Vanguard

Prepared for

Episcopal Foundation of Dallas

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Agenda

Presented by:

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Performance review

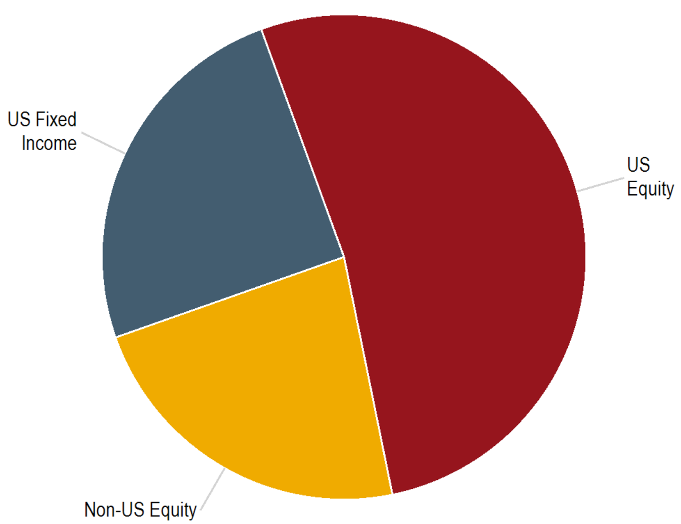
Total Portfolio Performance & Asset Allocation

Performance Summary ending December 31, 2022

	Market Value ($)	2022 Q4 (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
EPISCOPAL FOUNDATION OF DALLAS CONSOLIDATED	**40,039,112**	**8.64**	**-15.37**	**3.30**	**4.80**	**7.37**	**7.33**	**Dec-09**
EPISCOPAL FOUNDATION OF DALLAS CONSOLIDATED (Net)		**8.45**	**-15.96**	**2.63**	**4.14**	**6.86**	**6.94**	
Composite Benchmark		7.22	-17.06	2.49	4.38	7.19	7.57	Dec-09

- Composite Benchmark = 53% Spliced Total Stock Market Index / 22% Spliced Total International Stock Index / 25% Spliced Bloomberg Barclays US Aggregate Float Adjusted Index

Current Allocation as of December 31, 2022



	Current $	Current %	Policy	Difference*
US Equity	$20,952,883	52.3%	53.0%	-0.7%
Non-US Equity	$9,137,360	22.8%	22.0%	0.8%
US Fixed Income	$9,948,869	24.8%	25.0%	-0.2%
Total	**$40,039,112**	**100.0%**	**100.0%**	

*Difference between Policy and Current Allocation

Gross of Advisory Fee returns reflect the deduction of fund expense ratios and any other security-level expenses.

Net of Fee returns reflect the deduction of fund expense ratios, any purchase or redemption fees, and VIAS advisory fee applied to the client portfolio.

Returns greater than one year represent annualized returns. Returns less than one year represent cumulative returns.

Performance Summary (Gross of Advisory Fees) ending December 31, 2022

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EPISCOPAL FOUNDATION OF DALLAS CONSOLIDATED (Net)			**8.45**	**-15.96**	**2.63**	**4.14**	**6.86**	**6.94**	
Composite Benchmark			7.22	-17.06	2.49	4.38	7.19	7.57	Dec-09
Total Equity	**30,090,243**	**75.15**	**10.78**	**-16.62**	**5.31**	**6.18**	**--**	**7.90**	**Jul-15**
Equity Domestic	**20,952,883**	**52.33**	**9.44**	**-14.79**	**7.72**	**8.80**	**--**	**10.08**	**Jul-15**
Spliced Total Stock Market Index			7.15	-19.49	6.99	8.73	12.09	9.88	Jul-15
Equity International	**9,137,360**	**22.82**	**14.47**	**-18.72**	**1.63**	**2.24**	**--**	**4.61**	**Jul-15**
Spliced Total International Stock Index			14.14	-16.10	0.52	1.10	4.20	3.53	Jul-15
Total Fixed Income	**9,948,869**	**24.85**	**2.41**	**-11.77**	**-2.30**	**0.39**	**--**	**1.17**	**Jul-15**
Fixed Income Domestic	**9,948,869**	**24.85**	**2.26**	**-12.20**	**-2.10**	**0.42**	**--**	**1.15**	**Jul-15**
Spliced Bloomberg Barclays US Aggregate Float Adjusted Index			1.85	-13.07	-2.67	0.06	1.08	0.87	Jul-15

Gross of Advisory Fee returns reflect the deduction of fund expense ratios and any other security-level expenses.

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Performance Summary (Gross of Advisory Fees) ending December 31, 2022

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Composite Benchmark			7.22	-17.06	2.49	4.38	7.19	7.57	Dec-09
Total Equity	**30,090,243**	**75.15**	**10.78**	**-16.62**	**5.31**	**6.18**	**--**	**7.90**	**Jul-15**
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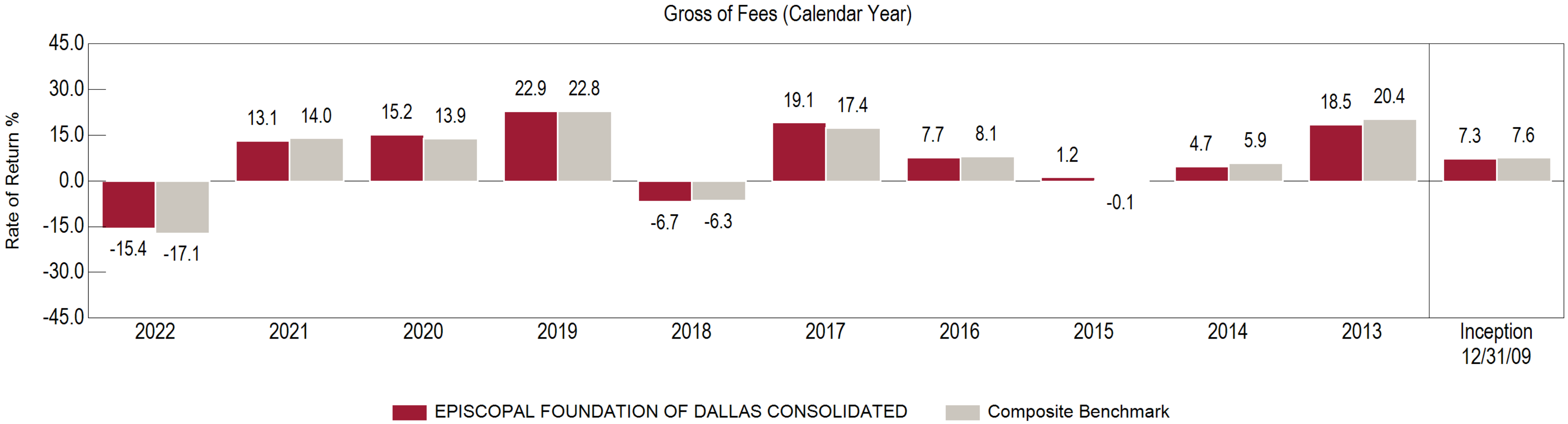
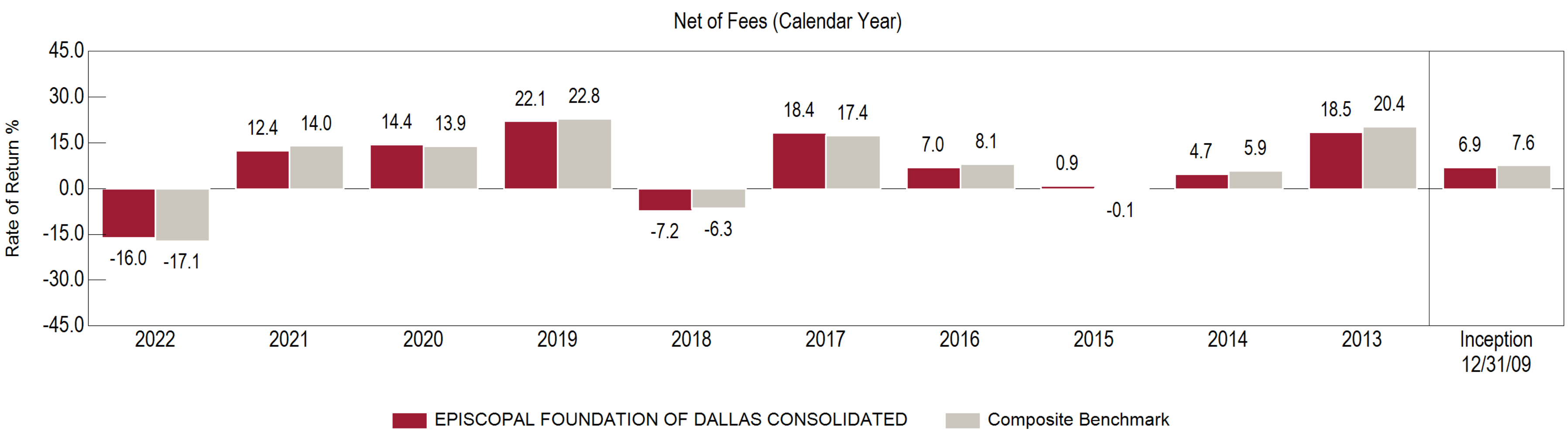
Spliced Total Stock Market Index			7.15	-19.49	6.99	8.73	12.09	9.88	Jul-15
Vanguard® Total Stock Market Index Fund Institutional Shares	10,343,690	25.83	7.16	-19.51	6.98	8.72	12.08	9.87	Jul-15
Spliced Total Stock Market Index			7.15	-19.49	6.99	8.73	12.09	9.88	Jul-15
Multi-Cap Core Funds Average			7.93	-17.93	5.77	6.82	9.96	7.71	Jul-15
Vanguard® Windsor™ Fund Admiral™ Shares	5,343,581	13.35	13.72	-2.96	10.17	8.87	11.72	9.27	Jul-15
Russell 1000 Value			12.42	-7.54	5.96	6.67	10.29	8.04	Jul-15
Multi-Cap Value Funds Average			12.57	-6.96	6.19	5.80	9.39	7.20	Jul-15
Vanguard® PRIMECAP Fund Admiral™ Shares	5,265,612	13.15	9.94	-15.09	6.69	8.78	14.06	11.17	Jul-15
Russell 1000 Growth			2.20	-29.14	7.79	10.96	14.10	11.92	Jul-15
S&P 500			7.56	-18.11	7.66	9.42	12.56	10.51	Jul-15
Multi-Cap Growth Funds Average			1.79	-32.90	2.73	6.77	10.59	7.65	Jul-15
Equity International	**9,137,360**	**22.82**	**14.47**	**-18.72**	**1.63**	**2.24**	**--**	**4.61**	**Jul-15**
Spliced Total International Stock Index			14.14	-16.10	0.52	1.10	4.20	3.53	Jul-15
Vanguard® Total International Stock Index Fund Institutional Shares	4,566,542	11.41	14.72	-15.98	0.53	1.12	4.09	3.53	Jul-15
Spliced Total International Stock Index			14.14	-16.10	0.52	1.10	4.20	3.53	Jul-15
International Funds Average			16.03	-17.59	0.40	1.00	4.13	2.95	Jul-15
Vanguard® International Growth Fund Admiral™ Shares	2,291,321	5.72	12.62	-30.79	3.15	4.75	7.84	7.69	Jul-15
Spliced International Index			14.80	-15.63	0.22	0.97	3.85	3.26	Jul-15
International Funds Average			16.03	-17.59	0.40	1.00	4.13	2.95	Jul-15
Vanguard® International Value Fund	2,279,497	5.69	15.76	-11.66	1.30	1.36	4.31	3.28	Jul-15
Spliced International Index			14.80	-15.63	0.22	0.97	3.85	3.26	Jul-15
International Funds Average			16.03	-17.59	0.40	1.00	4.13	2.95	Jul-15

Performance Summary (Gross of Advisory Fees) ending December 31, 2022

	Market Value ($)	% of Portfolio	2022 Q4 (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Total Fixed Income	**9,948,869**	**24.85**	**2.41**	**-11.77**	**-2.30**	**0.39**	**--**	**1.17**	**Jul-15**
Fixed Income Domestic	**9,948,869**	**24.85**	**2.26**	**-12.20**	**-2.10**	**0.42**	**--**	**1.15**	**Jul-15**
Spliced Bloomberg Barclays US Aggregate Float Adjusted Index			1.85	-13.07	-2.67	0.06	1.08	0.87	Jul-15
Vanguard® Total Bond Market Index Institutional Shares	5,166,167	12.90	1.67	-13.15	-2.73	0.01	1.02	-10.72	Sep-21
Spliced Bloomberg Barclays US Aggregate Float Adjusted Index			1.85	-13.07	-2.67	0.06	1.08	-10.57	Sep-21
Spliced Intermediate-Term Investment-Grade Debt Funds Average			1.73	-13.54	-2.61	-0.06	0.95	-11.12	Sep-21
Vanguard® Intermediate-Term Investment-Grade Fund Admiral™ Shares	3,186,015	7.96	3.49	-13.78	-2.00	0.69	1.77	1.61	Jul-15
Bloomberg US Credit 5-10 Yr TR			3.63	-13.74	-2.40	0.84	2.06	1.96	Jul-15
Spliced Core Bond Funds Average			1.73	-13.54	-2.61	-0.06	0.95	0.76	Jul-15
Vanguard® Short-Term Investment-Grade Fund Admiral™ Shares	1,596,687	3.99	1.72	-5.75	-0.38	1.10	1.45	1.41	Jul-15
Bloomberg US Credit 1-5 Yr TR			1.78	-5.56	-0.41	1.26	1.54	1.48	Jul-15
1-5 Year Investment-Grade Debt Funds Average			1.24	-6.96	-1.11	0.42	0.75	0.73	Jul-15

Total Portfolio Performance





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Cash Flow Summary

	Fourth Quarter	Year-To-Date	One Year
Beginning Market Value	$36,896,244	$49,540,398	$49,540,398
Net Cash Flow	-$27,371	-$2,004,511	-$2,004,511
Capital Appreciation	$2,790,621	-$8,300,022	-$8,300,022
Income	$379,617	$803,246	$803,246
Ending Market Value	$40,039,112	$40,039,112	$40,039,112

Quarter Ending December 31, 2022

	Beginning Market Value	Net Cash Flow	Capital Appreciation	Income	Ending Market Value
Vanguard® Intermediate-Term Investment-Grade Fund Admiral™ Shares	$2,312,220	$760,042	$87,494	$26,258	$3,186,015
Vanguard® International Growth Fund Admiral™ Shares	$2,199,615	-$166,092	$225,380	$32,418	$2,291,321
Vanguard® International Value Fund	$2,566,809	-$604,520	$255,100	$62,109	$2,279,497
Vanguard® PRIMECAP Fund Admiral™ Shares	$3,845,286	$945,964	$411,488	$62,874	$5,265,612
Vanguard® Short-Term Investment-Grade Fund Admiral™ Shares	$1,165,154	$403,713	$19,003	$8,817	$1,596,687
Vanguard® Total Bond Market Index Institutional Shares	$3,881,116	$1,189,652	$61,404	$33,995	$5,166,167
Vanguard® Total International Bond Index Fund Admiral™ Shares	$2,355,172	-$2,323,078	-$32,094	$0	--
Vanguard® Total International Stock Index Fund Institutional Shares	$5,060,790	-$1,084,136	$534,160	$55,728	$4,566,542
Vanguard® Total Stock Market Index Fund Institutional Shares	$9,706,837	-$55,177	$641,942	$50,089	$10,343,690
Vanguard® Windsor™ Fund Admiral™ Shares	$3,803,245	$906,262	$586,744	$47,330	$5,343,581
Total	**$36,896,244**	**-$27,371**	**$2,790,621**	**$379,617**	**$40,039,112**

Investment Expense Analysis as of December 31, 2022

Name	Market Value	% of Portfolio	Expense Ratio
Total Equity	**$30,090,243**	**75.2%**	
Equity Domestic	**$20,952,883**	**52.3%**	
Vanguard® PRIMECAP Fund Admiral™ Shares	$5,265,612	13.2%	0.310%
Vanguard® Total Stock Market Index Fund Institutional Shares	$10,343,690	25.8%	0.030%
Vanguard® Windsor™ Fund Admiral™ Shares	$5,343,581	13.3%	0.200%
Equity International	**$9,137,360**	**22.8%**	
Vanguard® Total International Stock Index Fund Institutional Shares	$4,566,542	11.4%	0.080%
Vanguard® International Growth Fund Admiral™ Shares	$2,291,321	5.7%	0.340%
Vanguard® International Value Fund	$2,279,497	5.7%	0.360%
Total Fixed Income	**$9,948,869**	**24.8%**	
Fixed Income Domestic	**$9,948,869**	**24.8%**	
Vanguard® Intermediate-Term Investment-Grade Fund Admiral™ Shares	$3,186,015	8.0%	0.100%
Vanguard® Short-Term Investment-Grade Fund Admiral™ Shares	$1,596,687	4.0%	0.100%
Vanguard® Total Bond Market Index Institutional Shares	$5,166,167	12.9%	0.035%
Total	**$40,039,112**	**100.0%**	**0.141%**

Episcopal Foundation of Dallas - Aggregated Performance Summary *as-of December 31, 2022*								
	Market Value*	Portfolio Allocation	Three-Month	Year-to-Date	One-Year	Three-Year	Five-Year	Since Inception
Vanguard	$40,039,112	100.00%	8.60%	-15.47%	-15.47%	3.19%	4.69%	6.19%
Vanguard Composite Benchmark			7.22%	-17.06%	-17.06%	2.49%	4.38%	5.90%
Aggregate Portfolio (net of EFD fee)*	**$40,039,112**	**100.00%**	**8.45%**	**-15.96%**	**-15.96%**	**2.63%**	**4.14%**	**6.94%**
Aggregate Composite Benchmark*			**7.22%**	**-17.06%**	**-17.06%**	**2.49%**	**4.38%**	**7.57%**

Notes: Return data achieved before February 2016 provided by client. All returns are net of fund-level fees and the Vanguard advisory fee. Aggregate portfolio returns are net of the EFD administrative fee. Vanguard Composite provides a comparison for Vanguard portfolio return and constitutes 42% Spliced Total Stock Market Index/28% Spliced Total International Stock Index/18% Spliced Barclays U.S. Agg Flt-Adj. Index/6% Barclays GA ex-USD Flt-Adj. RIC Capped Index Hedged/6% REIT Spliced Index and has been calculated as-of December 31, 2022. Performance effective date for Vanguard Composite as-of December 31, 2015. Aggregate Composite provides a comparison for Episcopal Foundation of Dallas portfolio and constitutes a weighted average of the Vanguard Composite and HFRI Fund of Funds Composite. Since inception date is January 1, 2010.

**Aggregate portfolio performance and Aggregate composite performance include hedge fund and HFRI performance, respectively, through February 29, 2016 for the Five-Year and Since Inception time periods.*

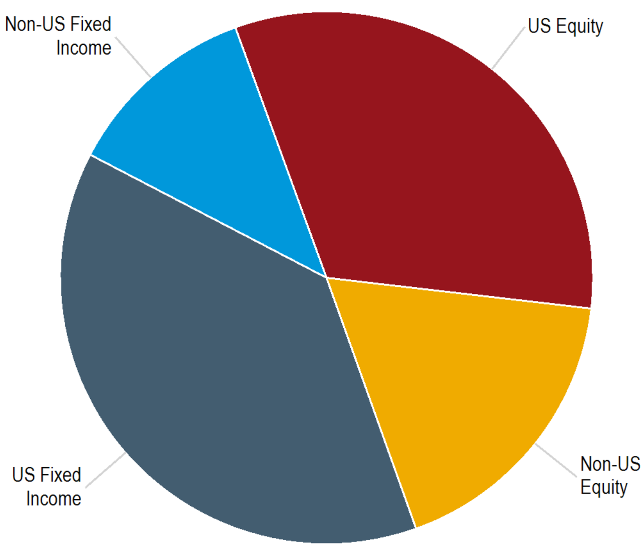
Total Portfolio Performance & Asset Allocation

Performance Summary ending December 31, 2022

	Market Value ($)	1 Mo (%)	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Episcopal Foundation of Dallas - SJES OPERATING RESERVES	**2,340,293**	**-2.76**	**6.18**	**-14.37**	**--**	**--**	**--**	**-9.66**	**Jul-21**
Episcopal Foundation of Dallas - SJES OPERATING RESERVES (Net)		**-2.76**	**6.14**	**-14.47**	**--**	**--**	**--**	**-9.75**	
Composite Benchmark		-2.39	5.66	-15.31	--	--	--	-9.94	Jul-21

- Composite Benchmark = 31% Spliced Total Stock Market Index / 19% Spliced Total International Stock Index / 38% Spliced Bloomberg Barclays US Aggregate Float Adjusted Index / 12% Bloomberg Barclays Global Aggregate ex-USD Float Adjusted RIC Capped Hedged

Current Allocation as of December 31, 2022



	Current $	Current %	Policy	Difference*
US Equity	$757,524	32.4%	31.0%	1.4%
Non-US Equity	$414,858	17.7%	19.0%	-1.3%
US Fixed Income	$891,685	38.1%	38.0%	0.1%
Non-US Fixed Income	$276,226	11.8%	12.0%	-0.2%
Total	**$2,340,293**	**100.0%**	**100.0%**	

*Difference between Policy and Current Allocation

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Cash Flow Summary

	Last Month	Last Three Months	Year-To-Date	One Year
Beginning Market Value	$2,406,606	$2,208,103	$2,751,227	$2,751,227
Net Cash Flow	$0	-$3,938	-$16,466	-$16,466
Capital Appreciation	-$82,027	$115,490	-$444,483	-$444,483
Income	$15,713	$20,637	$50,014	$50,014
Ending Market Value	$2,340,293	$2,340,293	$2,340,293	$2,340,293

Month Ending December 31, 2022

	Beginning Market Value	Net Cash Flow	Capital Appreciation	Income	Ending Market Value
Vanguard® Intermediate-Term Investment-Grade Fund Admiral™ Shares	$280,208	$0	-$2,669	$829	$278,368
Vanguard® International Growth Fund Admiral™ Shares	$84,109	$0	-$5,278	$1,126	$79,957
Vanguard® International Value Fund	$108,544	$0	-$4,568	$2,858	$106,834
Vanguard® PRIMECAP Fund Admiral™ Shares	$165,227	$0	-$11,261	$1,861	$155,826
Vanguard® Short-Term Investment-Grade Fund Admiral™ Shares	$144,082	$0	-$145	$298	$144,235
Vanguard® Total Bond Market Index Institutional Shares	$471,900	$0	-$3,949	$1,131	$469,082
Vanguard® Total International Bond Index Fund Admiral™ Shares	$284,432	$0	-$9,452	$1,246	$276,226
Vanguard® Total International Stock Index Fund Institutional Shares	$233,126	$0	-$7,788	$2,729	$228,067
Vanguard® Total Stock Market Index Fund Institutional Shares	$447,731	$0	-$28,307	$2,041	$421,465
Vanguard® Windsor™ Fund Admiral™ Shares	$187,248	$0	-$8,611	$1,596	$180,233
Total	**$2,406,606**	**$0**	**-$82,027**	**$15,713**	**$2,340,293**

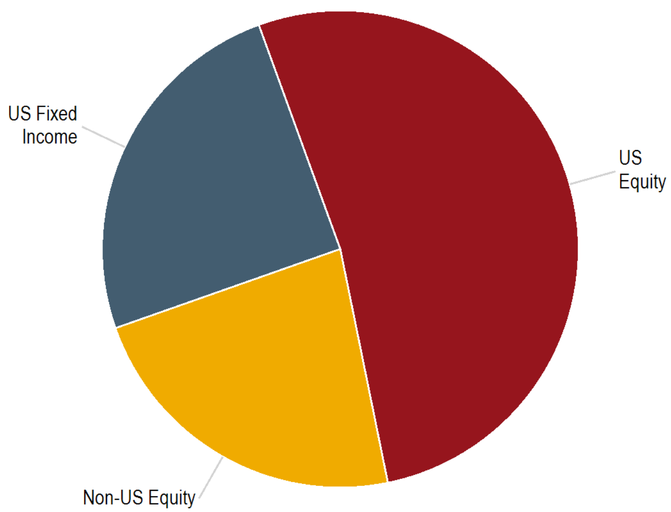
Total Portfolio Performance & Asset Allocation

Performance Summary ending December 31, 2022

	Market Value ($)	1 Mo (%)	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
EPISCOPAL FOUNDATION OF DALLAS	**40,039,112**	**-3.56**	**8.64**	**-15.37**	**3.30**	**4.80**	**--**	**6.30**	**Jun-15**
EPISCOPAL FOUNDATION OF DALLAS (Net)		**-3.56**	**8.60**	**-15.47**	**3.19**	**4.69**	**--**	**6.19**	
Composite Benchmark		-3.34	7.22	-17.06	2.49	4.38	--	5.90	Jun-15

- Composite Benchmark = 53% Spliced Total Stock Market Index / 22% Spliced Total International Stock Index / 25% Spliced Bloomberg Barclays US Aggregate Float Adjusted Index

Current Allocation as of December 31, 2022



	Current $	Current %	Policy	Difference*
US Equity	$20,952,883	52.3%	53.0%	-0.7%
Non-US Equity	$9,137,360	22.8%	22.0%	0.8%
US Fixed Income	$9,948,869	24.8%	25.0%	-0.2%
Total	**$40,039,112**	**100.0%**	**100.0%**	

*Difference between Policy and Current Allocation

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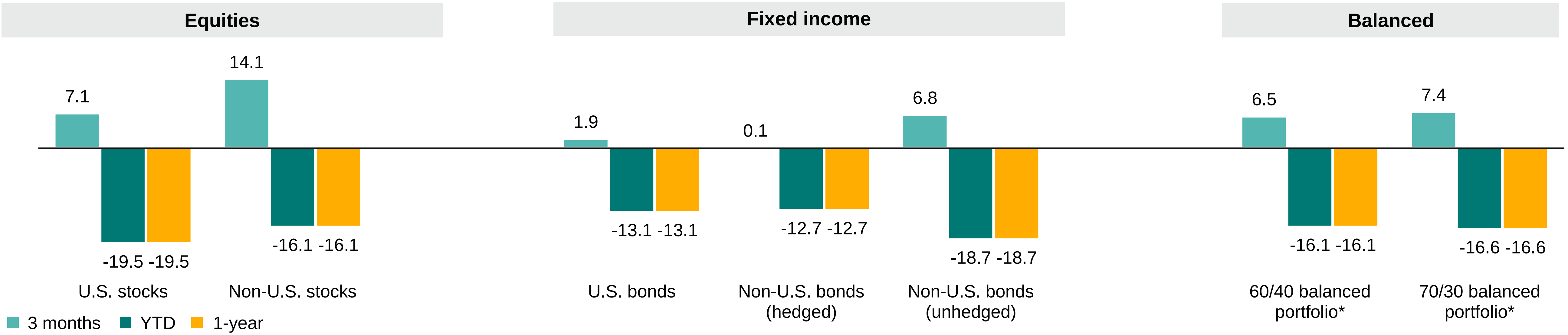
Markets and economy

Markets gain; focus remains on inflation, interest rates

- Stocks ended 2022 down with the S&P 500 down 19.4% and NASDAQ down over 33.0%. This has been the worst year for stocks since the Great Financial Crisis in 2008.
- The rate of inflation began to slow due to easing pressure in supply chains but remains stubbornly high at 7.1%.
- The Federal Reserve continued its battle against inflation by raising its benchmark interest rate to the highest level in 15 years.

Global market returns as of December 31, 2022 (%)



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.

Sources: Bloomberg, FTSE, MSCI, Russell, CRSP and Dow Jones.

US Stocks (CRSP US Total Market Index), Non-US Stocks (FTSE Global All-Cap ex-US Index), US Bonds (Bloomberg US Aggregate Float Adjusted Index), Non-US Bonds hedged (Bloomberg Global Aggregate ex-USD Float Adjusted RIC Capped Index hedged), Non-US Bonds unhedged (Bloomberg Global Aggregate Index ex-USD).

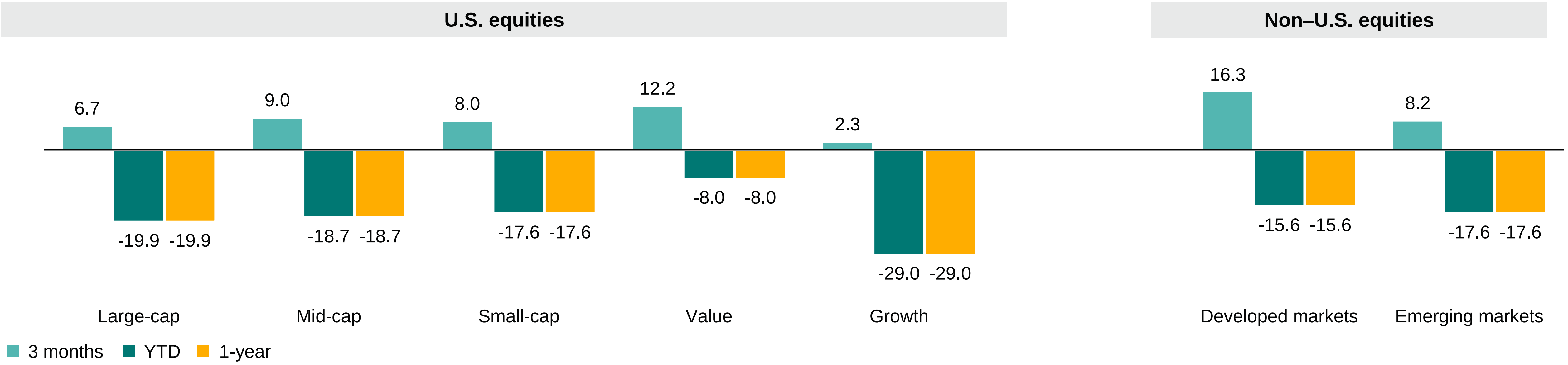
* 60/40 balanced portfolio Static Composite (36% U.S. stocks, 24% international stocks, and 28% investment-grade U.S. bonds, 12% investment-grade international bonds).

** 70/30 balanced portfolio Static Composite (42% U.S. stocks, 28% international stocks, and 21% investment-grade U.S. bonds, 9% investment-grade international bonds).

Markets down across the world, hope on the horizon

- China reverses Zero-Covid policy amid rising protests, but lifting of policy has brought rising infections, drug shortages and disruption to everyday life.
- Lower energy prices in Eurozone help to slow inflation, but war in Ukraine weighs on market performance.
- Value stocks outperformed growth fueled by rapidly rising interest rates. Higher borrowing costs have triggered revaluation on high priced growth stocks.

Global equity market returns as of December 31, 2022 (%)



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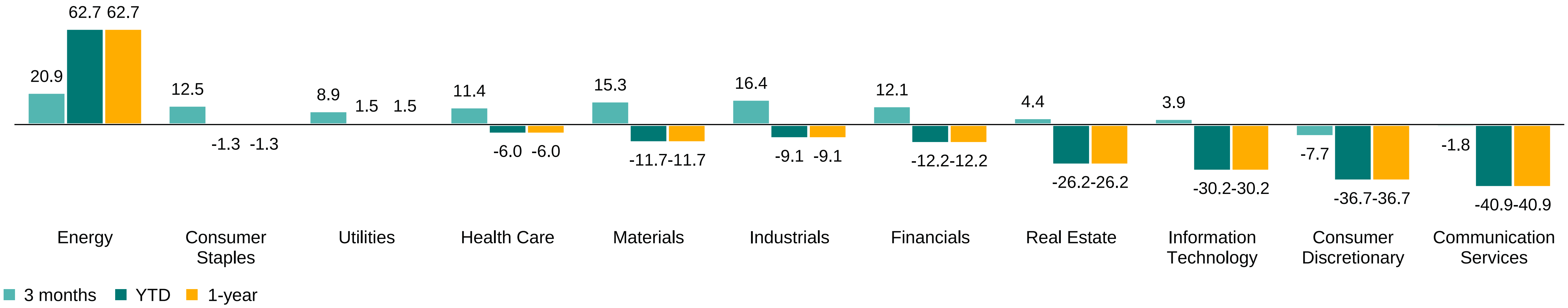
Sources: FTSE, MSCI, Russell, CRSP and Dow Jones.
Large-cap (CRSP US Mega Cap Index), Mid-cap (CRSP US Mid Cap Index), Small-cap (CRSP US Small Cap Index); Value (Russell 3000 Value Index), Growth (Russell 3000 Growth Index); Developed markets (FTSE Developed All Cap ex-US Index), Emerging markets (FTSE Emerging Markets All Cap China A Inclusion Index).

Investors retreat to defensive stocks amid changing market

- Large technology firms including Meta, Amazon, Netflix and Twitter have laid off large swaths of their workforce among falling profits and rising borrowing costs.
- Fears of a coming recession has led investors to flock to utility, consumer-staples and healthcare companies.
- Tight supply of energy and increased demand in the winter months have led to outperformance in Energy sector.

U.S. equity sector returns as of December 31, 2022 (%)



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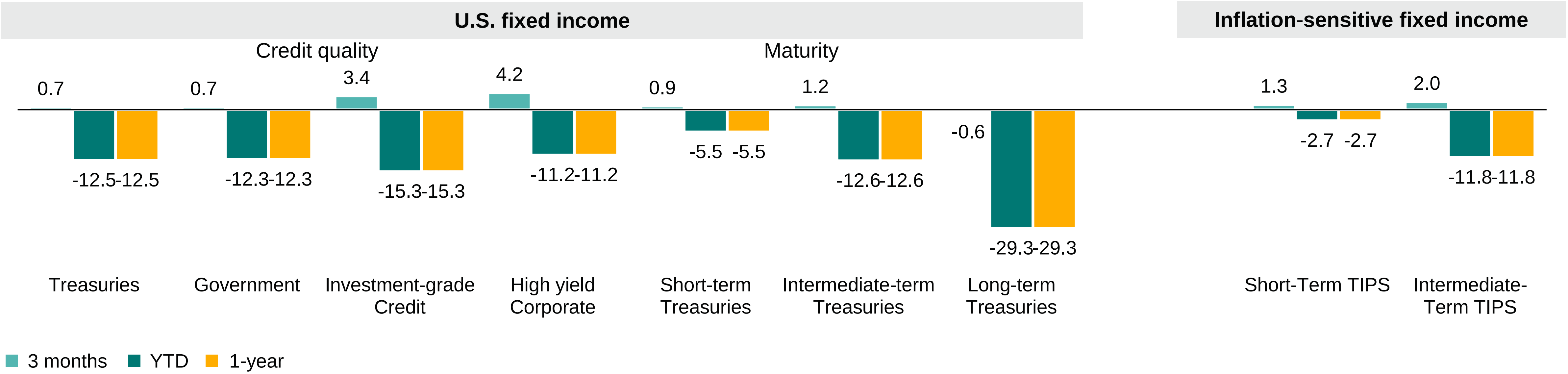
Source: FactSet.
U.S. markets measured by CRSP U.S. Total Market Index.

No safe place for investors to hide

- Barclay's U.S. Aggregate Bond Index posted the worst year ever at -13%.
- The Federal Reserve continued its battle against inflation by raising its benchmark interest rate to the highest level in 15 years. The Federal Reserve indicated that rates will continue to rise through 2023.

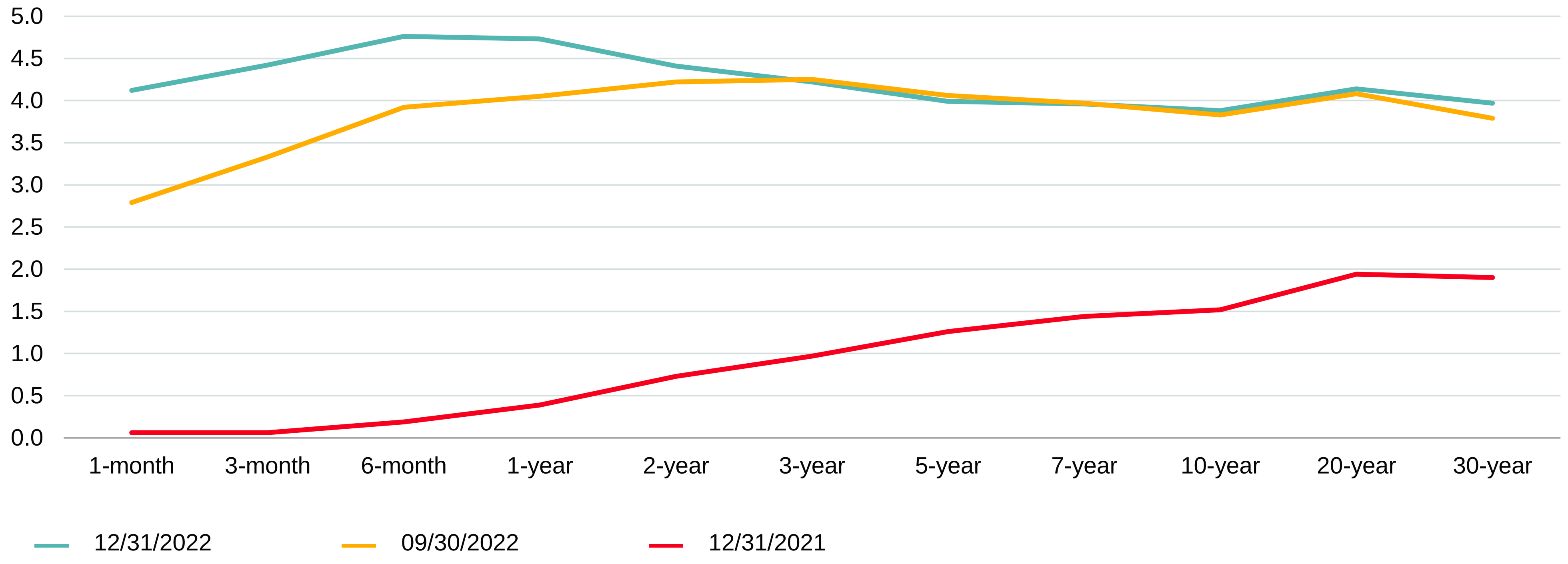
Domestic fixed income market returns as of December 31, 2022 (%)



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.
Source: Bloomberg.
Treasuries, government, investment-grade credit; high-yield (Bloomberg U.S. Treasury/Government/Credit/Corporate High-Yield Indices); short-inter-long-term Treasuries (Bloomberg U.S. 1–5/5–10/Long Treasury Indices); short-term TIPS (Bloomberg U.S. Treasury 0–5 Year Inflation-Protected Index); intermediate-term TIPS (Bloomberg U.S. Treasury Inflation-Protected Index).

U.S. Treasury yield curve: front rises above back end of curve

Yield (%) and change (bps)	1-month	3-month	6-month	1-year	2-year	3-year	5-year	7-year	10-year	20-year	30-year
Current yield (%)	4.12	4.42	4.76	4.73	4.41	4.22	3.99	3.96	3.88	4.14	3.97
3 Mo. Δ	133	109	84	68	19	-3	-7	-1	5	6	18
12 Mo. Δ	406	436	457	434	368	325	273	252	236	220	207



Source: Morningstar.

Market leadership changes

- Emerging markets equities appears at both the top and bottom multiple times, illustrating the relatively high volatility of single asset classes
- The balanced composite generally falls near the middle, demonstrating the volatility dampening effect of high-grade fixed income and the consistency resulting from holding a broadly diversified portfolio
- U.S. stock returns exceeded non-U.S. stock returns by a significant amount over the past ten years, yet it's important to remember that recent outperformance by a sub-asset class or market segment does not imply future outperformance

2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	10-Year Average
Emg 18.1	Sml 38.8	REIT 30.4	Grw 5.1	Sml 21.3	Emg 31.1	IB 3.2	Grw 35.8	Grw 38.3	Cmd 13.8	Grw 13.8
REIT 17.8	Grw 34.2	Lrg 13.2	REIT 2.5	Val 18.4	Grw 29.6	T-Bill 1.9	Lrg 31.4	Lrg 21.0	T-Bill 1.5	Lrg 12.4
Val 17.5	Lrg 33.1	Val 12.7	IB 1.4	HY 17.1	Dev 26.3	Bnd 0.0	Val 26.3	Sml 20.0	HF -4.4	Val 10.2
Dev 17.4	Val 32.7	Grw 12.4	Lrg 0.9	Lrg 12.1	Lrg 21.7	HY -2.1	REIT 25.8	Emg 15.5	Val -8.0	Sml 9.0
Lrg 16.4	Dev 20.5	IB 8.8	Bnd 0.5	Cmd 11.4	Bal 16.5	Grw -2.1	Sml 25.5	Bal 13.4	IB -9.8	Bal 6.5
Sml 16.4	Bal 16.8	Bal 6.4	T-Bill 0.0	Emg 10.3	Sml 14.6	REIT -4.6	Dev 22.3	Dev 10.0	HY -11.2	REIT 6.5
HY 15.8	HY 7.4	Bnd 6.0	Bal -0.6	REIT 8.6	Val 13.2	Lrg -4.8	Bal 20.7	Bnd 7.5	Bnd -13.0	Dev 4.8
Grw 15.2	HF 6.7	Sml 4.9	Dev -1.8	Grw 7.4	HY 7.5	Bal -5.5	Emg 20.4	HY 7.1	Dev -15.6	HY 4.0
Bal 12.7	REIT 2.5	Emg 2.6	HF -3.6	Bal 7.3	HF 6.0	HF -6.7	HY 14.3	HF 6.8	Bal -15.9	Emg 2.1
IB 6.5	IB 1.2	HY 2.5	Val -4.1	IB 4.9	REIT 5.1	Val -8.6	Bnd 8.7	IB 3.9	Emg -17.6	IB 2.1
Bnd 4.2	T-Bill 0.1	T-Bill 0.0	Sml -4.4	Dev 3.1	Bnd 3.5	Sml -11.0	HF 8.6	Val 2.9	Lrg -19.1	HF 1.8
HF 3.5	Bnd -2.0	HF -0.6	HY -4.5	Bnd 2.6	IB 2.5	Cmd -13.0	IB 7.6	T-Bill 0.6	Sml -20.4	Bnd 1.1
T-Bill 0.1	Emg -3.2	Dev -4.4	Emg -13.5	HF 2.5	T-Bill 0.8	Emg -14.8	Cmd 5.4	Cmd -3.5	REIT -24.5	T-Bill 0.7
Cmd -1.1	Cmd -9.6	Cmd -17.0	Cmd -24.7	T-Bill 0.3	Cmd 0.7	Dev -14.8	T-Bill 2.3	REIT -7.6	Grw -29.0	Cmd -2.1

Val	Value oriented U.S. based stocks (Russell 3000 Value Index)
Grw	Growth oriented U.S. based stocks (Russell 3000 Growth Index)
Lrg	Large U.S. based stocks (Russell 1000 Index)
Sml	Small U.S. based stocks (Russell 2000 Index)
Dev	International stocks from developed countries (FTSE Developed All Cap ex US Index)
Emg	International stocks from emerging countries (FTSE Emerging ACap CN A Inclus Idx)
Bnd	Investment-grade U.S. bonds (Bloomberg US Aggregate Bond Index)
HY	High-yield U.S. bonds (Bloomberg US Corp High Yield Index)
IB	Investment-grade international bonds (Bloomberg GA ex-USD Index Hedged)
T-Bill	Short-term Treasury rates (Citigroup 3-Month US T-Bill Index)
REIT	U.S. public equity real estate (REIT) (MSCI US REIT Index)
Cmd	Commodities (Bloomberg Commodity Index)
HF	Hedge funds (HFRX Global Hedge Fund Index*)
Bal	Balanced Static Composite (39% U.S. stocks**, 26% Int'l stocks†, 24.5% Invest-grade U.S. bonds††, 10.5% Invest-grade Int'l bonds††)

Source: Vanguard. Last observation: December 31, 2022; 10-year average performance from December 31, 2011 through December 31, 2022.

* Source: Hedge Fund Research, Inc.

** U.S. stocks: MSCI U.S. Broad Market Index.

† International Stocks: FTSE Global All Cap ex-US Index.

†† Bonds: Bloomberg US Aggregate Bond Index and Bloomberg Global Aggregate ex-USD Index Hedged.

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.

Headwinds for active equity mutual fund managers

Percentage of actively managed funds underperforming their style benchmarks*

Ten-year: December 31, 2022

	Value	Blend	Growth
Large	97%	93%	89%
Mid	96%	95%	76%
Small	92%	89%	63%

International

Emerging	Developed	Global
76%	86%	65%

Vanguard active equity funds versus their primary and peer group benchmarks**

Ten-year: December 31, 2022

	Below benchmark	Above benchmark
Above peer group average	11%	76%
Below peer group average	8%	5%

Key

≥ 75%	≥ 50%	< 50%	≥25%	< 25%

The competitive performance data shown represent past performance, which is not a guarantee of future results, and all investments are subject to risks. For the most recent Vanguard fund performance, visit our website at www.vanguard.com/performance.

Note: Performance data reflect periods ending December 31, 2022. Sources: Vanguard calculations, using data from ViFi and Morningstar.

* Style benchmarks are represented by the following indexes—large blend: MSCI US Prime Market 750 Index through January 30, 2013, CRSP US Large Cap Index thereafter; large growth: MSCI US Prime Market Growth Index through April 16, 2013, CRSP US Large Cap Growth Index thereafter; large value: MSCI US Prime Market Value Index through April 16, 2013, CRSP US Large Cap Value Index thereafter; mid blend: MSCI US Mid Cap 450 Index through January 30, 2013, CRSP US Mid Cap Index thereafter; mid growth: MSCI US Mid Cap Growth Index through April 16, 2013, CRSP US Mid Cap Growth Index thereafter; mid value: MSCI US Mid Cap Value Index through April 16, 2013, CRSP US Mid Cap Value Index thereafter; small blend: MSCI US Small Cap 1750 Index through January 30, 2013, CRSP US Small Cap Index thereafter; small growth: MSCI US Small Cap Growth Index through April 16, 2013, CRSP US Small Cap Growth Index thereafter; small value: MSCI US Small Cap Value Index through April 16, 2013, CRSP US Small Cap Value Index thereafter. International and global benchmarks are represented by the following indexes—Emerging: MSCI Emerging Markets Index; Developed: MSCI World Index; Global: MSCI All Country World Index.

** Performance measured relative to each Vanguard fund's respective primary benchmark and current Lipper category average.

Vanguard February 2023 market and economic outlook

Key Highlights

- We still assign a 90% probability to a U.S. recession over the course of 2023 and view a path to a soft landing as exceptionally narrow.
- Our forecast for year-on-year core inflation is just below 3% at the end of 2023, still well above the Federal Reserve's 2% inflation target.
- We have upgraded our forecast for China's 2023 economic growth to 5.3%.

Asset-class return outlooks

Our 10-year annualized nominal return projections are shown below. The projections listed below are based on the September 30, 2022, running of the Vanguard Capital Markets Model® (VCMM). Please note the figures are based on a 2-point range around the 50th percentile of the distribution of return outcomes for equities and a 1-point range around the 50th percentile for fixed income.

Equities	Return projection	Median volatility
U.S. equities	**4.7%–6.7%**	17.4%
Global equities ex-U.S. (unhedged)	**7.4%–9.4%**	18.8%

Fixed income	Return projection	Median volatility
U.S. aggregate bonds	**4.1%–5.1%**	5.6%
U.S. Treasury bonds	**3.7%–4.7%**	5.8%
Global bonds ex-U.S. (hedged)	**4.0%–5.0%**	4.4%

These probabilistic return assumptions depend on current market conditions and, as such, may change over time.

IMPORTANT: The projections or other information generated by the Vanguard Capital Markets Model® 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 the VCMM are derived from 10,000 simulations for each modeled asset class. Simulations are as of September 30, 2022. Results from the model may vary with each use and over time. For more information, see Important information page.

Source: Vanguard Investment Strategy Group.

Note: Vanguard's views are as of January 19, 2023, unless otherwise stated

Vanguard February 2023 market and economic outlook

Region-by-region outlook

United States

We expect the first reading of fourth-quarter GDP to reflect growth around 3% on an annualized basis. Economic growth was driven by stronger-than-expected consumer activity, with savings drawdowns serving as the primary source of financing amid a shortfall in real incomes.

- Vanguard still assigns a 90% probability to a U.S. recession over the course of 2023 and views a path to a soft landing as exceptionally narrow.
- We expect only marginal growth, around 0.25%, for all of 2023.

Euro area

We now expect full-year 2023 GDP to contract by 0.5% to 1.0%, compared with our previous expectation for flat 2023 growth. Vanguard continues to expect a recession in 2023, though we believe it will be relatively mild.

- Recent data suggest that the euro area most likely avoided a contraction in the fourth quarter of 2022, and leading indicators suggest more near-term optimism about the euro area economy.
- We see elevated risks for a double-dip recession further out, toward the end of 2023 and into 2024.

United Kingdom

The need for tighter monetary policy amid elevated inflationary pressures is one reason we believe the United Kingdom economy will enter a recession in 2023.

- Recession remains likely in 2023 given the time it takes for higher interest rates to hit the economy.
- We believe a U.K. recession will be deeper and longer than the one in the euro area.
- We continue to expect GDP to contract by 1.0% to 1.5% in 2023.

Vanguard February 2023 market and economic outlook

Region-by-region outlook

China

China's policymakers have departed abruptly from COVID-19 mitigation efforts, a development that promises to accelerate the economy in 2023 even as untold numbers of people are sickened.

- We had expected a bumpy, gradual exit from China's zero-COVID approach, but policymakers now appear adamant about removing all COVID controls, even as the virus overwhelms China's health system.
- That development and stronger-than-expected economic data released on January 17 lead us to upgrade our forecast for full-year 2023 growth from 4.5% to 5.3%.
- The key downside risks we foresee are the potential emergence of new COVID variants and recurring waves of infections that would restrain the recovery in consumption, and a deeper-than-expected global downturn.
- A faster, stronger rebound in China's economy would be positive for global growth, lowering the likelihood of a global recession, and would have implications for global inflation.

Emerging markets

Given a materially slowing global economy and further anticipated developed-market central bank rate hikes, Vanguard expects below-consensus economic growth of about 3% for emerging markets in 2023.

- In Latin America, our view is that materially slowing global growth will weigh on growth in emerging markets.
- In emerging Asia, where exports already have begun to slow, we expect central banks won't deliver on rate hikes that markets are pricing in.

Slide ID #: S070008 Tracking #: 2709155 Expiration date: 7/12/2024

Vanguard February 2023 market and economic outlook

Labor market stays strong–for now

Unemployment falls

The labor market remained resilient in December as a greater-than-expected 223,000 jobs were created and the unemployment rate fell to 3.5%.

- As the economy slows, we expect moderate labor-market cooling in the second quarter.
- Look for several months of job losses and a year-end unemployment rate in a range of 4.5% to 5.0%.

UNEMPLOYMENT RATE

fell to

3.5%

in December 2022

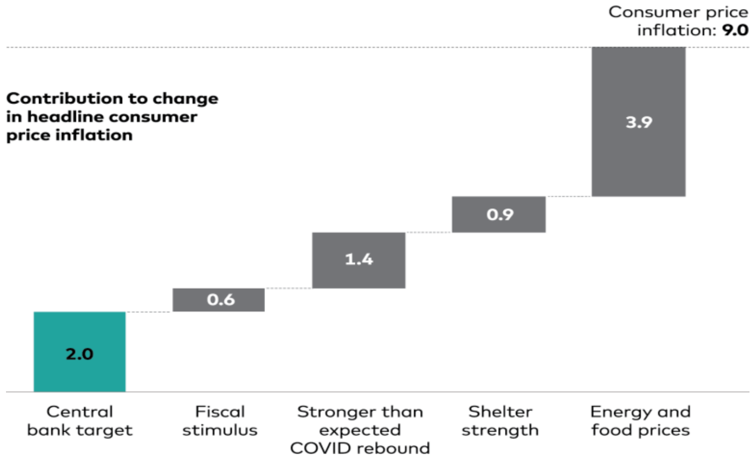
Monetary policy: Balancing risks is key

Rate target likely to move higher

From the Federal Reserve's perspective, the immediate future of the U.S. economy comes down to balancing two risks: that insufficiently restrictive monetary policy would allow inflation to rekindle and spiral out of control, and that the lagged cumulative effects of overly restrictive policy could lead to an unnecessary reduction in economic activity.

- Minutes of the central bank's December 13–14 policy meeting show that the Fed remains more concerned about inflation risk than overly restrictive policy.
- Vanguard believes that it matters less whether the Fed raises its rate target by 25 rather than 50 basis points at its next policy meeting, on February 1 than how high the Fed ultimately raises its rate target and how long it keeps it there.
- We continue to expect the Fed to push its rate target higher, to a terminal rate in a range of 5.0% to 5.25% during 2023's first quarter, and to keep it at that level the rest of the year.
- Because central banks' tools are most effective in bringing down inflation by tamping down demand, the decomposition of the drivers of inflation is crucial (see chart on the right).

Global inflation has been driven by a multitude of factors



Notes: This decomposition of inflation into each of the subcategories is based on subjective analysis of our latest inflation forecast for year-end 2022 compared with expectations at the start of 2021. Shelter inflation is the component that captures the effect of shelter costs in the overall CPI. Shelter includes prices for both renters and homeowners. For renters, shelter inflation measures rent, temporary lodging away from home, and utility payments. For homeowners, the U.S. Bureau of Labor Statistics calculates what it would cost to rent a similar house. Values in the figure reflect rounding.
Sources: Vanguard calculations, based on data from Moody's, Refinitiv, and Bloomberg, as of October 31, 2022.

Vanguard February 2023 market and economic outlook

Stickier inflation is a major focus

Higher wages could bump up core inflation

Inflation is driving the Fed's deliberations, though not just headline or even core inflation (which excludes volatile food and energy prices).

- "Stickier" inflation components, those that are harder to tamp down, such as wages, are particularly in the Fed's sights.
- Wage inflation, as measured by average hourly earnings, slowed to 4.6% compared with a year earlier in the December Bureau of Labor Statistics (BLS) employment report, continuing a months-long deceleration trend.
- We see as an upside risk, however, the potential that higher wages could filter into higher-than-expected core inflation later this year.

- Although we expect year-on-year headline inflation to continue to fall, we anticipate that monthly headline CPI could come in stronger on February 14 than in the past few months' readings, as we expect a recent trend of falling used car prices to have moderated.

- Digging deeper, the December CPI report showed persistently strong services and shelter prices that continue to support our forecast for year-on-year core inflation just below 3% at the end of 2023, still well above the Federal Reserve's 2% inflation target.

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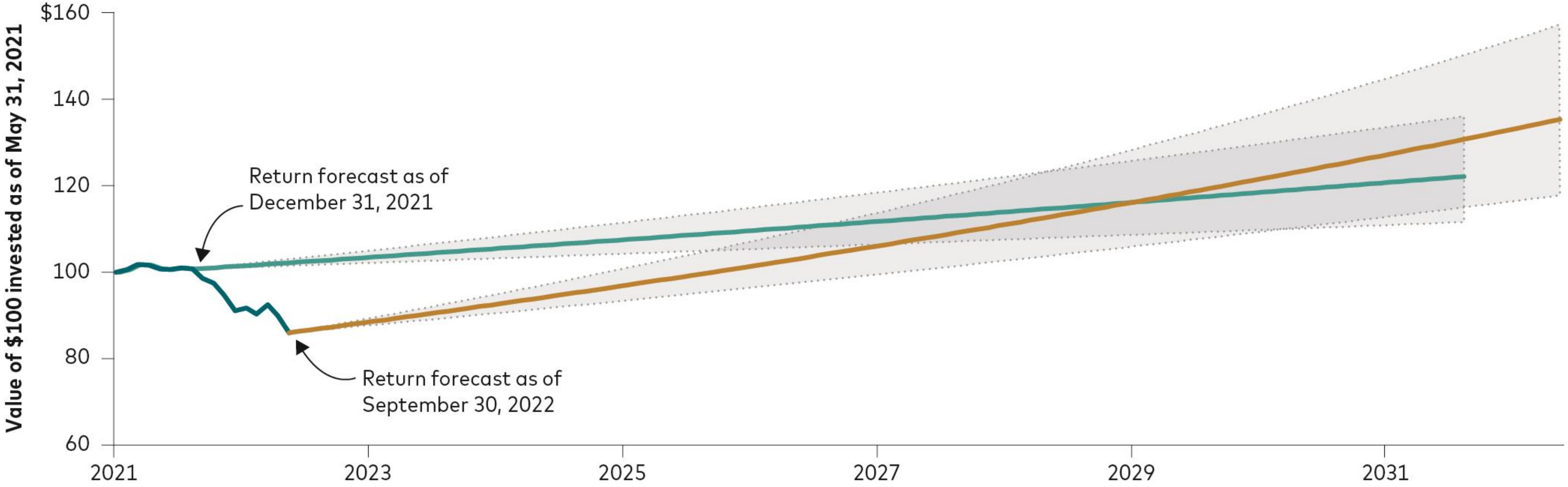
Investment-grade U.S. bonds: We expect investors to be better off because, not in spite, of the sell-off



Notes: The chart shows actual returns for the Bloomberg U.S. Aggregate Bond Index along with Vanguard's forecast for cumulative returns over the subsequent 10 years as of December 31, 2021, and September 30, 2022. The dotted lines represent the 10th and 90th percentiles of the forecasted distribution. Data are as of September 30, 2022.

Sources: Vanguard calculations and Bloomberg, as of September 30, 2022.

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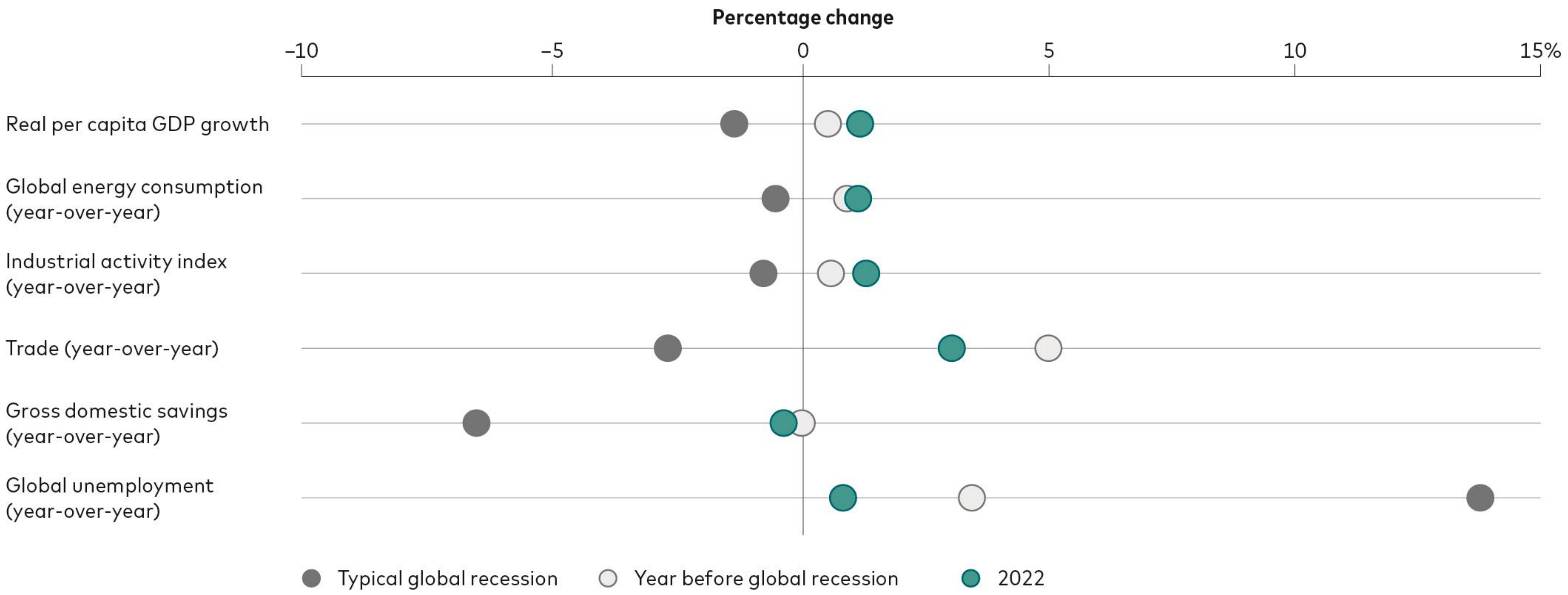
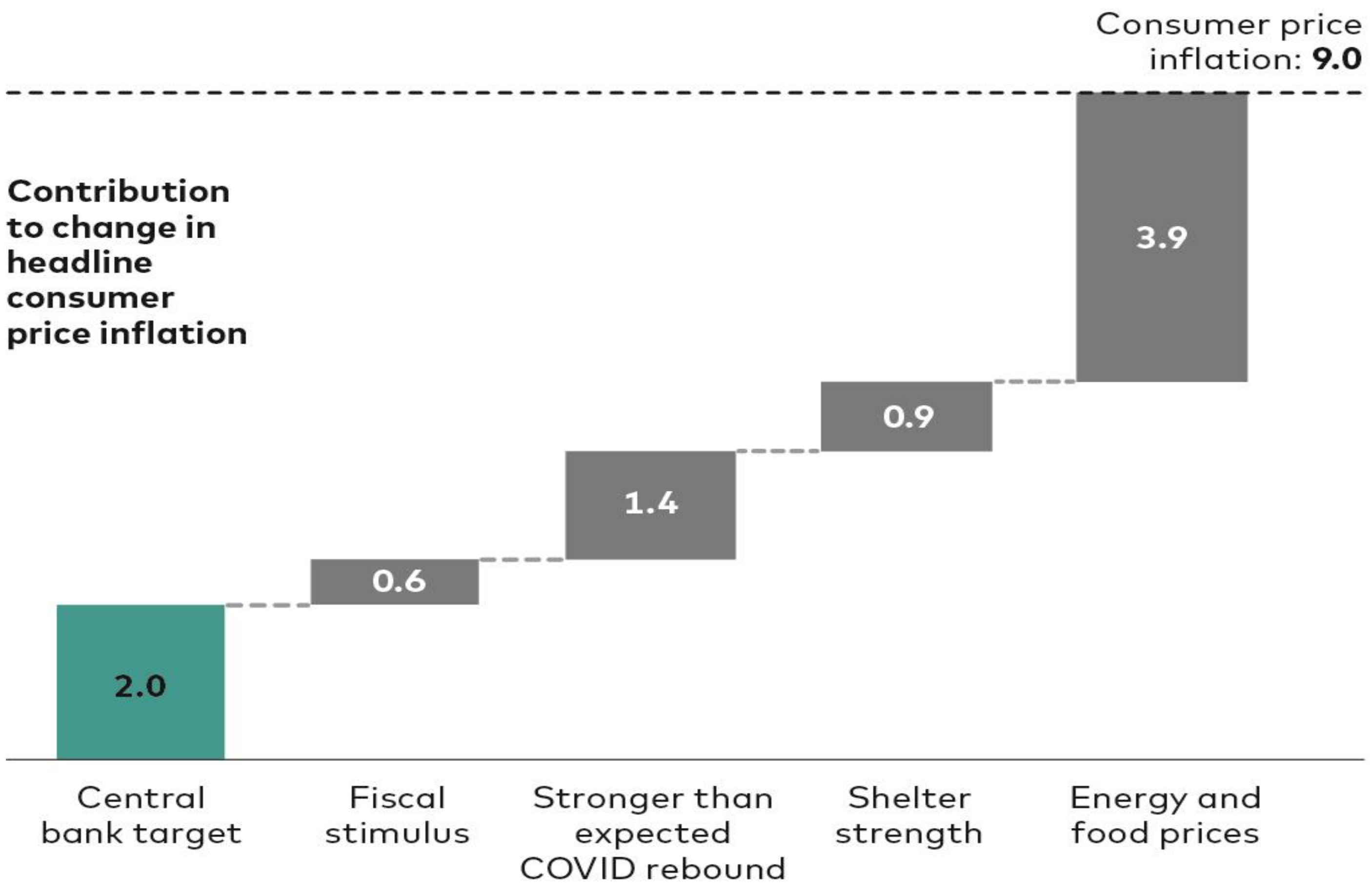
Comparison: Global recessions versus now



Notes: Global recession years were 1975, 1982, 1991, 2009, and 2020. Year before includes the year before each, excluding 2019. Vanguard calculations are as of October 31, 2022. The typical global recession reflects the median result for each category in the global recession years.

Sources: World Bank, British Petroleum Statistical Review of World Energy, OECD, Federal Reserve Bank of St. Louis FRED database, OeNB, CPB Netherlands Bureau for Economic Policy Analysis, UNCTAD, and Our World in Data, as of October 31, 2022. Global unemployment data and years of global recession are from Kose, Sugawara, and Terrones (2020).

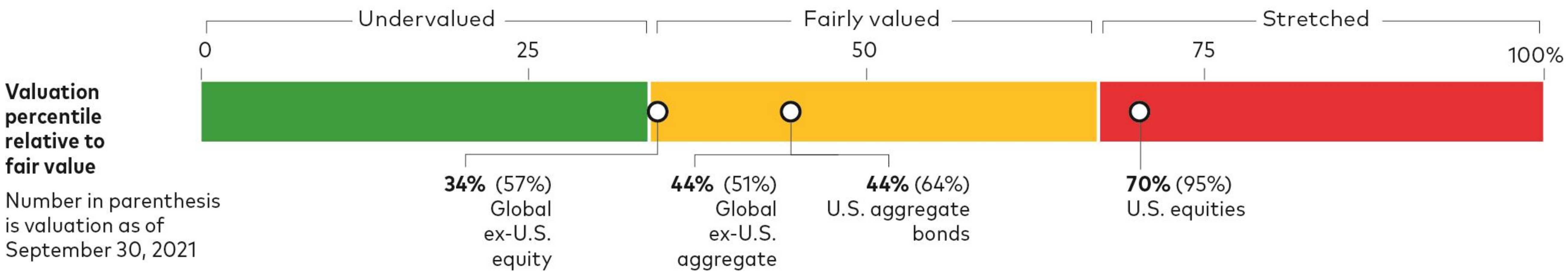
Global inflation has been driven by a multitude of factors



Notes: This decomposition of inflation into each of the subcategories is based on subjective analysis of our latest inflation forecast for year-end 2022 compared with expectations at the start of 2021. Shelter inflation is the component that captures the effect of shelter costs in the overall CPI. Shelter includes prices for both renters and homeowners. For renters, shelter inflation measures rent, temporary lodging away from home, and utility payments. For homeowners, the U.S. Bureau of Labor Statistics calculates what it would cost to rent a similar house. Values in the figure reflect rounding.

Sources: Vanguard calculations, based on data from Moody's, Refinitiv, and Bloomberg, as of October 31, 2022.

Equity and bond valuations are attractive



Notes: The U.S. valuation measure is the current cyclically adjusted price/earnings ratio (CAPE) percentile relative to fair-value CAPE for the Standard & Poor's Composite Index from 1940 to 1957 and the S&P 500 Index from 1957 through September 30, 2022. Global ex-U.S. equity is a 70% developed markets/30% emerging markets blend. Developed-market equity valuation measures are the current CAPE percentile relative to the fair-value CAPE for the local MSCI index. 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. Emerging markets is based on the percentile rank based on our fair-value model relative to the market. U.S. aggregate bonds are the weighted average between intermediate-term credit and Treasury valuation percentiles. The global ex-U.S. aggregate valuation measure is the market-weighted average of each region's (Australia, U.K., euro area, Japan, and Canada) valuation percentile. The valuation percentiles in parenthesis are as of one year prior.

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 September 30, 2022, and September 30, 2021.

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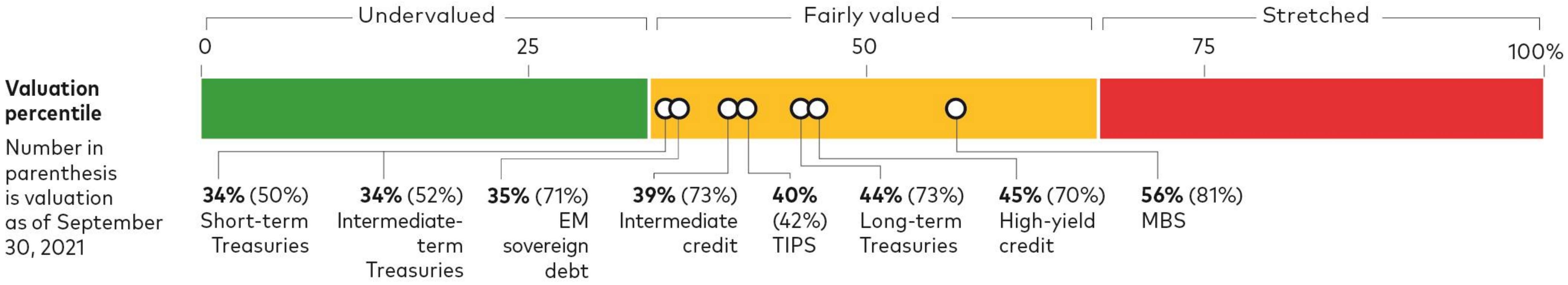
Fixed income securities are fairly valued



Notes: 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 our proprietary fundamental fair-value model. TIPS are calculated using 10-year-ahead annualized inflation expectation relative to years 21–30. The valuation percentiles in parenthesis are as of one year prior.

Source: Vanguard calculations, as of September 30, 2022, and September 30, 2021.

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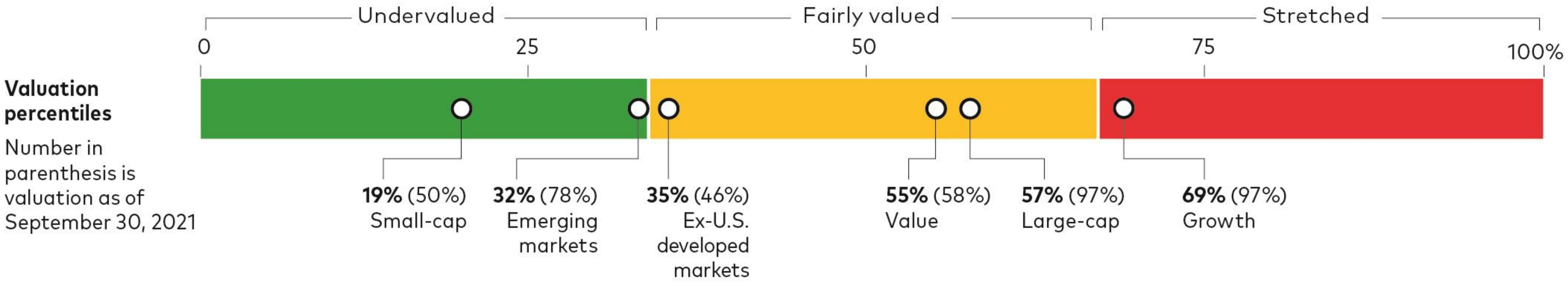
At year-end 2022, equity valuations were mixed

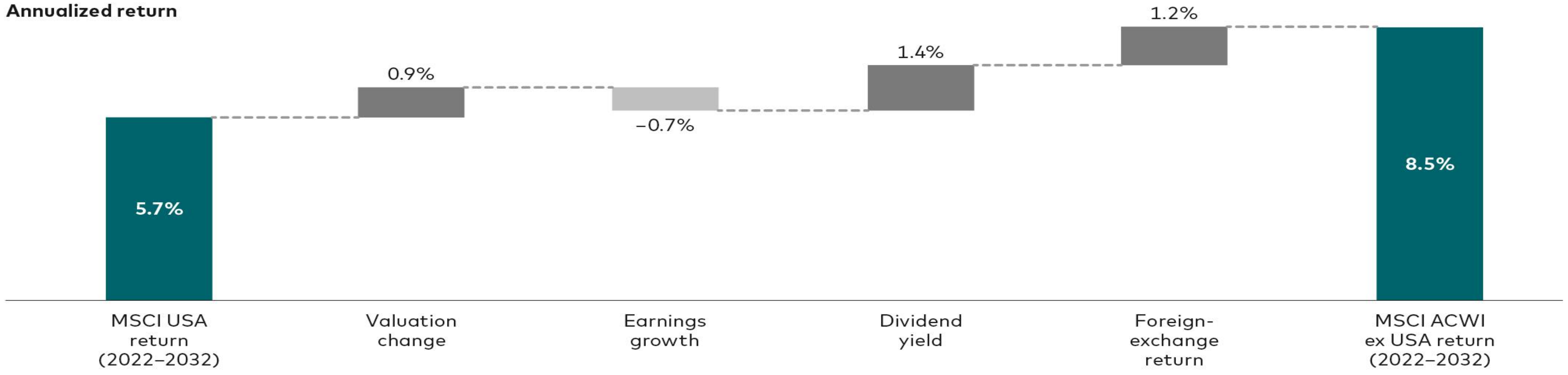


Notes: With the exception of emerging markets and ex-U.S. developed markets, valuations are relative to U.S. equities as the base at the 50th percentile. Growth, value, and small-cap are all based on the percentile rank based on our fair-value model relative to the market. Large-cap valuations are composite valuation measures of the style factor to U.S. relative valuations and the current U.S. cyclically adjusted price/earnings ratio (CAPE) percentile relative to its fair-value CAPE. 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. Emerging markets are based on the percentile rank based on our fair-value model relative to the market. Valuation percentiles in parenthesis are as of one year prior.

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 September 30, 2022, and September 30, 2021.

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 September 30, 2022 , and September 30, 2021. Results from the model may vary with each use and over time.

Since relative valuations have improved, a weaker dollar is becoming a more important driver of expected international equity outperformance



	Valuation change	Earnings growth	Dividend yield	Foreign-exchange return	Total return
MSCI USA Index	–1.18%	5.0%	1.9%	—	5.7%
MSCI ACWI ex USA Index	–0.27%	4.3%	3.3%	1.2%	8.5%

Notes: Forward-looking return estimates are from the VCMM, as of September 30, 2022, for the period October 1, 2022, through September 30, 2032. 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, as of September 30, 2022.

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 September 30, 2022. Results from the model may 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 September 30, 2022. 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.
Emerging-market sovereign bonds: Bloomberg Emerging Markets USD Aggregate Bond Index.
Commodities: Bloomberg Commodity Index.
Mortgage-backed securities (MBS): Bloomberg U.S. Mortgage Backed Securities 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 one-third 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.

Indexes used in our historical calculations

The long-term returns for our hypothetical portfolios are based on data for the appropriate market indexes through September 30, 2022. We chose these benchmarks to provide the best history possible, and we split the global allocations to align with Vanguard's guidance in constructing diversified portfolios.

U.S. bonds: Standard & Poor's High Grade Corporate Index from 1926 through 1968; Citigroup High Grade Index from 1969 through 1972; Lehman Brothers U.S. Long Credit AA Index from 1973 through 1975; and Bloomberg U.S. Aggregate Bond Index thereafter.

Ex-U.S. bonds: Citigroup World Government Bond Ex-U.S. Index from 1985 through January 1989 and Bloomberg Global Aggregate ex-USD Index thereafter.

Global bonds: Before January 1990, 100% U.S. bonds, as defined above. From January 1990 onward, 70% U.S. bonds and 30% ex-U.S. bonds, rebalanced monthly.

U.S. equities: S&P 90 Index from January 1926 through March 1957; S&P 500 Index from March 1957 through 1974; Dow Jones Wilshire 5000 Index from the beginning of 1975 through April 2005; and MSCI US Broad Market Index thereafter.

Ex-U.S. equities: MSCI World ex USA Index from January 1970 through 1987 and MSCI All Country World ex USA Index thereafter.

Global equities: Before January 1970, 100% U.S. equities, as defined above. From January 1970 onward, 60% U.S. equities and 40% ex-U.S. equities, rebalanced monthly.

Important information

The asset-return distributions shown here represent Vanguard's view on the potential range of risk premiums that may occur over the next 10 years; such long-term projections are not intended to be extrapolated into a short-term view. These potential outcomes for long-term investment returns are generated by the Vanguard Capital Markets Model® (VCMM) and reflect the collective perspective of our Investment Strategy Group. The expected risk premiums—and the uncertainty surrounding those expectations—are among a number of qualitative and quantitative inputs used in Vanguard's investment methodology and portfolio construction process.

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 the VCMM are derived from 10,000 simulations for each modeled asset class. Simulations are as of September 30, 2022. Results from the model may vary with each use and over time. For more information, see the Appendix section "About the Vanguard Capital Markets Model."

IMPORTANT: The projections and other information generated by the Vanguard Capital Markets Model 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 important, the VCMM may be underestimating extreme negative scenarios unobserved in the historical period on which the model estimation is based.

The VCMM is a proprietary financial simulation tool developed and maintained by Vanguard's Investment Strategy Group. 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. 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.

The primary value of the VCMM is in its application to analyzing potential client portfolios. VCMM asset-class forecasts—comprising distributions of expected returns, volatilities, and correlations—are key to the evaluation of potential downside risks, various risk–return trade-offs, and the diversification benefits of various asset classes. Although central tendencies are generated in any return distribution, Vanguard stresses that focusing on the full range of potential outcomes for the assets considered, such as the data presented in this paper, is the most effective way to use VCMM output. We encourage readers interested in more details of the VCMM to read Vanguard's white paper (Davis et al., 2014).

The VCMM seeks to represent the uncertainty in the forecast by generating a wide range of potential outcomes. It is important to recognize that the VCMM does not impose "normality" on the return distributions, but rather is influenced by the so-called fat tails and skewness in the empirical distribution of modeled asset-class returns. Within the range of outcomes, individual experiences can be quite different, underscoring the varied nature of potential future paths. Indeed, this is a key reason why we approach asset-return outlooks in a distributional framework.

All investing is subject to risk, including the possible loss of the money you invest. Past performance is no guarantee of future returns. Diversification does not ensure a profit or protect against a loss in a declining market. 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. The performance of an index is not an exact representation of any particular investment, as you cannot invest directly in an index.

Stocks and bonds of companies in emerging markets are generally more risky than stocks of companies in developed countries. U.S. government backing of Treasury or agency securities applies only to the underlying securities and does not prevent price fluctuations. Investments that concentrate on a relatively narrow market sector face the risk of higher price volatility. Investments in stocks issued by non-U.S. companies are subject to risks including country/regional risk and currency risk.

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 U.S. Treasury obligations held in the fund is subject to federal income tax, some or all of that income may be exempt from state and local taxes.

Asset Allocation Study

FORWARD-LOOKING ANALYSIS

Summary: Total return framework, risk/return study

Forecast: September 2022 **Time horizon: 10 years**

Asset classes	Current	Portfolio A	Portfolio B	Portfolio C	Portfolio D	Distribution of annualized returns 5%	25%	50%	75%	95%	Volatility
U.S. Equity	47.00%	42.00%	39.00%	36.00%	33.00%	-1.30%	2.76%	5.69%	8.61%	12.94%	17.43%
Non-U.S. Equity	28.00%	28.00%	26.00%	24.00%	22.00%	2.17%	5.80%	8.40%	11.03%	14.85%	18.76%
U.S. Aggregate Bonds	10.00%	12.50%	15.00%	17.50%	20.00%	2.92%	3.92%	4.64%	5.35%	6.50%	5.56%
Non-U.S. Aggregate Bonds	6.00%	7.00%	8.00%	9.00%	10.00%	2.40%	3.56%	4.47%	5.42%	6.88%	4.36%
U.S. Short-Term Credit	3.00%	3.50%	4.00%	4.50%	5.00%	2.87%	3.99%	4.81%	5.70%	6.98%	2.99%
U.S. Intermediate-Term Credit	6.00%	7.00%	8.00%	9.00%	10.00%	3.43%	4.48%	5.20%	5.97%	7.12%	5.29%
Portfolio analytics											
Median return (geometric)	6.32%	6.29%	6.20%	6.10%	6.00%						
Median inflation-adjusted return	3.70%	3.69%	3.61%	3.53%	3.43%						
Median risk (volatility)	12.56%	11.72%	10.88%	10.06%	9.26%						
Max drawdown (5th percentile)	-30.60%	-27.84%	-25.21%	-22.77%	-20.47%						
Sharpe ratio	0.24	0.25	0.25	0.26	0.26						

Source: Vanguard, Investment Strategy Group.

The Consumer Price Index for All Urban Consumers (CPI-U) is used to adjust nominal returns into real returns.

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. Distribution of return outcomes from VCMM derived from 10,000 simulations for each modeled asset class. Simulations as of September 30, 2022. Results from the model may vary with each use and over time.
For more information with respect to VCMM and returns, please read the Important Information slide.

FORWARD-LOOKING ANALYSIS

Summary: Total return framework, risk/return study

Forecast: September 2022 **Time horizon: 10 years**

Distribution of annualized returns	**5%**	**25%**	**50%**	**75%**	**95%**
Current nominal return	1.87%	4.47%	6.32%	8.21%	10.99%
Current real return	-1.12%	1.74%	3.70%	5.83%	8.95%
Portfolio A nominal return	2.13%	4.59%	6.29%	8.05%	10.67%
Portfolio A real return	-0.84%	1.85%	3.69%	5.69%	8.65%
Portfolio B nominal return	2.35%	4.61%	6.20%	7.85%	10.31%
Portfolio B real return	-0.68%	1.87%	3.61%	5.51%	8.29%
Portfolio C nominal return	2.54%	4.64%	6.10%	7.67%	9.96%
Portfolio C real return	-0.52%	1.88%	3.53%	5.31%	7.97%
Portfolio D nominal return	2.71%	4.65%	6.00%	7.46%	9.59%
Portfolio D real return	-0.39%	1.88%	3.43%	5.12%	7.64%

Source: Vanguard, Investment Strategy Group.

The Consumer Price Index for All Urban Consumers (CPI-U) is used to adjust nominal returns into real returns.

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FORWARD-LOOKING ANALYSIS

Summary: Total return framework, risk/return study

Forecast: September 2022 **Time horizon: 30 years**

Asset classes	Current	Portfolio A	Portfolio B	Portfolio C	Portfolio D	Distribution of annualized returns 5%	25%	50%	75%	95%	Volatility
U.S. Equity	47.00%	42.00%	39.00%	36.00%	33.00%	3.80%	5.53%	6.69%	7.85%	9.57%	18.21%
Non-U.S. Equity	28.00%	28.00%	26.00%	24.00%	22.00%	5.44%	7.33%	8.65%	10.06%	12.14%	19.26%
U.S. Aggregate Bonds	10.00%	12.50%	15.00%	17.50%	20.00%	3.12%	3.94%	4.54%	5.17%	6.14%	5.89%
Non-U.S. Aggregate Bonds	6.00%	7.00%	8.00%	9.00%	10.00%	2.60%	3.47%	4.12%	4.81%	5.86%	4.67%
U.S. Short-Term Credit	3.00%	3.50%	4.00%	4.50%	5.00%	3.15%	3.97%	4.61%	5.26%	6.23%	3.30%
U.S. Intermediate-Term Credit	6.00%	7.00%	8.00%	9.00%	10.00%	3.58%	4.42%	5.04%	5.67%	6.62%	5.58%
Portfolio analytics											
Median return (geometric)	6.84%	6.77%	6.66%	6.52%	6.38%						
Median inflation-adjusted return	4.58%	4.51%	4.40%	4.27%	4.12%						
Median risk (volatility)	12.98%	12.11%	11.25%	10.41%	9.58%						
Max drawdown (5th percentile)	-37.57%	-34.35%	-31.37%	-28.56%	-25.73%						
Sharpe ratio	0.31	0.32	0.33	0.33	0.34						

Source: Vanguard, Investment Strategy Group.

The Consumer Price Index for All Urban Consumers (CPI-U) is used to adjust nominal returns into real returns.

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FORWARD-LOOKING ANALYSIS

Summary: Total return framework, risk/return study

Forecast: September 2022 **Time horizon: 30 years**

Distribution of annualized returns	5%	25%	50%	75%	95%
Current nominal return	4.87%	6.03%	6.84%	7.69%	8.91%
Current real return	2.30%	3.64%	4.58%	5.52%	6.88%
Portfolio A nominal return	4.89%	6.00%	6.77%	7.57%	8.73%
Portfolio A real return	2.34%	3.62%	4.51%	5.39%	6.70%
Portfolio B nominal return	4.88%	5.92%	6.66%	7.40%	8.50%
Portfolio B real return	2.33%	3.54%	4.40%	5.23%	6.48%
Portfolio C nominal return	4.84%	5.83%	6.52%	7.23%	8.27%
Portfolio C real return	2.31%	3.45%	4.27%	5.06%	6.24%
Portfolio D nominal return	4.77%	5.72%	6.38%	7.06%	8.04%
Portfolio D real return	2.27%	3.34%	4.12%	4.88%	6.00%

Source: Vanguard, Investment Strategy Group.

The Consumer Price Index for All Urban Consumers (CPI-U) is used to adjust nominal returns into real returns.

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For more information with respect to VCMM and returns, please read the Important Information slide.

Forward-looking analysis assumptions

Forecast: **September 2022**

	Current		Portfolio A		Portfolio B		Portfolio C		Portfolio D	
	Active	Passive	Active	Passive	Active	Passive	Active	Passive	Active	Passive
U.S. Equity		47.00%		42.00%		39.00%		36.00%		33.00%
Non-U.S. Equity		28.00%		28.00%		26.00%		24.00%		22.00%
U.S. Aggregate Bonds		10.00%		12.50%		15.00%		17.50%		20.00%
U.S. Short-Term Credit		3.00%		3.50%		4.00%		4.50%		5.00%
U.S. Intermediate-Term Credit		6.00%		7.00%		8.00%		9.00%		10.00%
Non-U.S. Aggregate Bonds		6.00%		7.00%		8.00%		9.00%		10.00%

Style weights are determined by using returns-based style analysis (RBSA) of the individual investments and aggregated at the portfolio/benchmark level considering the allocation of each investment.

Forward-looking analysis assumptions

Initial investment for analysis: **$42,000,000**

	Current		Portfolio A		Portfolio B		Portfolio C		Portfolio D	
	Withdrawals	Contributions	Withdrawals	Contributions	Withdrawals	Contributions	Withdrawals	Contributions	Withdrawals	Contributions
Cash flow type	None	None	None	None	None	None	None	None	None	None
Cash flow frequency	—	—	—	—	—	—	—	—	—	—
Annual amount	—	—	—	—	—	—	—	—	—	—
Start value	—	—	—	—	—	—	—	—	—	—
Annual growth rate	—	—	—	—	—	—	—	—	—	—
Smoothing period	—	—	—	—	—	—	—	—	—	—
Advisory fees	0.19%		0.19%		0.19%		0.19%		0.19%	
Investment fees	0.14%		0.14%		0.14%		0.14%		0.14%	
Fee frequency	Annually		Annually		Annually		Annually		Annually	

All forward-looking analysis assumes an annual rebalance policy.

FORWARD-LOOKING ANALYSIS

Distribution of annualized returns

Nominal | 10 Years

	Current	Portfolio A	Portfolio B	Portfolio C	Portfolio D
95th	10.99%	10.67%	10.31%	9.96%	9.59%
75th	8.21%	8.05%	7.85%	7.67%	7.46%
50th	6.32%	6.29%	6.20%	6.10%	6.00%
25th	4.47%	4.59%	4.61%	4.64%	4.65%
5th	1.87%	2.13%	2.35%	2.54%	2.71%

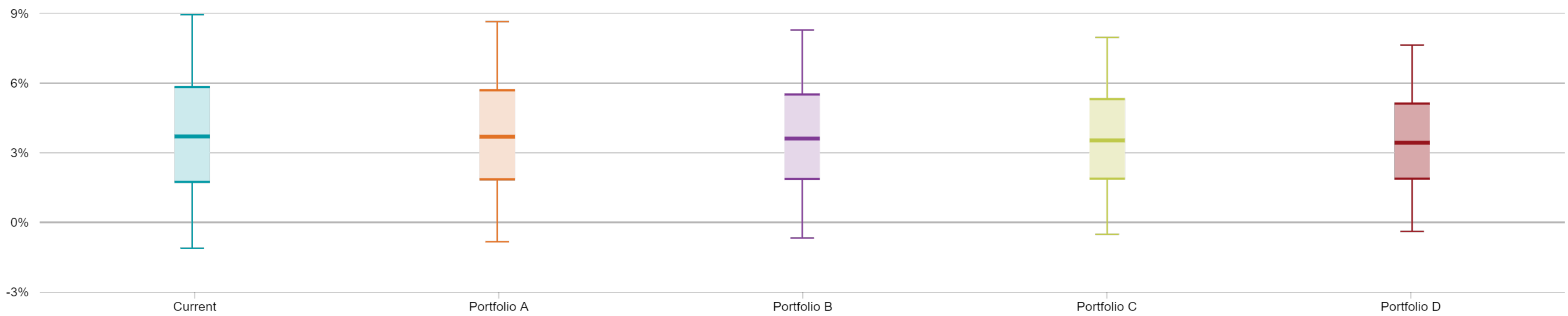
Source: Vanguard, Investment Strategy Group

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 September 2022. Results from the model may vary with each use and over time. Projected performance returns of the asset classes within the portfolio(s) are based upon underlying benchmarks. Projected returns assume annual rebalancing. The returns shown reflect the deduction of all fees and expenses paid by the client with respect to services. The hypothetical performance shown also reflects the reinvestment of dividends, capital gains, and interest. Projected returns do not reflect the effect of taxes. Had taxes been included returns would have been lower. Indexes are unmanaged; direct investment is not possible. Projected returns may vary from actual portfolio performance and clients may have investment results that are materially different from results portrayed. There are limitations inherent in the projected results, particularly that the model does not reflect actual trading and may not reflect the effect that material economic and market factors had on the adviser's decision-making had the adviser actually managed the client's portfolio. Projected performance does not represent actual returns and the interpretation of the results should take into consideration the limitations inherent in the results of the projected performance model. **For more information with respect to VCMM, Methodology, and Benchmarks, please read the Important Information in the Appendix.**

FORWARD-LOOKING ANALYSIS

Distribution of annualized returns

Real | 10 Years



	Current	Portfolio A	Portfolio B	Portfolio C	Portfolio D
95th	8.95%	8.65%	8.29%	7.97%	7.64%
75th	5.83%	5.69%	5.51%	5.31%	5.12%
50th	3.70%	3.69%	3.61%	3.53%	3.43%
25th	1.74%	1.85%	1.87%	1.88%	1.88%
5th	-1.12%	-0.84%	-0.68%	-0.52%	-0.39%

Source: Vanguard, Investment Strategy Group

The Consumer Price Index for All Urban Consumers (CPI-U) is used to adjust nominal returns into real returns.

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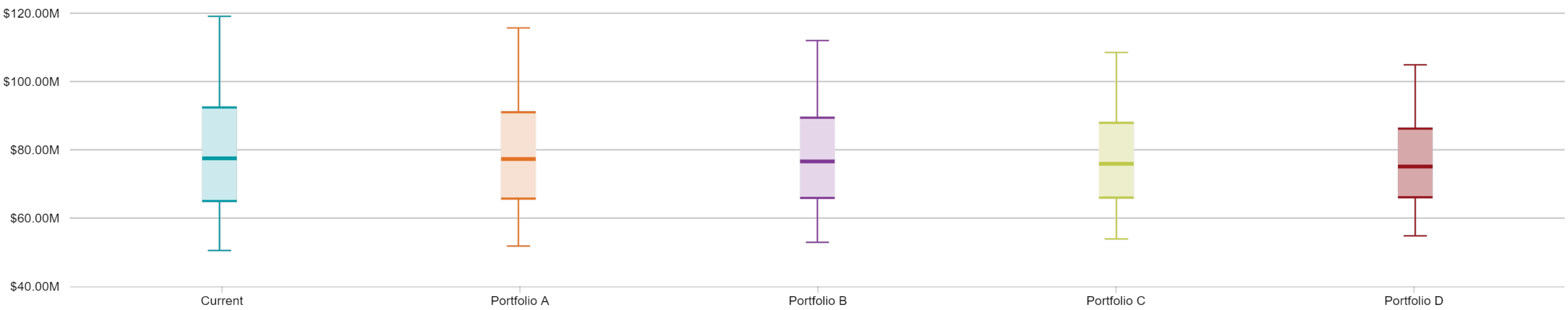
FORWARD-LOOKING ANALYSIS

Distribution of ending investment values

Nominal | 10 Years



	Current	Portfolio A	Portfolio B	Portfolio C	Portfolio D
95th	$119.10M (2.84x)	$115.70M (2.75x)	$112.00M (2.67x)	$108.50M (2.58x)	$104.90M (2.50x)
75th	$92.40M (2.20x)	$91.00M (2.17x)	$89.40M (2.13x)	$87.90M (2.09x)	$86.20M (2.05x)
50th	$77.50M (1.85x)	$77.30M (1.84x)	$76.59M (1.82x)	$75.90M (1.81x)	$75.09M (1.79x)
25th	$65.00M (1.55x)	$65.70M (1.56x)	$65.90M (1.57x)	$66.00M (1.57x)	$66.09M (1.57x)
5th	$50.50M (1.20x)	$51.80M (1.23x)	$52.90M (1.26x)	$53.90M (1.28x)	$54.80M (1.30x)

Source: Vanguard, Investment Strategy Group

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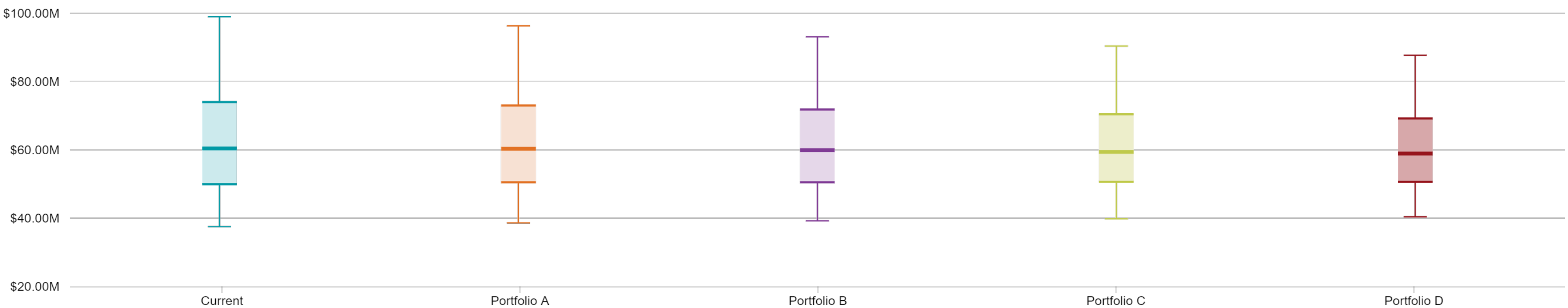
FORWARD-LOOKING ANALYSIS

Distribution of ending investment values

Real | 10 Years



	Current	Portfolio A	Portfolio B	Portfolio C	Portfolio D
95th	$99.00M (2.36x)	$96.30M (2.29x)	$93.10M (2.22x)	$90.40M (2.15x)	$87.70M (2.09x)
75th	$74.00M (1.76x)	$73.00M (1.74x)	$71.80M (1.71x)	$70.40M (1.68x)	$69.20M (1.65x)
50th	$60.40M (1.44x)	$60.30M (1.44x)	$59.90M (1.43x)	$59.40M (1.41x)	$58.90M (1.40x)
25th	$49.90M (1.19x)	$50.50M (1.20x)	$50.50M (1.20x)	$50.60M (1.20x)	$50.60M (1.20x)
5th	$37.50M (0.89x)	$38.60M (0.92x)	$39.20M (0.93x)	$39.79M (0.95x)	$40.40M (0.96x)

Source: Vanguard, Investment Strategy Group

The Consumer Price Index for All Urban Consumers (CPI-U) is used to adjust nominal returns into real returns.

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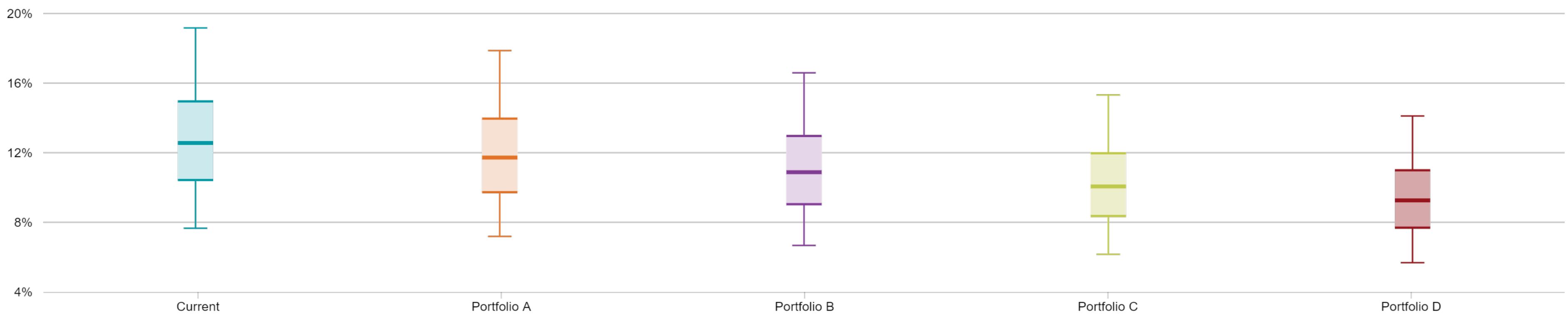
FORWARD-LOOKING ANALYSIS

Distribution of annualized standard deviations

10 Years



	Current	Portfolio A	Portfolio B	Portfolio C	Portfolio D
95th	19.17%	17.87%	16.59%	15.32%	14.11%
75th	14.95%	13.96%	12.96%	11.97%	10.99%
50th	12.56%	11.72%	10.88%	10.06%	9.26%
25th	10.43%	9.73%	9.04%	8.36%	7.69%
5th	7.66%	7.19%	6.67%	6.16%	5.68%

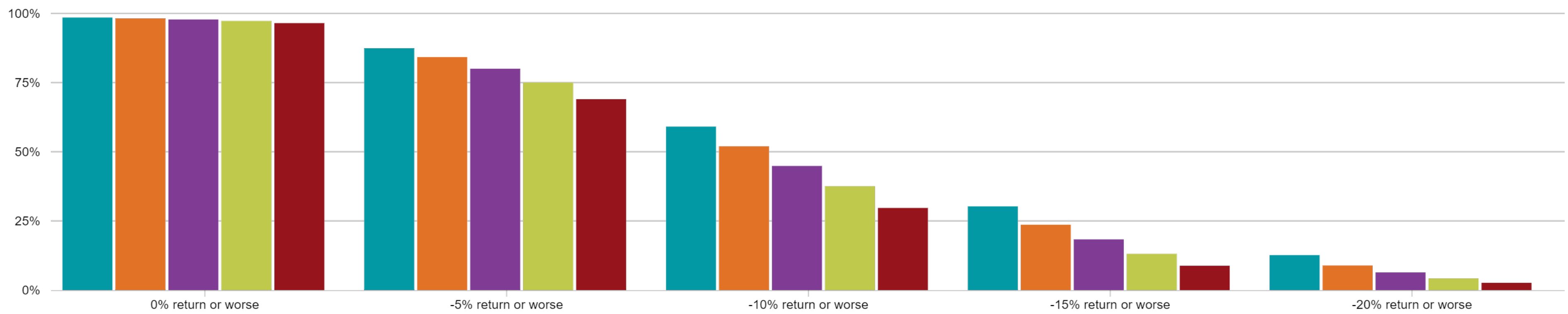
Source: Vanguard, Investment Strategy Group

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 September 2022. Results from the model may vary with each use and over time. Projected performance returns of the asset classes within the portfolio(s) are based upon underlying benchmarks. Projected returns assume annual rebalancing. The returns shown reflect the deduction of all fees and expenses paid by the client with respect to services. The hypothetical performance shown also reflects the reinvestment of dividends, capital gains, and interest. Projected returns do not reflect the effect of taxes. Had taxes been included returns would have been lower. Indexes are unmanaged; direct investment is not possible. Projected returns may vary from actual portfolio performance and clients may have investment results that are materially different from results portrayed. There are limitations inherent in the projected results, particularly that the model does not reflect actual trading and may not reflect the effect that material economic and market factors had on the adviser's decision-making had the adviser actually managed the client's portfolio. Projected performance does not represent actual returns and the interpretation of the results should take into consideration the limitations inherent in the results of the projected performance model. **For more information with respect to VCMM, Methodology, and Benchmarks, please read the Important Information in the Appendix.**

FORWARD-LOOKING ANALYSIS

Probability of a negative return in any given year

Nominal | 10 Years



	Current	Portfolio A	Portfolio B	Portfolio C	Portfolio D
0% return or worse	98.51%	98.19%	97.82%	97.27%	96.50%
-5% return or worse	87.40%	84.21%	80.01%	75.00%	69.00%
-10% return or worse	59.09%	51.95%	44.86%	37.53%	29.68%
-15% return or worse	30.25%	23.61%	18.31%	13.08%	8.79%
-20% return or worse	12.63%	8.88%	6.37%	4.19%	2.60%

Source: Vanguard, Investment Strategy Group

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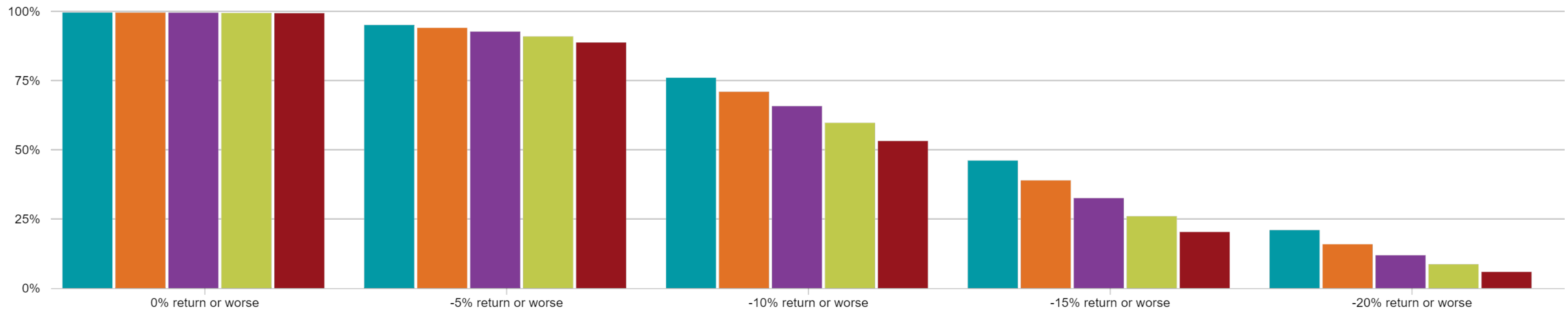
FORWARD-LOOKING ANALYSIS

Probability of a negative return in any given year

Real | 10 Years



	Current	Portfolio A	Portfolio B	Portfolio C	Portfolio D
0% return or worse	99.57%	99.55%	99.53%	99.42%	99.34%
-5% return or worse	95.06%	94.04%	92.67%	90.91%	88.75%
-10% return or worse	76.01%	70.94%	65.74%	59.70%	53.15%
-15% return or worse	46.08%	38.91%	32.50%	25.94%	20.28%
-20% return or worse	20.95%	15.84%	11.87%	8.58%	5.86%

Source: Vanguard, Investment Strategy Group

The Consumer Price Index for All Urban Consumers (CPI-U) is used to adjust nominal returns into real returns.

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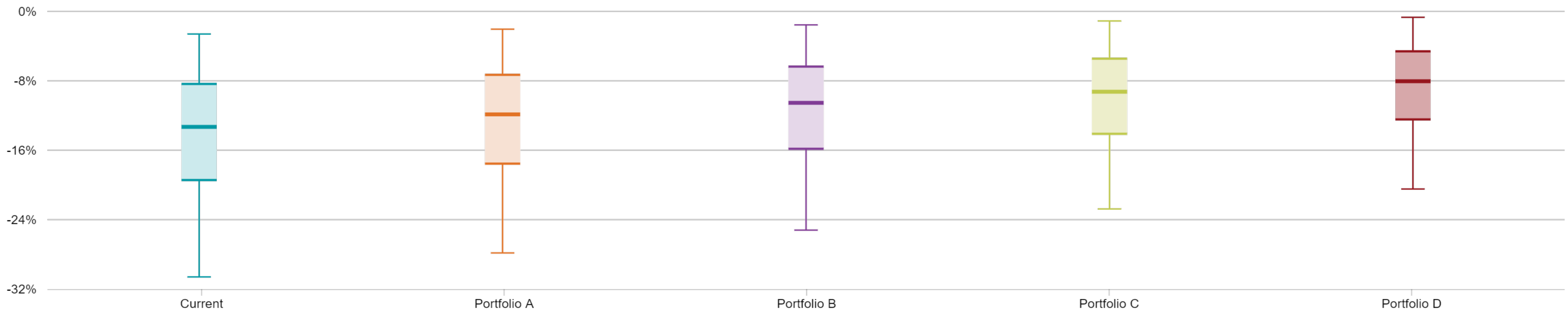
FORWARD-LOOKING ANALYSIS

Distribution of max drawdowns

10 Years



	Current	Portfolio A	Portfolio B	Portfolio C	Portfolio D
95th	-2.61%	-2.05%	-1.55%	-1.10%	-0.68%
75th	-8.36%	-7.31%	-6.36%	-5.45%	-4.60%
50th	-13.31%	-11.87%	-10.54%	-9.26%	-8.05%
25th	-19.44%	-17.55%	-15.84%	-14.11%	-12.45%
5th	-30.60%	-27.84%	-25.21%	-22.77%	-20.47%

Source: Vanguard, Investment Strategy Group

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 September 2022. Results from the model may vary with each use and over time. Projected performance returns of the asset classes within the portfolio(s) are based upon underlying benchmarks. Projected returns assume annual rebalancing. The returns shown reflect the deduction of all fees and expenses paid by the client with respect to services. The hypothetical performance shown also reflects the reinvestment of dividends, capital gains, and interest. Projected returns do not reflect the effect of taxes. Had taxes been included returns would have been lower. Indexes are unmanaged; direct investment is not possible. Projected returns may vary from actual portfolio performance and clients may have investment results that are materially different from results portrayed. There are limitations inherent in the projected results, particularly that the model does not reflect actual trading and may not reflect the effect that material economic and market factors had on the adviser's decision-making had the adviser actually managed the client's portfolio. Projected performance does not represent actual returns and the interpretation of the results should take into consideration the limitations inherent in the results of the projected performance model. **For more information with respect to VCMM, Methodology, and Benchmarks, please read the Important Information in the Appendix.**

Methodology

Historical analysis methodology:

This report may illustrate the hypothetical performance of a current and/or proposed asset allocation, portfolio or both. Although the portfolio is based upon historical performance of the underlying funds and individual asset classes, the combination of these assets classes within the allocation or these investments in the portfolio may be new or proposed and the combination does not have an actual performance record. **Therefore these results constitute hypothetical back-tested performance of the model portfolios and are not indicative or a guarantee of future results.** The hypothetical back-tested results shown are based on criteria applied retroactively with the benefit of hindsight, with the knowledge of factors that may have positively affected performance, and that cannot account for all financial risk that may have affected an actual investment in the portfolio. The hypothetical back-tested performance shown is constructed with the benefit of hindsight, including the ability to adjust the method for selecting securities until returns for the past period are maximized. Therefore, the actual performance of the portfolio may vary significantly from hypothetical back-tested returns, including loss. The hypothetical back-tested model portfolio returns are shown net of all fees and expenses and reflect the reinvestment of dividends, capital gains, and interest. The hypothetical performance results do not take into consideration the effect of taxes. Had taxes been included, actual investment results would have been lower. Investment results also do not reflect the opportunity for fee waivers and discounts. Any interpretation of the performance results should take into consideration the limitations, assumptions, and quantitative parameters inherent in the results of the model.

The information contained in this report is from the most recent information available at MSCI from Morningstar and various benchmark providers as of the release date, and may or may not be an accurate reflection of the current composition of the securities included in the portfolio. There is no assurance that the weightings, composition and ratios will remain the same.

Market environments scenarios

The scenarios shown represent hypothetical performance which is not indicative of future results. The hypothetical performance results for the various scenarios will only appear if all of the selected products in the portfolio have an inception date prior to the start of the market environment. The hypothetical results do reflect the gross expenses of the funds and do reflect reinvestment of dividends, capital gains, and interest. These results however do not take into consideration the withholding of taxes. Additionally, the performance does not include any entered cash flows. Had these expenses been deducted performance would have been lower.

Global financial crisis refers to the severe worldwide financial crisis during 2007 through 2009. Excessive risk taking by banks combined with the bursting of the United States housing bubble caused the values of securities tied to U.S. real estate to plummet, damaging financial institutions globally, culminating with the bankruptcy of Lehman Brothers and an international banking crisis.

Euro debt crisis refers specifically to the timeframe starting with Greece announcing they would take a 45 billion euro loan from eurozone countries and the International Monetary Fund to avoid default and the subsequent beginning of the Securities Markets Program, the European Financial Stability Facility, and the European Financial Stabilisation Mechanism to help preserve financial stability.

U.S. credit downgrade refers to Standard & Poors (S&P) downgrade that was the first time the U.S. federal government was given a rating below AAA.

Oil price concerns refers to the plunge in oil prices at the beginning of 2016 when supplies piled up in storage due to resilient shale production and rising output from OPEC.

Forward-looking analysis methodology:

IMPORTANT: The projections and other information generated by the Vanguard Capital Markets Model® 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 important, 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.

Historical Analysis Reference Indexes

Asset Class/Active Strategy	Historical Index
U.S. Equity	Spliced Total Stock Market Index
Non-U.S. Equity	Spliced Total International Stock Index
U.S. Aggregate Bonds	Spliced Bloomberg Barclays US Aggregate Float Adjusted Index
Non-U.S. Aggregate Bonds	Bloomberg Barclays Global Aggregate ex USD Float Adjusted RIC - USD hedged
U.S. Short-term Credit	Bloomberg Barlcays Credit 1-5 Year TR USD
U.S. Intermediate-term Credit	Bloomberg Barclays US Credit 5-10 Year TR USD

Please read index descriptions on page entitled "Benchmarks."

Forward-looking analysis reference indexes

Sub-asset Class	Proxy index
U.S. Equity	MSCI US Broad Market Index
U.S. Large-Cap	A rules-based index that is rebalanced quarterly based on a universe of securities selected from the Russell 1000 Index. The rule is as follows: Select the bottom one-third of stocks with the lowest market capitalization weighted by the security's respective market-capitalization.
U.S. Small-Cap	A rules-based index that is rebalanced quarterly based on a universe of securities selected from the Russell 3000 Index. The rule is as follows: Select the bottom two-thirds of stocks with the lowest market capitalization weighted by the security's respective market-capitalization.
U.S. Value	A rules-based index that is rebalanced quarterly based on a universe of securities selected from the Russell 1000 Index. The rule is as follows: Select the bottom 30% of stocks with a Price-to-Book ratio from the universe weighted by the security's respective market-capitalization.
U.S. Growth	A rules-based index that is rebalanced quarterly based on a universe of securities selected from the Russell 1000 Index. The rule is as follows: Select the top 30% of stocks with a Price-to-Book ratio from the universe weighted by the security's respective market-capitalization.
Non-U.S. Equity	MSCI All Country World ex USA Index
Emerging Markets Equity	MSCI Emerging Markets Index
Developed Markets Ex U.S.	MSCI World ex USA Index
Global Equity	MSCI All Country World Index
U.S. Aggregate Bonds	Bloomberg Barclays U.S. Aggregate
Non-U.S. Aggregate Bonds	Bloomberg Barclays Global Aggregate ex-USD
Emerging Markets Bonds	Bloomberg EM USD Sovereign Index
U.S. High Yield Bonds	Bloomberg Barclays U.S. High Yield Corporate Bond Index
Total U.S. Credit	Bloomberg Barclays U.S. Credit
U.S. Short-term Credit	Bloomberg Barclays U.S. 1-3 Year Credit Bond Index
U.S. Intermediate-term Credit	Bloomberg Barclays U.S. Intermediate Credit
U.S. Long-term Credit	Bloomberg Barclays U.S. Long Credit
Total Treasury	Bloomberg Barclays U.S. Treasury
U.S. Short-term Treasury	Bloomberg Barclays U.S. 1-5 Year Treasury Bond Index
U.S. Intermediate-term Treasury	Bloomberg Barclays U.S. 5-10 Year Treasury Index
U.S. Long-term Treasury	Bloomberg Barclays U.S. Long Treasury Index
U.S. Extended Duration	Bloomberg U.S. Treasury Strips 20-30 Year Equal Par Bond Index
Long-term Gov't / Credit	40% Bloomberg Barclays U.S. Treasury Long and 60% Bloomberg Barclays U.S. Long Credit
U.S. REITs	FTSE/NAREIT US Real Estate Index
U.S. Short-term TIPS	Bloomberg Barclays U.S. 0-5 Year Treasury Inflation Protected Securities Index
U.S. Intermediate-term TIPS	Bloomberg Barclays U.S Treasury Inflation Protected Securities Index
U.S. Long-term TIPS	Bloomberg Barclays U.S. 10+ Year Treasury Inflation Protected Securities Index
Commodities	Bloomberg Commodity Index
U.S. Cash	U.S. 3-Month Treasury-constant maturity

Benchmarks

Benchmark descriptions:

Bloomberg Barclays Global Aggregate ex USD TR USD (Ret): The index measures the performance of global investment grade fixed-rate debt markets that excludes USD-dominated securities.

Bloomberg Barclays U.S. Aggregate (Ret): The index measures the performance of investment grade, U.S. dollar-denominated, fixed-rate taxable bond market, including Treasuries, government-related and corporate securities, MBS (agency fixed-rate and hybrid ARM passthroughs), ABS, and CMBS. It rolls up into other Bloomberg flagship indices, such as the multi-currency Global Aggregate Index and the U.S. Universal Index, which includes high yield and emerging markets debt.

Bloomberg Barclays U.S. Intermediate Credit (Ret): The index measures the performance of the US Corporate and a non-corporate component that includes foreign agencies, sovereigns, supranationals and local authorities with maturities of 1-10 years. It is a subset of the US Government/Credit Index and the US Aggregate Index.

MSCI ACWI ex USA - Daily: The index measures the performance of the large and mid cap segments of the particular regions, excluding USA equity securities, including developed and emerging market. It is free float-adjusted market-capitalization weighted.

MSCI US BROAD MARKET INDEX - Daily: The index measures the performance of broad US equity market. It includes constituents across large, mid, small and micro capitalizations, representing most of the US equity universe. The index is free float-adjusted market-capitalization weighted.

Consumer Price Index for all Urban Consumers (CPI-U): This index measures the changes in prices of goods and services purchased by urban households.

Glossary

Cash flow frequency: For forward-looking analytics, withdrawals are assumed to occur at the beginning of each calendar year. Contributions are assumed to occur at the end of the year.

Returns-based style analysis (RBSA): A technique to deconstruct the returns of a portfolio against style indices returns providing a proportional exposure to the respective asset class. The calculation of the RBSA is based on Morningstar data for the past five years of monthly returns for each fund.

SEC yield: A non-money market fund's SEC yield is based on a formula mandated by the Securities and Exchange Commission (SEC) that calculates a fund's hypothetical annualized income, as a percentage of its assets. A security's income, for the purposes of this calculation, is based on the current market yield to maturity (in the case of bonds) or projected dividend yield (for stocks) of the fund's holdings over a trailing 30 day period. This hypothetical income will differ (at times, significantly) from the fund's actual experience; as a result, income distributions from the fund may be higher or lower than implied by the SEC yield.

The SEC yield for a money market fund is calculated by annualizing its daily income distributions for the previous seven days. Any money market yields listed more closely reflect the current earnings of the fund than the average annual total returns shown.

Smoothing period: The time frame used to determine the average portfolio balance in order to calculate the withdrawal. Initial years of the smoothing period will assume the portfolio balance of the initial investment amount.

Standard deviation: The standard deviation is a gauge of the variance of a manager's return over its average or mean. Statistically, it is the square root of the variance. Because it measures total variation of the return, standard deviation is a measure of total risk, unlike beta, which measures only market risk. Investors use the standard deviation to try to predict the range of returns that is most likely for a given investment. When a portfolio has a high standard deviation, the predicted range of performance is wide, implying greater volatility. The converse, a low standard deviation implies that the portfolio will exhibit lower volatility.

Important information

For more information about any Vanguard funds, visit institutional.vanguard.com or call 800-523-1036 to obtain a prospectus or, if available, a summary prospectus. Investment objectives, risks, charges, expenses, and other important information about a fund 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 or 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.

Collective trusts and separately managed accounts (SMAs) are not mutual funds. These investments are available only to tax-qualified plans and their eligible participants. Investment objectives, risks, charges, expenses, and other important information should be considered carefully before investing.

Vanguard municipal money market funds: The Fund is only available to retail investors (natural persons). You could lose money by investing in the Fund. Although the Fund seeks to preserve the value of your investment at $1.00 per share, it cannot guarantee it will do so. The Fund may impose a fee upon the sale of your shares or may temporarily suspend your ability to sell shares if the Fund's liquidity falls below required minimums because of market conditions or other factors. An investment in the Fund is not insured or guaranteed by the Federal Deposit Insurance Corporation or any other government agency. The Fund's sponsor has no legal obligation to provide financial support to the Fund, and you should not expect that the sponsor will provide financial support to the Fund at any time.

Vanguard Federal, Cash Reserves Federal, and Treasury Money Market Funds: You could lose money by investing in the Fund. Although the Fund seeks to preserve the value of your investment at $1.00 per share, it cannot guarantee it will do so. An investment in the Fund is not insured or guaranteed by the Federal Deposit Insurance Corporation or any other government agency. The Fund's sponsor has no legal obligation to provide financial support to the Fund, and you should not expect that the sponsor will provide financial support to the Fund at any time.

All investing is subject to risk, including the possible loss of the money you invest. 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 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. Because company stock funds concentrate on a single stock they are considered riskier than diversified stock funds.

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.

Investments in a target date fund are subject to the risks of their underlying funds. The year in the fund name refers to the approximate year (the target date) when an investor in the fund would retire and leave the workforce. The fund will gradually shift its emphasis from more aggressive investments to more conservative ones based on its target date. An investment in a target date fund is not guaranteed at any time, including on or after the target date.

Private investments involve a high degree of risk and, therefore, should be undertaken only by prospective investors capable of evaluating and bearing the risks such an investment represents. Investors in private equity generally must meet certain minimum financial qualifications that may make it unsuitable for specific market participants.

Advice services offered through Vanguard Institutional Advisory Services are provided by Vanguard Advisers, Inc., a registered investment advisor.

A stable value investment is neither insured nor guaranteed by the U.S. government. There is no assurance that the investment will be able to maintain a stable net asset value, and it is possible to lose money in such an investment.

Factor funds are subject to investment style risk, which is the chance that returns from the types of stocks in which the fund invests will trail returns from U.S. stock markets. Factor funds are subject to manager risk, which is the chance that poor security selection will cause the fund to underperform relevant benchmarks or other funds with a similar investment objective.

Important information

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U.S. Patent No. 6,879,964

Important information

The forward looking information generated within this report while based on historical performance is hypothetical and constitutes forward projected performance. Projected performance returns of the asset classes within the portfolio(s) are based upon underlying benchmarks. Projected returns assume annual rebalancing. The returns shown reflect the deduction of all fees and expenses paid by the client with respect to services. The hypothetical performance shown also reflects the reinvestment of dividends, capital gains, and interest. Projected returns do not reflect the effect of taxes. Had taxes been included returns would have been lower. Investment results also do not reflect the opportunity for fee waivers and discounts.

Indexes are unmanaged; direct investment is not possible. Projected returns may vary from actual portfolio performance and clients may have investment results that are materially different from results portrayed. There are limitations inherent in the projected results, particularly that the model does not reflect actual trading and may not reflect the effect that material economic and market factors had on the adviser's decision-making had the adviser actually managed the client's portfolio. Projected performance does not represent actual returns and the interpretation of the results should take into consideration the limitations inherent in the results of the projected performance model. The results shown should not be considered a recommendation to invest in any particular security. **For more information on Benchmarks, please read the Important Information in the Appendix.**

IMPORTANT: The projections and other information generated by the Vanguard Capital Markets Model® 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 important, 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.

For more information about Vanguard funds, visit vanguard.com or call 866-499-8473 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.

Mutual funds and all investments are subject to risk, including the possible loss of the money you invest. 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 sector face the risk of higher share-price volatility.

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. Diversification does not ensure a profit or protect against a loss.

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. We recommend that you consult a tax or financial advisor about your individual situation.

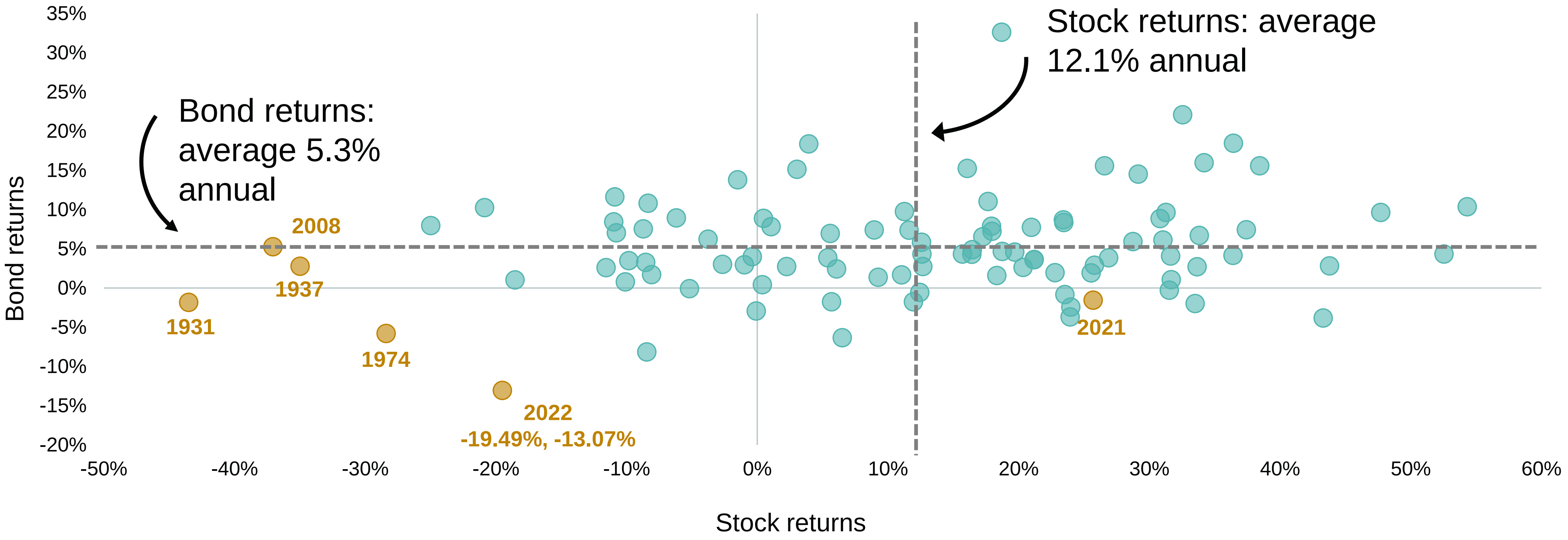
Advice services are provided by Vanguard Advisers, Inc., a registered investment advisor.

Vanguard Marketing Corporation, Distributor of the Vanguard Funds.

Appendix

Manage your expectations: In the short term, an investor's experience is anything but the historical average

Annual stock and bond returns 1926 through 2022

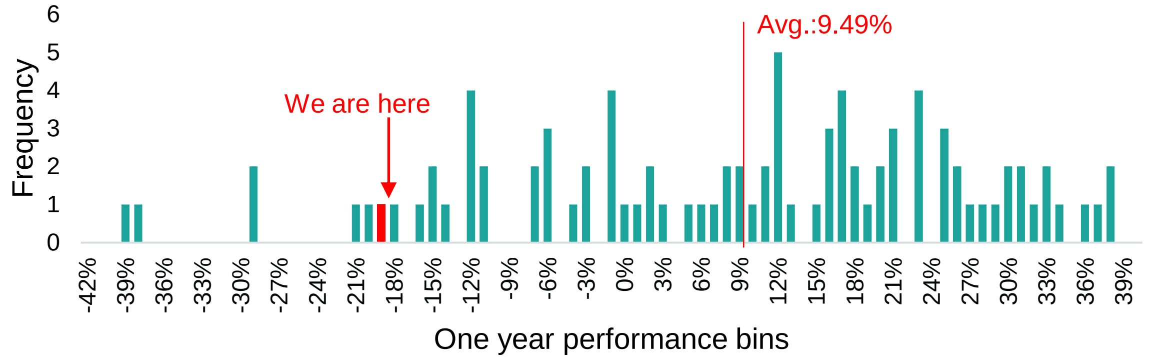


Past performance is no guarantee of future returns. The performance of an index is not an exact representation of any particular investment, as you cannot invest directly in an index.

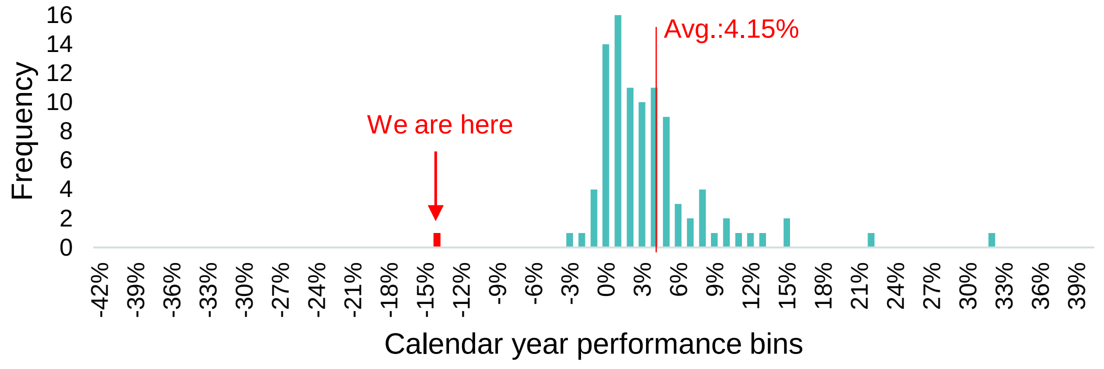
Notes: US Stocks are represented by Standard & Poor's 500(dividends included) from 1926 through 12/31/1970; Wilshire 5000 Index from 1971 through 4/22/2008; MSCI US Broad Market Index through June 2, 2013; CRSP US Total Stock Market Index thereafter. Fixed income is represented by Standard & Poor's High Grade Corporate Index from 1926 through 1968; Citigroup High Grade Index from 1969 through 1972; Lehman Brothers U.S. Long Credit AA Index 1973 through 1975; Bloomberg U.S. Aggregate Index 1976 through 2009; Spliced Bloomberg U.S. Aggregate Float Adjusted Index thereafter (Bloomberg U.S. Aggregate Bond Index through December 31, 2009; Bloomberg U.S. Aggregate Float Adjusted Index thereafter.

Calendar year performance and volatility going back to 1928

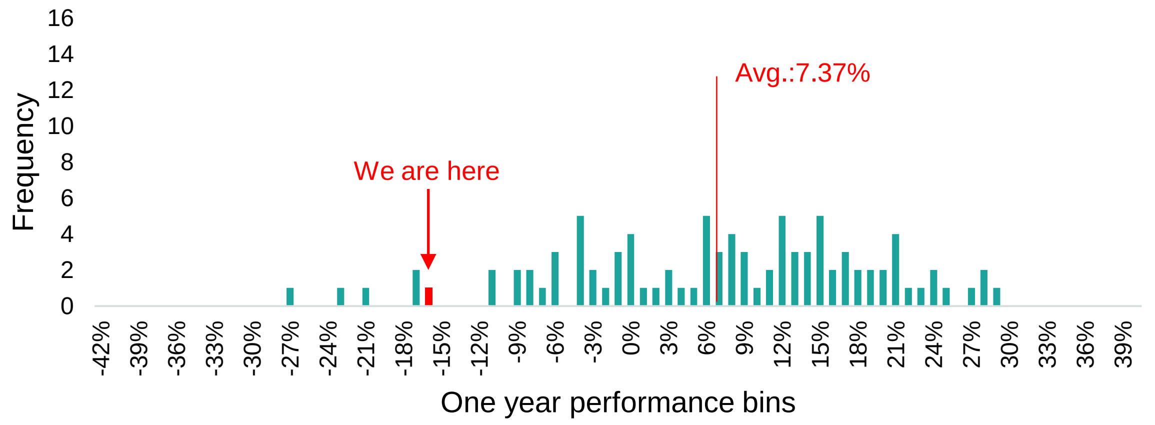
a.) Distribution of calendar year **stock** performance (1928-2022)



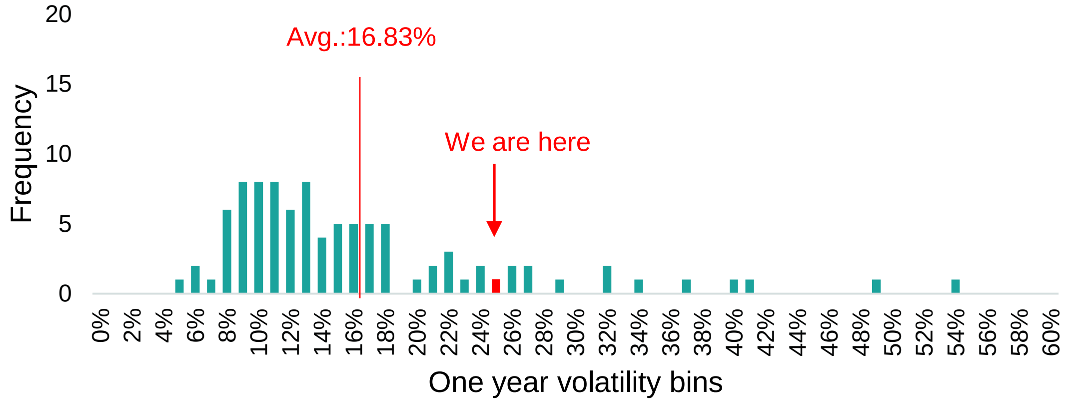
b.) Distribution of calendar year **bond** performance (1928-2022)



c.) Distribution of calendar year **60-40** performance (1928-2022)



d.) Distribution calendar year **stock volatility** (1928-2022)

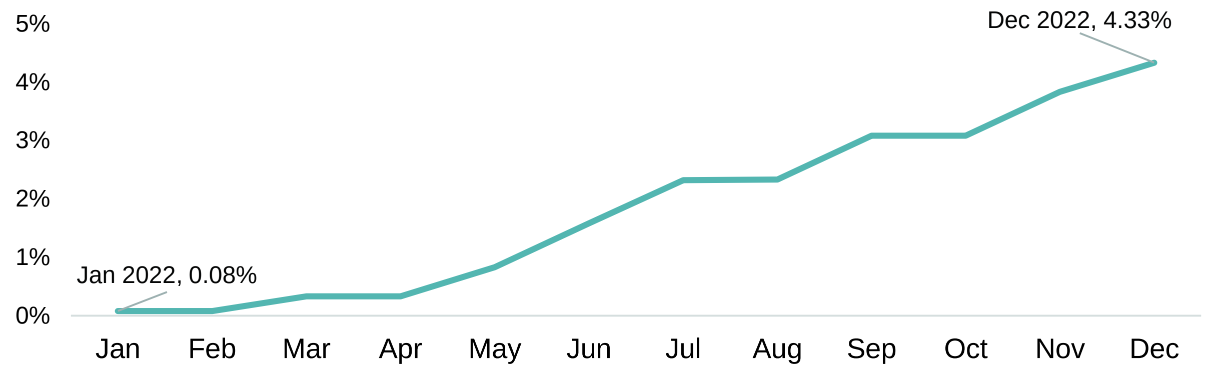


Past performance is no guarantee of future returns. The performance of an index is not an exact representation of any particular investment, as you cannot invest directly in an index.

Notes: Figures a. through c. show the cumulative performance from January through December each calendar year going back to 1928. 'We are here' performance represents calendar year 2022. Figure d. shows the annualized volatility for the year. Sources: Figures a. -c.: Stocks: S&P 500 through 1970; Wilshire 5000 from 1971 through April 22, 2005; MSCI US Broad Market Index through June 2, 2013; CRSP US Total Market Index thereafter. Bonds: IA SBBI U.S. Intermediate-Term Government Bond Index through 1972; Bloomberg U.S. Government/Credit Intermediate-Term Index from 1973 through 1975; Bloomberg U.S. Aggregate Bond Index thereafter. Figure d.: S&P 500 from 1928 through December 31, 2022.

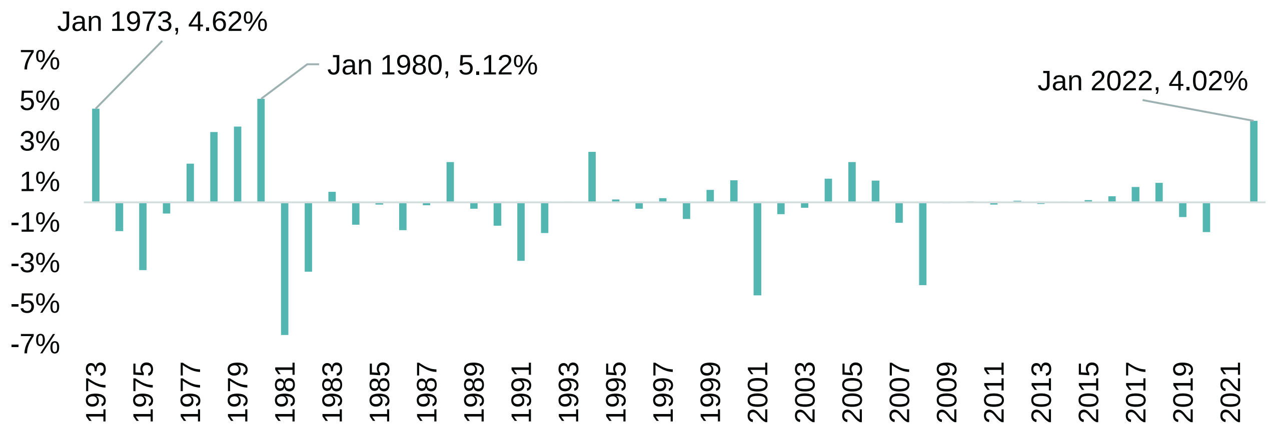
Monetary policy - 2022

The Fed increased its policy rate seven consecutive times in 2022



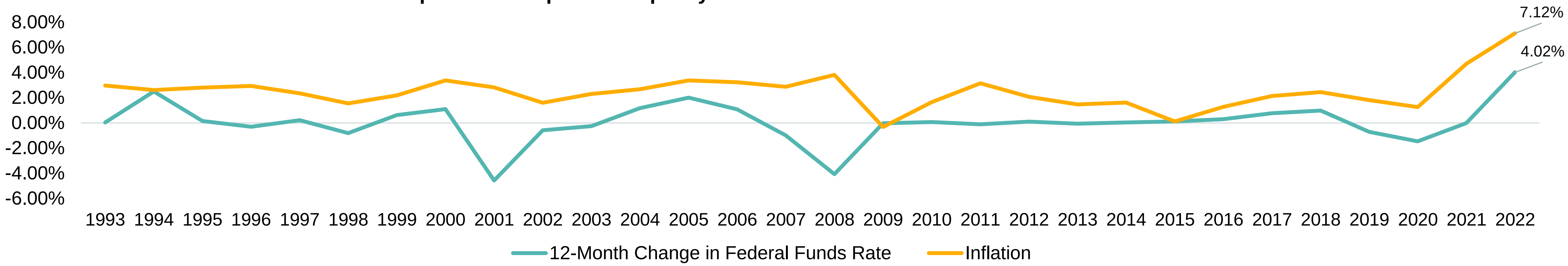
Source: FactSet

2022 rate hikes represented the third largest annual increase in the last 50 years



Source: FactSet, Federal Reserve Bank of St. Louis

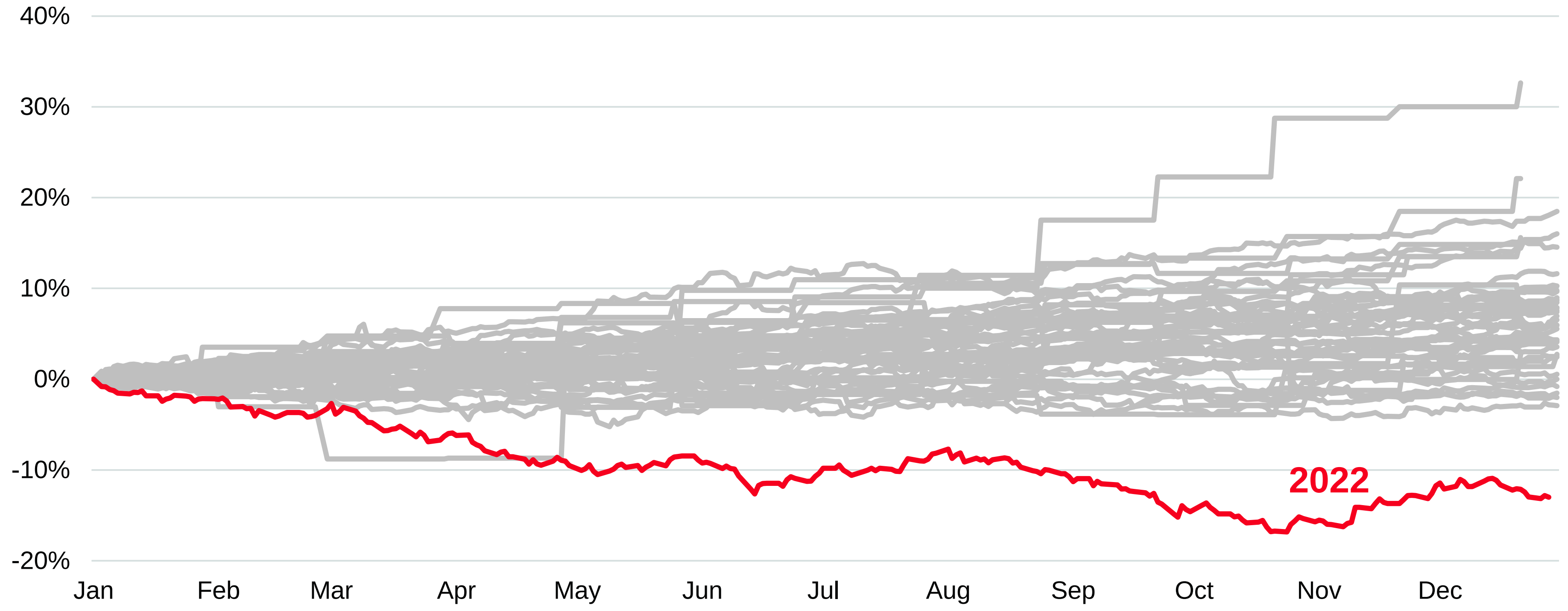
As inflation reached historic levels The Fed responded with persistent policy rate increases

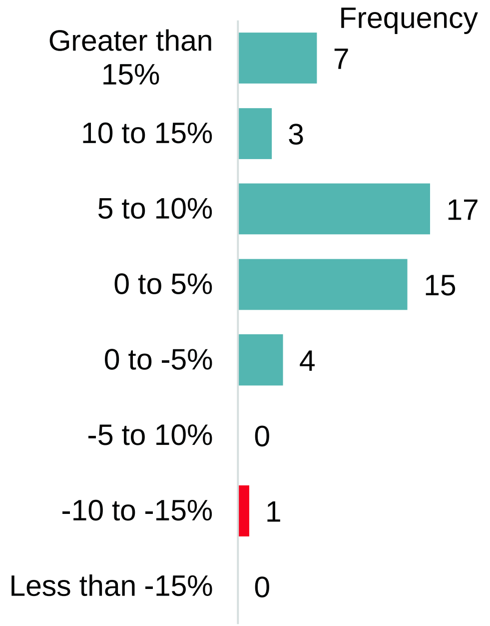


Source: FacetSet

U.S. Bloomberg Aggregate Bond Index from 1976-2022

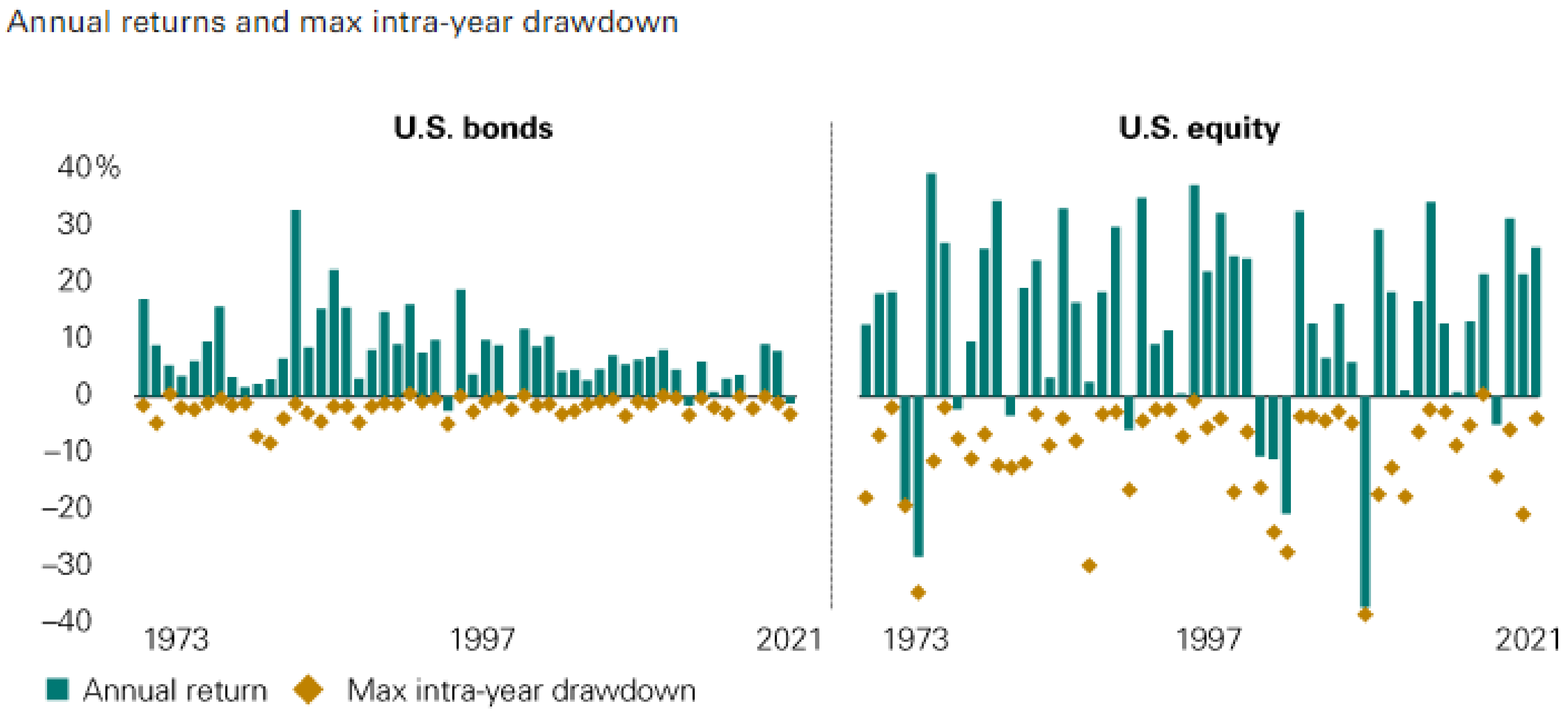
- The Bloomberg Aggregate Index, in the face of inflation and an aggressive FED, is off to its worst start on record.
- Prior to 2022, the largest intra-year drawdown was in 1980, when the index dropped about -9% but fully recovered into year-end.
- While bonds have been hit hard so far in 2022, there is an upside to the down market in that while rising yields may detract from bonds' current prices, rising yields mean more income in the future as interest payments are reinvested in higher-interest bonds.





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
Source: Factset as of December 31, 2022
Chart illustrates annual total of the U.S. Bloomberg Aggregate Bond Index from 1976- 2022

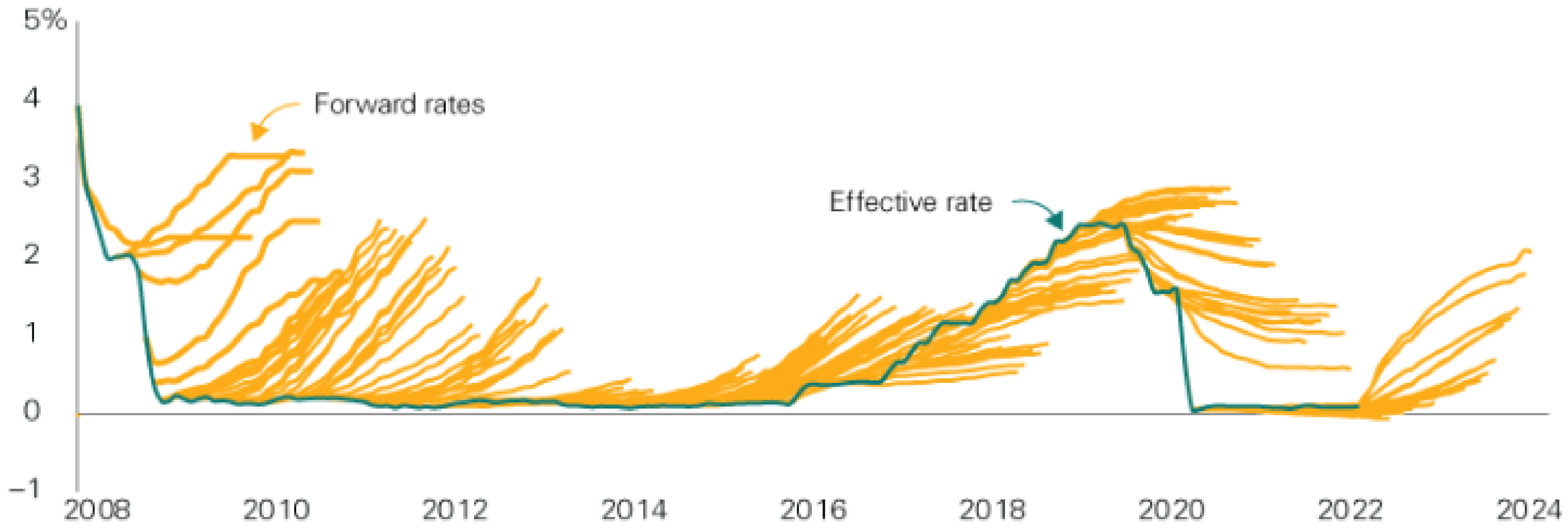
Stocks exhibit exponentially more drawdown risk than bonds



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.
Note: U.S. bonds as represented by IA SBBI U.S. Intermediate-Term Government Bond Index from January 1, 1970, to December 31, 1972; Bloomberg U.S. Government/Credit Intermediate-Term Index from January 1, 1973, to December 31, 1975; Bloomberg U.S. Aggregate Bond Index from January 1, 1976, to June 30, 2009; and Bloomberg U.S. Aggregate Bond Index Float Adjusted thereafter. U.S. equity as represented by the FT Wilshire 5000 Index from April 1, 1972, to June 30, 1994; MSCI USA Investable Market Index from July 1, 1994, to June 30, 2001; and CRSP US Total Market Index thereafter.
Sources: Vanguard analysis of Morningstar Direct data, as of March 31, 2022.

Making the right call on rates has proven difficult

U.S. federal funds effective rate and forward rates



Notes: Monthly data are from January 31, 2008, to February 28, 2022. The federal funds effective rate is annualized. Forward rates are based on futures contracts with tenor up to 2 years.
Source: Bloomberg.

Important information

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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.

Important information

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Mutual funds and all investments are subject to risk, including the possible loss of the money you invest. 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 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. Because company stock funds concentrate on a single stock, they are considered riskier than diversified stock funds.

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. 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.

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