

State of the markets

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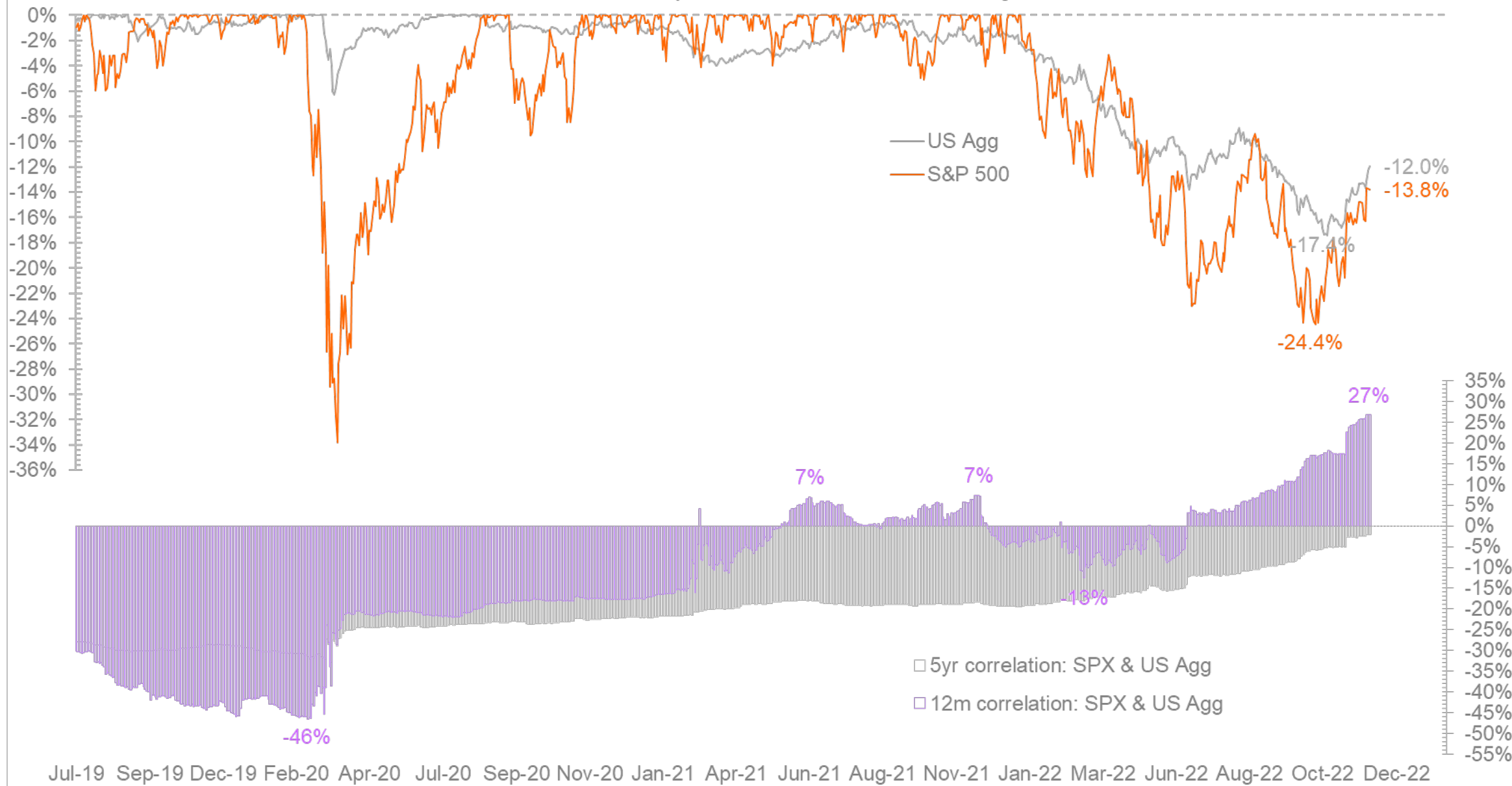
December 2022

The Periodic Table of Sharpe Ratios

REIT	EAF	EMD	gold	HY	LV	TIPS	IGB	EMD	HF	com	SPX	HF	HY	IGB	JPN	TIPS	HF	IGB	HF	HY	EMD	HY	IGB	LT	HY	gold	Ⓝ	HY	Ⓝ	LT	JPN	HY	Ⓝ	LG	LG	Ⓝ	LV	com
IGB	HY	HY	com	EMD	IGB	IGB	EMD	HY	EMD	EAF	LV	HY	HF	LT	EM	IGB	IGB	gold	HY	LV	EM	LV	gold	IGB	EMD	IGB	IGB	Ⓝ	LG	IGB	Ⓝ	Ⓝ	LG	IGB	HF	gold	REIT	gold
TIPS	EUR	EAF	EAF	LV	TIPS	LT	HY	SV	HY	JPN	LG	EUR	SV	HF	HF	LT	REIT	com	REIT	EAF	JPN	EUR	EM	gold	HF	HY	TIPS	EMD	SG	REIT	LG	SV	EAF	gold	EMD	TIPS	SPX	SV
LT	EMD	IGB	TIPS	SV	LG	LG	TIPS	LV	EM	LG	HF	REIT	IGB	TIPS	EAF	com	TIPS	TIPS	EM	EUR	EAF	EAF	TIPS	TIPS	gold	EMD	LT	IGB	SPX	SPX	EMD	LV	EM	LT	HY	IGB	com	LV
JPN	TIPS	JPN	EM	EM	SPX	com	LT	IGB	IGB	EUR	HY	EMD	LV	LG	EMD	REIT	SV	LT	EMD	SV	com	REIT	LT	EMD	EM	REIT	EMD	LV	SC	LV	IGB	EMD	SPX	REIT	IGB	LG	SV	Ⓝ
HY	IGB	TIPS	EMD	JPN	LT	EUR	EM	REIT	SV	SPX	IGB	com	SPX	EUR	com	SV	LT	HF	LG	EM	gold	SPX	EMD	REIT	LG	com	gold	SPX	LV	TIPS	REIT	SPX	HF	SPX	LV	LT	LG	SC
LV	LV	EUR	HY	EAF	EM	SPX	SG	SC	LV	REIT	LT	SV	REIT	SPX	LG	HF	HY	EMD	SV	SPX	EUR	HF	EUR	SV	IGB	SG	HY	REIT	SV	LG	SPX	SC	JPN	SG	SPX	SG	HY	REIT
EMD	SV	REIT	IGB	SC	SG	EM	SC	LT	LT	HF	TIPS	LV	LT	EAF	SG	EMD	gold	REIT	SC	REIT	LV	SV	LG	SC	com	HF	REIT	SV	HF	EMD	EAF	com	EUR	LV	REIT	HF	SC	SPX
EM	SPX	LT	JPN	REIT	SC	gold	REIT	TIPS	EUR	SV	SV	SPX	LG	LV	SPX	LV	EMD	HY	SG	EMD	LT	EM	EAF	HY	EUR	SC	LG	TIPS	JPN	HY	SG	TIPS	SG	SC	JPN	EM	EUR	SG
SV	REIT	LV	LG	SPX	JPN	SG	LG	SPX	SC	SC	SC	LG	EUR	HY	EUR	SC	SC	EM	EAF	SC	IGB	EMD	com	JPN	SG	JPN	SPX	LG	EAF	SG	LT	LG	HY	HY	EAF	SPX	HF	HY
SPX	LT	gold	EUR	TIPS	EUR	LV	SV	LG	TIPS	LV	SG	SC	SC	gold	TIPS	gold	EM	JPN	SPX	IGB	TIPS	IGB	HF	com	EAF	SV	LV	SC	EUR	SC	EUR	IGB	EMD	com	EUR	JPN	EAF	LG
EAF	LG	SV	SPX	IGB	SV	HY	SPX	EM	EAF	SG	EUR	EAF	TIPS	SG	SC	SPX	SG	SV	LV	TIPS	REIT	SC	SG	SG	SPX	EM	SG	HF	HY	SV	LV	HF	LV	SV	gold	SC	SG	HF
EUR	SC	SPX	LV	com	REIT	EMD	LV	SG	SPX	HY	REIT	IGB	EMD	SC	HY	SG	LV	LV	EUR	LT	SPX	LG	SPX	EM	SC	LG	SC	EUR	REIT	EM	SC	EM	IGB	TIPS	SG	HY	Ⓝ	JPN
LG	EM	LG	REIT	LG	EAF	EAF	EUR	com	REIT	gold	com	SG	SG	SV	LV	EUR	SPX	EUR	JPN	gold	HF	gold	HY	EAF	LV	LT	SV	EAF	EM	gold	SV	SG	SC	EMD	TIPS	EMD	TIPS	EAF
SC	SG	EM	SV	EUR	EMD	SC	EAF	EUR	gold	EM	EMD	EM	EAF	EMD	SV	LG	LG	EAF	com	SG	LG	SG	LV	LG	TIPS	TIPS	EUR	SG	IGB	HF	TIPS	gold	LT	Ⓝ	SC	EAF	JPN	EUR
SG	JPN	SC	SC	SG	HY	JPN	JPN	EAF	SG	IGB	EAF	TIPS	EM	JPN	gold	HY	EUR	SC	gold	JPN	HY	JPN	SC	EUR	SV	LV	EAF	EM	EMD	JPN	HY	REIT	TIPS	EM	SV	EUR	EM	TIPS
com	gold	SG	LT	LT	gold	REIT	gold	JPN	JPN	EMD	gold	LT	com	EM	IGB	EAF	EAF	SPX	IGB	HF	SV	LT	JPN	LV	REIT	SPX	EM	JPN	LT	EAF	HF	JPN	SV	JPN	Ⓝ	SV	EMD	EM
gold	com	com	SG	gold	com	SV	com	gold	LG	LT	JPN	JPN	JPN	REIT	REIT	JPN	JPN	SG	TIPS	com	SC	com	SV	SPX	JPN	EAF	com	LT	TIPS	EUR	EM	EAF	gold	EUR	EM	LV	gold	EMD
									com	TIPS	EM	gold	gold	com	LT	EM	com	LG	LT	LG	SG	TIPS	REIT	HF	LT	EUR	JPN	gold	com	Ⓝ	gold	LT	REIT	EAF	LT	com	LT	IGB
Annual data since 1984. YTD 2022 through Sep.																											Source: FMRCo, Bloomberg, Haver, Factset, MSCI											

S&P 500 vs Barclays Agg

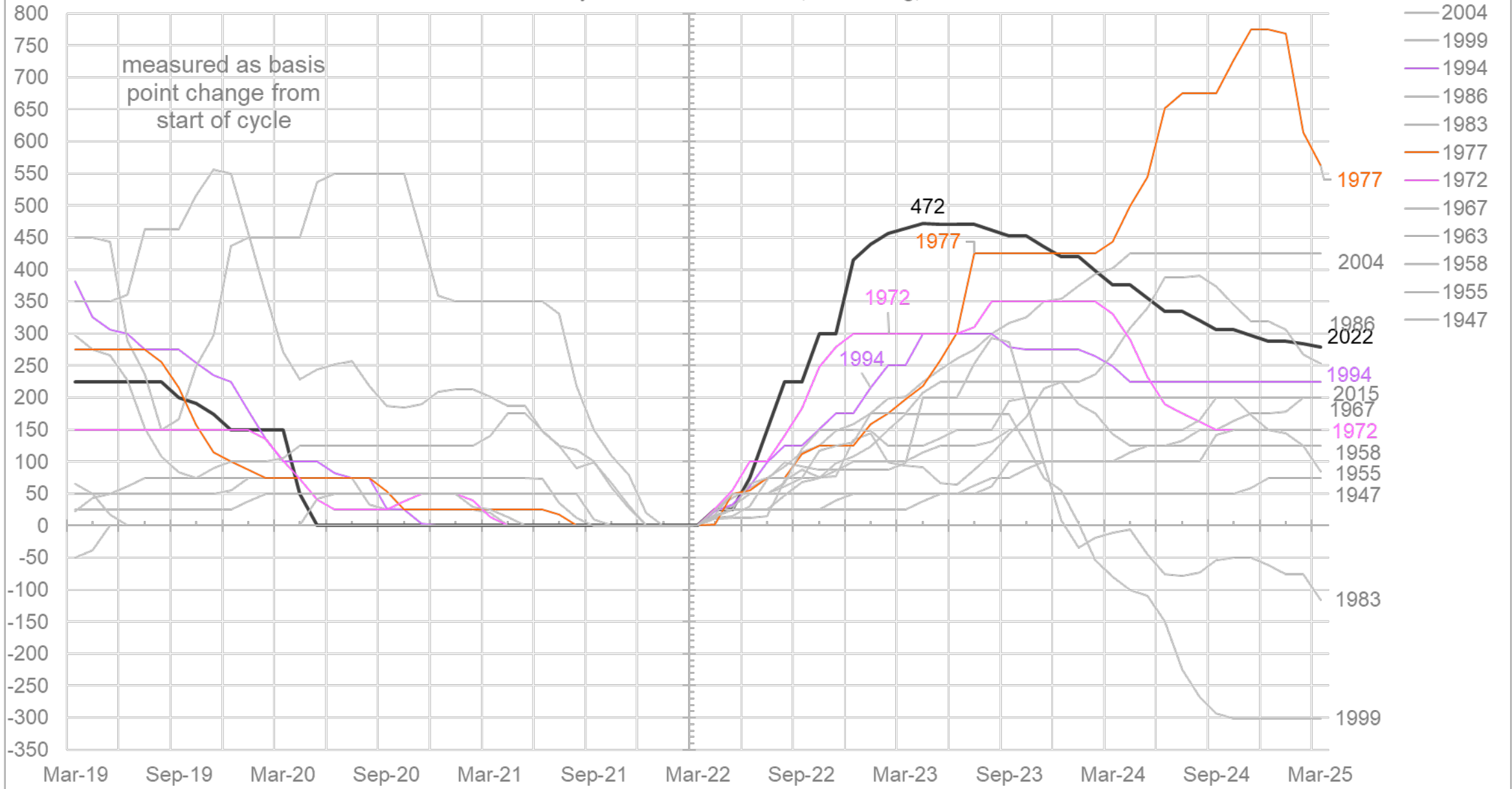
Daily data. Source: FMRCo, Bloomberg



Data as at December 5, 2022.

Fed Tightening Cycles

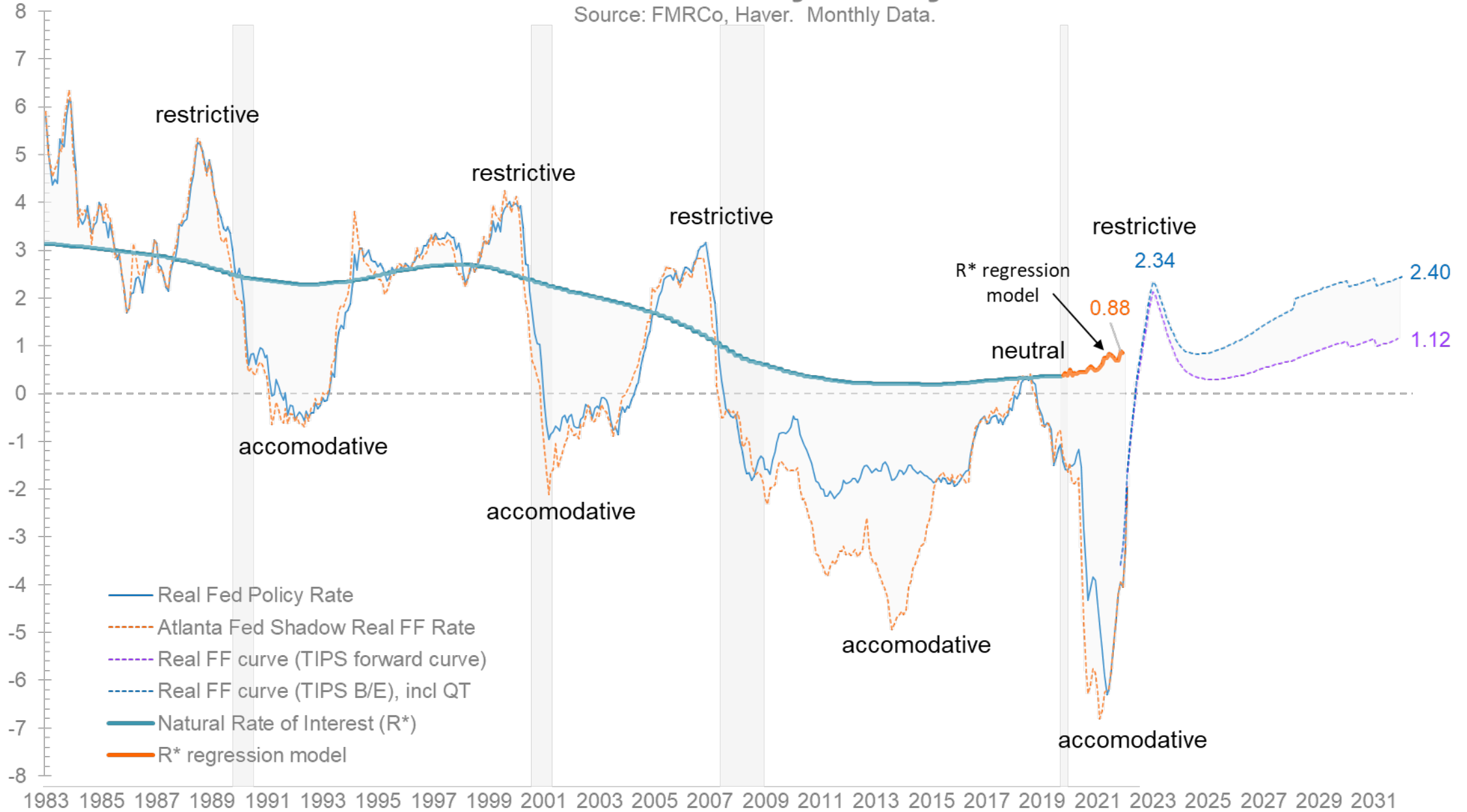
Monthly data. Source: FMRCo, Bloomberg, Haver.



Data as at December 5, 2022.

US Monetary Policy

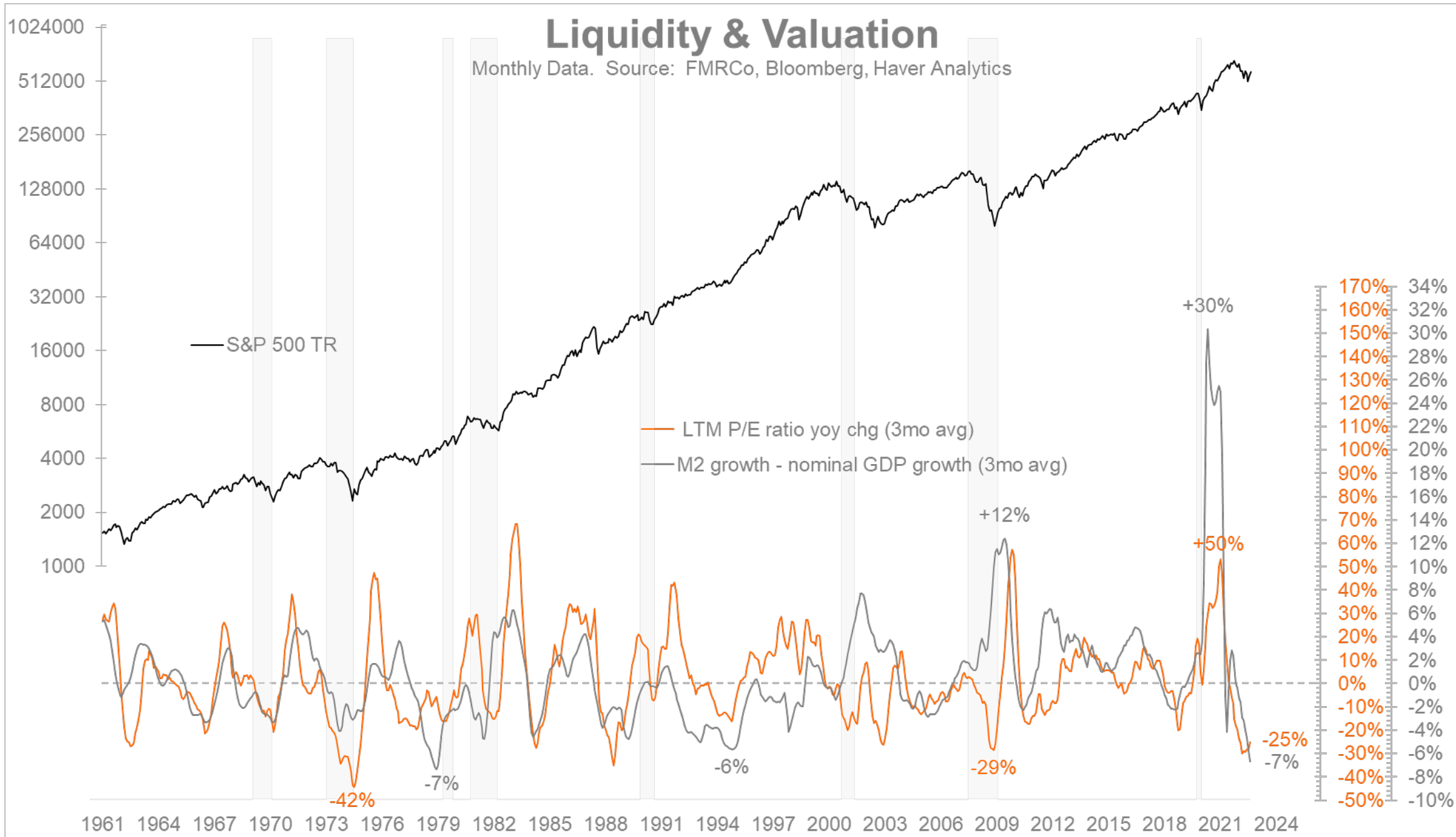
Source: FMRCo, Haver. Monthly Data.



Data as at December 5, 2022.

Liquidity & Valuation

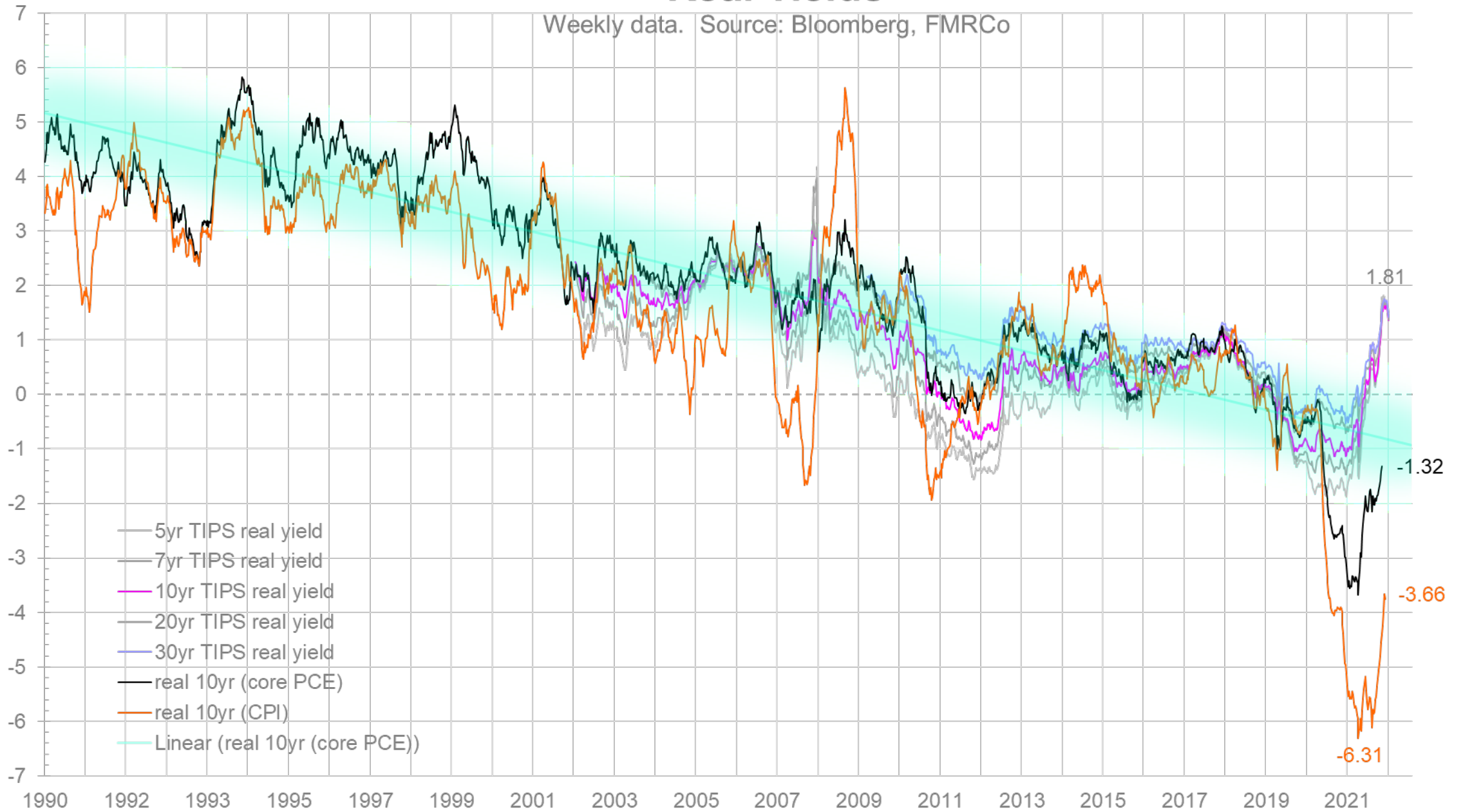
Monthly Data. Source: FMRCo, Bloomberg, Haver Analytics



Data as at December 5, 2022.

Real Yields

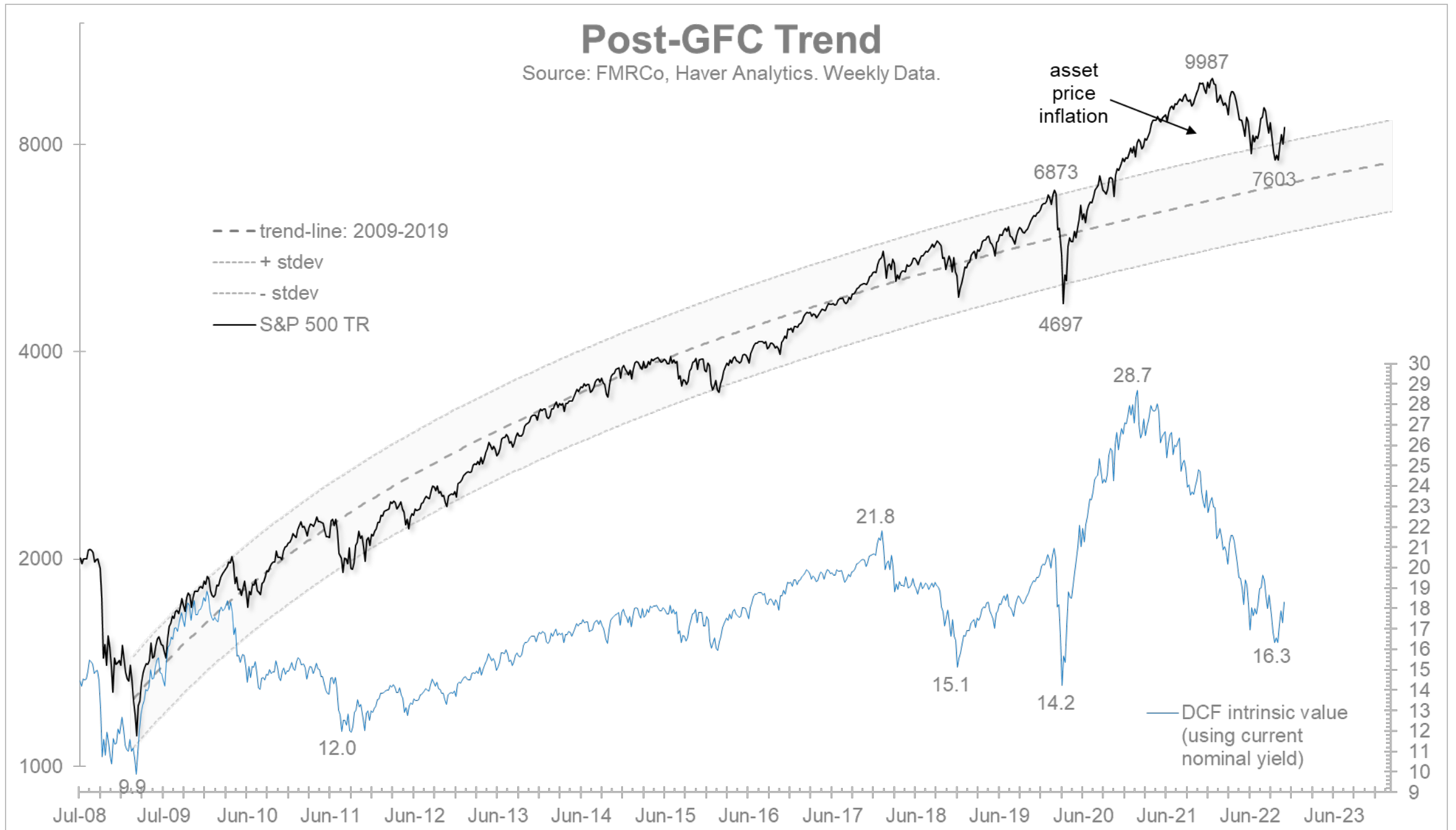
Weekly data. Source: Bloomberg, FMRCo



Data as at December 5, 2022.

Post-GFC Trend

Source: FMRCo, Haver Analytics. Weekly Data.



Data as at December 5, 2022.

Bear Markets (& Serious Corrections)																			
top	botom	#mo	Δ nom SPX	Δ real SPX	P/E high	P/E low	Δ P/E	Δ CPI (ann)	Δ Fed	Δ nom EPS	Δ real EPS	next peak	#mo	nom %chg	prev high	#mo	NBER		
Jun-1872	Jun-1877	61	-47%	-31%	12.4	9.4	-24%	-5%	-190	-30%	-13%	Jun-1881	49	+140%	Mar-1980	95	recession		
Jun-1881	Jan-1885	44	-36%	-26%	14.1	13.8	-2%	-4%	+120	-37%	-26%	May-1887	28	+39%	Jan-1999	215	recession		
May-1887	Aug-1896	113	-35%	-17%	17.2	17.1	-1%	-3%	+260	-39%	-25%	Jun-1901	75	+123%	Jan-1999	143	recession		
Jun-1901	Nov-1903	29	-26%	-31%	17.3	11.7	-33%	+3%	+210	+7%	-5%	Jan-1906	27	+57%	May-1905	48	recession		
Jan-1906	Nov-1907	22	-37%	-40%	14.6	9.4	-36%	+3%	+220	-8%	-9%	Nov-1909	24	+63%	Nov-1909	46	recession		
Nov-1909	Dec-1914	62	-28%	-29%	13.7	14.1	+3%	+0%	-70	-24%	-29%	Nov-1919	60	+31%	Oct-1916	84	recession		
Nov-1919	Aug-1921	22	-35%	-36%	10.1	13.6	+35%	+1%	+60	-52%	-87%	Sep-1929	98	+410%	Feb-1925	65	recession		
Sep-1929	Jun-1932	33	-87%	-82%	20.5	8.6	-58%	-8%	-330	-73%	-64%	Mar-1937	58	+348%	Dec-1954	308	recession		
Mar-1937	Apr-1942	63	-60%	-65%	16.8	7.3	-56%	+2%	-10	-20%	-30%	May-1946	50	+158%	Feb-1946	109	recession		
May-1946	Jun-1949	37	-30%	-46%	22.4	5.6	-75%	+9%	+79	+172%	+110%	Aug-1956	87	+271%	May-1950	48	recession		
Aug-1956	Oct-1957	15	-23%	-24%	14.3	11.8	-18%	+3%	+98	-8%	-12%	Dec-1961	50	+90%	Sep-1958	26	recession		
Dec-1961	Jun-1962	7	-30%	-28%	21.6	14.0	-35%	+1%	+13	+10%	+9%	Feb-1966	44	+84%	Oct-1963	22	recession		
Feb-1966	Oct-1966	8	-24%	-24%	18.2	12.3	-33%	+4%	+70	+2%	+0%	Nov-1968	26	+51%	Nov-1968	34			
Nov-1968	May-1970	18	-37%	-41%	18.0	12.3	-32%	+6%	+139	-7%	-12%	Jan-1973	32	+77%	Nov-1972	48	recession		
Jan-1973	Oct-1974	21	-50%	-57%	19.9	6.7	-66%	+11%	+205	+27%	+2%	Sep-1976	24	+78%	Dec-1982	121	recession		
Sep-1976	Mar-1978	18	-20%	-27%	11.8	8.0	-32%	+7%	+121	+2%	+5%	Nov-1980	33	+64%	Apr-1981	55	recession		
Nov-1980	Aug-1982	21	-29%	-36%	9.1	6.3	-31%	+8%	-473	-8%	-20%	Aug-1987	61	+233%	Oct-1982	23	recession		
Aug-1987	Oct-1987	2	-36%	-36%	24.0	14.3	-40%	+5%	+12	+11%	+10%	Jul-1990	33	+71%	Jul-1989	23			
Jul-1990	Oct-1990	3	-20%	-22%	16.0	13.4	-16%	+10%	-47	-32%	-35%	Jan-1994	40	+64%	Feb-1991	7	recession		
Jan-1994	Nov-1994	9	-8%	-10%	22.8	14.8	-35%	+3%	+272	+41%	+38%	Jul-1998	45	+169%	Feb-1995	13			
Jul-1998	Oct-1998	3	-22%	-23%	27.1	21.1	-22%	+2%	-102	-0%	-1%	Mar-2000	17	+68%	Dec-1998	5			
Mar-2000	Oct-2002	31	-51%	-53%	30.0	16.8	-44%	+2%	-425	-24%	-26%	Oct-2007	61	+105%	Jul-2007	89	recession		
Oct-2007	Mar-2009	17	-58%	-58%	17.6	12.0	-32%	+1%	-378	-50%	-51%	May-2011	26	+105%	Apr-2013	67	recession		
May-2011	Oct-2011	5	-21%	-22%	16.0	12.2	-24%	+3%	-4	+6%	+6%	Sep-2018	85	+174%	Feb-2012	10			
Sep-2018	Dec-2018	3	-20%	-20%	20.1	15.6	-22%	+0%	+24	+8%	+8%	Feb-2020	14	+45%	Apr-2019	7			
Feb-2020	Mar-2020	1	-35%	-35%	21.9	14.9	-32%	-3%	-124	-17%	-17%	Jan-2022	22	+120%	Aug-2020	6	recession		
Jan-2022	?	9	-28%	-31%	24.9	16.9	-32%	+7%	+372	+7%	+1%								
median - all cycles		19	-33%	-31%	17.5	12.3	-32%	+3%	+19	-8%	-12%		42	+87%		48			
median - recession		22	-35%	-36%	17.0	11.9	-32%	+3%	+42	-18%	-19%		46	+97%		60			
median - non-recessi		4	-22%	-22%	21.4	14.6	-28%	+3%	+18	+7%	+7%		30	+70%		11			

* Δ CPI is annualized

* Δ SPX is price-only

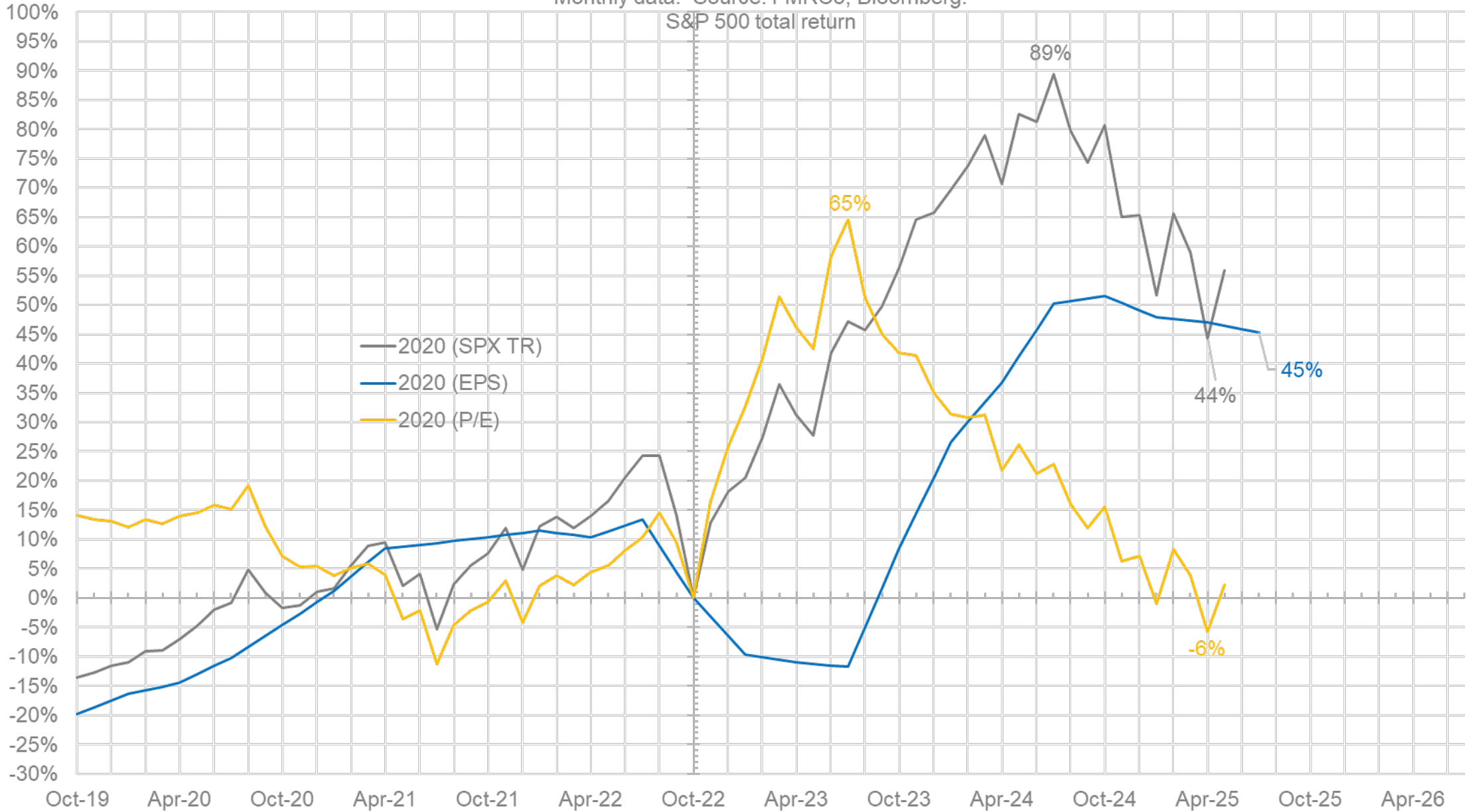
* Δ Fed is nominal rate in bps

% change from
SPTR low

The Market Cycle

Monthly data. Source: FMRCo, Bloomberg.

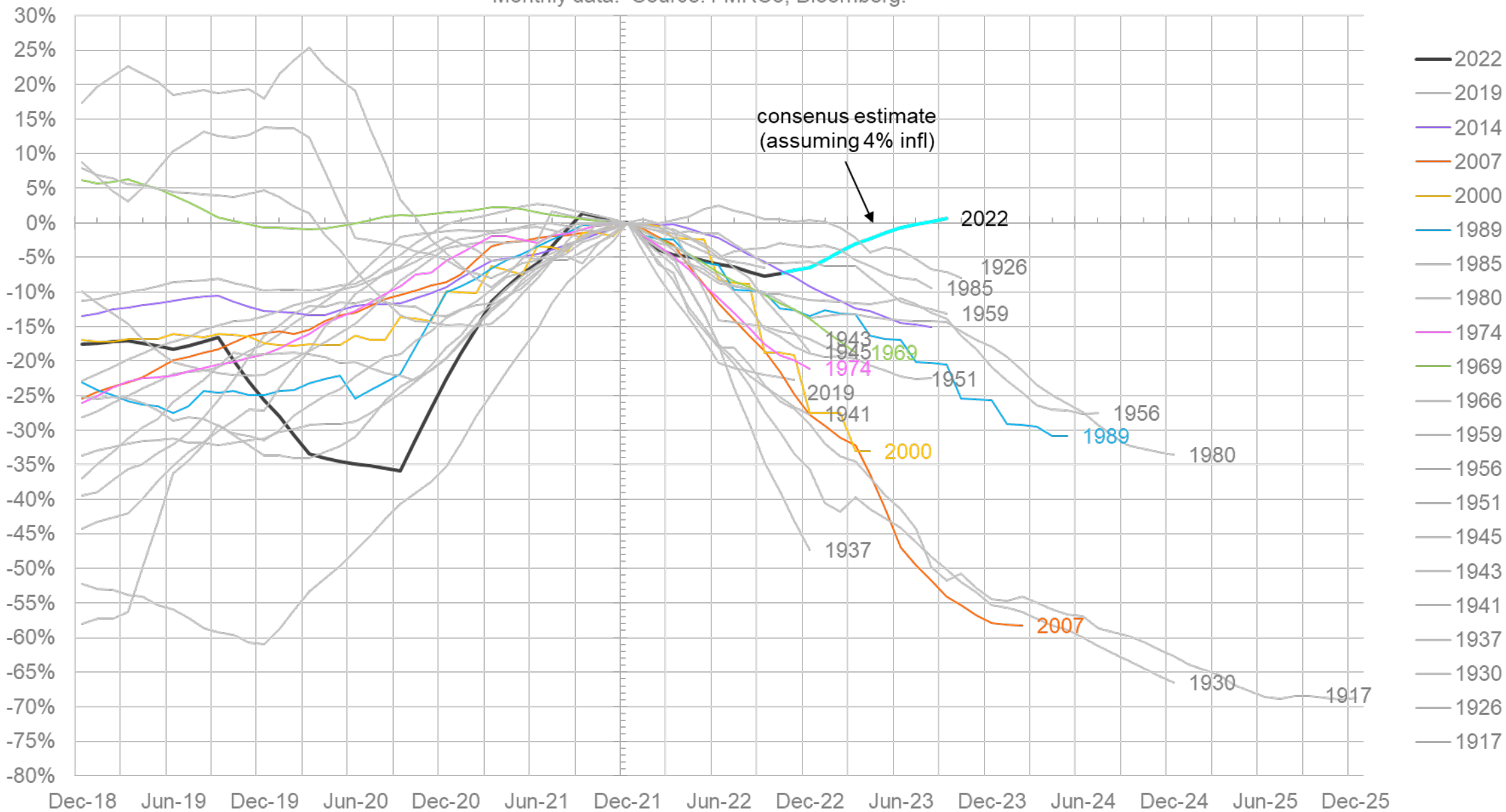
S&P 500 total return



Data as at December 5, 2022.

Earnings Peaks (Real EPS)

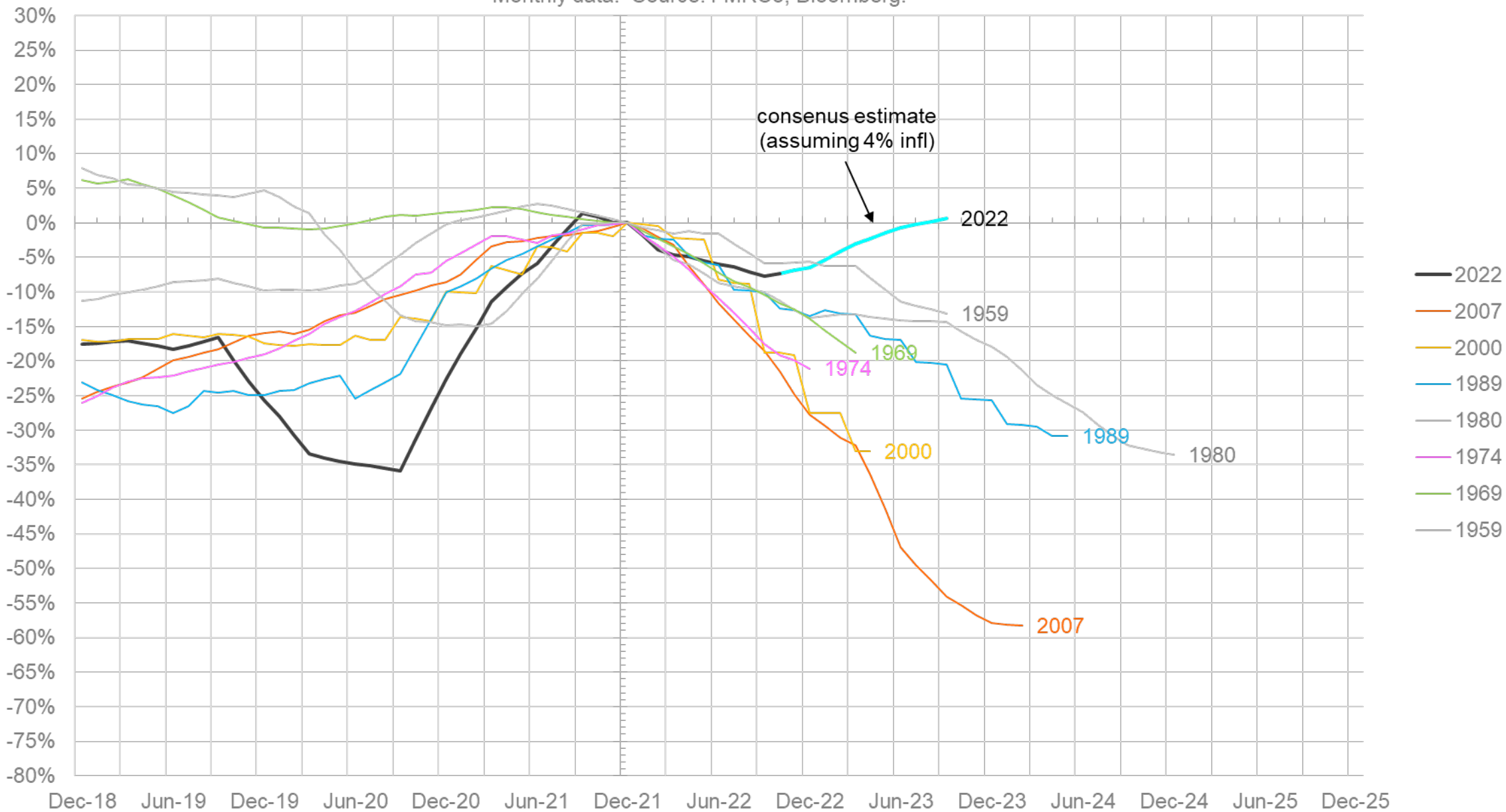
Monthly data. Source: FMRCo, Bloomberg.



Data as at December 5, 2022.

Earnings Peaks (Real EPS)

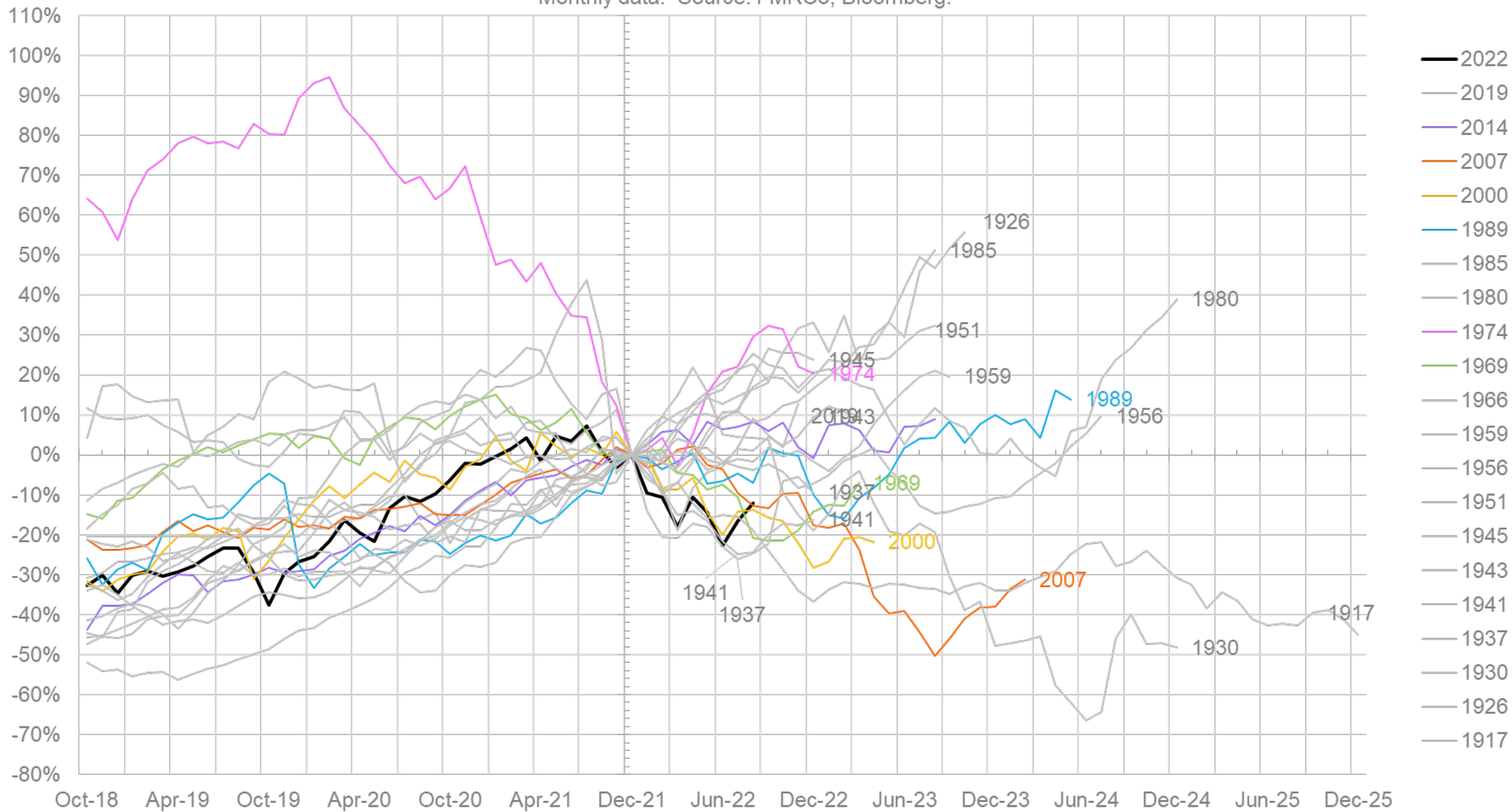
Monthly data. Source: FMRCo, Bloomberg.



Data as at December 5, 2022.

Earnings Peaks (Real Return)

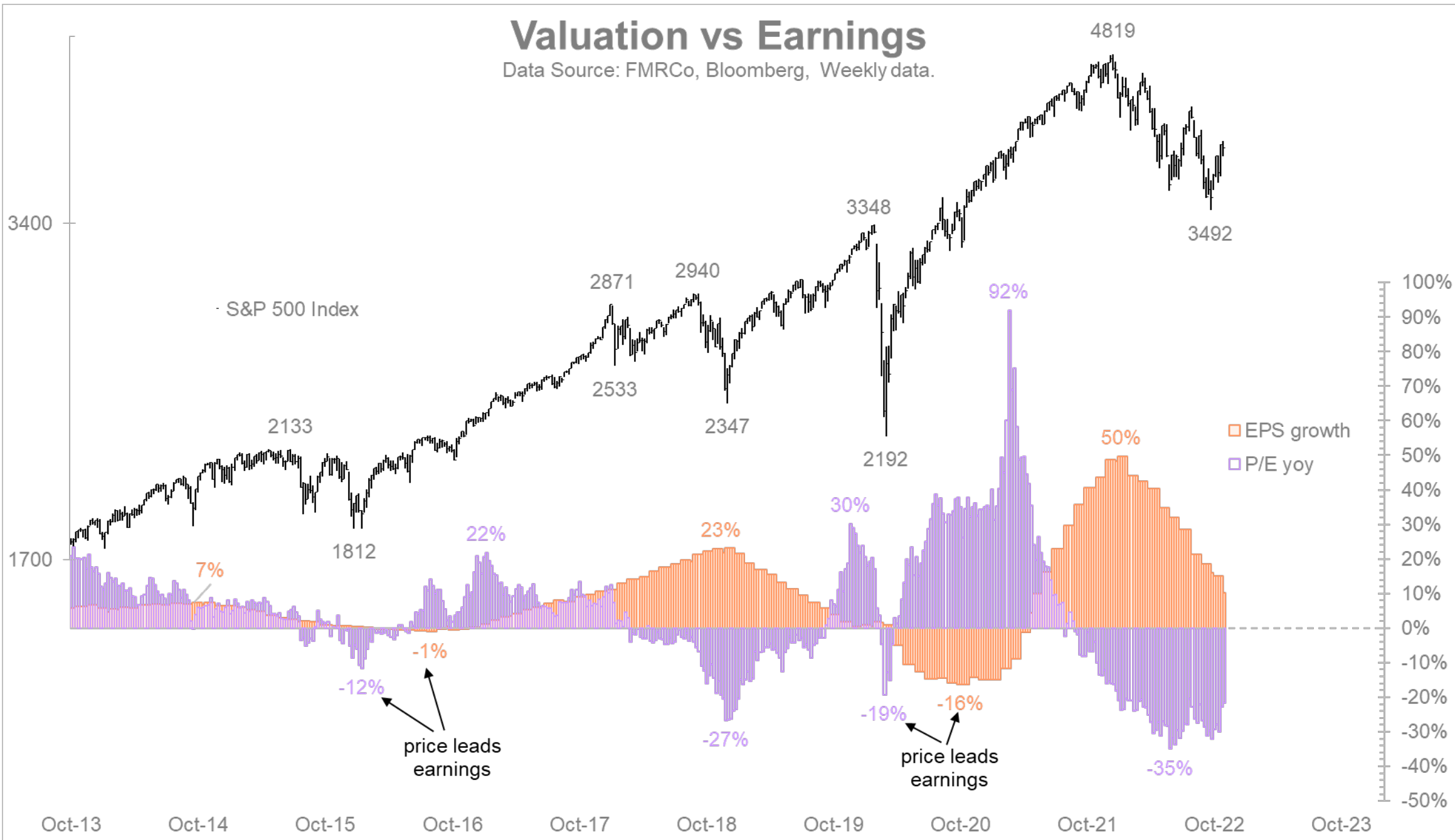
Monthly data. Source: FMRCo, Bloomberg.



Data as at December 5, 2022.

Valuation vs Earnings

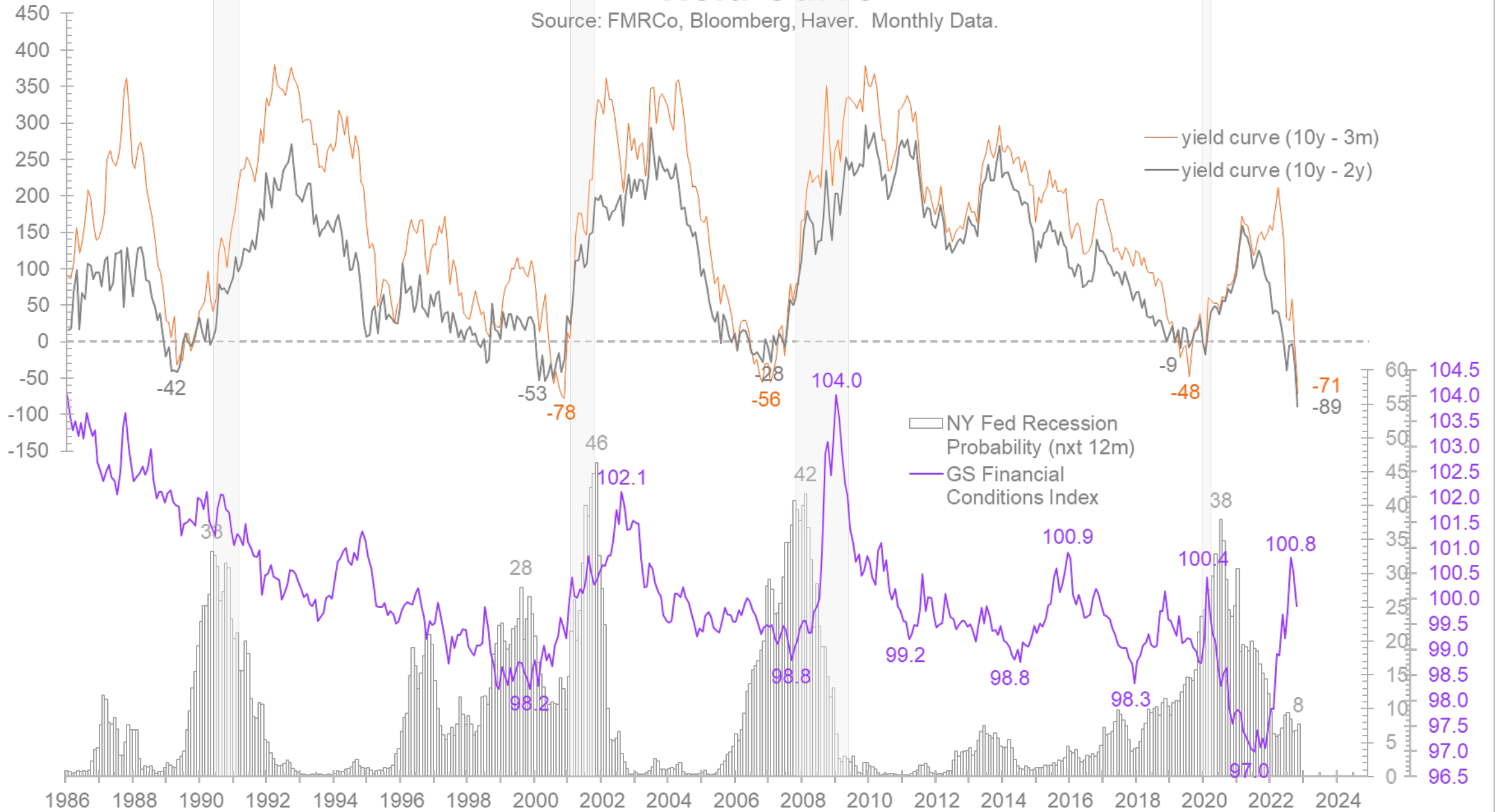
Data Source: FMRCo, Bloomberg, Weekly data.



Data as at December 5, 2022.

Yield Curve

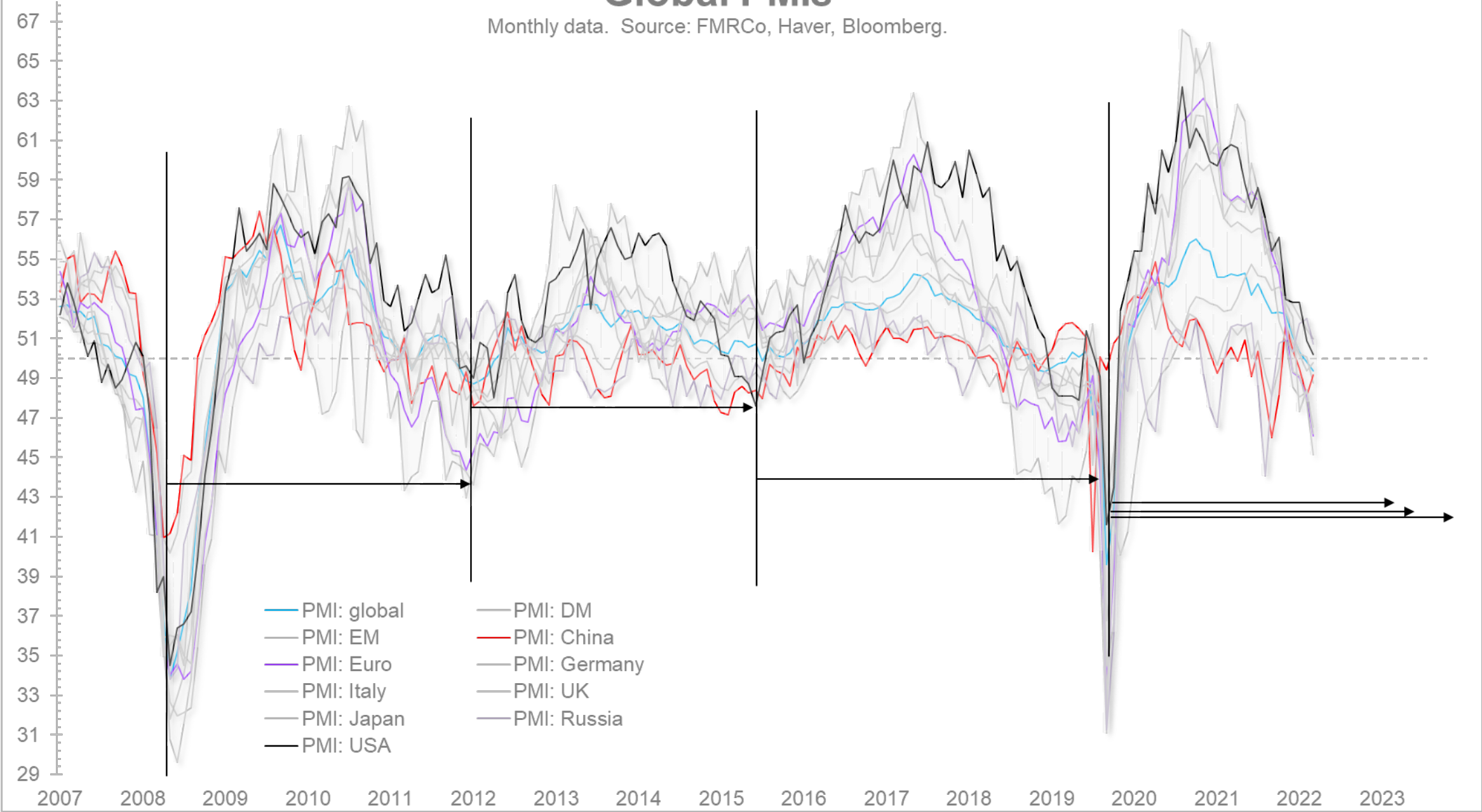
Source: FMRCo, Bloomberg, Haver. Monthly Data.



Data as at December 5, 2022.

Global PMIs

Monthly data. Source: FMRCo, Haver, Bloomberg.

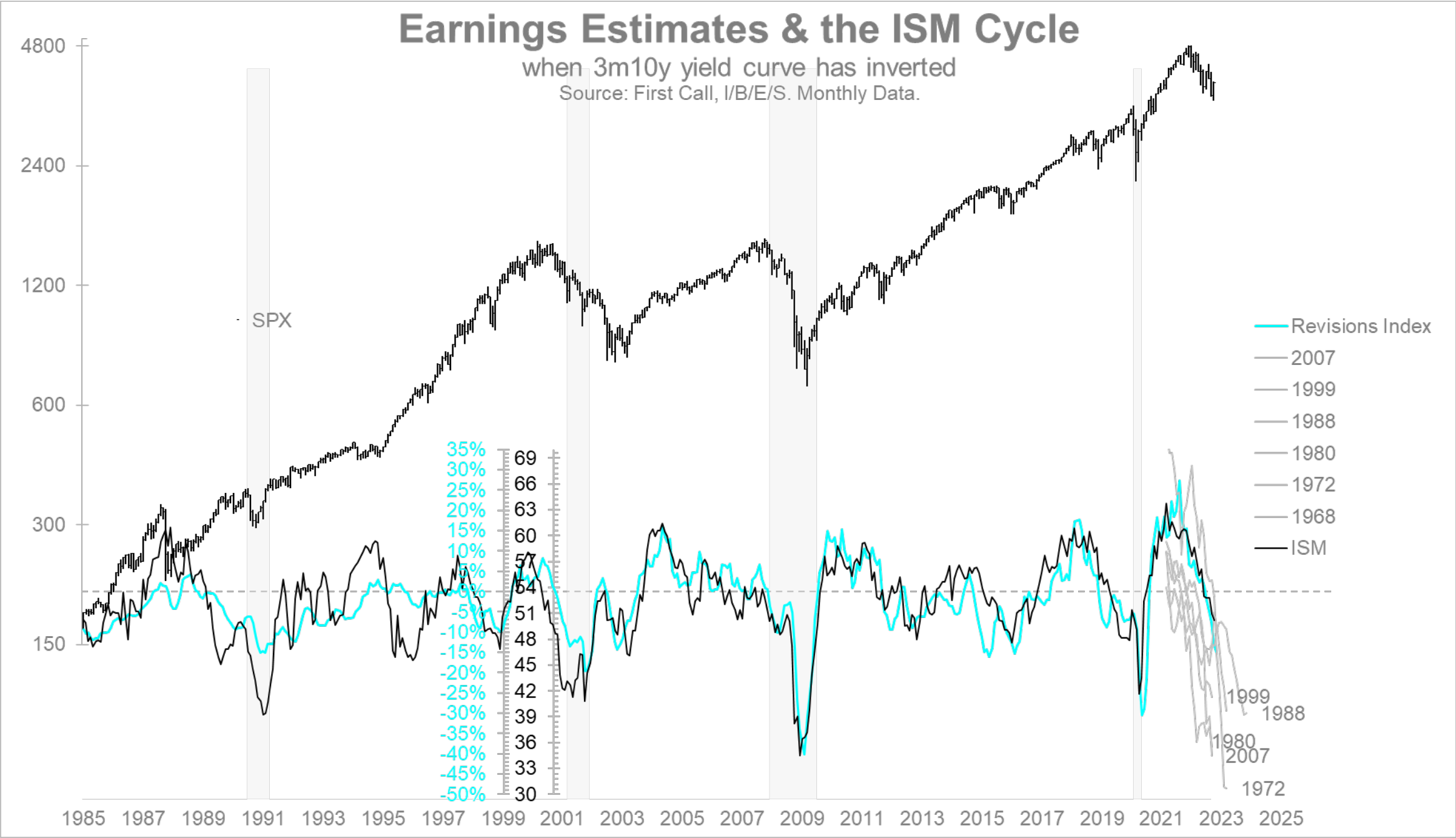


Data as at December 5, 2022.

Earnings Estimates & the ISM Cycle

when 3m10y yield curve has inverted

Source: First Call, I/B/E/S. Monthly Data.



Data as at December 5, 2022.

The Fed & the Market

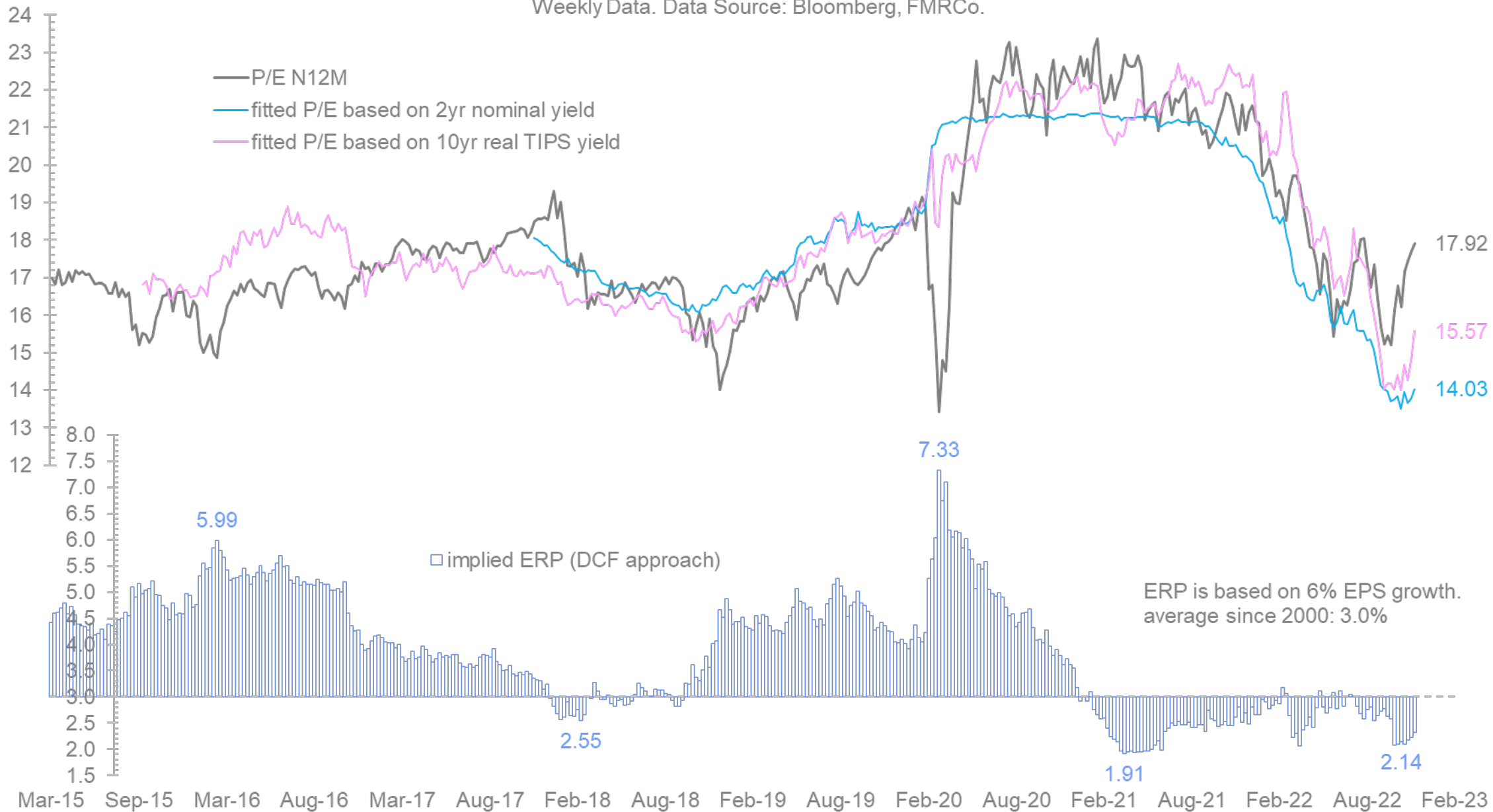
Weekly data. Source: Bloomberg, FMRCo.



Data as at December 5, 2022.

Equity Valuation

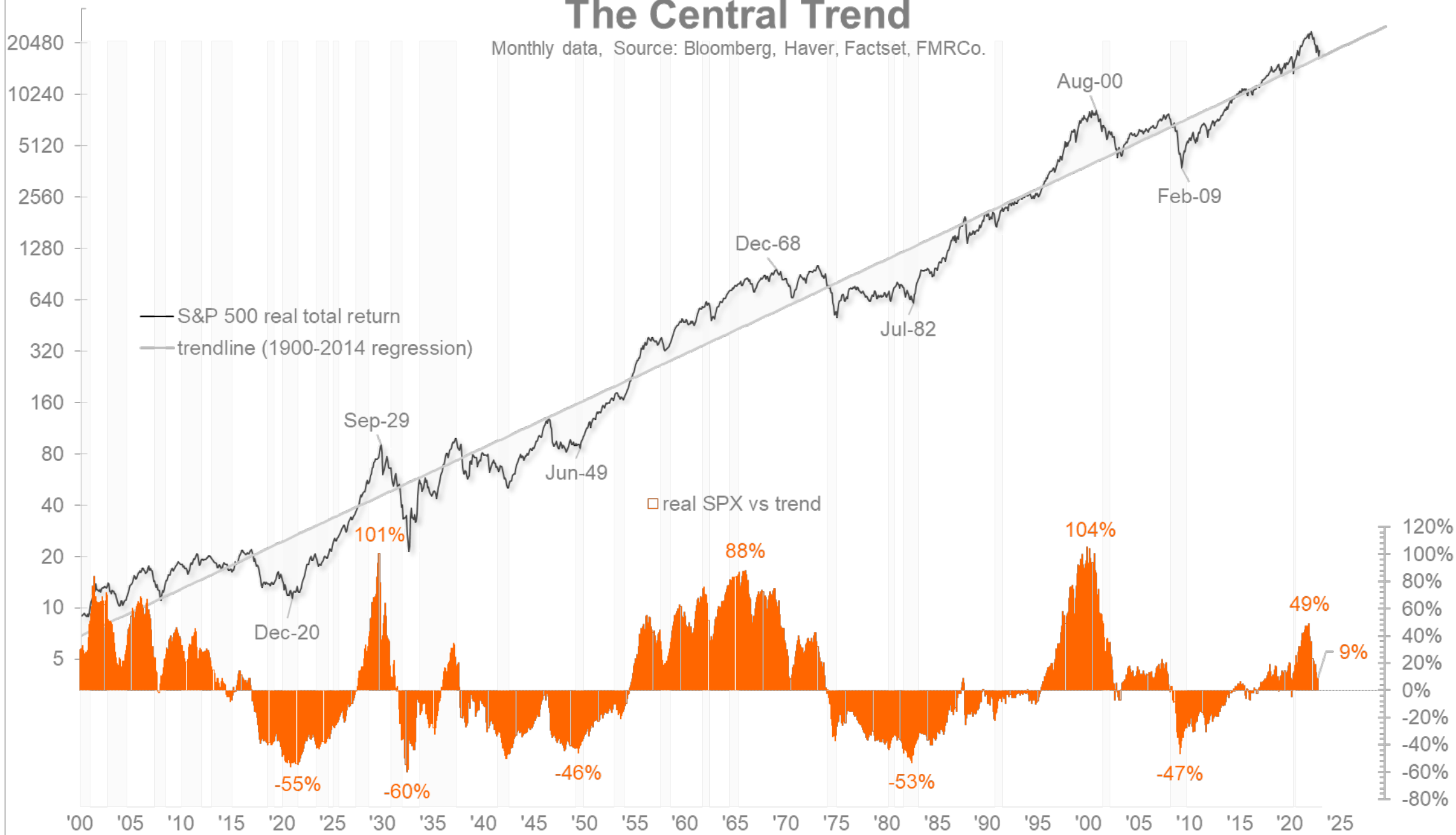
Weekly Data. Data Source: Bloomberg, FMRCo.



Data as at December 5, 2022.

The Central Trend

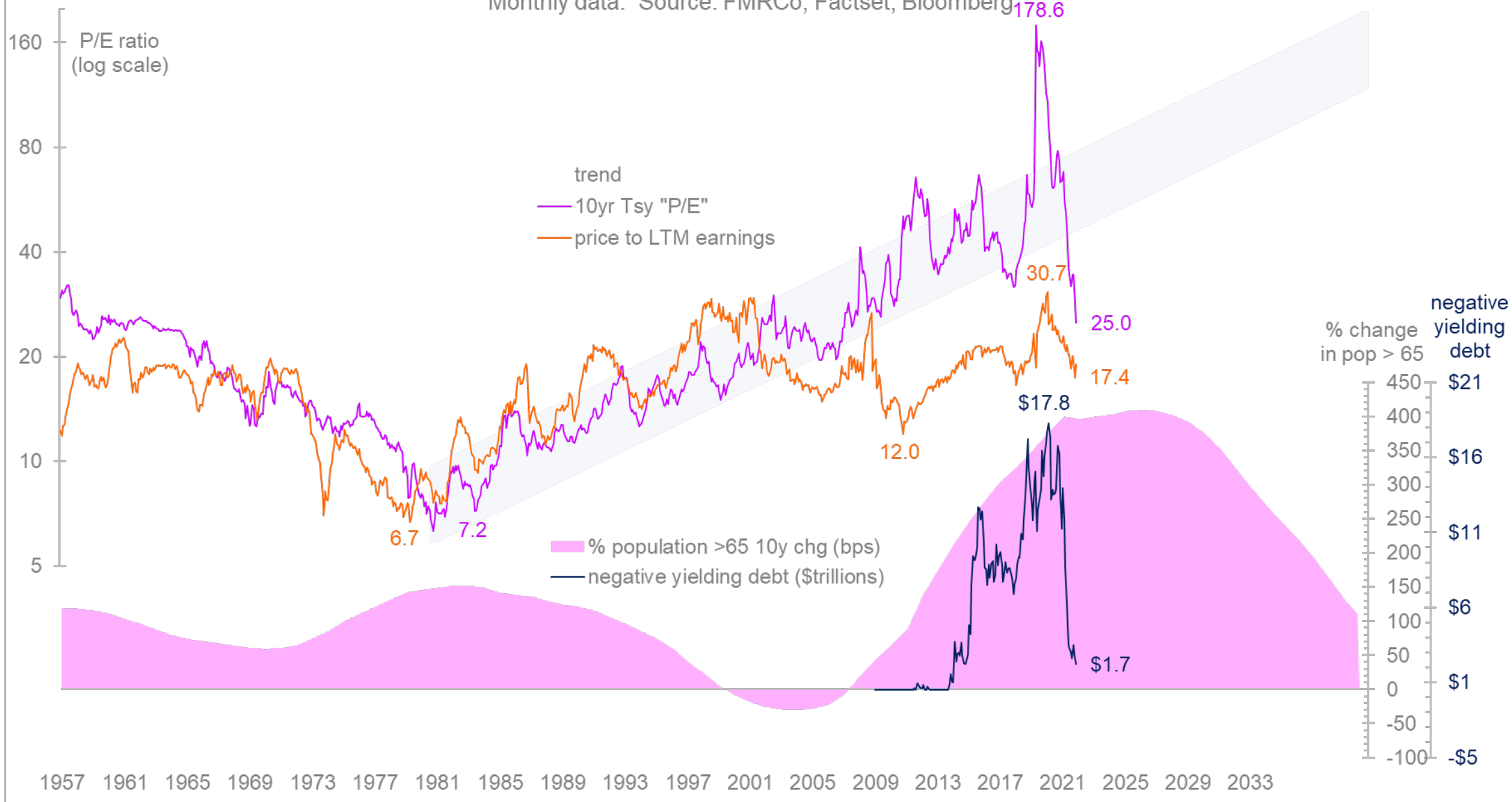
Monthly data, Source: Bloomberg, Haver, Factset, FMRCo.



Data as at December 5, 2022.

Valuation & Demographics

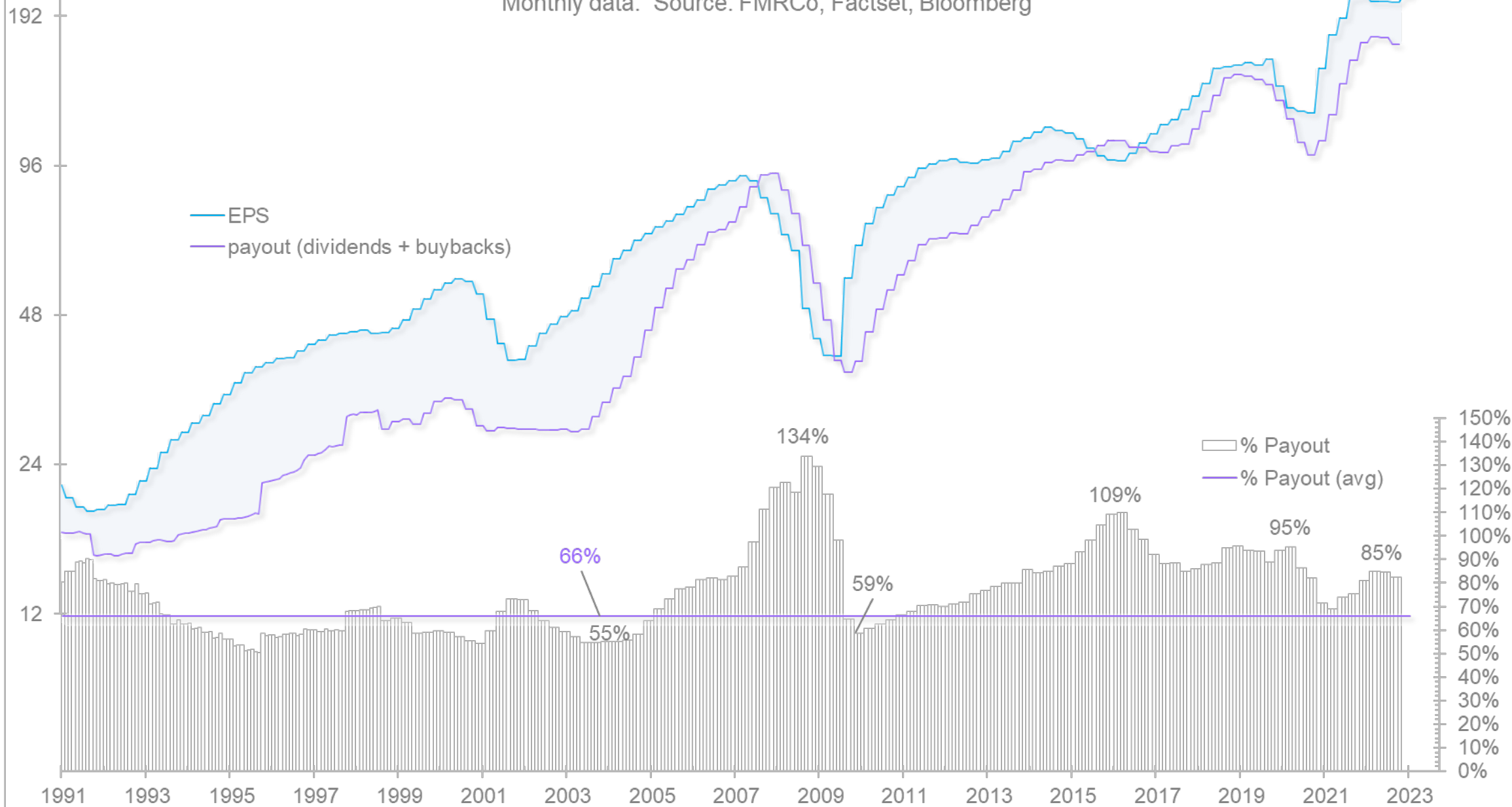
Monthly data. Source: FMRCo, Factset, Bloomberg



Data as at December 5, 2022.

DCF: Payout Ratio

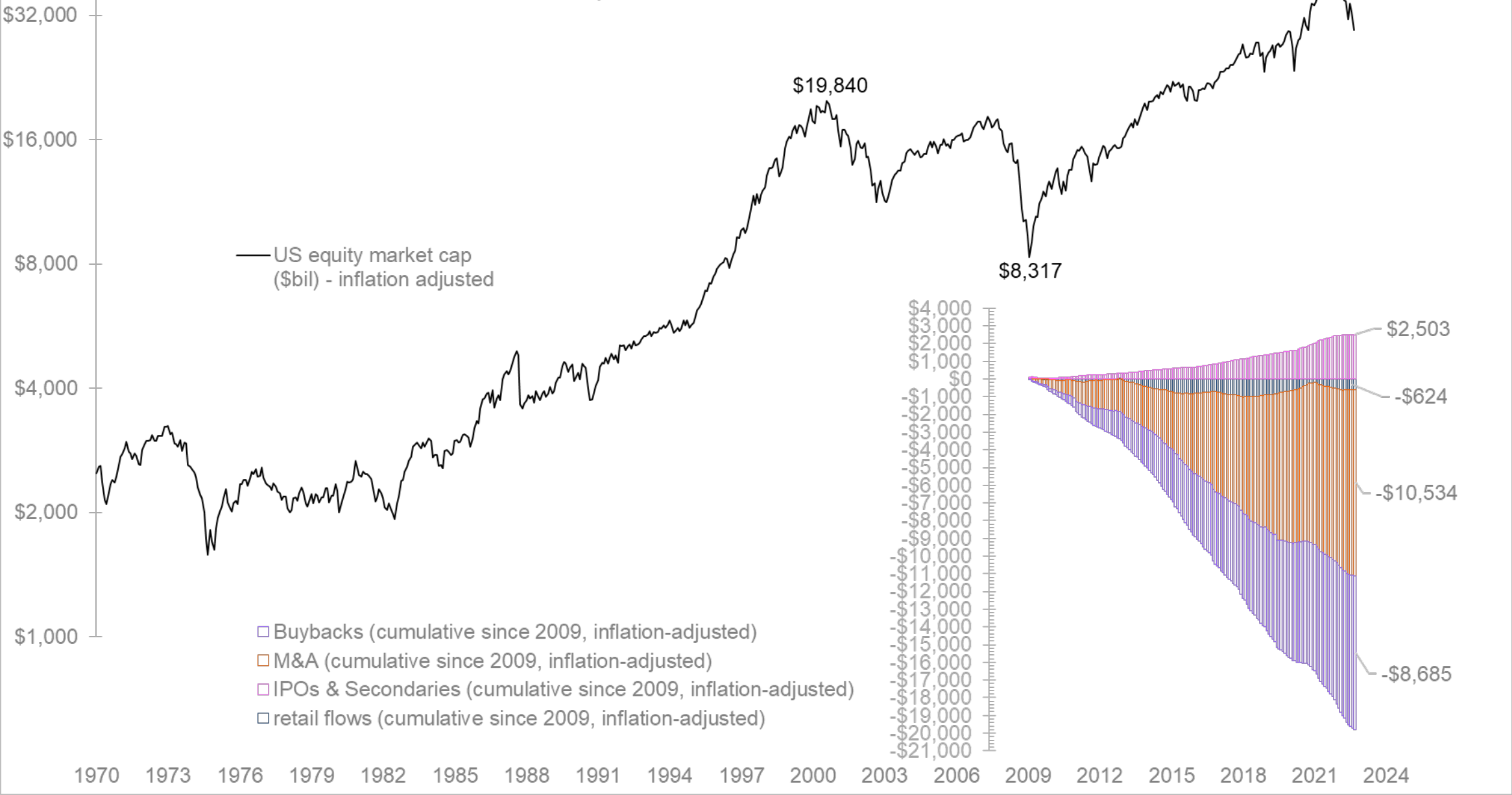
Monthly data. Source: FMRCo, Factset, Bloomberg



Data as at December 5, 2022.

Equity Supply & Demand

Monthly Data. Source: FMRCo, SDC, Facset.



Data as at December 5, 2022.

Top 50 vs Bottom 450

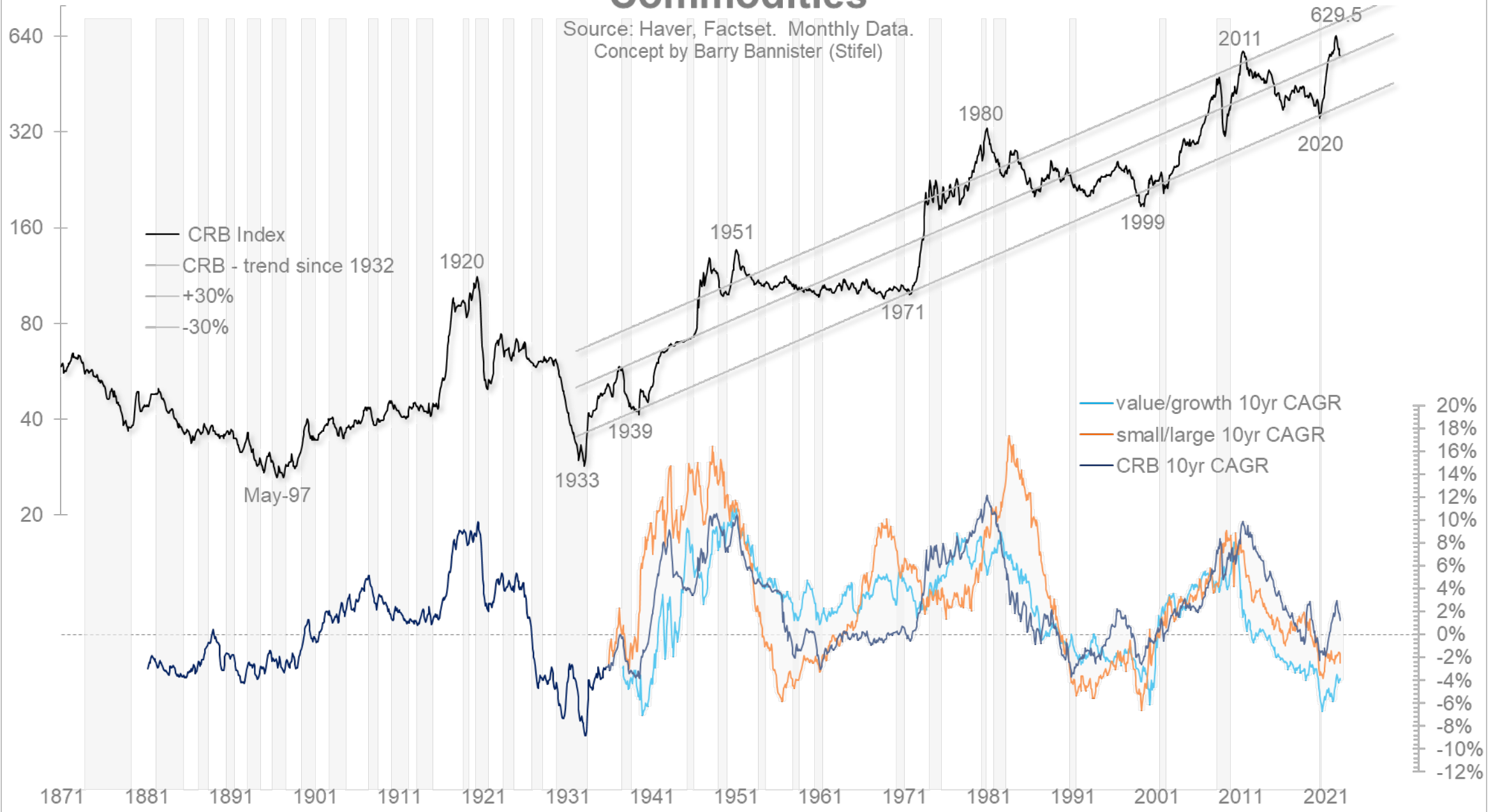
Monthly data. Monthly rebalance. Source: FMRCo.



Data as at December 5, 2022.

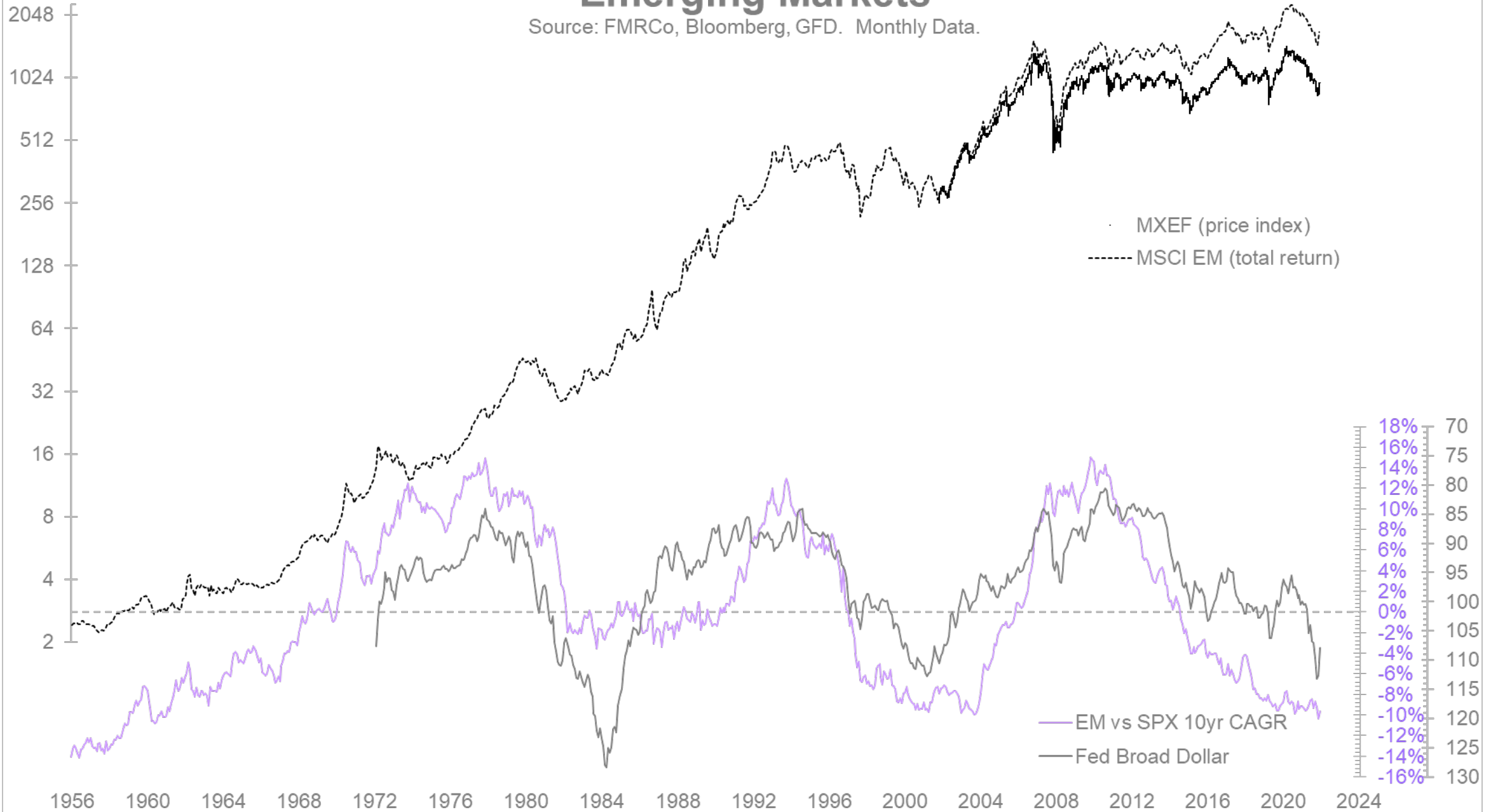
Commodities

Source: Haver, Factset. Monthly Data.
Concept by Barry Bannister (Stifel)



Emerging Markets

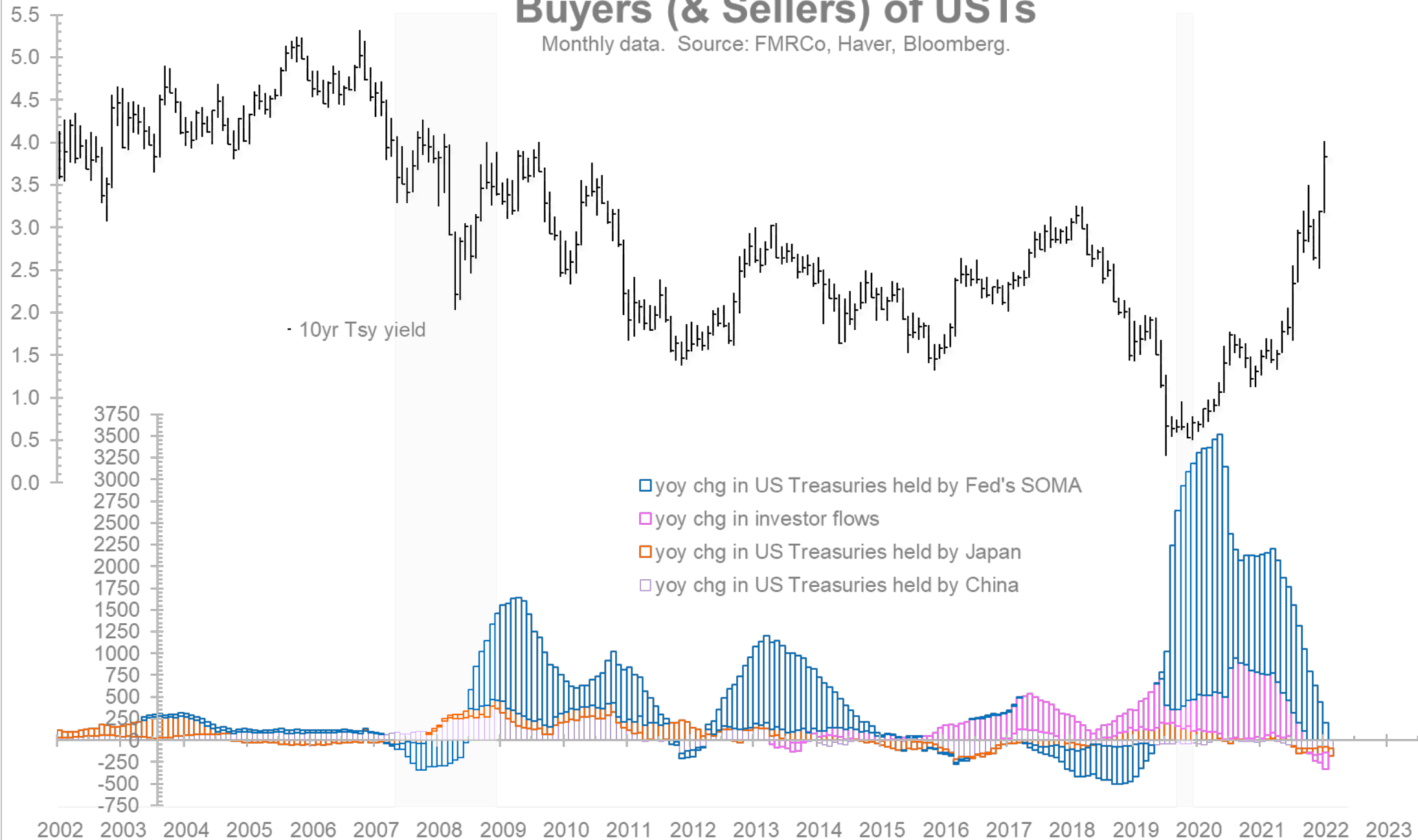
Source: FMRCo, Bloomberg, GFD. Monthly Data.



Data as at December 5, 2022.

Buyers (& Sellers) of USTs

Monthly data. Source: FMRCo, Haver, Bloomberg.



US Bond Market

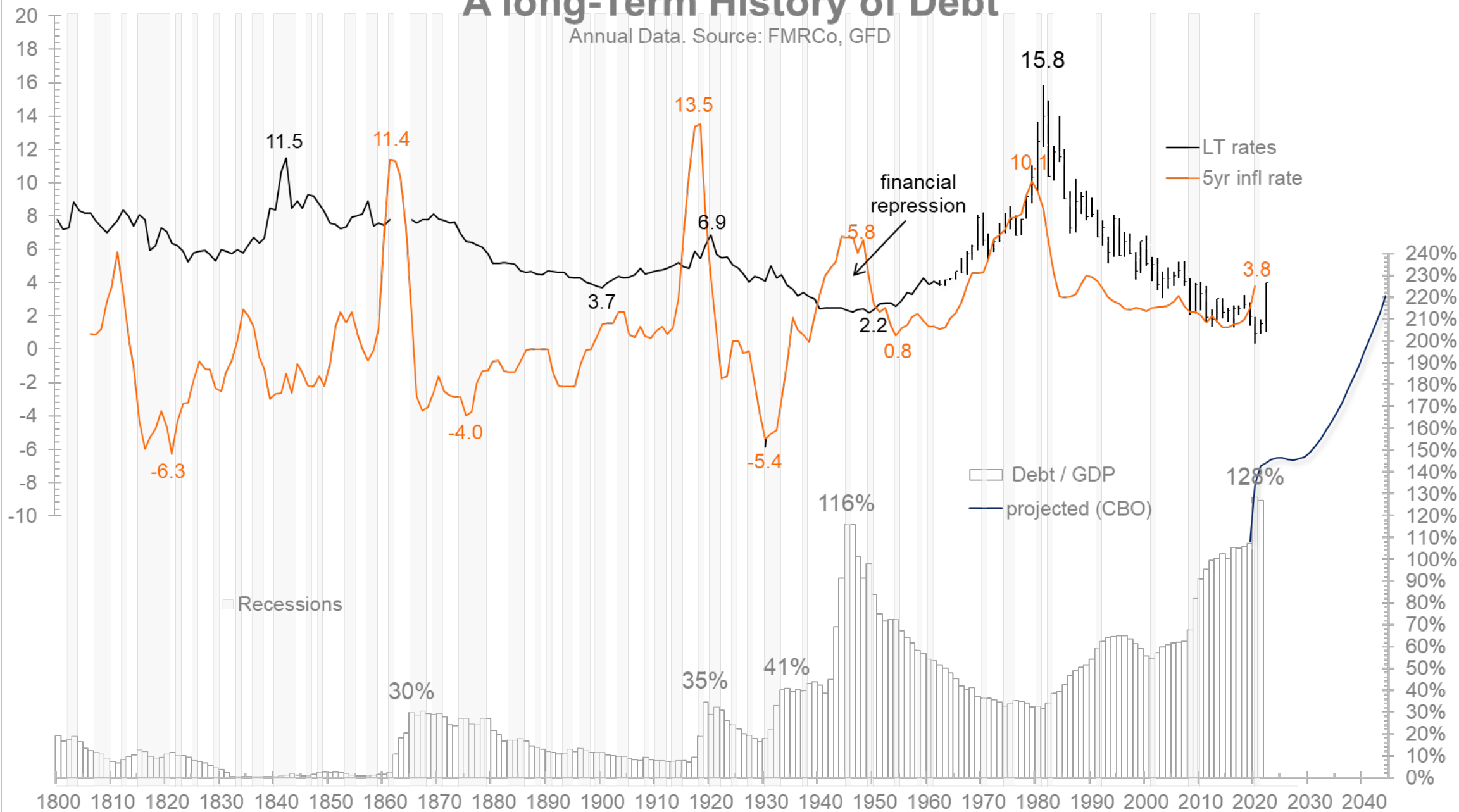
Data Source: FMRCo, Bloomberg. Weekly data.



Data as at December 5, 2022.

A long-Term History of Debt

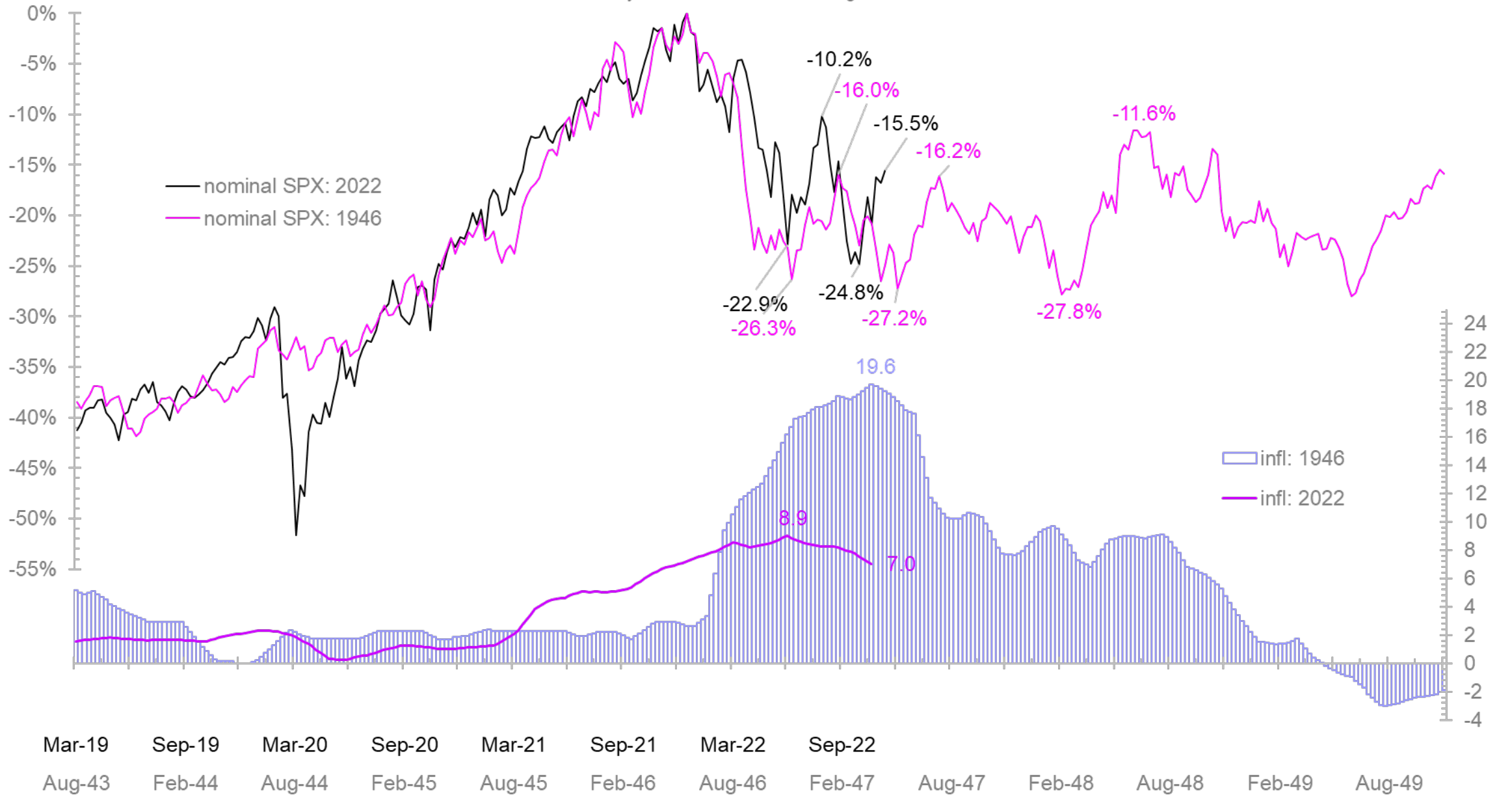
Annual Data. Source: FMRCo, GFD



Data as at December 5, 2022.

1946-1948 Analog

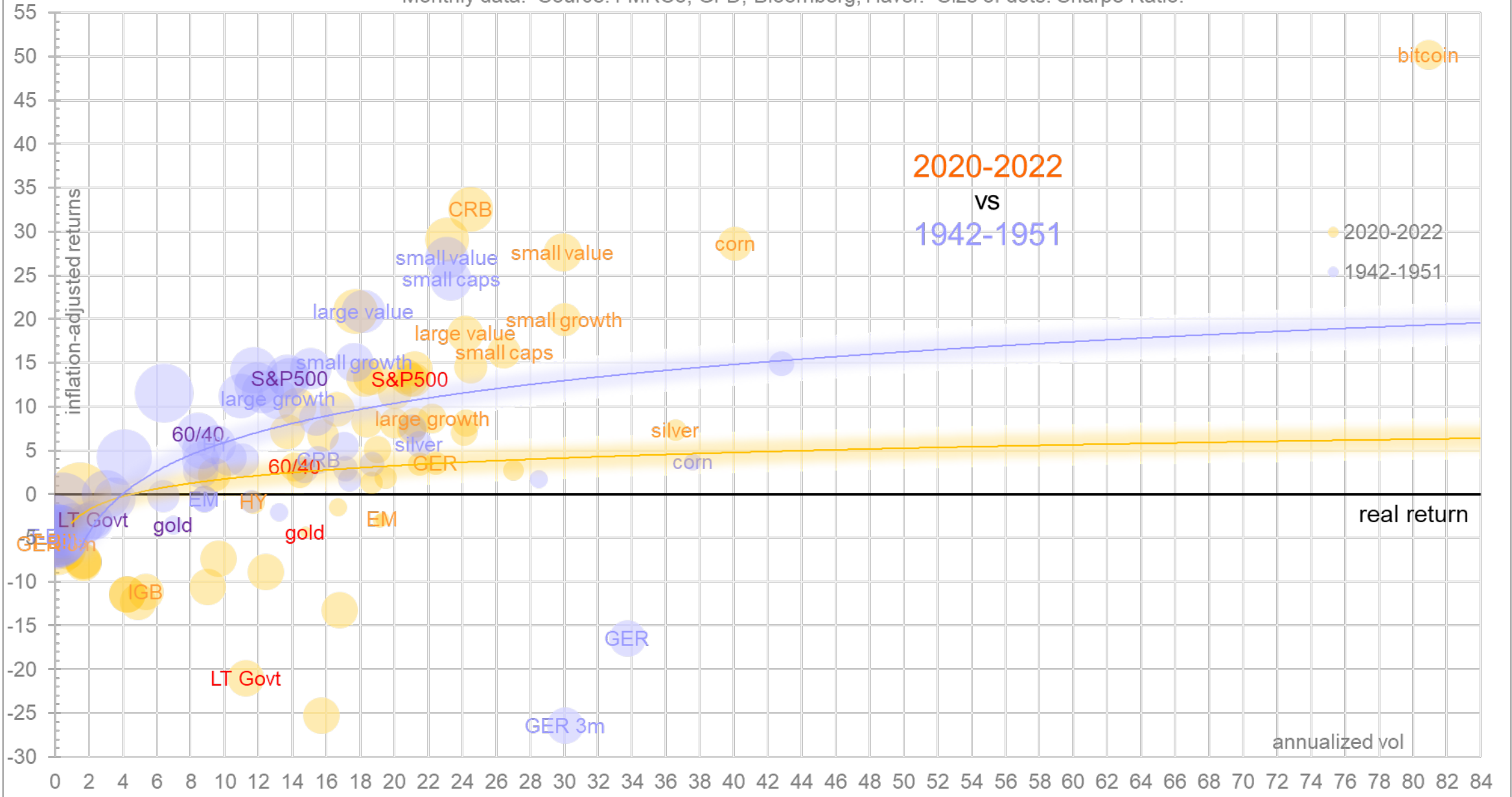
Weekly data. Source: Bloomberg, Factset, FMRCo



Data as at December 5, 2022.

Risk & Return

Monthly data. Source: FMRCo, GFD, Bloomberg, Haver. Size of dots: Sharpe Ratio.



Data as at December 5, 2022.



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Sources for correlation slide: All data downloaded from Haver Analytics. All country and regional equity indices: MSCI. All bond indices: Barclays Capital. Gold: Handy & Harman. All GSCI: Goldman Sachs Commodity Index. Currencies: Morgan Stanley. Hedge Fund Data: HFRX.

Data source for periodic table: SG: Russell 2000 growth, REIT: MSCI REIT index, SC: Russell 2000, SPX: S&P 500, SV: Russell 2000 value, LG: Russell 1000 growth, EUR: MSCI Europe, EAF: MSCI EAFE, EM: MSCI EM, LV: Russell 1000 value, HY: Bloomberg Barclays high yield, JPN: MSCI Japan, EMD: JP Morgan EMBI, TIPS: Bloomberg Barclays TIPS, LT: Bloomberg Barclays long duration, gold: Bloomberg spot gold, IGB: Bloomberg Barclays investment grade bonds, HFs: HFRX hedge fund index, com: Bloomberg commodities index, cash: 3mo T-Bill yield.

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