Vanguard

Prepared for

Episcopal Foundation of Dallas

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Agenda

Presented by:

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Performance review

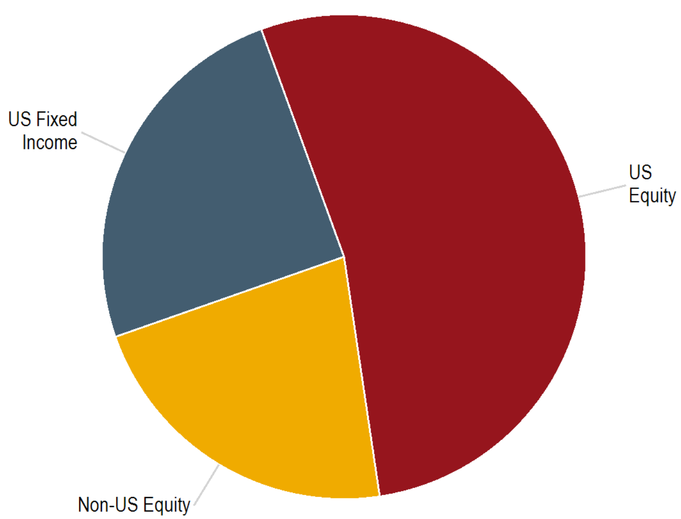
Total Portfolio Performance & Asset Allocation

Performance Summary ending March 31, 2023

	Market Value ($)	2023 Q1 (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
EPISCOPAL FOUNDATION OF DALLAS CONSOLIDATED	**41,608,706**	**5.92**	**-5.17**	**12.32**	**6.12**	**7.42**	**7.66**	**Dec-09**
EPISCOPAL FOUNDATION OF DALLAS CONSOLIDATED (Net)		**5.77**	**-5.82**	**11.58**	**5.45**	**6.90**	**7.26**	
Composite Benchmark		5.96	-7.06	11.05	5.85	7.12	7.89	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 March 31, 2023



	Current $	Current %	Policy	Difference*
US Equity	$22,118,136	53.2%	53.0%	0.2%
Non-US Equity	$9,163,973	22.0%	22.0%	0.0%
US Fixed Income	$10,326,596	24.8%	25.0%	-0.2%
Total	**$41,608,706**	**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 March 31, 2023

	Market Value ($)	% of Portfolio	2023 Q1 (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
EPISCOPAL FOUNDATION OF DALLAS CONSOLIDATED	**41,608,706**	**100.00**	**5.92**	**-5.17**	**12.32**	**6.12**	**7.42**	**7.66**	**Dec-09**
EPISCOPAL FOUNDATION OF DALLAS CONSOLIDATED (Net)			**5.77**	**-5.82**	**11.58**	**5.45**	**6.90**	**7.26**	
Composite Benchmark			5.96	-7.06	11.05	5.85	7.12	7.89	Dec-09
Total Equity	**31,282,109**	**75.18**	**6.83**	**-5.83**	**17.24**	**7.56**	**--**	**8.57**	**Jul-15**
Equity Domestic	**22,118,136**	**53.16**	**6.05**	**-6.25**	**19.62**	**10.09**	**--**	**10.58**	**Jul-15**
Spliced Total Stock Market Index			7.15	-8.77	18.37	10.37	11.69	10.54	Jul-15
Equity International	**9,163,973**	**22.02**	**8.62**	**-3.58**	**13.81**	**3.85**	**--**	**5.58**	**Jul-15**
Spliced Total International Stock Index			6.42	-5.71	12.47	2.61	4.48	4.26	Jul-15
Total Fixed Income	**10,326,596**	**24.82**	**3.17**	**-3.47**	**-1.59**	**1.17**	**--**	**1.55**	**Jul-15**
Fixed Income Domestic	**10,326,596**	**24.82**	**3.17**	**-3.72**	**-1.48**	**1.30**	**--**	**1.52**	**Jul-15**
Spliced Bloomberg Barclays US Aggregate Float Adjusted Index			3.01	-4.72	-2.73	0.95	1.39	1.24	Jul-15

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 March 31, 2023

	Market Value ($)	% of Portfolio	2023 Q1 (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
EPISCOPAL FOUNDATION OF DALLAS CONSOLIDATED	**41,608,706**	**100.00**	**5.92**	**-5.17**	**12.32**	**6.12**	**7.42**	**7.66**	**Dec-09**
Composite Benchmark			5.96	-7.06	11.05	5.85	7.12	7.89	Dec-09
Total Equity	**31,282,109**	**75.18**	**6.83**	**-5.83**	**17.24**	**7.56**	**--**	**8.57**	**Jul-15**
Equity Domestic	**22,118,136**	**53.16**	**6.05**	**-6.25**	**19.62**	**10.09**	**--**	**10.58**	**Jul-15**
Spliced Total Stock Market Index			7.15	-8.77	18.37	10.37	11.69	10.54	Jul-15
Vanguard® Total Stock Market Index Fund Institutional Shares	11,067,591	26.60	7.15	-8.77	18.36	10.37	11.69	10.53	Jul-15
Spliced Total Stock Market Index			7.15	-8.77	18.37	10.37	11.69	10.54	Jul-15
Multi-Cap Core Funds Average			5.73	-7.83	17.17	8.20	9.48	8.23	Jul-15
Vanguard® PRIMECAP Fund Admiral™ Shares	5,533,409	13.30	6.97	-4.75	17.61	9.90	13.32	11.76	Jul-15
Russell 1000 Growth			14.37	-10.90	18.57	13.66	14.59	13.48	Jul-15
S&P 500			7.50	-7.73	18.60	11.19	12.24	11.20	Jul-15
Multi-Cap Growth Funds Average			11.33	-14.57	12.69	8.47	10.81	8.91	Jul-15
Vanguard® Windsor™ Fund Admiral™ Shares	5,517,137	13.26	2.93	-2.00	24.17	9.60	10.80	9.36	Jul-15
Russell 1000 Value			1.01	-5.91	17.93	7.50	9.13	7.91	Jul-15
Multi-Cap Value Funds Average			1.27	-5.32	19.58	6.60	8.31	7.13	Jul-15
Equity International	**9,163,973**	**22.02**	**8.62**	**-3.58**	**13.81**	**3.85**	**--**	**5.58**	**Jul-15**
Spliced Total International Stock Index			6.42	-5.71	12.47	2.61	4.48	4.26	Jul-15
Vanguard® Total International Stock Index Fund Institutional Shares	4,541,897	10.92	6.65	-4.60	12.71	2.53	4.46	4.28	Jul-15
Spliced Total International Stock Index			6.42	-5.71	12.47	2.61	4.48	4.26	Jul-15
International Funds Average			8.39	-2.58	12.66	2.77	4.58	3.94	Jul-15
Vanguard® International Growth Fund Admiral™ Shares	2,346,924	5.64	12.49	-6.82	13.48	6.54	8.79	9.09	Jul-15
Spliced International Index			6.87	-4.65	11.96	2.57	4.22	4.05	Jul-15
International Funds Average			8.39	-2.58	12.66	2.77	4.58	3.94	Jul-15
Vanguard® International Value Fund	2,275,152	5.47	8.67	1.16	15.30	3.19	4.96	4.30	Jul-15
Spliced International Index			6.87	-4.65	11.96	2.57	4.22	4.05	Jul-15
International Funds Average			8.39	-2.58	12.66	2.77	4.58	3.94	Jul-15

Performance Summary (Gross of Advisory Fees) ending March 31, 2023

	Market Value ($)	% of Portfolio	2023 Q1 (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Total Fixed Income	**10,326,596**	**24.82**	**3.17**	**-3.47**	**-1.59**	**1.17**	**--**	**1.55**	**Jul-15**
Fixed Income Domestic	**10,326,596**	**24.82**	**3.17**	**-3.72**	**-1.48**	**1.30**	**--**	**1.52**	**Jul-15**
Spliced Bloomberg Barclays US Aggregate Float Adjusted Index			3.01	-4.72	-2.73	0.95	1.39	1.24	Jul-15
Vanguard® Total Bond Market Index Institutional Shares	5,372,057	12.91	3.16	-4.70	-2.77	0.93	1.34	-7.11	Sep-21
Spliced Bloomberg Barclays US Aggregate Float Adjusted Index			3.01	-4.72	-2.73	0.95	1.39	-7.07	Sep-21
Spliced Intermediate-Term Investment-Grade Debt Funds Average			3.07	-5.27	-1.76	0.84	1.23	-7.51	Sep-21
Vanguard® Intermediate-Term Investment-Grade Fund Admiral™ Shares	3,314,410	7.97	3.81	-3.90	-0.61	1.82	2.11	2.05	Jul-15
Bloomberg US Credit 5-10 Yr TR			3.61	-3.99	0.07	2.02	2.39	2.37	Jul-15
Spliced Core Bond Funds Average			3.07	-5.27	-1.76	0.84	1.23	1.13	Jul-15
Vanguard® Short-Term Investment-Grade Fund Admiral™ Shares	1,640,128	3.94	1.88	-0.19	0.75	1.59	1.59	1.61	Jul-15
Bloomberg US Credit 1-5 Yr TR			1.74	-0.29	0.58	1.75	1.66	1.66	Jul-15
1-5 Year Investment-Grade Debt Funds Average			1.72	-2.54	0.13	0.83	0.89	0.93	Jul-15

Cash Flow Summary

	First Quarter	Year-To-Date	One Year
Beginning Market Value	$40,039,112	$40,039,112	$46,164,910
Net Cash Flow	-$793,678	-$793,678	-$2,133,970
Capital Appreciation	$2,232,992	$2,232,992	-$3,254,332
Income	$130,280	$130,280	$832,098
Ending Market Value	$41,608,706	$41,608,706	$41,608,706

Quarter Ending March 31, 2023

	Beginning Market Value	Net Cash Flow	Capital Appreciation	Income	Ending Market Value
Vanguard® Intermediate-Term Investment-Grade Fund Admiral™ Shares	$3,186,015	$6,933	$91,932	$29,530	$3,314,410
Vanguard® International Growth Fund Admiral™ Shares	$2,291,321	-$228,419	$284,022	$0	$2,346,924
Vanguard® International Value Fund	$2,279,497	-$200,287	$195,942	$0	$2,275,152
Vanguard® PRIMECAP Fund Admiral™ Shares	$5,265,612	-$95,549	$363,346	$0	$5,533,409
Vanguard® Short-Term Investment-Grade Fund Admiral™ Shares	$1,596,687	$13,529	$19,034	$10,878	$1,640,128
Vanguard® Total Bond Market Index Institutional Shares	$5,166,167	$42,851	$124,806	$38,234	$5,372,057
Vanguard® Total International Stock Index Fund Institutional Shares	$4,566,542	-$327,430	$292,993	$9,791	$4,541,897
Vanguard® Total Stock Market Index Fund Institutional Shares	$10,343,690	-$14,209	$696,264	$41,846	$11,067,591
Vanguard® Windsor™ Fund Admiral™ Shares	$5,343,581	$8,903	$164,653	$0	$5,517,137
Total	**$40,039,112**	**-$793,678**	**$2,232,992**	**$130,280**	**$41,608,706**

Episcopal Foundation of Dallas - Aggregated Performance Summary

as-of March 31, 2023

	Market Value*	Portfolio Allocation	Three-Month	Year-to-Date	One-Year	Three-Year	Five-Year	Since Inception
Vanguard	$41,608,706	100.00%	5.92%	5.92%	-5.17%	12.32%	6.12%	6.88%
Vanguard Composite Benchmark			5.96%	5.96%	-7.06%	11.05%	5.85%	6.49%
Aggregate Portfolio (net of EFD fee)*	**$41,608,706**	**100.00%**	**5.77%**	**5.77%**	**-5.82%**	**11.58%**	**5.45%**	**7.26%**
Aggregate Composite Benchmark*			**5.96%**	**5.96%**	**-7.06%**	**11.05%**	**5.85%**	**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 March 31, 2023. 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.*

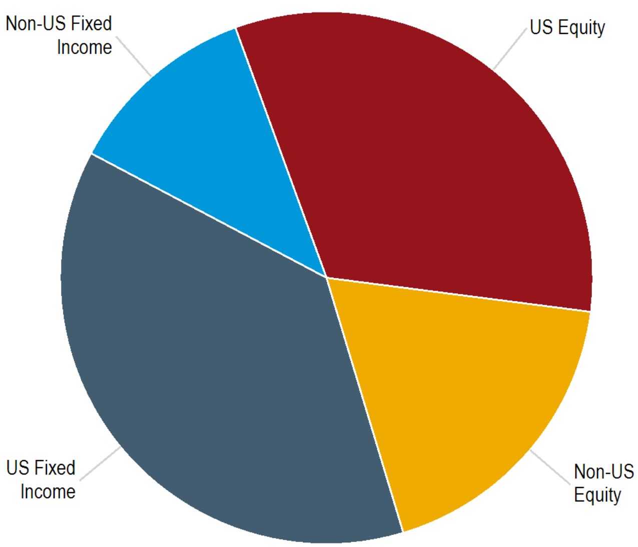
Total Portfolio Performance & Asset Allocation

Performance Summary ending March 31, 2023

	Market Value ($)	1 Mo (%)	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Episcopal Foundation of Dallas - SJES OPERATING RESERVES	**2,455,561**	**2.46**	**5.07**	**-4.76**	**--**	**--**	**--**	**-5.51**	**Jul-21**
Episcopal Foundation of Dallas - SJES OPERATING RESERVES (Net)		**2.46**	**5.06**	**-4.86**	**--**	**--**	**--**	**-5.60**	
Composite Benchmark		2.48	4.97	-5.89	--	--	--	-5.81	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 March 31, 2023



	Current $	Current %	Policy	Difference*
US Equity	$800,685	32.6%	31.0%	1.6%
Non-US Equity	$449,258	18.3%	19.0%	-0.7%
US Fixed Income	$919,535	37.4%	38.0%	-0.6%
Non-US Fixed Income	$286,083	11.7%	12.0%	-0.3%
Total	**$2,455,561**	**100.0%**	**100.0%**	

*Difference between Policy and Current Allocation

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

Cash Flow Summary

	Last Month	Last Three Months	Year-To-Date	One Year
Beginning Market Value	$2,396,515	$2,340,293	$2,340,293	$2,594,926
Net Cash Flow	$0	-$3,537	-$3,537	-$15,543
Capital Appreciation	$53,964	$108,473	$108,473	-$176,406
Income	$5,083	$10,333	$10,333	$52,584
Ending Market Value	$2,455,561	$2,455,561	$2,455,561	$2,455,561

Month Ending March 31, 2023

	Beginning Market Value	Net Cash Flow	Capital Appreciation	Income	Ending Market Value
Vanguard® Intermediate-Term Investment-Grade Fund Admiral™ Shares	$280,700	$0	$7,405	$877	$288,982
Vanguard® International Growth Fund Admiral™ Shares	$85,300	$0	$4,652	$0	$89,952
Vanguard® International Value Fund	$112,991	$0	$3,079	$0	$116,070
Vanguard® PRIMECAP Fund Admiral™ Shares	$159,887	$0	$6,800	$0	$166,687
Vanguard® Short-Term Investment-Grade Fund Admiral™ Shares	$144,406	$0	$1,889	$337	$146,631
Vanguard® Total Bond Market Index Institutional Shares	$471,781	$0	$10,937	$1,204	$483,922
Vanguard® Total International Bond Index Fund Admiral™ Shares	$279,535	$0	$6,140	$408	$286,083
Vanguard® Total International Stock Index Fund Institutional Shares	$237,012	$0	$5,699	$525	$243,236
Vanguard® Total Stock Market Index Fund Institutional Shares	$440,022	$0	$9,854	$1,733	$451,608
Vanguard® Windsor™ Fund Admiral™ Shares	$184,881	$0	-$2,491	$0	$182,390
Total	**$2,396,515**	**$0**	**$53,964**	**$5,083**	**$2,455,561**

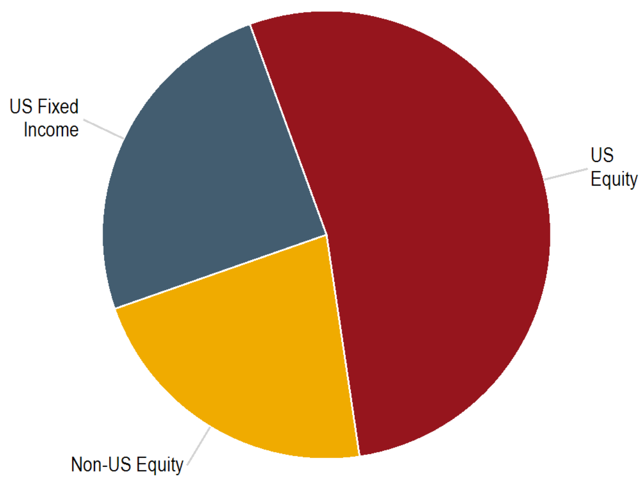
Total Portfolio Performance & Asset Allocation

Performance Summary ending March 31, 2023

	Market Value ($)	1 Mo (%)	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
EPISCOPAL FOUNDATION OF DALLAS	**41,608,706**	**2.46**	**5.92**	**-5.17**	**12.32**	**6.12**	**--**	**6.88**	**Jun-15**
EPISCOPAL FOUNDATION OF DALLAS (Net)		**2.46**	**5.91**	**-5.26**	**12.21**	**6.01**	**--**	**6.77**	
Composite Benchmark		2.51	5.96	-7.06	11.05	5.85	--	6.49	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 March 31, 2023



	Current $	Current %	Policy	Difference*
US Equity	$22,118,136	53.2%	53.0%	0.2%
Non-US Equity	$9,163,973	22.0%	22.0%	0.0%
US Fixed Income	$10,326,596	24.8%	25.0%	-0.2%
Total	**$41,608,706**	**100.0%**	**100.0%**	

*Difference between Policy and Current Allocation

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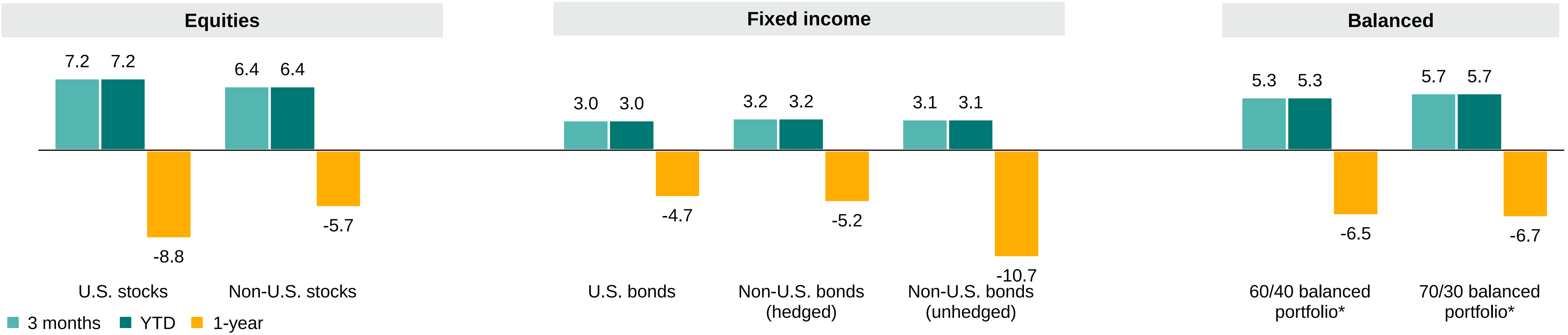
Markets and economy

Navigating with optimism

- Markets finished in the green for March despite volatility and concerns.
- Credit Suisse, Silicon Valley Bank, and Silvergate create most of the buzz around the decline in the beginning of the month.
- Yellen and Powell remain confident in banking and the economy as inflation continues to cool and job market remains resilient.
- Federal Reserve remains on course with another interest rate increase of 25 bps.

Global market returns as of March 31, 2023 (%)



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).

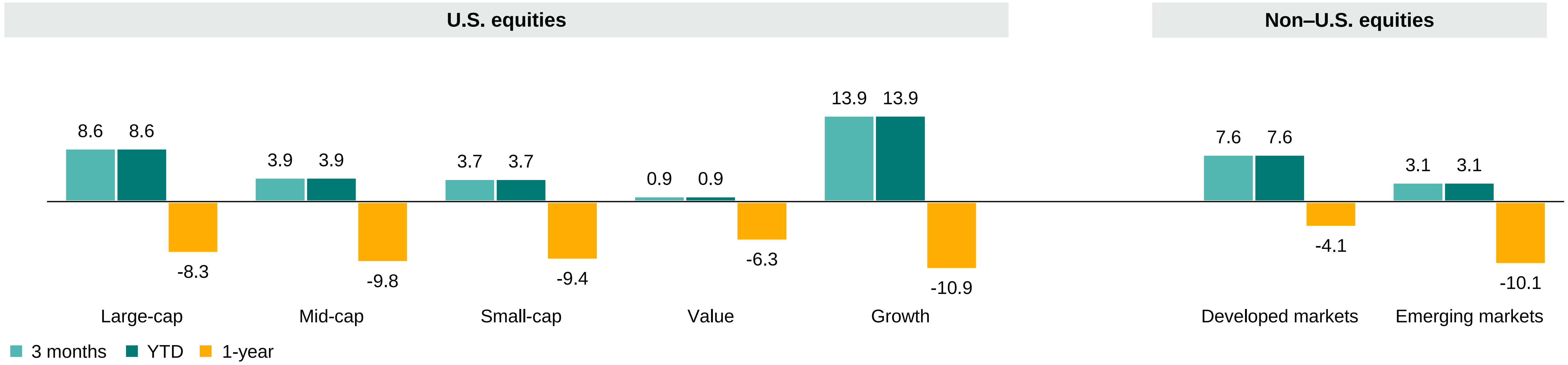
* 60/40 balanced portfolio Static Composite (36% U.S. stocks, 24% international stocks, and 28% investment-grade U.S. bonds, 12% investment-grade international bonds).

** 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).

Equities are starting to pick up steam for 2023

- Bank of England and The European Central Bank raise interest rates in the month of March.
- U.S. Equity markets finished positive for the first quarter of 2023.
- Large, Mid, and Small Cap all saw positive first quarters following the push in March.

Global equity market returns as of March 31, 2023 (%)



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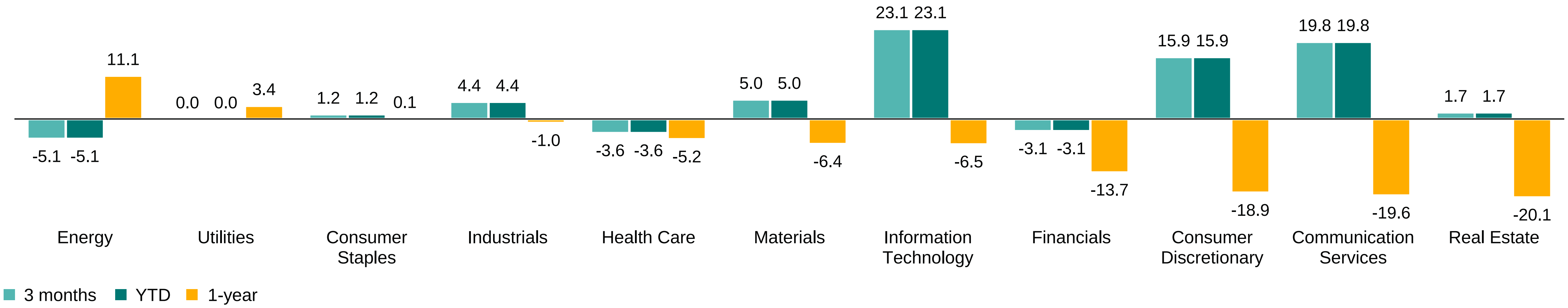
Sources: FTSE, MSCI, Russell, CRSP and Dow Jones.
Large-cap (CRSP US Mega Cap Index), Mid-cap (CRSP US Mid Cap Index), Small-cap (CRSP US Small Cap Index); Value (Russell 3000 Value Index), Growth (Russell 3000 Growth Index); Developed markets (FTSE Developed All Cap ex-US Index), Emerging markets (FTSE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

The tide is beginning to change

- Information Tech and Consumer Discretionary bounce back after a long 2022.
- Banks were the anchor holding down financials for the month as consumers continue to monitor the situation with caution.
- The expectation of interest rate cuts at the end of 2023 have created a tilt in investment.

U.S. equity sector returns as of March 31, 2023 (%)



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

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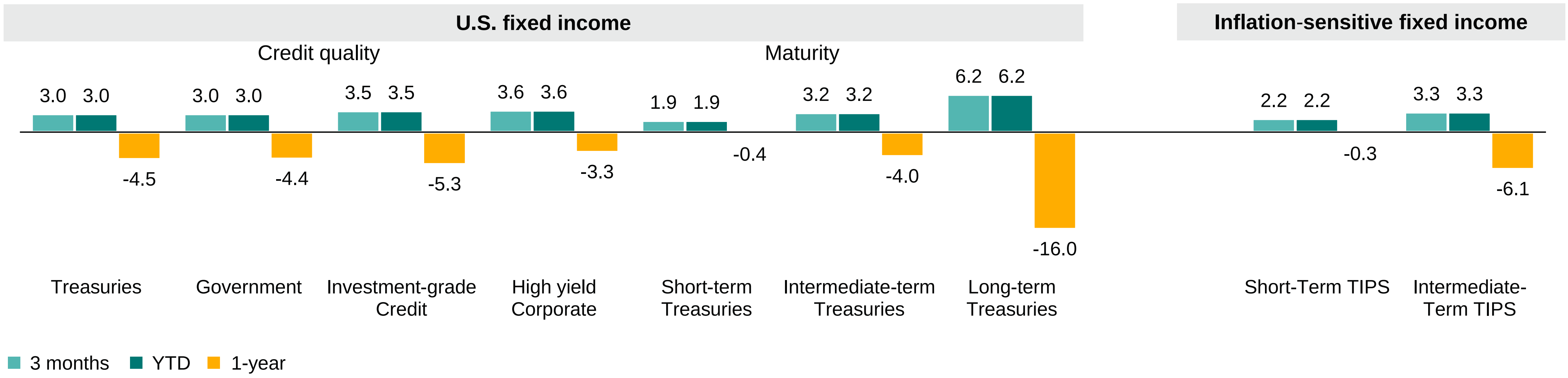
Bonds continue to fight the rough waters

- Bond markets up slightly for Q1 2023 but still feeling the pain of the rapid increase in interest rates.
- Long-term Treasuries, although up on the quarter, still far below break even for the one year.
- Powell mentions that the FED will continue to watch the Fixed Income market as they decide on their rate increases moving forward.

Domestic fixed income market returns as of March 31, 2023 (%)



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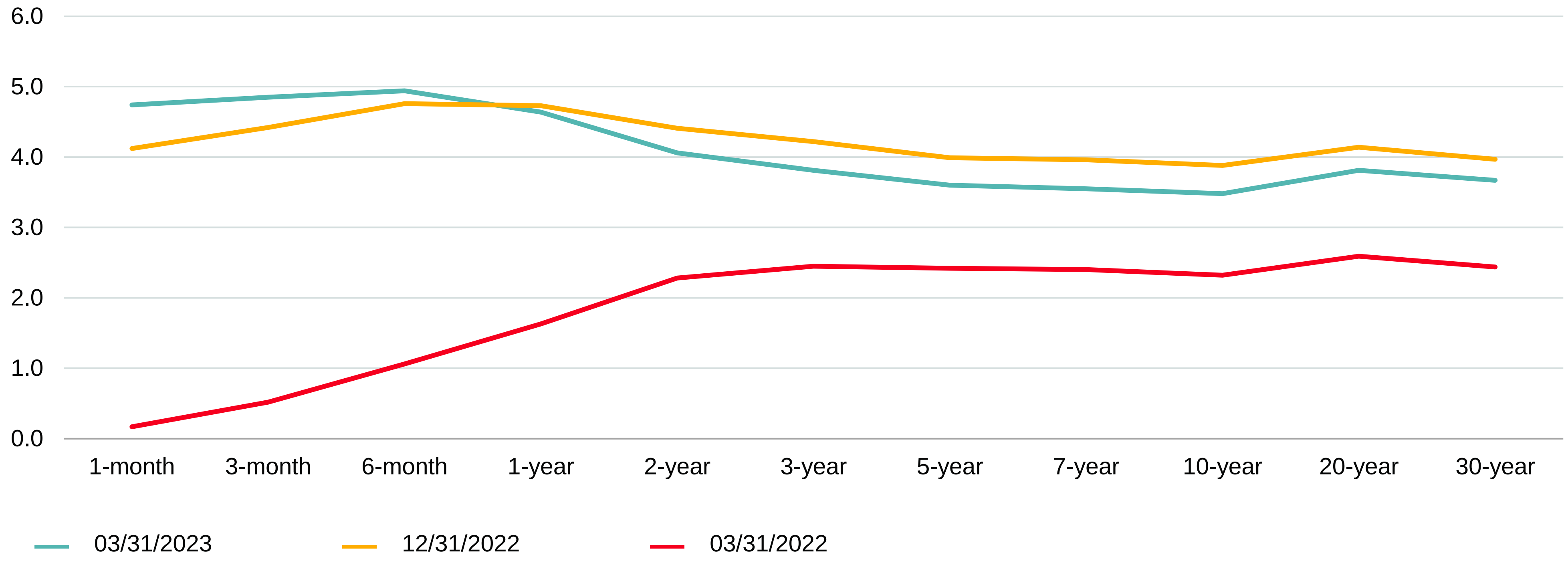
Source: Bloomberg.
Treasuries, government, investment-grade credit; high-yield (Bloomberg U.S. Treasury/Government/Credit/Corporate High-Yield Indices); short-inter-long-term Treasuries (Bloomberg U.S. 1–5/5–10/Long Treasury Indices); short-term TIPS (Bloomberg U.S. Treasury 0–5 Year Inflation-Protected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

Yield curves remain in limbo

	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 (%)	4.74	4.85	4.94	4.64	4.06	3.81	3.60	3.55	3.48	3.81	3.67
—	3 Mo. Δ	62	43	18	-9	-35	-41	-39	-41	-40	-33	-30
—	12 Mo. Δ	457	433	388	301	178	136	118	115	116	122	123



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
Sml 38.8	REIT 30.4	Grw 5.1	Sml 21.3	Emg 31.1	IB 3.2	Grw 35.8	Grw 38.3	REIT 43.1	Cmd 13.8	Grw 13.8
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	Cmd 27.1	T-Bill 1.5	Lrg 12.4
Lrg 33.1	Val 12.7	IB 1.4	HY 17.1	Dev 26.3	Bnd 0.0	Val 26.3	Sml 20.0	Lrg 26.5	HF -4.4	Val 10.2
Val 32.7	Grw 12.4	Lrg 0.9	Lrg 12.1	Lrg 21.7	HY -2.1	REIT 25.8	Emg 15.5	Grw 25.8	Val -8.0	Sml 9.0
Dev 20.5	IB 8.8	Bnd 0.5	Cmd 11.4	Bal 16.5	Grw -2.1	Sml 25.5	Bal 13.4	Val 25.4	IB -9.8	Bal 6.5
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	Sml 14.8	HY -11.2	REIT 6.5
HY 7.4	Bnd 6.0	Bal -0.6	REIT 8.6	Val 13.2	Lrg -4.8	Bal 20.7	Bnd 7.5	Bal 12.0	Bnd -13.0	Dev 4.8
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 11.6	Dev -15.6	HY 4.0
REIT 2.5	Emg 2.6	HF -3.6	Bal 7.3	HF 6.0	HF -6.7	HY 14.3	HF 6.8	HY 5.3	Bal -15.9	Emg 2.1
IB 1.2	HY 2.5	Val -4.1	IB 4.9	REIT 5.1	Val -8.6	Bnd 8.7	IB 3.9	HF 3.7	Emg -17.6	IB 2.1
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	Emg 1.5	Lrg -19.1	HF 1.8
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	T-Bill 0.0	Sml -20.4	Bnd 1.1
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	IB -1.4	REIT -24.5	T-Bill 0.7
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	Bnd -1.5	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.

Vanguard monthly market and economic update

Key Highlights

- Recent events in the U.S. and European banking sectors have not altered our macroeconomic views.
- The Federal Reserve still has work to do to bring down inflation—likely to entail higher unemployment and tighter credit and financial conditions.
- A recession in the second half of 2023 remains our base case, but the odds of a later downturn have risen.

Asset-class return outlooks

Our 10-year annualized nominal return projections are shown below. The projections listed below are based on the December 31, 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	**4.4%–6.4%**	17.2%
Global equities ex-U.S. (unhedged)	**6.7%–8.7%**	18.5%

Fixed income	Return projection	Median volatility
U.S. aggregate bonds	**4.0%–5.0%**	5.5%
U.S. Treasury bonds	**3.6%–4.6%**	5.8%
Global bonds ex-U.S. (hedged)	**3.9%–4.9%**	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 December 31, 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.

Vanguard monthly market and economic update

Region-by-region outlook

United States

In its March 22 policy announcement, the Federal Reserve endorsed the health of the U.S. banking system but cautioned that recent developments were likely to result in tighter credit conditions and to weigh on economic activity. The Fed raised its target for short-term interest rates by 25 basis points (0.25 percentage point) to a range of 4.75%–5.00%.

- The core Consumer Price Index, which excludes food and energy prices, rose by 0.5% in February, its fastest pace in five months, and by 5.5% compared with a year earlier. The core Personal Consumption Expenditures (PCE) index, the Fed's preferred inflation measure, rose by 4.7% in January compared with a year earlier. We expect core PCE to end 2023 at about 3.0%, still higher than the Fed's 2.0% inflation target.
- Aspects of the February jobs report suggest a softening in labor conditions. The size of the labor force increased by more than the number of jobs created, and wage growth lagged expectations. We expect a year-end unemployment rate of 4.5%–5.0%, up from 3.6%, which would mean monthly job losses averaging 250,000 in the second half of 2023.
- A recession in the second half of 2023 remains our base case, but the odds of a later downturn have risen. Core aspects of the economy, such as consumption and the labor market, continue to show above-trend activity.
- We have increased our 2023 U.S. growth outlook to 0.75%, higher than the 0.25% we set forth in the *Vanguard economic and market outlook for 2023: Beating back inflation*.

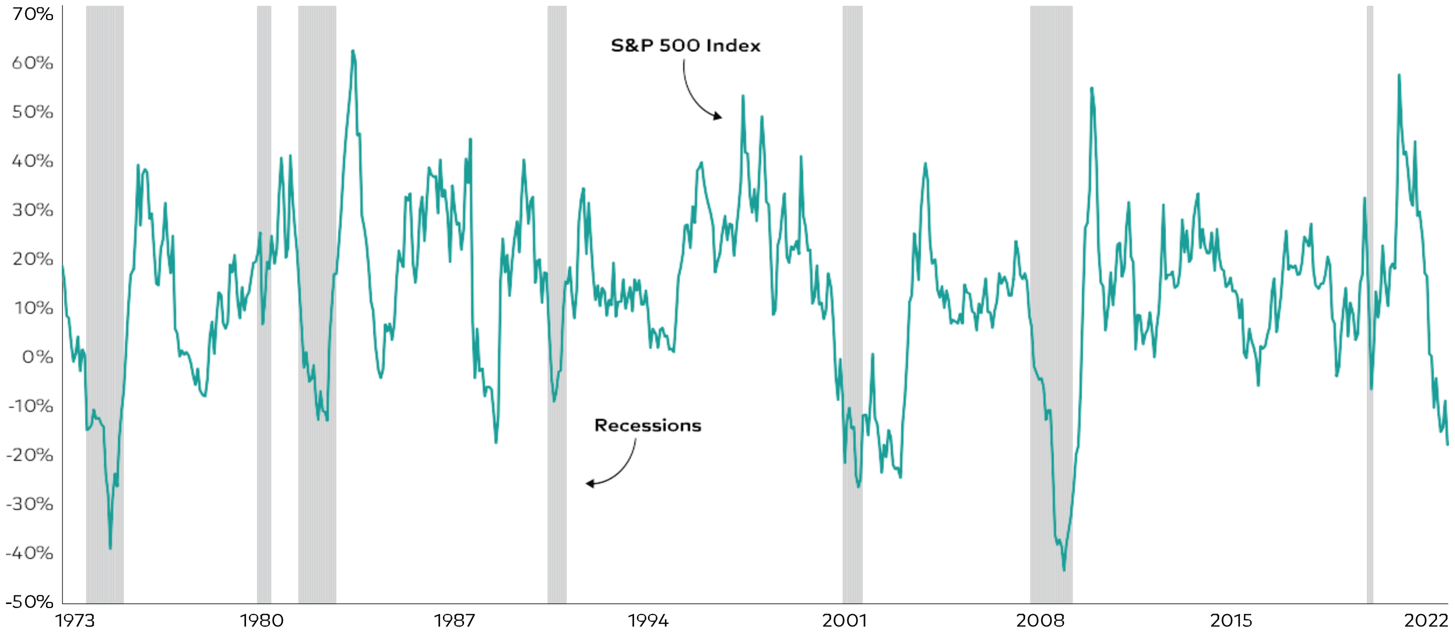
Slide ID #: S037447 Tracking #: 2841587 Expiration date: 7/1/2024

Vanguard monthly market and economic update

Stocks start to recover before recessions end

This chart shows the performance of the S&P 500 from 1973 through 2022, including during seven recessions.

- We don't know when a recession might begin, how long it will last, or precisely when equity markets will recover from one.
- But equity prices have frequently begun to fall prior to the start of a recession, hit their low point during the recession, and have typically started to recover before the end of the recession.



Notes: This chart shows the one-year annualized returns for the Standard & Poor's 500 Index from 1973 through 2022. The shaded areas represent months where the U.S. economy was in recession as defined by the National Bureau of Economic Research (NBER).

Source: Vanguard calculations as of December 31, 2022, using data from Refinitiv.

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

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

Vanguard monthly market and economic update

China

A surprise move by the People's Bank of China (PBoC) will inject liquidity into the banking system but doesn't

affect our outlook. The bank announced on March 17 that, effective March 27, it was cutting its reserve requirement ratio (RRR) by 25 basis points for large and medium-size banks with RRRs above 5%. We estimate the move will lower the banking system's effective RRR to 7.6% and release about CNY 500 billion ($73 billion) of liquidity, resulting in modest bank-financing cost reductions.

- The PBoC move came even amid signs of economic improvement and as China has provided liquidity and credit support through other vehicles. We regard it as a strong signal to boost domestic confidence and as acknowledgment of the challenge posed by globally tightening financial conditions.
- Recent data depict economic strength after the country's post-COVID reopening. Retail sales rebounded in the first two months of the year, having declined in the three previous months, and the Index of Services Production rose 5.5% year-on-year. We anticipate that pent-up demand will be a key growth driver this year.
- Recent events in the U.S. and European banking sectors may have intensified Chinese policymakers' concerns of a deeper-than-expected global downturn, which would exert downward pressure on China's growth through financial or trade channels. Our base case for China's 2023 GDP growth remains unchanged at an above-consensus 5.3%, a figure consistent with a mild global downturn.

Emerging markets

Stronger-than-expected current data and leading indicators in both developed and emerging markets have led us to increase our forecast of aggregate 2023 emerging markets GDP growth from about 3.00% to about 3.25%. Purchasing managers' indexes and consumer spending data suggest that, like some developed markets, economies in emerging markets are holding up better than expected.

- In Mexico, as in the United States, disinflation remains a gradual process. Core inflation inched down in February but remained stubborn at 8.29% compared with a year earlier. Headline inflation, however, slowed to 7.62% year-on-year in February, its slowest pace of increase since March 2022.
- The Bank of Mexico on February 9 cited the "slower-than- foreseen disinflationary process" in raising the target for its overnight interbank rate by 50 basis points to 11%. It said the balance of risks for inflation's trajectory remained biased to the upside.
- Banco Central do Brasil left its Selic rate unchanged at 13.75% for a fifth straight meeting on March 2

Vanguard monthly market and economic update

Euro area

When the European Central Bank (ECB) raised its key interest rate by 50 basis points, to a 15-year high of 3.0%, on March 16, it said "inflation is projected to remain too high for too long." It emphasized that, because of recent stresses in the banking sector, it "stands ready to respond as necessary to preserve price stability and financial stability in the euro area."

- We foresee the ECB raising its key rate to a range of 3.75% to 4.00%, up from our previous view of 3.5%, though risks are skewed to the downside in the potential form of a slower-than-expected pace of hikes or a lower terminal rate. We don't expect rate cuts before 2024.
- Core inflation (which excludes volatile food and energy prices) was 5.6% in February compared with a year earlier, a third straight month of acceleration. We expect core inflation to average 4.5% in 2023—50 basis points higher than our previous expectation—and to end the year around 3.3% as the effects of tighter monetary policy take hold.
- Buoyed by the post-pandemic reopening of China's economy and fewer supply-chain disruptions, we now foresee euro area GDP growing by 0.5% in 2023, up from our most recent view of no growth.
- We continue to foresee a mild recession in the euro area in 2023, though we now expect it to occur in the second half of the year. The region faces a slowdown from the lagged effects of tighter monetary policy.

United Kingdom

The Bank of England (BOE) raised the interest rate it pays on commercial bank deposits by 25 basis points to 4.25% on March 23. The bank noted in its statement that "global growth is expected to be stronger than projected in the February Monetary Policy Report, and core consumer price inflation in advanced economies has remained elevated."

- Core inflation, which excludes volatile food and energy prices, climbed to 6.2% in February, higher than 5.8% in January but below a 6.5% October 2022 peak. We expect core inflation to fall below 4.0% by the end of 2023 as the effect of higher interest rates and the benefits of lower energy prices work through the economy.
- The slow disinflation process underscores our belief that the BOE will raise the bank rate to a high of 4.5% and that rate cuts will occur no earlier than 2024. Greater global financial stability concerns increase downside risks to our view.
- Forward-looking surveys suggest weakness in both wages and the broader labor market in coming quarters. We continue to expect recession in 2023, with three quarters of contraction and full-year GDP falling by about 1%, though recently stronger high-frequency data skew risks to the upside. We foresee growth of about 0.6% in 2024.

Banking crisis

Key takeaways

- Stresses in the banking sector (SVB, Credit Suisse) induced significant volatility in financial markets; prompting fears of a credit crunch & evoking memories of the GFC.

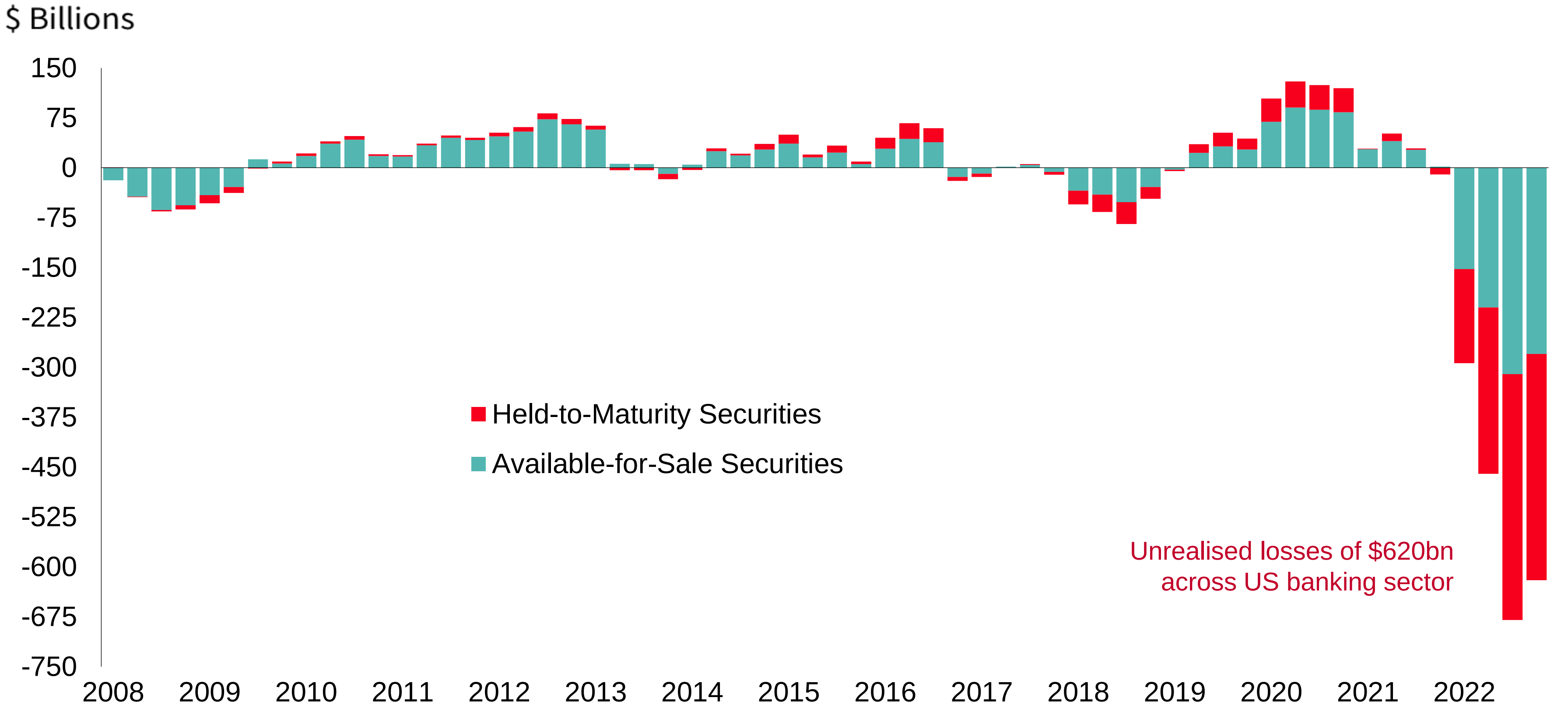
- Central banks stepped in to provide liquidity support.

- Markets in risk-off mode & significantly pared back expectations of further interest rate rises. 2-3 rate cuts now priced-in for the Fed later this year.

- In our base case, we view the banking shocks as temporary and contagion to be limited but acknowledge the elevated risks of *‘other things breaking’*. We stick to our call for higher CB rates and a mild recession this year.

The demise of Silicon Valley Bank (SVB)

All FDIC-insured institutions: unrealized gains (losses) on Investment Securities

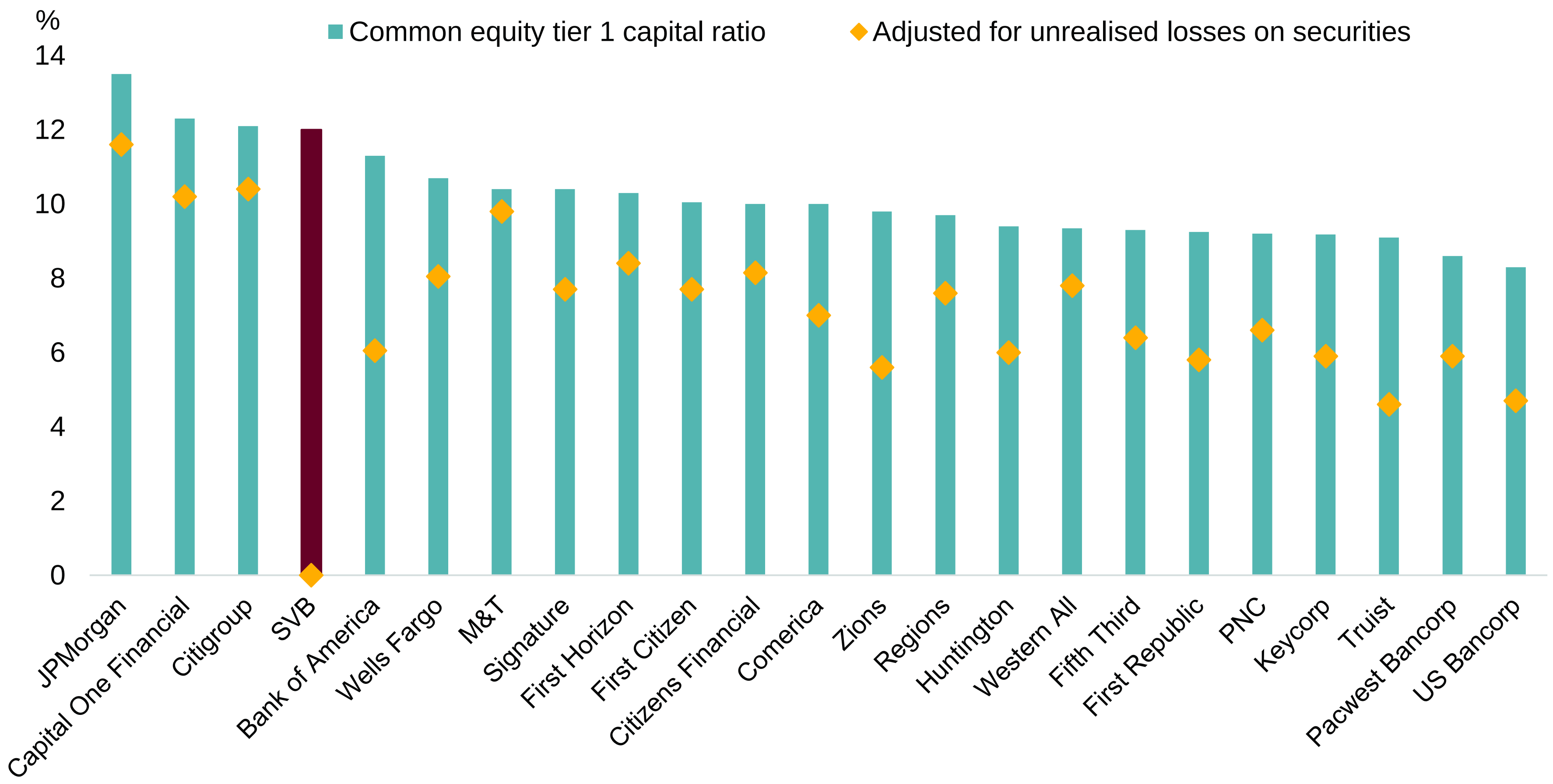


Source: FDIC.
Note: Insured Call Report filers only. Date labels are centered under the first quarter of each year. Data start in first quarter 2008.

- Concentrated client & deposit base.
- Large, unhedged, exposure to duration risk.
- Not subject to regulatory stress tests.

SVB was an exception, not the rule

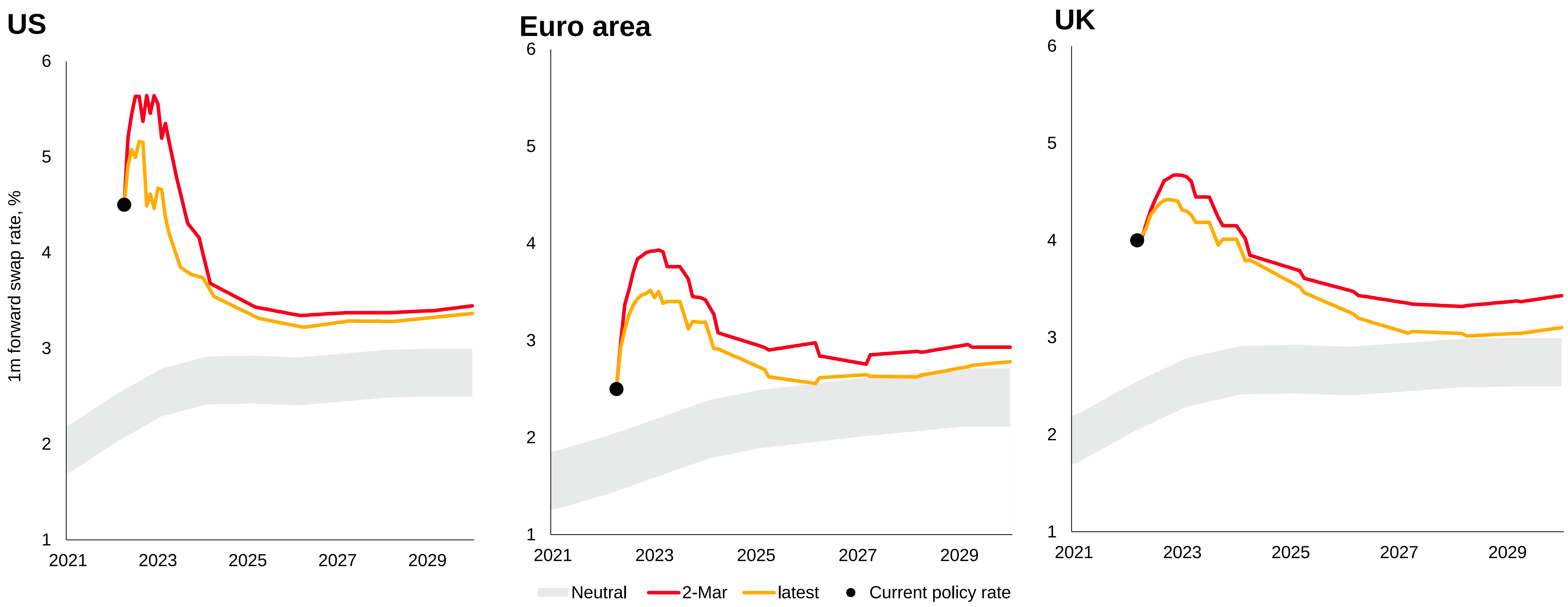
US bank capital ratios, adjusted for unrealised losses on securities



- Most regional US banks still have a positive capital base, even after adjusting for unrealised losses.
- SVB was the exception. Poor risk management.

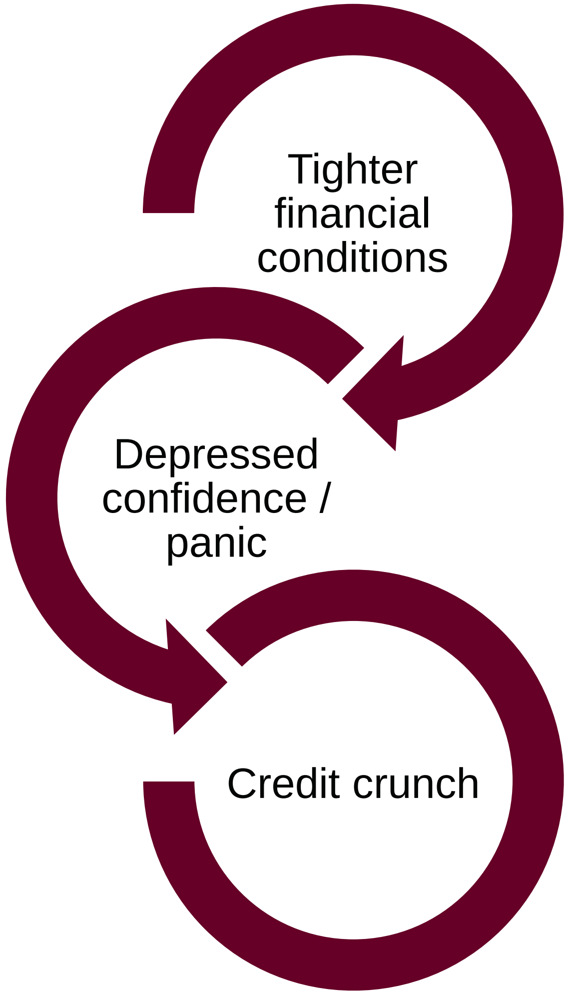
Source: Financial Times, Vanguard, as at Q4 2022

Financial market reaction (2): Rate hike expectations pared back



Note: Monthly data from March 2023 until December 2030. Market expectations for central bank policy rates at a given time are represented by one-month forward swap rates. Shaded bands represent Vanguard neutral rate estimates, which are determined by long-term economic factors and are subject to a wide band of statistical uncertainty. Estimates of the nominal neutral rate assume inflation of 2% in the US & UK, and 1.8% in the euro area. US terminal rate shows the lower bound of the target federal funds rate. Source: Vanguard calculations, using data from Bloomberg, as of 14 Mach 2023.

How could a banking collapse flow through to the real economy?



Scenarios

(1) Contained & temporary shock:
- Limited contagion.
- Macro conditions revert to those prevalent before bank crises.
- No change to views.

(2) Moderate contagion:
- Problems continue to emerge but confined to Europe and US financial sector.
- Private-sector credit growth continues to fall & financial conditions remain tight.

(3) Severe contagion:
- Bank crises lifts the hood on severe hidden risks in the global financial system.
- Central bank response insufficient to prevent a loss of confidence and significant credit crunch.

Appendix

Debt ceilings

The federal government borrows money through the issuance of debt securities through the Treasury.

The debt limit is the total amount of money that the United States government is authorized to borrow to meet its existing legal obligations. It does not authorize new spending commitments.

Without Congress raising the debt limit, the U.S. could eventually default on its debt obligations.

The debt limit was created as part of the 1917 Liberty Bond Act.

Since 1960, Congress has acted 78 separate times to permanently raise, temporarily extend, or revise the definition of the debt limit.

Congressional leaders of both parties have recognized raising the debt ceiling is necessary. The debt ceiling has been raised 49 times under Republican presidents and 29 times under Democratic presidents.

Debates over federal fiscal policy have been especially animated in the past decade, in part because of the accumulation of federal debt in the wake of the 2007–2008 financial crisis as well as debt accumulated due to COVID-19 responses.

Source: U.S. Department of the Treasury: https://home.treasury.gov/policy-issues/financial-markets-financial-institutions-and-fiscal-service/debt-limit.

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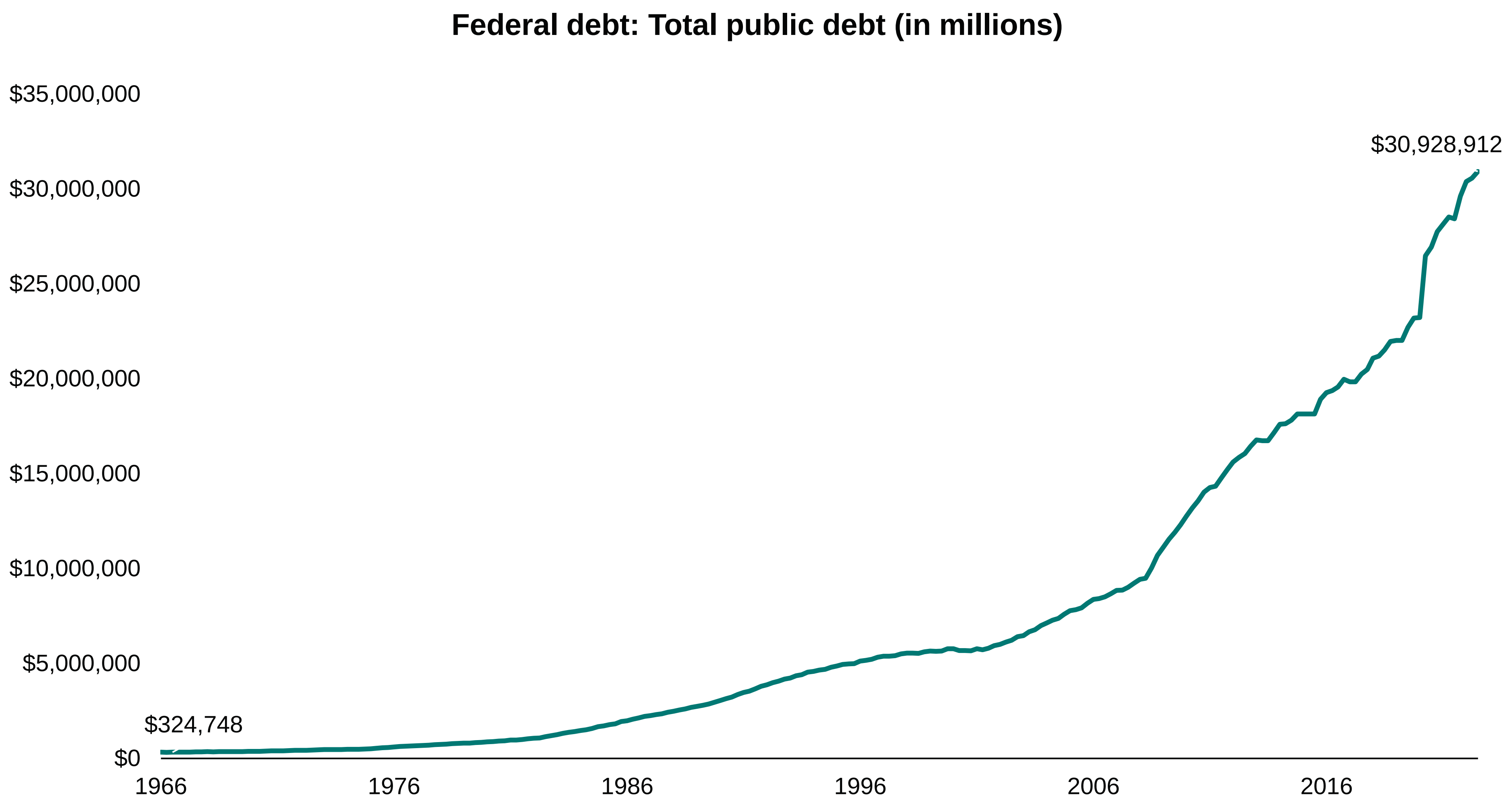
National debt over time



Source: U.S. Department of the Treasury. Fiscal Service, Federal Debt: Total Public Debt [GFDEBTN], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/GFDEBTN, February 15, 2023.

History of debt ceiling standoffs

1995–1996

November 1995: Republicans pledge to balance the budget under their “contract with America” platform. Disputes with President Bill Clinton result in a five-day government shutdown.

December 1995: Continuing debate over the size and measurement of budget cuts results in a 21-day government shutdown—at the time, the longest shutdown in U.S. history. Government debt is funded using emergency measures.

January 1996: Congressional Republicans state they will abandon the national debt as a weapon against President Clinton if he would support modest budget cuts.

March 1996: President Clinton signs measures to raise the debt ceiling, averting federal default.

2011

May 2011: The U.S. House of Representatives rejects a bill to raise the debt ceiling without any spending cuts tied to the increase. Debt ceiling negotiations are halted.

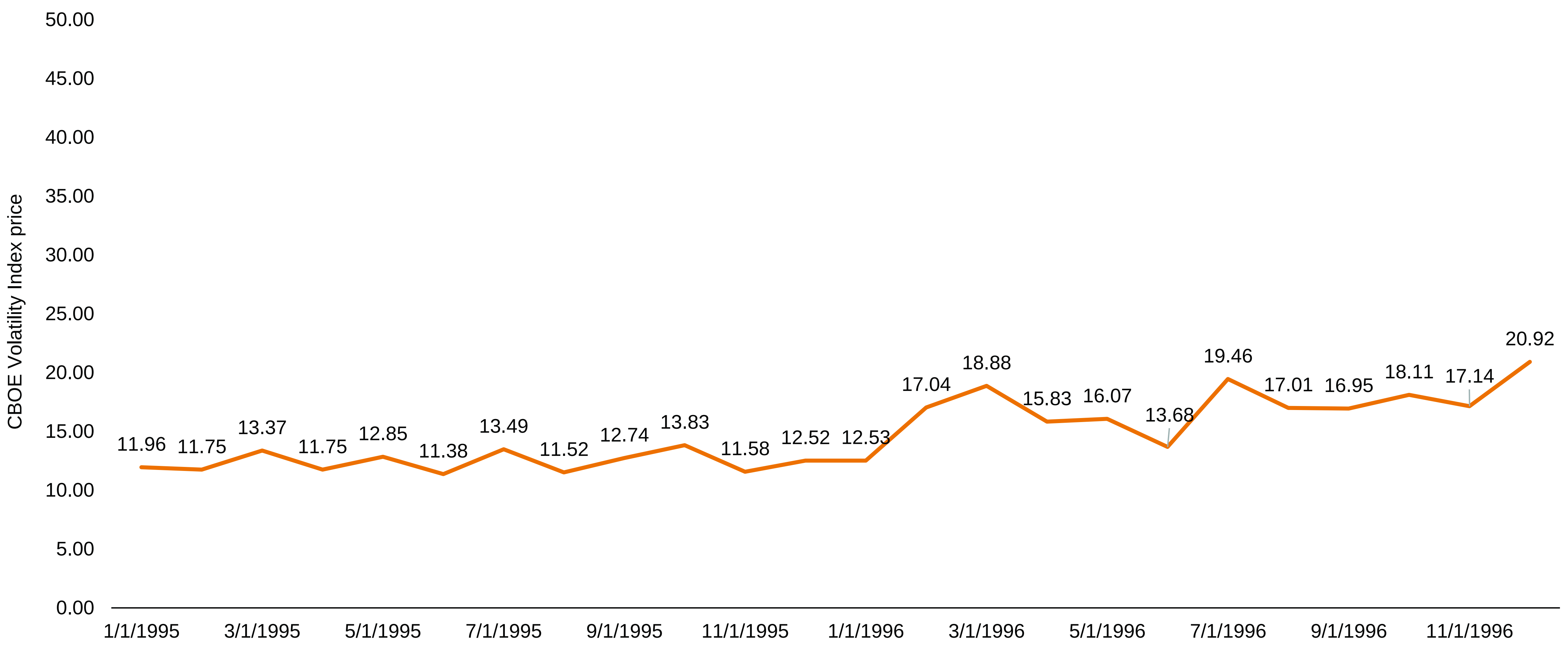
July 2011: The Senate plans to forgo its scheduled recess to work on legislation to raise the debt ceiling and cut the deficit. President Obama hosts a series of heated talks between lawmakers at the White House.

August 2011: The U.S. House passes the debt ceiling deal reached by Congress and the President. Obama signs the measures August 2, 2011, the last day before a national default.

On **August 6, 2011**, Standard and Poor’s made the unprecedented move to cut the long-term US Rating from AAA to AA+

Source: *Debt ceiling: Timeline of deal's development:* http://www.cnn.com/2011/POLITICS/07/25/debt.talks.timeline/index.html, *G.O.P. LAWMAKERS OFFER TO ABANDON DEBT-LIMIT THREAT:* http://www.cnn.com/2011/POLITICS/07/25/debt.talks.timeline/index.html, *Gingrich Promises Solution on Debt Ceiling:* https://www.nytimes.com/1996/01/13/us/gingrich-promises-solution-on-debt-ceiling.html, *The Longest Government Shutdown In History, No Longer — How 1995 Changed Everything:* https://www.npr.org/2019/01/12/683304824/the-longest-government-shutdown-in-history-no-longer-how-1995-changed-everything, and *THE 1995–96 GOVERNMENT SHUTDOWN:* https://millercenter.org/1995-96-government-shutdown.

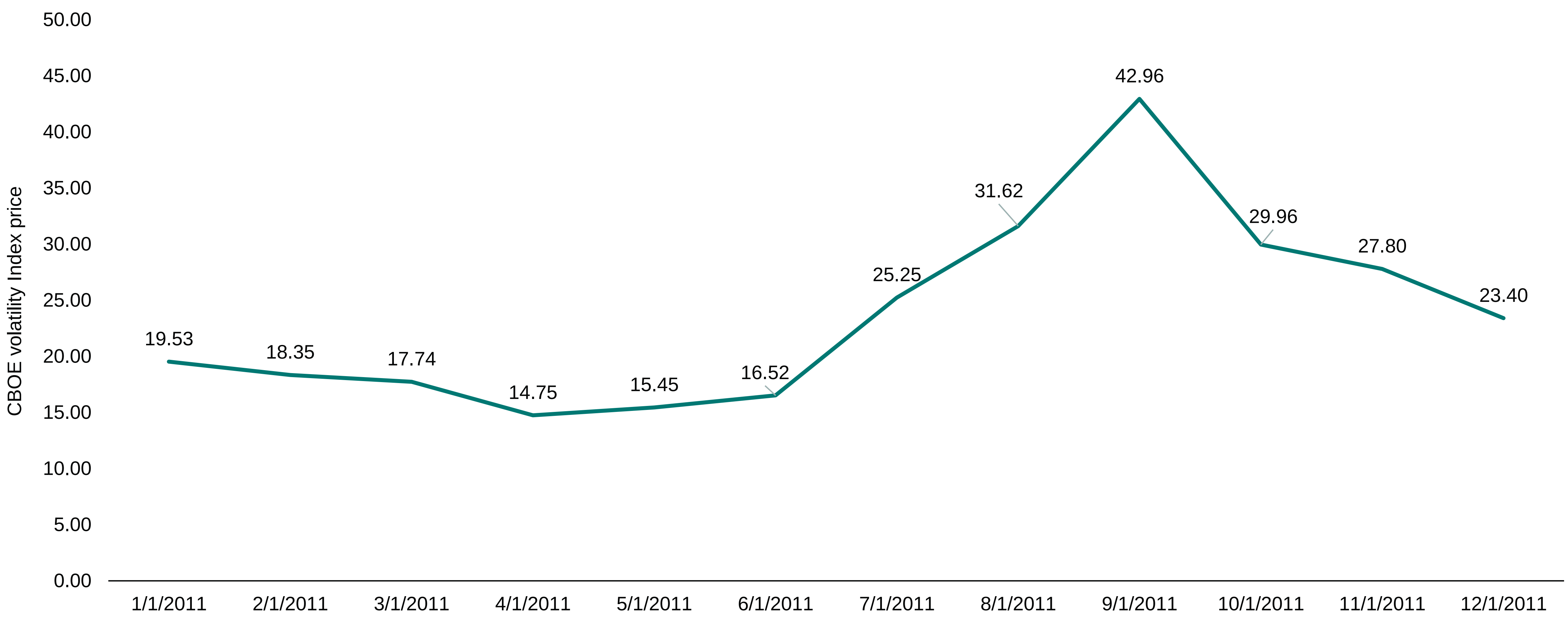
S&P500 volatility 1995–1996



Source: FactSet.

Past performance is no guarantee of future returns.

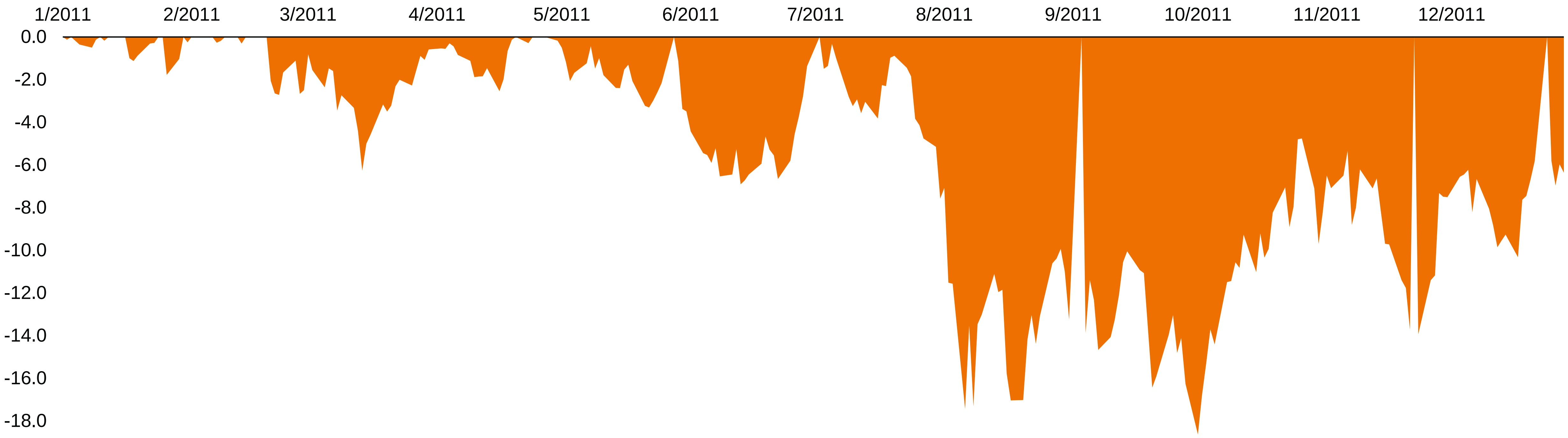
S&P500 volatility 2011



Source: FactSet.

Past performance is no guarantee of future returns.

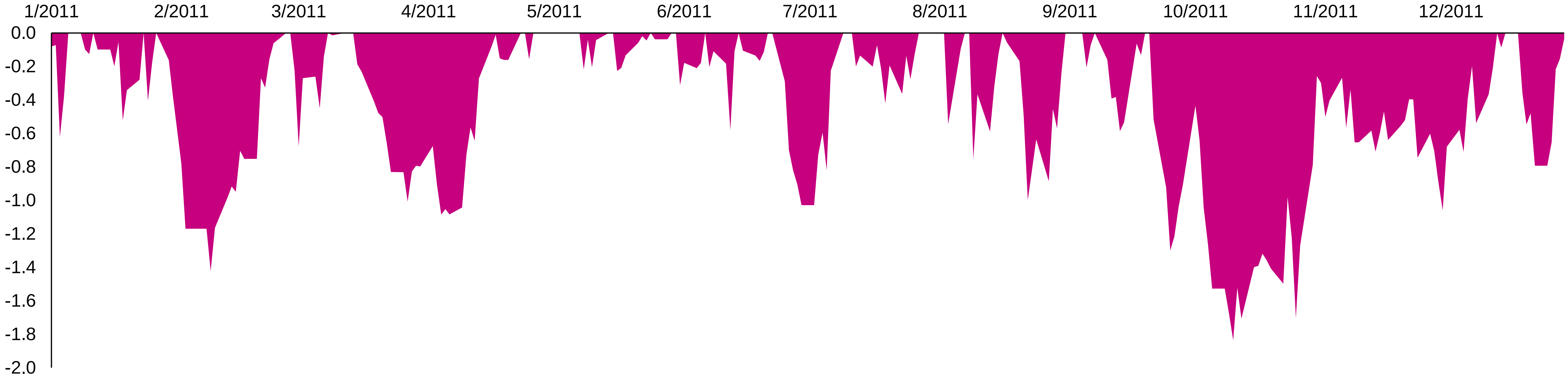
S&P500 maximum drawdown in 2011



Maximum drawdown: –18.64%
1-year return: 2.11%

Source: FactSet.
Note: Figure represents maximum drawdown of an investment in the S&P 500 for the period January 1, 2011, through December 31, 2011. Figure is for illustrative purposes only. It is not possible to invest directly in a benchmark.
All investment is subject to risk. Past performance is not an indication of future performance

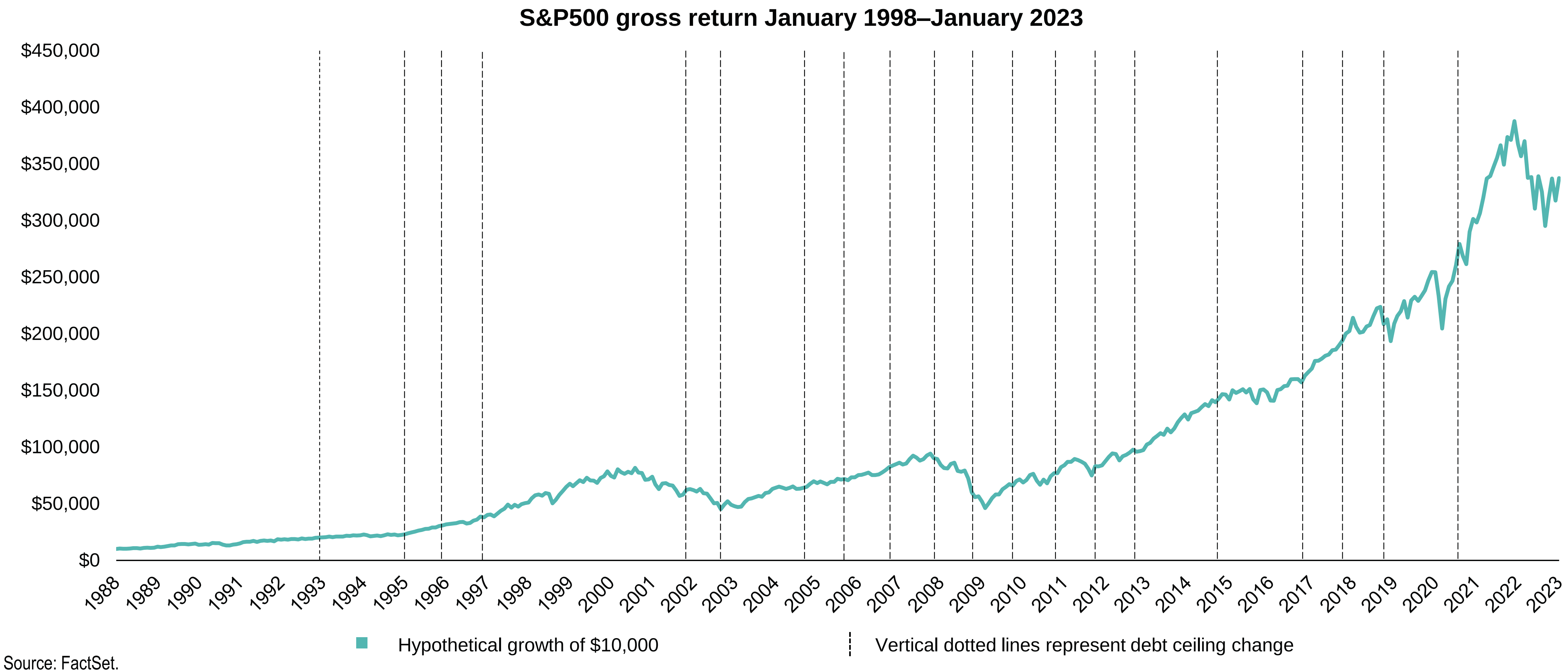
Bloomberg U.S. Aggregate maximum drawdown in 2011



Maximum drawdown: –1.84%
1-year return: 7.92%

Source: FactSet.
Note: Figure represents maximum drawdown of an investment in the Bloomberg U.S. Aggregate Float Adjusted benchmark for the period January 1, 2011, through December 31, 2011. Figure is for illustrative purposes only. It is not possible to invest directly in a benchmark.
All investment is subject to risk. Past performance is not an indication of future performance.

Debt ceiling negotiations have little to no impact on U.S. equities in the long run

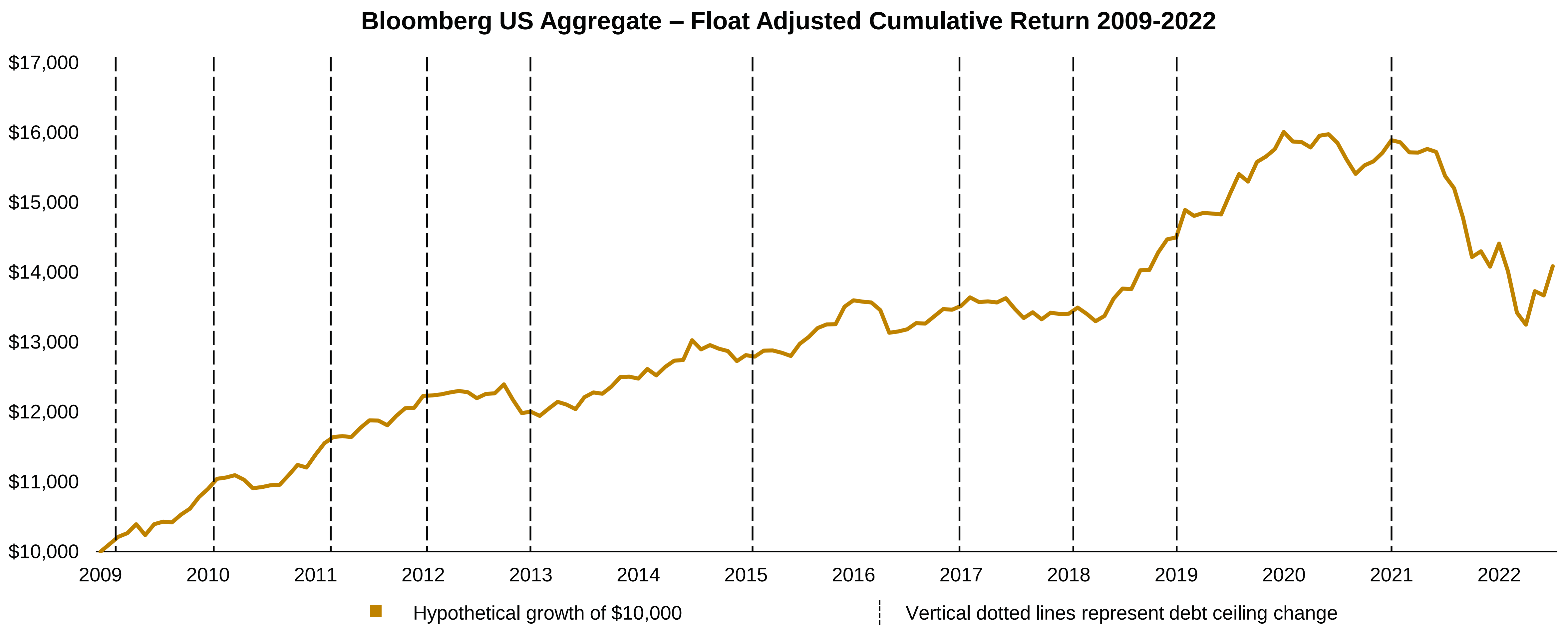


Source: FactSet.

Figures show hypothetical growth of $10,000 investment in S&P 500 from January 31, 1988, through January 31, 2023. Figure is for illustrative purposes only. It is not possible to invest directly in a benchmark. Vertical lines represent years in which congress has acted to raise, temporarily extend, or redefine the federal debt ceiling.

All investment is subject to risk. Past performance is not an indication of future performance.

Debt ceiling negotiations have little to no impact on U.S. fixed income markets in the long run



Source: FactSet.
Figures show hypothetical growth of $10,000 investment in Bloomberg U.S. Aggregate Float Adjusted benchmark from July 31, 2009, through January 31, 2023. Figure is for illustrative purposes only. It is not possible to invest directly in a benchmark. Vertical lines represent years in which congress has acted to raise, temporarily extend, or redefine the federal debt ceiling.
All investment is subject to risk. Past performance is not an indication of future performance.

The Vanguard view

"These episodes surrounding the debt limit have happened in the past and undoubtedly will happen in the future. Nevertheless, the very nature of this situation brings uncertainty, and the markets don't like uncertainty—which can mean greater volatility over the short term. But it's important to remember that volatility goes in both directions—up as well as down—and the markets are efficient at processing news. Time in the markets is ultimately better for your portfolio than market timing."

— **Greg Davis**
Chief Investment Officer

Source: Economics and markets, The Debt Limit—We've Been Here Before: https://corporate.vanguard.com/content/corporatesite/us/en/corp/articles/debt-limit.html. As of January 19, 2023.

Inflation will continue to drive policy in 2023

Growth | Inflation | Monetary policy

Globally coordinated policy tightening in 2022 has slowed the pace of price increases but has raised the prospect of global recession in 2023.

Policymakers fighting high inflation will be challenged with determining how restrictive to be with policy and for how long. This will impact the likelihood and severity of a recession. Emerging markets are even more at risk.

Wages have replaced monetary and fiscal stimulus and global supply shortages as the main driver of high inflation and are the main focus of policymakers attempting to bring inflation back to target.

Normalizing headline inflation complicates central banks' efforts to contain core inflation. Policymakers are more focused on price stability and are less likely to react to declining growth until inflation is arrested. Wages and inflation expectations will be key.

After an unprecedented rise in global policy rates, the biggest question for financial markets is how long these rates will stay restrictive.

We expect monetary policy rates for the Federal Reserve, the European Central Bank, and the Bank of England to be higher at the end of 2023 than they were at the end of 2022. We no longer expect any broad-based macro policy from the People's Bank of China as the COVID reopening proceeds.

Source: Vanguard analysis as of December 31, 2022.

Global market outlook
Equities | Fixed income

Equities

Valuations contracted in 2022 as investors dealt with higher prices, which central banks fought to contain. Value stocks outperformed growth, and international equities outperformed those of the U.S. due to small valuation contractions.

Current valuations are the biggest driver of 10-year returns, which is why we are more constructive on regions where valuations are less stretched. Growth and value stocks have converged toward fair value.

Developed-market sovereign bonds

Yield curves continued to flatten as developed-market central banks made it clear they would do whatever was necessary to bring down inflation. Market participants are pricing in central bank cuts on the heels of economic weakness.

Initial yield is a key driver of fixed income returns and supports our outlook for rising returns on developed-market government debt. Near-term pain is still possible because persistently high inflation would support rates remaining higher for longer, but the risk-return trade-off for bonds is very attractive.

Credit

Credit spreads have declined over the last three months of 2022 and are reasonably valued based on current conditions. The likelihood of recession skews risks toward higher spreads.

Higher spreads increase excess returns for credit because of an increasing risk premium. Our economic outlook suggests that spreads are unlikely to rise past their historical average during recessions. At the same time, a persistent return premium, combined with lower volatility for longer holding periods, offers a compelling case for credit in long-term portfolios.

Source: Vanguard analysis as of December 31, 2022.

Global market outlook

Equities | Fixed income

Near-term risks are still present as valuations remain stretched

U.S. equity valuations are 30% below their highs from a year ago but remain above our estimate of fair value. The correction has been more pronounced in the large-cap growth space, where valuations are down 40%. Although our U.S. equity return outlook is higher than a year ago, we still caution investors against extreme overweights to U.S. stocks.

Lower valuations present an opportunity for investors

International equities are increasingly likely to outperform their U.S. peers by 1.3 to 3.3 percentage points per year despite our expectations for lower earnings growth. Dollar strength could turn from headwind to tailwind as global policy normalization continues.

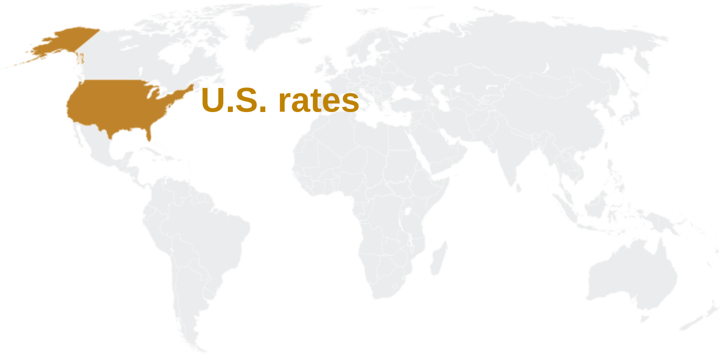
Valuations are attractive for the first time since the pandemic began

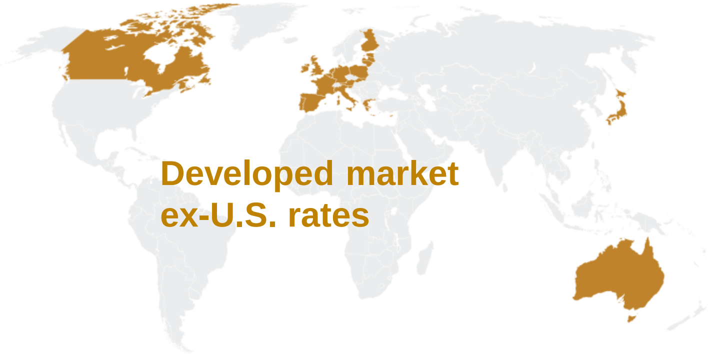
The recent sell-off has brought emerging markets below our estimated fair-value range. Still, we expect EM equity to under-perform developed-market ex-U.S. by approximately 0.3 percentage points per year over the next decade. The EM growth and inflation outlooks and central banks' response to U.S. policy tightening will be important considerations.

Source: Vanguard analysis as of December 31, 2022.

Global market outlook

Equities | Fixed income





Higher yields are making bonds more attractive

A restrictive policy rate and normalizing inflation support higher fixed income returns in the long term that are nearing levels seen before the 2008 global financial crisis. Our outlook for 10-year yields in 10 years is close to that of the forward curve.

Policy decisions will drive outcome disparity

As international central banks, which lagged the U.S. Federal Reserve in 2022, continue to normalize policy, we expect a global divergence in yields. It is increasingly likely that some policy normalization will occur in Japan, but not to the degree seen in other countries. Overall, U.S. bonds should marginally outperform their global counterparts after currency hedging.

Compressed spreads suggest lower future returns

Global growth risks and emerging-market central banks' policy response to tightening in developed markets will be important considerations over the next few years. In credit, we see emerging markets as increasingly likely to underperform high-yield, both of which should outperform U.S. investment-grade in the USD markets.

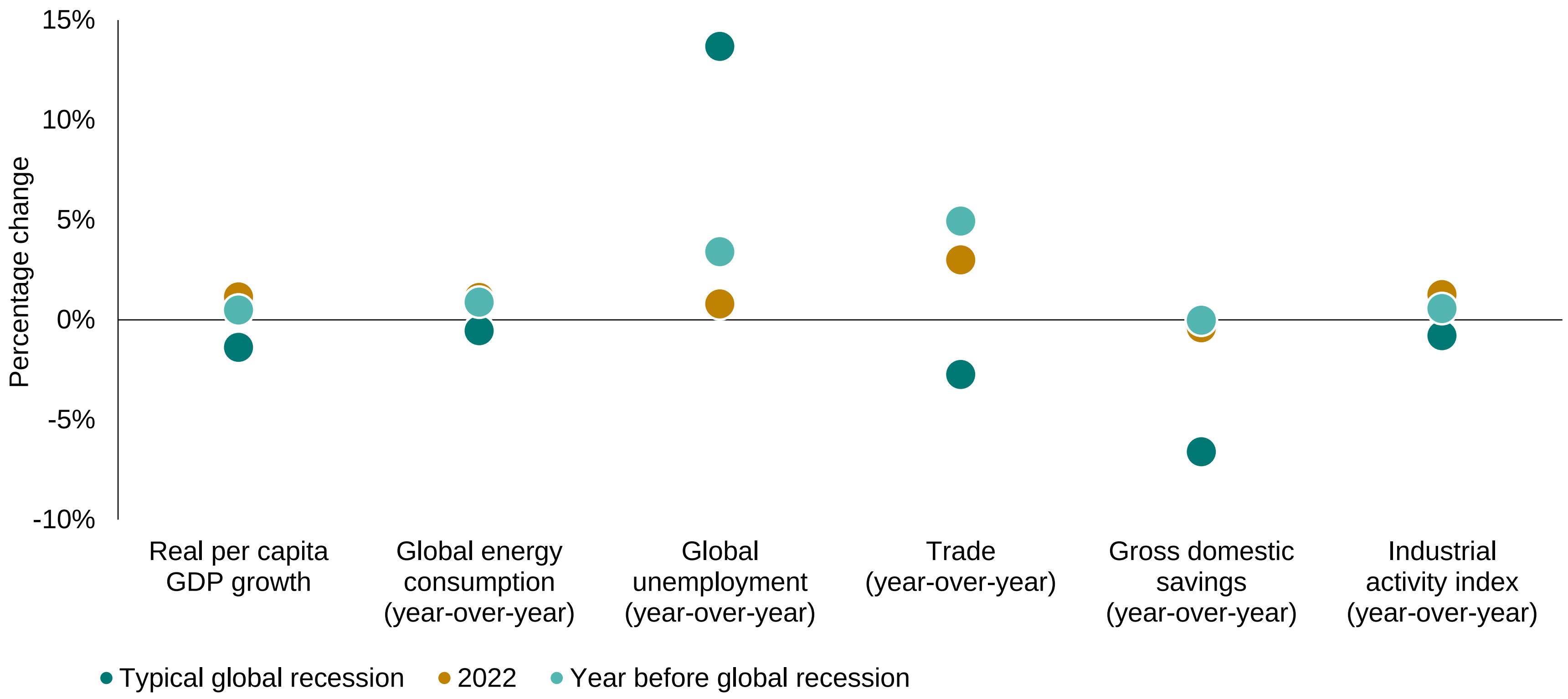
Source: Vanguard analysis as of December 31, 2022.

Global recession is increasingly likely

A stronger starting point could limit the depth of a downturn

- Industrial activity is higher and unemployment is lower than during the year before previous recessions.
- We see a 50% probability of a globally synchronized recession in the next year.
- The only time probability of recession was as high as it is today and there was not a recession was in 2001.

Comparison: Global recessions and 2022

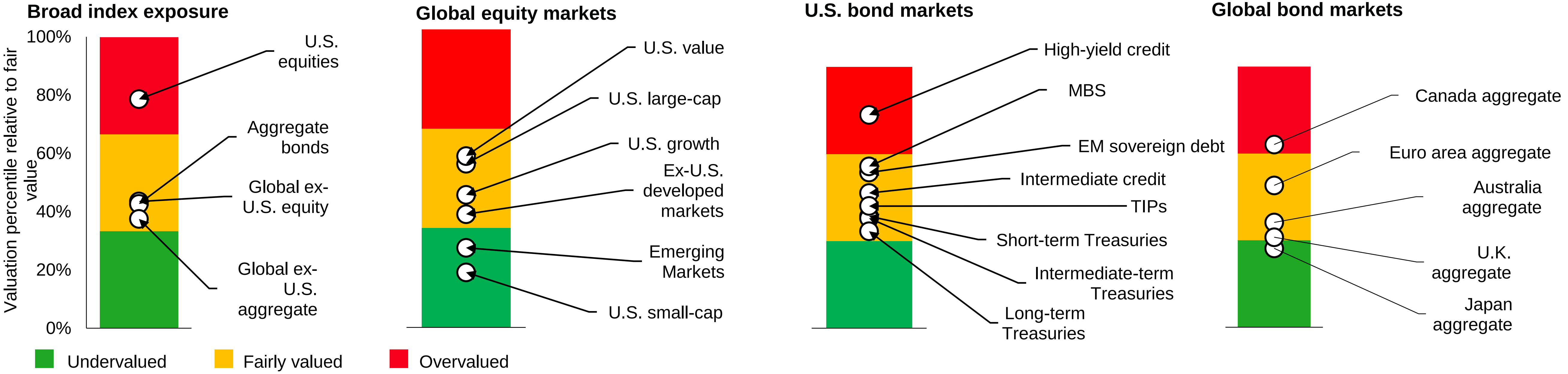


Notes: Global recession years were 1975, 1982, 1991, 2009, and 2020. *Year before global recession* includes the year before each, excluding 2019. Vanguard calculations are as of October 31, 2022. The typical global recession reflects the median result for each category in the global recession years.

Sources: World Bank, British Petroleum Statistical Review of World Energy, Organisation for Economic Co-operation and Development, Federal Reserve Bank of St. Louis FRED database, OeNB, CPB Netherlands Bureau for Economic Policy Analysis, United Nations Conference on Trade and Development, and Our World in Data, as of October 31, 2022. Global unemployment data and years of global recession are from Kose, M. Ayhan, Naotaka Sugawara, and Marco E. Terrones, 2020. *Global Recessions*. Policy Research Working Paper No. 9172. Washington, D.C.: World Bank.

After a volatile year, most valuations are fair

Within the equity space, small-cap and ex-U.S. stocks are more favorably valued; Treasuries and broad ex-U.S. bonds are most undervalued in the fixed income space

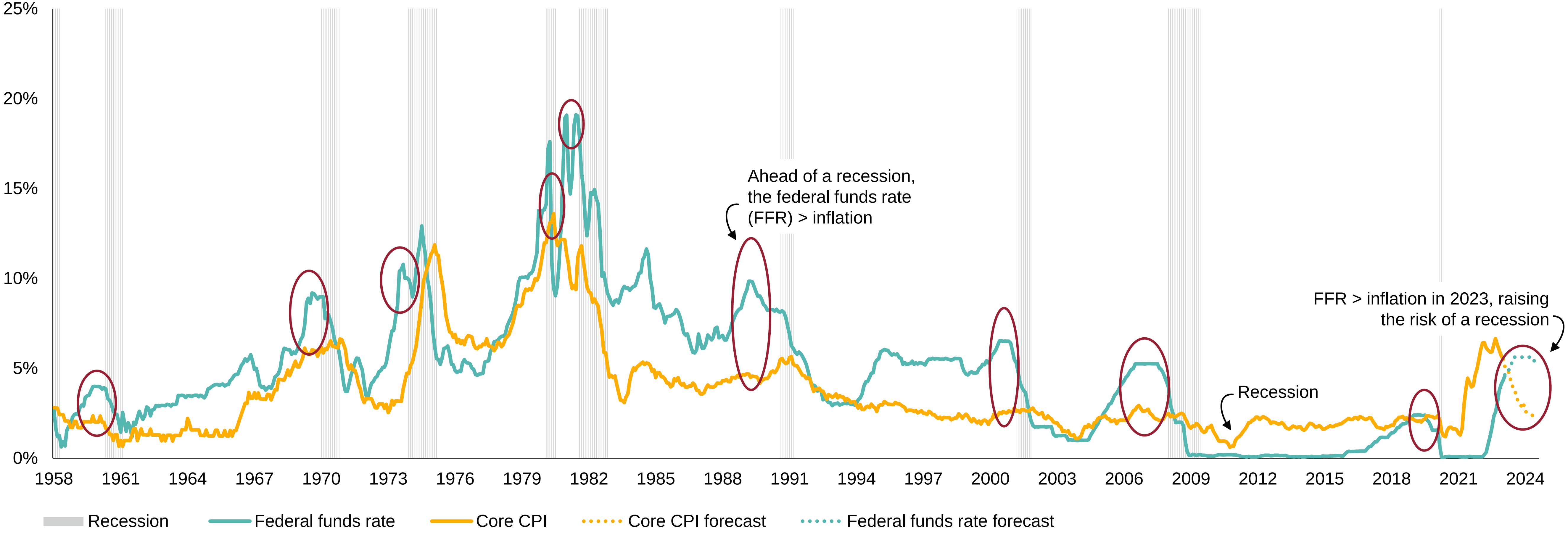


IMPORTANT: The projections and other information generated by the VCMM regarding the likelihood of various investment outcomes are hypothetical in nature, do not reflect actual investment results, and are not guarantees of future results. Distribution of return outcomes from VCMM are derived from 10,000 simulations for each modeled asset class. Simulations as of December 31, 2022. Results from the model may vary with each use and over time. For more information, please see the "Important information" section.

Notes: From left to right: **Broad index exposure:** The U.S. valuation measure is the current cyclically adjusted price/earnings ratio (CAPE) percentile relative to fair-value CAPE for the S&P Composite Index from 1940 to 1957 and the S&P 500 Index from 1957 through December 31, 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. **Global equity markets**: With the exception of emerging markets and ex-U.S. developed markets, the rest 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. 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. **U.S. bond markets**: Valuation percentiles are relative to year-30 projections from the VCMM assuming U.S. aggregate bonds' valuation is at the 50th percentile. Intermediate and high-yield credit valuations are relative to our current fair-value models presented on slide 37. Emerging sovereign debt and mortgage-backed securities (MBS) valuations are based on current spreads relative to year 30. Treasury valuation is the key rate duration-weighted average of the fundamental fair-value model outlined on page 30. TIPS are calculated using 10-year-ahead annualized inflation expectations relative to years 21–30. **Global bond markets:** Valuation percentiles are relative to year-30 projections from the VCMM. Country aggregate bond valuations are a weighted average between long-term and short-term Treasury yield and the credit spread relative to year 30.

Sources: From left to right—first and second chart: Vanguard calculations, based on Robert Shiller's website, at aida.wss.yale.edu/~shiller/data.htm, the U.S. Bureau of Labor Statistics, the Federal Reserve Board, and Refinitiv, as of December 31, 2022. Third and fourth charts: Vanguard calculations, using December 31, 2022, VCMM simulation.

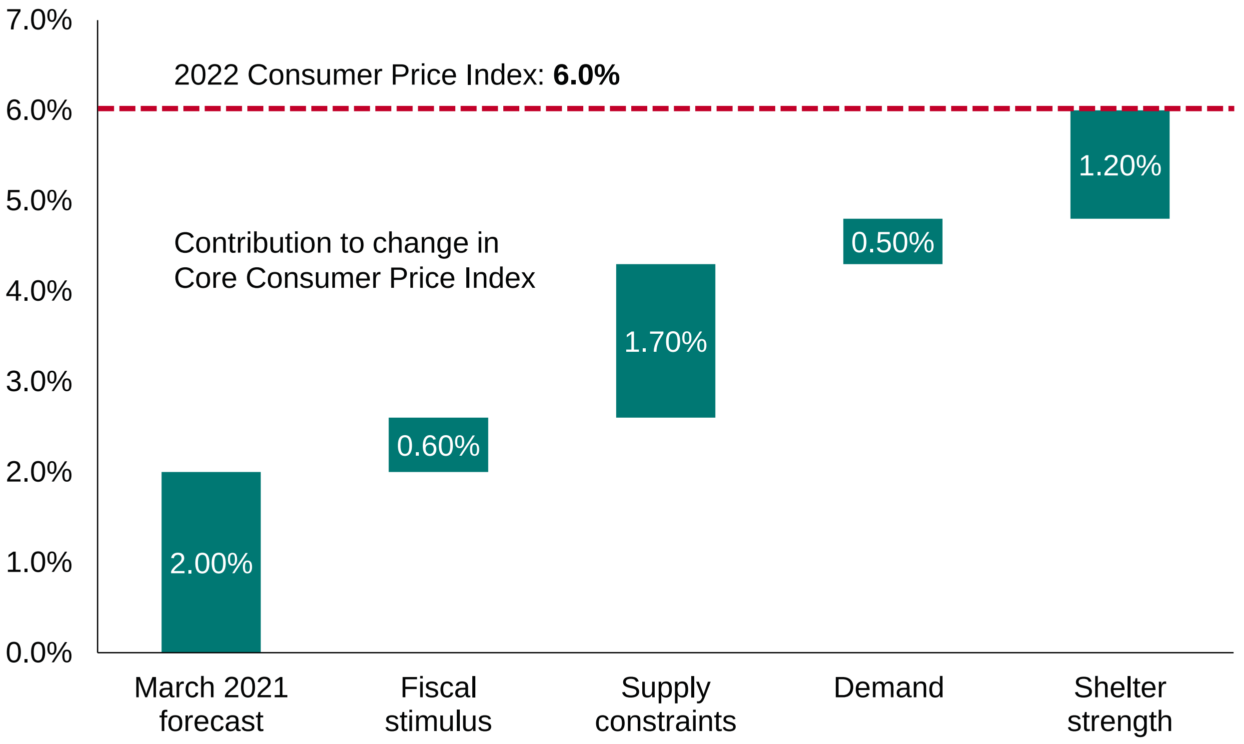
Short-term interest rates above inflation are a necessary condition for recession historically



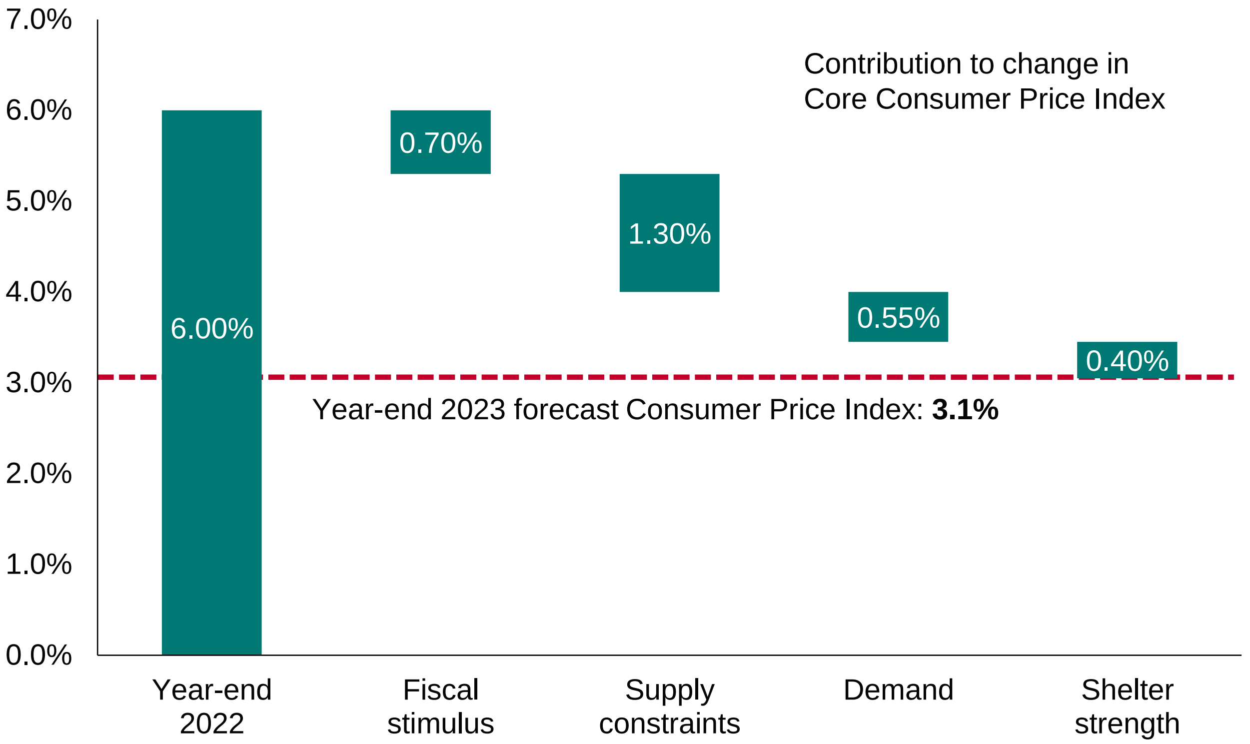
Notes: Core CPI data are for year-on-year percentage changes in the core Consumer Price Index (CPI), monthly frequency. The federal funds rate is the effective federal funds rate in percentage points, monthly frequency.
Sources: Vanguard calculations, using data from the Federal Reserve Bank of St. Louis. Inflation data are from January 1958 through January 2023.

Inflation should stay on a downward trajectory through 2023

2022: Supply shocks are key drivers of U.S. inflation



2023: Demand destruction helps subdue U.S. inflation



Note: The magnitude of inflation attributed to each of the subcategories of fiscal stimulus, supply constraints, demand destruction, and shelter strength is based on subjective analysis of surprises to prior inflation forecasts and reasons for each.
Sources: Vanguard calculations based on data from Moody's, Refinitiv, and Bloomberg.

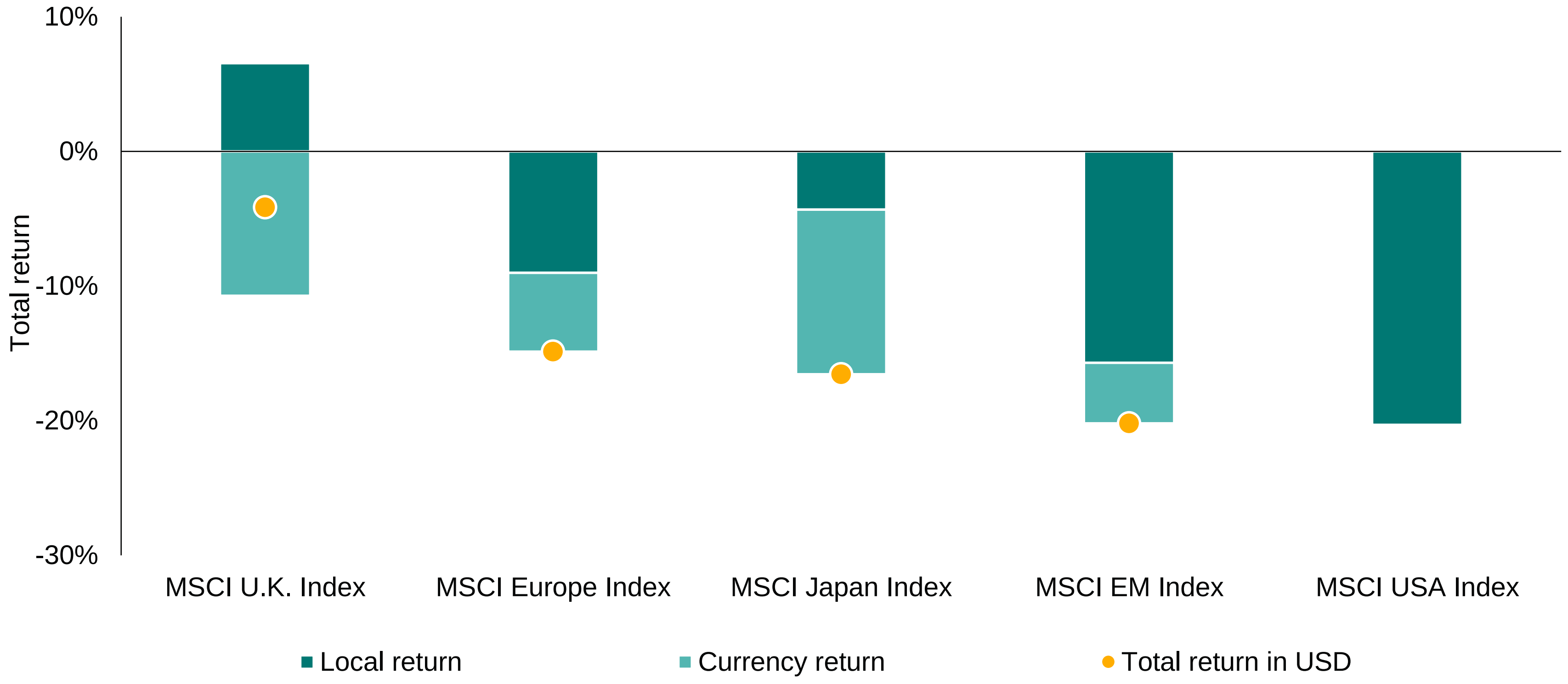
Note: The magnitude of inflation attributed to each of the subcategories of fiscal stimulus, supply constraints, demand destruction, and shelter strength is based on subjective analysis of surprises to prior inflation forecasts and reasons for each.
Sources: Vanguard calculations based on data from Moody's, Refinitiv, and Bloomberg.

Dollar strength held back international performance for U.S. investors in 2022

Currency accounted for a sizable portion of international equity returns in 2022

- Local currency returns were much stronger internationally in 2022.
- The strong dollar on the back of higher U.S. rates offset some of that outperformance.
- The U.S. dollar is 12% above what long-term fundamental drivers of currency suggest.

Non-U.S. equities greatly outperformed those of the U.S. in local currency terms



Notes: The chart breaks down the unhedged USD return from December 31, 2021, to December 31, 2022, into the local and exchange-rate return components. The indexes used are the MSCI United Kingdom Net Total Return Index, the MSCI Europe Net Total Return Index, the MSCI Japan Net Total Return Index, the MSCI Emerging Market Net Total Return Index, and the MSCI USA Net Total Return Index. The currency exchange rates are the EUR/USD, GBP/USD, and JPY/USD cross-rates. The MSCI Emerging Markets currency return is derived using the local currency index, which accounts for exchange-rate differences based on each country's weight in the index.
Sources: Vanguard calculations, based on data from Bloomberg. Data as of December 31, 2022.

Important information

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.

Indexes for VCMM simulations

The long-term returns of our hypothetical portfolios are based on data for the appropriate market indexes through December 31, 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.
Euro area aggregate bonds: Bloomberg Euro-Aggregate Index.
U.K. aggregate bonds: Bloomberg Sterling Aggregate Index.
Global aggregate bonds: Bloomberg Global Aggregate Index.
U.S. aggregate bonds: Bloomberg U.S. Aggregate Index.
Japan aggregate bonds: Bloomberg Japanese Aggregate Index.
Australia aggregate bonds: Bloomberg Australia Aggregate Index.
Canada aggregate bonds: Bloomberg Canada Aggregate Index.
Emerging markets: MSCI Emerging Markets Index.
Developed markets ex-U.S.: MSCI World ex-US Index.

All equity indexes below are weighted by market capitalization. The factor definitions below apply to all slides except slide 9, where the factors are defined by the indexes described in the notes and sources.
Small-cap equities: Stocks with a market cap in the lowest two-thirds of the Russell 3000 Index.
Large-cap equities: Stocks with a market cap in the highest two-thirds of the Russell 1000 Index.
Growth equities: Stocks with a price/book ratio in the highest one-third of the Russell 1000 Index.
Value equities: Stocks with a price/book ratio in the lowest one-third of the Russell 1000 Index.

Important information (continued)

Sector indexes in the order they are presented on slide 9: S&P 500 Energy Sector Total Return Index, S&P 500 Industrials Sector Total Return Index, S&P 500 Financial Sector Total Return Index, S&P 500 Materials Sector Total Return Index, S&P 500 Consumer Discretionary Sector Total Return Index, S&P 500 Consumer Staples Sector Total Return Index, S&P 500 Information Technology Sector Total Return Index, S&P 500 Utility Sector Total Return Index, S&P 500 Health Care Sector Total Return Index, and S&P 500 Real Estate Sector GICS Level 1 Total Return Index. GICS stands for Global Industry Classification Standard.

Indexes for slide 13: Low-quality growth, high-quality growth, and high-quality value portfolios are constructed based on data from Kenneth R. French's website, using New York Stock Exchange-listed companies sorted in quintiles
by operating profit and the ratio of book value to market value (B/P). The low-quality growth portfolio is represented by the lowest quintile operating profit (quality) and B/P companies. The high-quality value portfolio is represented
by the highest quintile operating profit and B/P companies. U.S. equities are represented by the Dow Jones U.S. Total Stock Market Index (formerly known as the Dow Jones Wilshire 5000) through April 22, 2005; the MSCI US
Broad Market Index through June 2, 2013; and the CRSP US Total Market Index thereafter. Growth stocks are based on the S&P 500/Barra Growth Index through May 16, 2003; the MSCI US Prime Market Growth Index through April 16, 2013; and the CRSP US Large Cap Growth Index thereafter. Value stocks are based on the S&P 500/Barra Value Index through May 16, 2003; the MSCI US Prime Market Value Index through April 16, 2013; and the CRSP US Large Cap Value Index thereafter. Small-cap equities are based on the Russell 2000 Index through May 16, 2003; the MSCI US Small Cap 1750 Index through January 30, 2013; and the CRSP US Small Cap Index thereafter. Emerging-market equities are based on the Select Emerging Market Index through August 23, 2006; the MSCI Emerging Markets Index Net USD through January 9, 2013; the FTSE Emerging Transition Index through June 27, 2013; the FTSE Emerging Index through November 1, 2015; the FTSE Emerging Markets All Cap China A Transition Index through 9/18/2016; and the FTSE Emerging Markets All Cap China A Inclusion Index thereafter. High-yield bonds are based on the Bloomberg U.S. Corporate High-Yield Index. International equities are based on the MSCI EAFE Index through May 31, 2010, and the MSCI All Country World Index ex USA thereafter. Commodities are based on the Bloomberg Commodities Total Return Index. U.S. bonds are based on the Bloomberg U.S. Aggregate Bond Index through December 31, 2009, and the Bloomberg U.S. Aggregate Float Adjusted Index thereafter. U.S. home prices are obtained from the U.S. home price dataset published by Robert Shiller.

All investing is subject to risk, including the possible loss of the money you invest. Be aware that fluctuations in the financial markets and other factors may cause declines in the value of your account. 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. Diversification does not ensure a profit or protect against a loss. 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.

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. While U.S. Treasury or government agency securities provide substantial protection against credit risk, they do not protect investors against price changes due to changing interest rates. Unlike stocks and bonds, U.S. Treasury bills are guaranteed as to the timely payment of principal and interest. 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.

Important information

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Important information

For more information about any fund, visit institutional.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.

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.

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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Investments in Target Retirement Funds and Trusts are subject to the risks of their underlying funds. The year in the fund or trust name refers to the approximate year (the target date) when an investor in the fund or trust would retire and leave the workforce. The fund/trust will gradually shift its emphasis from more aggressive investments to more conservative ones based on its target date. The Income Trust/Fund and Income and Growth Trust have fixed investment allocations and are designed for investors who are already retired. An investment in a Target Retirement Fund or Trust is not guaranteed at any time, including on or after the target date.

Vanguard is responsible only for selecting the underlying funds and periodically rebalancing the holdings of target-date investments. The asset allocations Vanguard has selected for the Target Retirement Funds are based on our investment experience and are geared to the average investor. Investors should regularly check the asset mix of the option they choose to ensure it is appropriate for their current situation.

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Important information

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

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