMM) regarding the likelihood of various investment outcomes are hypothetical in nature, do not reflect actual investment results, and are not guarantees of future results. VCMM® results will vary with each use and over time.

The VCMM projections are based on a statistical analysis of historical data. Future returns may behave differently from the historical patterns captured in the VCMM. More importantly, the VCMM may be underestimating extreme negative scenarios unobserved in the historical period on which the model estimation is based.

The Vanguard Capital Markets Model is a proprietary financial simulation tool developed and maintained by Vanguard's primary investment research and advice teams. The model forecasts distributions of future returns for a wide array of broad asset classes. Those asset classes include U.S. and international equity markets, several maturities of the U.S. Treasury and corporate fixed income markets, international fixed income markets, U.S. money markets, commodities, and certain alternative investment strategies. The theoretical and empirical foundation for the Vanguard Capital Markets Model is that the returns of various asset classes reflect the compensation investors require for bearing different types of systematic risk (beta). At the core of the model are estimates of the dynamic statistical relationship between risk factors and asset returns, obtained from statistical analysis based on available monthly financial and economic data from as early as 1960. Using a system of estimated equations, the model then applies a Monte Carlo simulation method to project the estimated interrelationships among risk factors and asset classes as well as uncertainty and randomness over time. The model generates a large set of simulated outcomes for each asset class over several time horizons. Forecasts are obtained by computing measures of central tendency in these simulations. Results produced by the tool will vary with each use and over time.

Indexes for VCMM simulations

The long-term returns of our hypothetical portfolios are based on data for the appropriate market indexes through December 31, 2021. We chose these benchmarks to provide the most complete history possible, and we apportioned the global allocations to align with Vanguard's guidance in constructing diversified portfolios. Asset classes and their representative forecast indexes are as follows:

U.S. equities: MSCI US Broad Market Index.
Global ex-U.S. equities: MSCI All Country World ex USA Index.
U.S. REITs: FTSE/NAREIT US Real Estate Index.
U.S. cash: U.S. 3-Month Treasury—constant maturity.
U.S. Treasury bonds: Bloomberg U.S. Treasury Index.
U.S. short-term Treasury bonds: Bloomberg U.S. 1–5 Year Treasury Bond Index.
U.S. long-term Treasury bonds: Bloomberg U.S. Long Treasury Bond Index.
U.S. credit bonds: Bloomberg U.S. Credit Bond Index.
U.S. short-term credit bonds: Bloomberg U.S. 1–3 Year Credit Bond Index.
U.S. high-yield corporate bonds: Bloomberg U.S. High Yield Corporate Bond Index.
U.S. bonds: Bloomberg U.S. Aggregate Bond Index.
Global ex-U.S. bonds: Bloomberg Global Aggregate ex-USD Index.
U.S. TIPS: Bloomberg U.S. Treasury Inflation Protected Securities Index.
U.S. short-term TIPS: Bloomberg U.S. 1–5 Year Treasury Inflation Protected Securities Index.
Euro area aggregate bonds: Bloomberg Euro-Aggregate Index.
U.K. aggregate bonds: Bloomberg Sterling Aggregate Index.
Global aggregate bonds: Bloomberg Global Aggregate Index.
U.S. aggregate bonds: Bloomberg U.S. Aggregate Index.
Japan aggregate bonds: Bloomberg Japanese Aggregate Index.
Australia aggregate bonds: Bloomberg Australia Aggregate Index.
Canada aggregate bonds: Bloomberg Canada Aggregate Index.
Emerging markets: MSCI Emerging Market Index.
Developed markets ex-U.S.: MSCI World ex-US Index.

All equity indexes below are weighted by market capitalization:
Small-cap equities: Stocks with a market cap in the lowest two-thirds of the Russell 3000 Index.
Large-cap equities: Stocks with a market cap in the highest two-thirds of the Russell 1000 Index.
Growth equities: Stocks with a price/book ratio in the highest one-third of the Russell 1000 Index.
Value equities: Stocks with a price/book ratio in the lowest one-third of the Russell 1000 Index.

Important information

For more information about Vanguard funds or ETF Shares, contact your financial advisor to obtain a prospectus or, if available, a summary prospectus. Investment objectives, risks, charges, expenses, and other important information are contained in the prospectus; read and consider it carefully before investing.

Vanguard ETF Shares are not redeemable with the issuing Fund other than in very large aggregations worth millions of dollars. Instead, investors must buy and sell Vanguard ETF Shares in the secondary market and hold those shares in a brokerage account. In doing so, the investor may incur brokerage commissions and may pay more than net asset value when buying and receive less than net asset value when selling.

All investing is subject to risk, which may result in loss of principal. Be aware that fluctuations in the financial markets and other factors may cause declines in the value of your account. There is no guarantee that any particular asset allocation or mix of funds will meet your investment objectives or provide you with a given level of income. Prices of mid- and small-cap stocks often fluctuate more than those of large-company stocks. Investments in stocks or bonds issued by non-U.S. companies are subject to risks including country/regional risk and currency risk. These risks are especially high in emerging markets. Funds that concentrate on a relatively narrow market sector face the risk of higher share-price volatility. It is possible that tax-managed funds will not meet their objective of being tax-efficient.

Investments in bond funds are subject to the risk that an issuer will fail to make payments on time, and that bond prices will decline because of rising interest rates or negative perceptions of an issuer's ability to make payments. High-yield bonds generally have medium- and lower-range credit-quality ratings and are therefore subject to a higher level of credit risk than bonds with higher credit-quality ratings. Although the income from a municipal bond fund is exempt from federal tax, you may owe taxes on any capital gains realized through the fund's trading or through your own redemption of shares. For some investors, a portion of the fund's income may be subject to state and local taxes, as well as to the federal Alternative Minimum Tax. Diversification does not ensure a profit or protect against a loss.

The Factor Funds are subject to investment style risk, which is the chance that returns from the types of stocks in which a Factor Fund invests will trail returns from U.S. stock markets. The Factor Funds are also subject to manager risk, which is the chance that poor security selection will cause a Factor Fund to underperform its relevant benchmark or other funds with a similar investment objective, and sector risk, which is the chance that significant problems will affect a particular sector in which a Factor Fund invests, or that returns from that sector will trail returns from the overall stock market.

The information contained herein does not constitute tax advice, and cannot be used by any person to avoid tax penalties that may be imposed under the Internal Revenue Code. Each person should consult an independent tax advisor about his/her individual situation before investing in any fund or ETF.

Important information (continued)

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