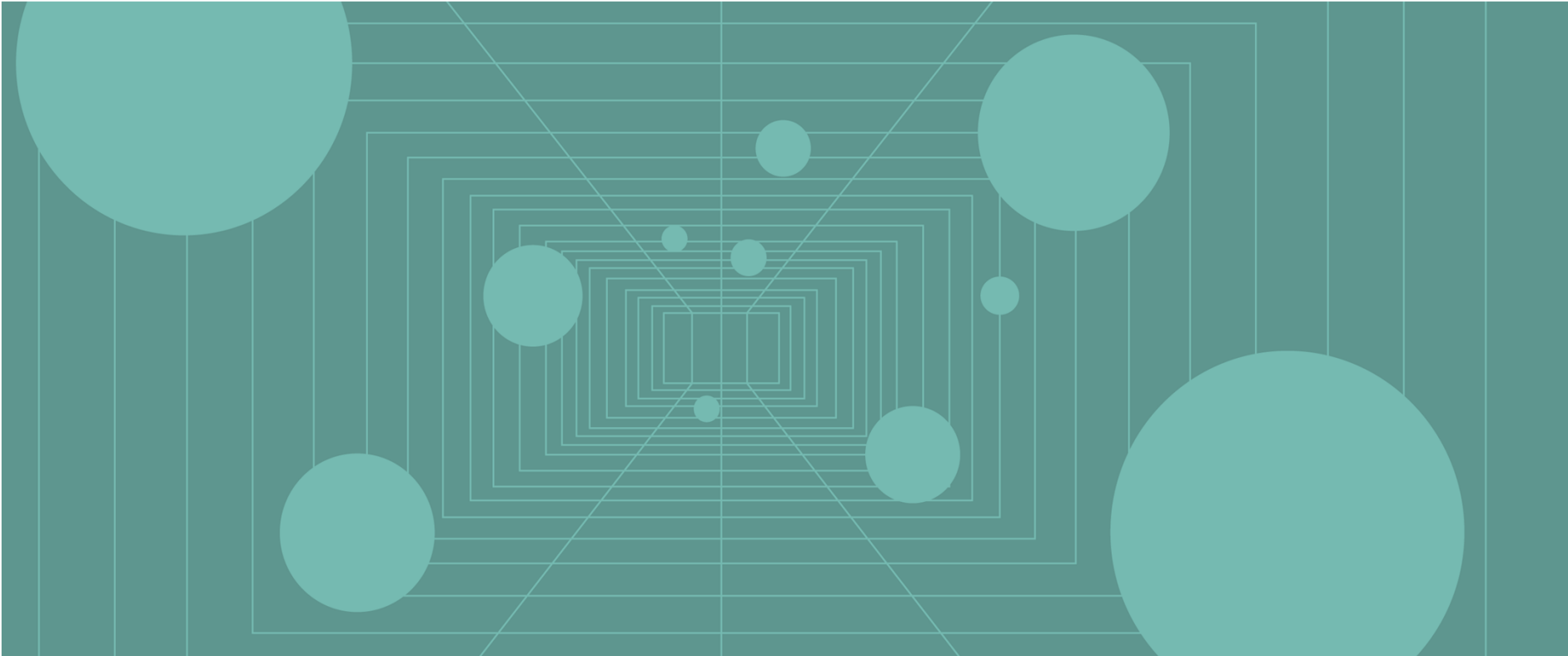


DECADES OF DATA: UNITED STATES

1900–2019



Executive Summary

- **Basing investment decisions on the extrapolation of capital markets returns from recent, relatively short periods is a common mistake.** Viable conclusions about long-term expected returns cannot be drawn from return data for periods shorter than several decades, and even then, investors should be mindful that long-term statistics are beginning- and end-point sensitive and that returns are more variable than commonly assumed. Still, consideration of shorter time periods within a longer-term context can provide a powerful framework for evaluating current market conditions.
- **US equities (31.5%) surged in 2019 to new all-time highs, in contrast to negative performance in 2018.** US stocks gained the most since calendar year 2013, and 2019's return ranks eighth highest in the past 50 years. Such strong performance for US stocks is not necessarily uncommon. In fact, US shares gained more than 30% in 23 of 120 calendar years since 1900, or 19% of the time. Investors might reasonably expect a market pullback in the subsequent year following such strong returns; however, the data show that strong performance can continue. In fact, in the initial calendar year following 30%+ market gains, the S&P 500 Index posted double-digit positive returns in 12 out of 22 years, while only declining in seven of those years, for an overall subsequent calendar year average of about 11%.
- **The post-global financial crisis (GFC) period has seen stronger returns than over the very long term in the United States.** For the full period analyzed, investors in US equities (1900–2019) earned a 9.7% nominal average annual compound return (AACR), which is up 20 basis points (bps) from 2018's full-period AACR. Over the past ten years, however, US equities have posted a nominal AACR of 13.6%. Monthly rolling ten-year AACRs reached their highest point this cycle in February 2019 at 16.7%, which was the strongest ten-year return period since the ten years ending January 2001. The February peak coincided with the ten-year lookback period when the largest declines during the GFC fell out of the data, with the data set beginning in March 2009 when the S&P 500 hit its bottom. This highlights the impact of beginning- and end-point sensitivity, and reminds investors that even over periods as long as ten years, returns can be skewed by short-term market fluctuations.

Executive Summary (continued)

- **Equities are most likely to outpace inflation over long-term periods, generating positive inflation-adjusted returns at the lower end of the returns range.** Over rolling 50-year periods, real AACRs for US stocks ranged from a low of 4.2% to a high of 9.5%, whereas the range for benchmark government bonds (-0.9% to 3.4%) and cash (-0.7% to 1.8%) indicated greater potential for diminished purchasing power over certain periods. However, equities never lost out to inflation over the very long term. Inflation in the United States has averaged 3.0% annually, among the lowest rates relative to other developed economies. Benchmark US government bonds and cash produced full-period AACRs of 4.6% and 3.8%, respectively, since 1900, which is a significantly narrower spread vis-à-vis inflation relative to stocks versus inflation. Interestingly, US government bonds had a lower minimum real return over the very long term relative to cash, likely a result of greater duration risk inherent in bonds versus cash.
- **Over the long term, US equity investors are compensated for the additional risk of holding stocks.** Since 1900, US equity returns exceeded bond returns during 77% of all five-year periods, 86% of all ten-year periods, and 100% of all 25-year periods (calculated on a nominal basis using rolling monthly data). While equities tend to outperform in the long term, since 1900 there have been sustained periods of underperformance over rolling five-year periods, as volatile equities are prone to larger drawdowns than bonds. Such periods are a reminder of the ballast fixed income allocations provide to portfolios in terms of diversification.
- **Earnings growth and dividend reinvestment, respectively, are the primary contributors to equity total return over time, while valuation mean reversion diminishes the impact of multiple expansion/contraction.** Earnings growth provided the highest degree of return contribution, on average, but can be highly volatile (especially during periods of economic decline) relative to the steady stream of reliable income provided by dividends. In the decade closed at the end of 2019, contributions from earnings growth dwarfed that of dividend reinvestment and multiple expansion/contraction; earnings growth in the most recent decade was the strongest since our data begin in 1900 and the highest contribution percentage on record when all three factors were positive. Dividend reinvestment's contribution has receded in recent decades as US corporations have prioritized share buybacks. In the past three decades, dividend reinvestment averaged 2.3% versus 5.0% in the nine-decade period from 1900 to 1989. Over the full historical period, dividend reinvestment averaged 4.3%.

Executive Summary (continued)

- **Starting valuations are a useful indicator for long-term (ten+ years) subsequent equity returns, but the relationship is weaker over shorter time horizons.** Normalized valuations and subsequent returns have a stronger relationship over long time periods (e.g., ten-year subsequent returns), but starting valuations alone do not completely explain subsequent returns—many factors can influence equity performance. Since 1979, our cyclically adjusted price-to-cash earnings (CAPCE) ratio for the United States has explained 78% of the variation in subsequent ten-year real returns, a moderately strong yet imperfect guide to future returns. At December 31, 2019, US equity valuations ended in the top decile of historical observations, and from these valuation levels the median subsequent ten-year real return for US equities has been about -3%.
- **High- or low-valuation environments alone are not a catalyst for market reversals and may persist for several years; waiting for valuations to revert to mean can be an exercise in frustration.** Low valuations provide what famed investment analyst Benjamin Graham called “a margin of safety.” High valuations, on the other hand, typically price in lofty projections for the future, providing little room for error. Despite uncertainty regarding the timing of market reversals, the historical record for US equities is clear—periods of low valuations are followed by higher long-term subsequent returns, while periods of high valuations are followed by poorer long-term returns.
- **Equity dividend yields are not as useful as normalized valuations when it comes to predicting subsequent performance, but starting dividend yields are consistent with the expected relative direction of future returns.** In the United States, higher starting dividend yields (i.e., lower equity prices relative to dividends) have typically been associated with higher subsequent ten-year returns relative to long-term averages. Dividend yields are currently in the 14th percentile of the historical distribution, where subsequent real ten-year returns historically have been about 5%. Dividend yields fail to capture the whole picture, however, as US company stock buybacks are an increasingly popular source of shareholder return.

Executive Summary (continued)

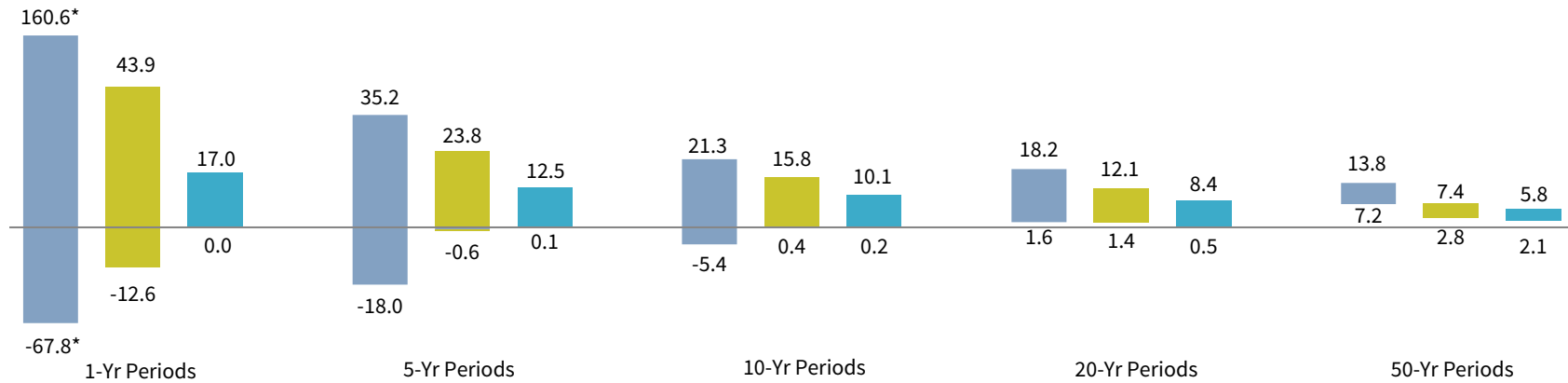
- **Subsequent nominal ten-year US bond returns closely track the starting yield**, and with bond yields at or near historical lows in the United States, the outlook for future returns is decidedly low. In August 2019, US ten-year government bond yields fell to their third-lowest levels on record, and ended the year at 1.9%. The only comparable historical period for which we have subsequent return data is the mid-1940's, when bond yields bottomed out at just under 1.6%. Over the subsequent ten-year period, US bonds returned a paltry 1.0% annually in nominal terms, while inflation of about 4% annualized over the same period meant losses in real terms. Falling yields have been a boon for US bond investors for the past 30+ years, with US Treasuries returning 8.1% since 1981. In today's low-yield environment, future returns are likely to be capped. The US historical record, and Japan's more recent experience, may serve as a guide.
- **Although rising interest rates are commonly viewed as detrimental to equity prices, this is not necessarily the case**—the drivers of change in interest rates, rather than their outright levels or the amount of changes in the rates, are what impact equity returns. Stocks can rise amid rising bond yields if such yields reflect improving growth conditions or increasing consumer confidence. In fact, a weak, albeit positive, statistical relationship exists between short-term interest rates and subsequent ten-year returns in the United States, counter to what one would expect. The relationship deteriorates, however, when the high inflationary and bond yield environment of the late 1970s/early 1980s is excluded, as equities gained strongly in the subsequent ten-year period on moderating inflation and falling interest rates. There are no clear performance trends during historical US Federal Reserve rate hike cycles, further evidence that many other factors influence risk asset performance. Still, the experience during the latest US policy rate regime certainly stands out; US equities delivered double-digit ten-year AACRs in real terms following the Fed's GFC rate cuts to 0.25%.
- **In 2019, the current US economic expansion, which began from the business cycle trough in June 2009, became the longest on record.** Despite its unprecedented duration, this economic expansion has been characterized by slower growth relative to prior cycles. The current upswing is the fourth strongest in cumulative growth terms out of the nine expansions since 1950. By another measure, this expansion has been the least vigorous; the ratio of cumulative growth to the length of the expansion ranks the lowest among cycles since 1950. Expansions do not die of old age; however, the US yield curve (based on a ten-year/three-month yield spread), which has been a consistent recession harbinger over the past 50 years, inverted during the year.

The range of investment returns narrows as holding periods increase

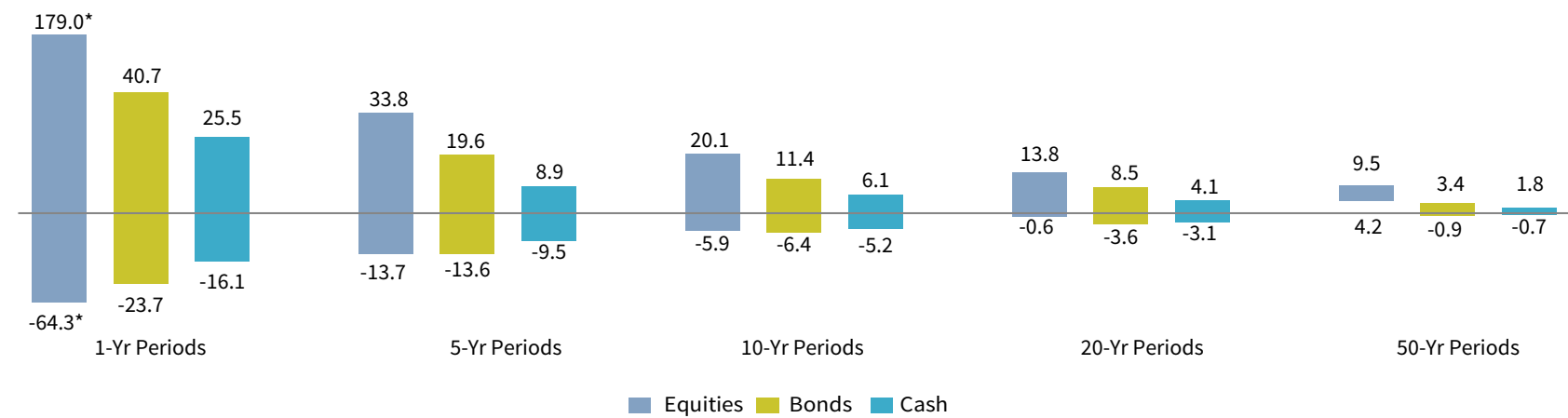
RANGE OF EQUITY, BOND, AND CASH RETURNS FOR VARIOUS ROLLING MONTHLY TIME HORIZONS

1900–2019 • Average Annual Compound Return (%)

Nominal Returns



Real Returns



* Axis capped for scaling purposes.

Sources: Global Financial Data, Inc., Standard & Poor's, and Thomson Reuters Datastream.

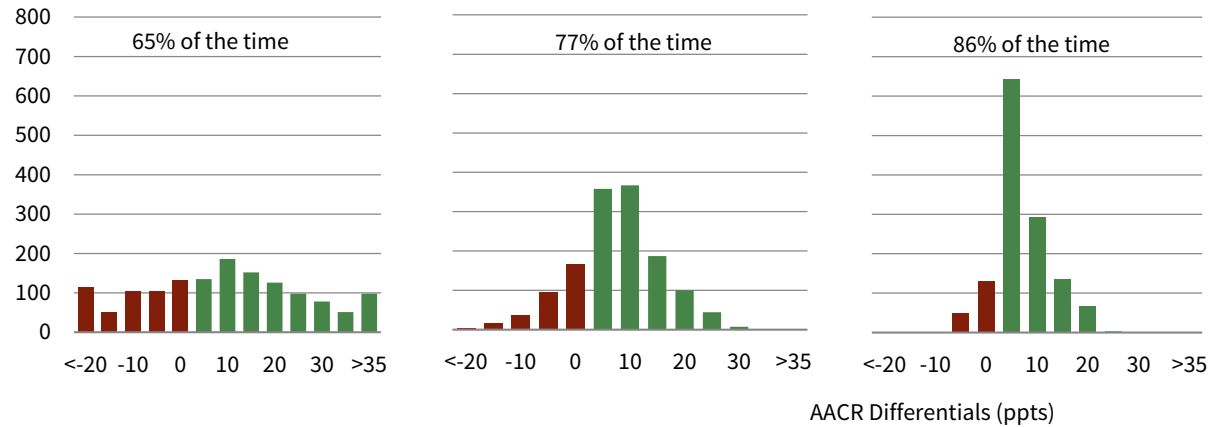
Equities outperform bonds and cash over the long term, but can underperform in the short run

EXCESS RETURNS OF EQUITIES OVER BONDS AND CASH

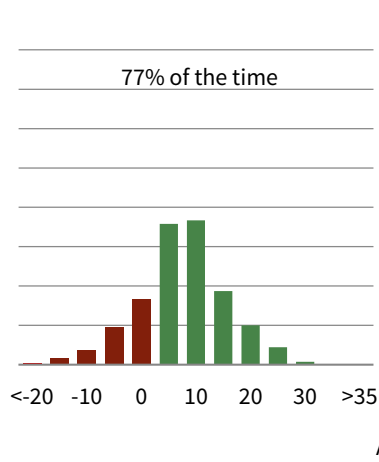
1900–2019 • Number of Rolling Monthly Periods

1-Yr Periods

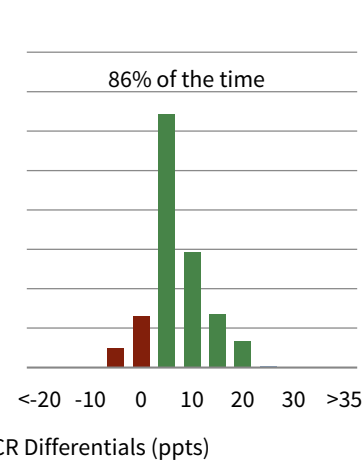
Equities have outperformed bonds



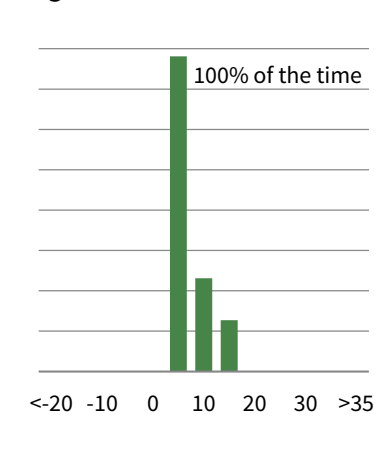
5-Yr Periods



10-Yr Periods

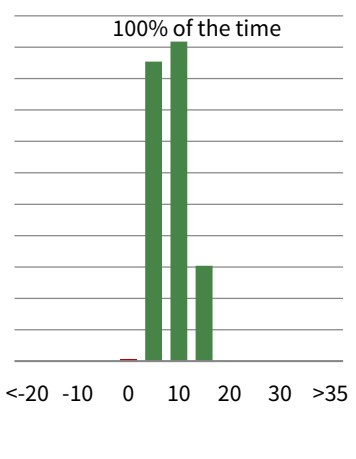
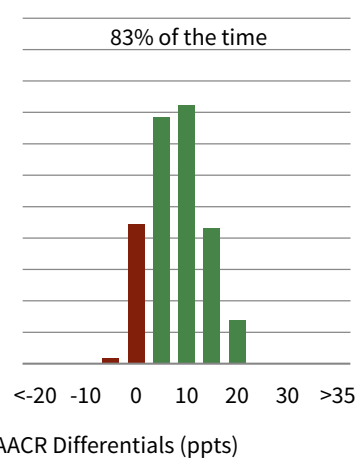
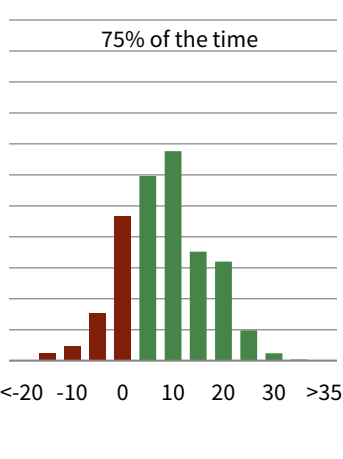
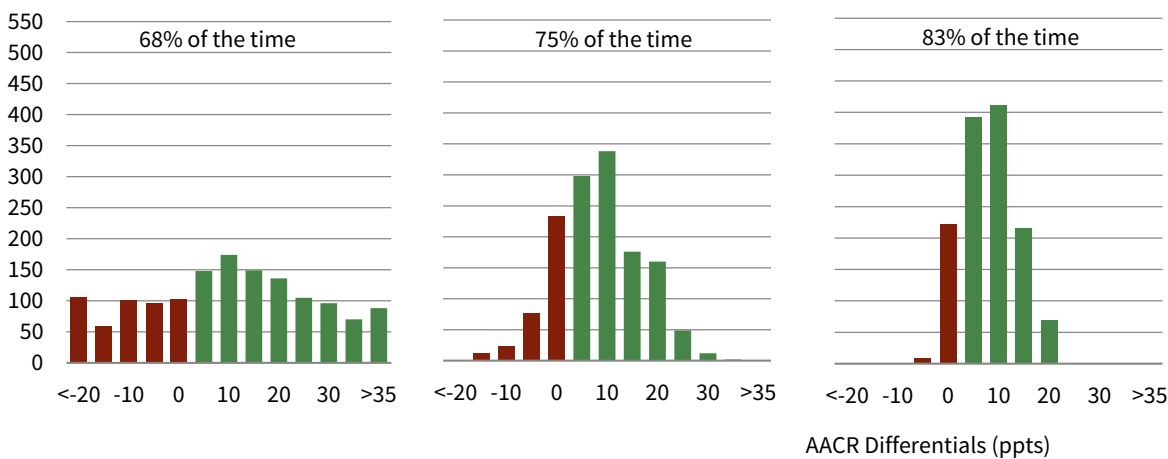


25-Yr Periods



AACR Differentials (ppts)

Equities have outperformed cash



AACR Differentials (ppts)

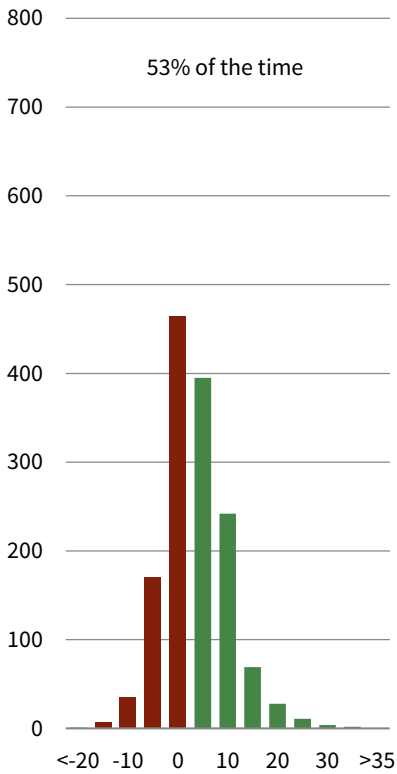
Bonds' outperformance over cash is inconsistent in the short and long term alike

EXCESS RETURNS OF BONDS OVER CASH

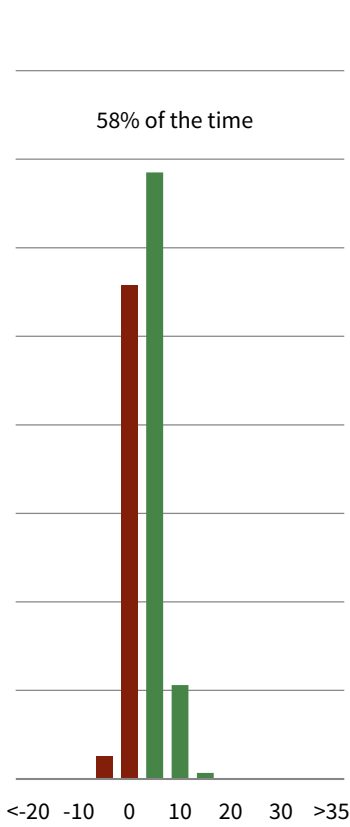
1900–2019 • Number of Rolling Monthly Periods

1-Yr Periods

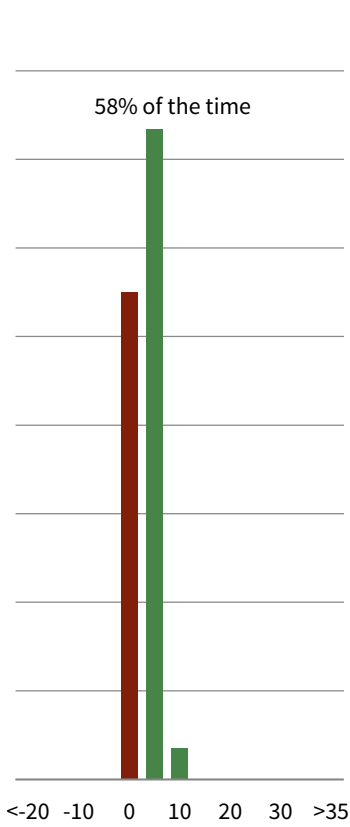
Bonds have outperformed cash



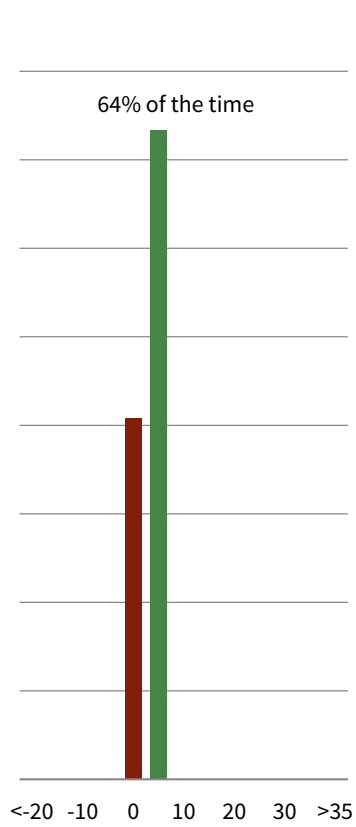
5-Yr Periods



10-Yr Periods



25-Yr Periods

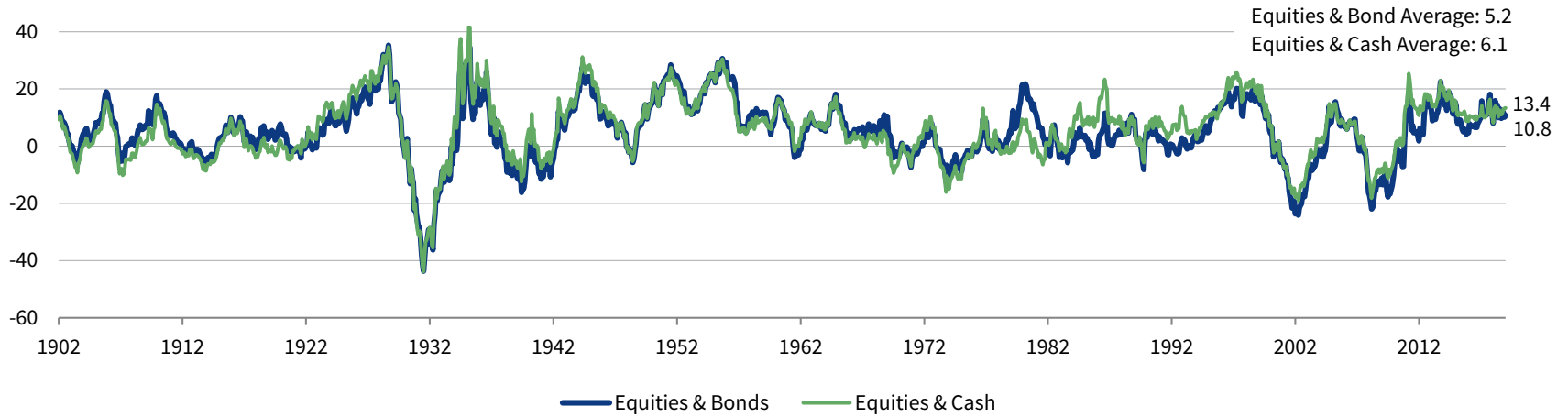


AACR Differentials (ppts)

Equities outperform bonds and cash by a wide margin; bonds outperform cash to a lesser degree

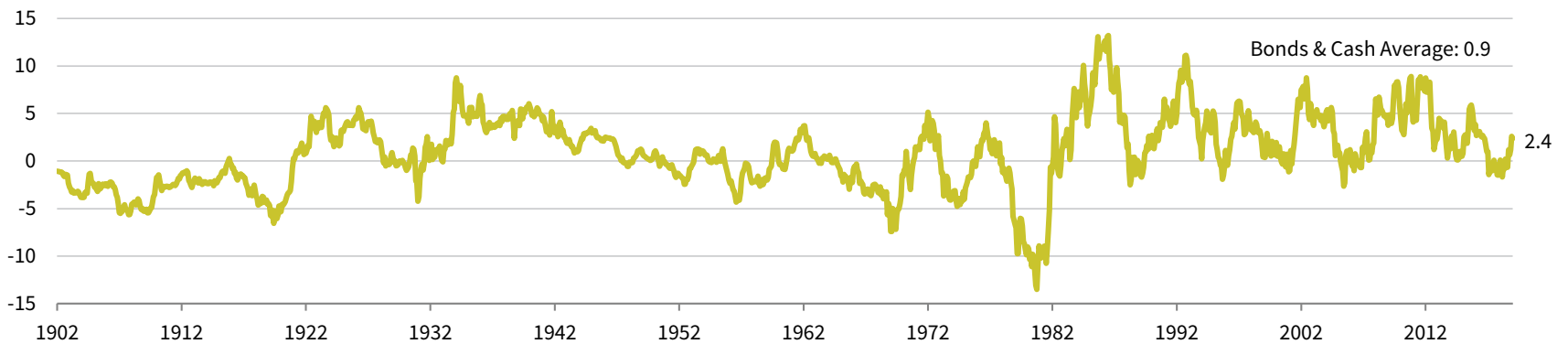
AACR OF ROLLING MONTHLY 3-YR RETURN DIFFERENTIAL BETWEEN EQUITY, CASH, AND BOND RETURNS

1902–2019 • Percent (%)



AACR OF ROLLING MONTHLY 3-YR RETURN DIFFERENTIAL BETWEEN BOND AND CASH RETURNS

1902–2019 • Percent (%)

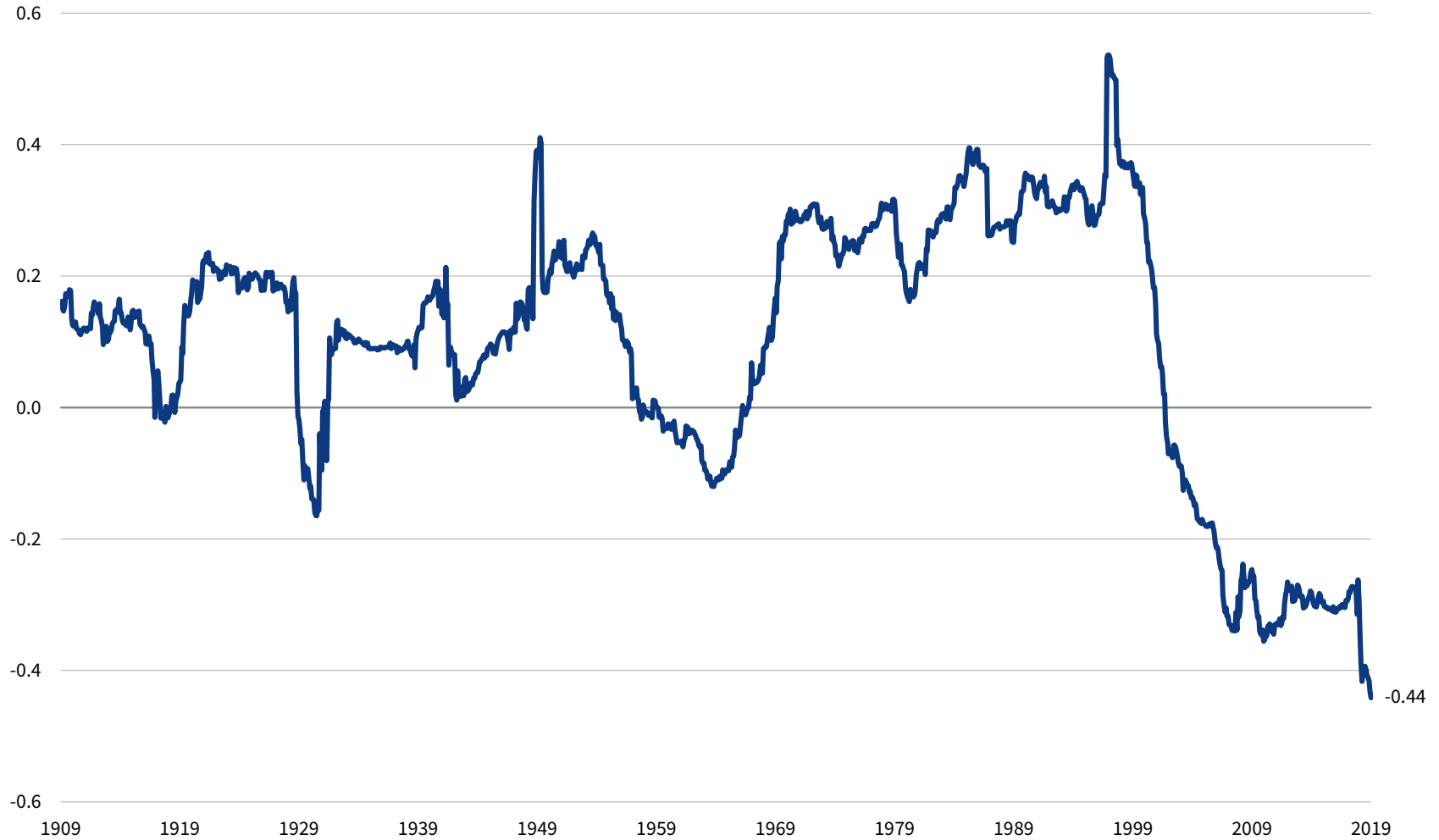


Sources: Global Financial Data, Inc., Standard & Poor's, and Thomson Reuters Datastream.

Stock and bond correlation is currently at historically low levels

ROLLING 10-YR CORRELATIONS OF STOCK AND BOND RETURNS

December 31, 1909 – December 31, 2019 • Correlation Coefficient



Sources: Global Financial Data, Inc., Standard & Poor's, and Thomson Reuters Datastream.

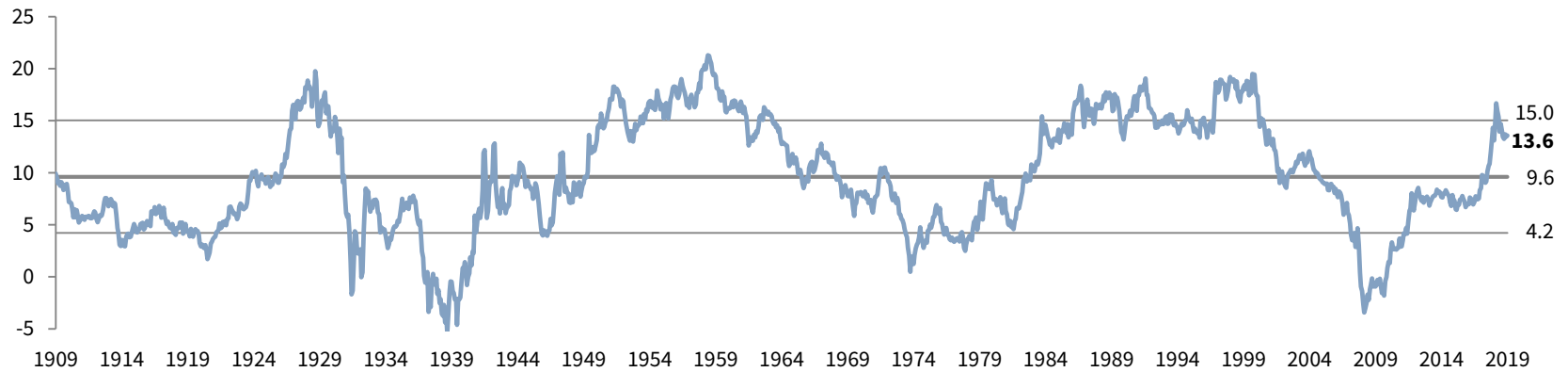
Notes: Data begin on January 31, 1900. All return data are monthly.

Equity performance tends to cycle about long-term averages

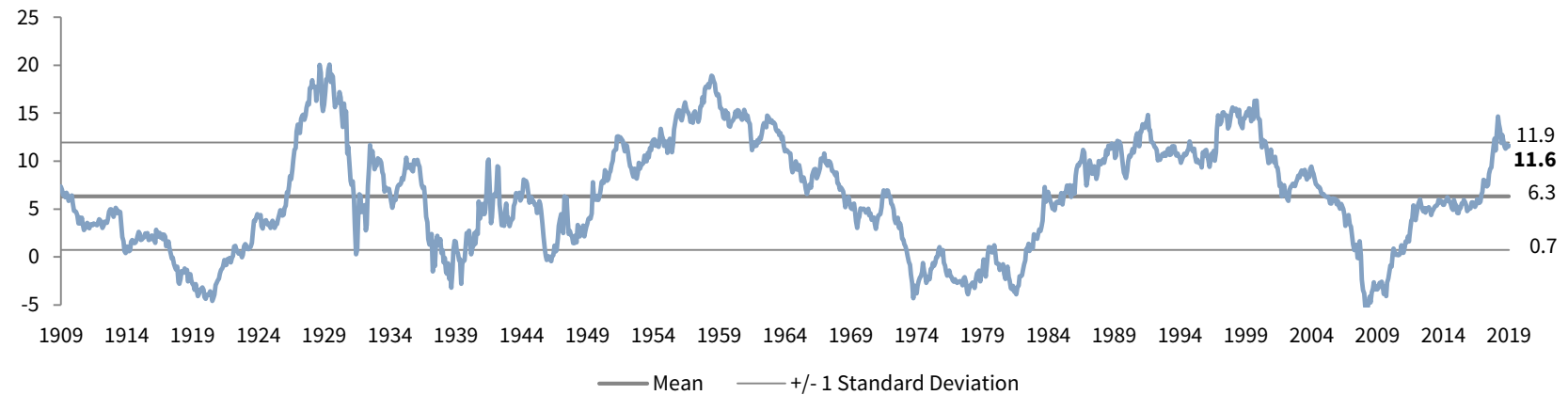
ROLLING MONTHLY EQUITY TOTAL RETURN 10-YR AACR

1909–2019 • Percent (%)

Nominal Returns



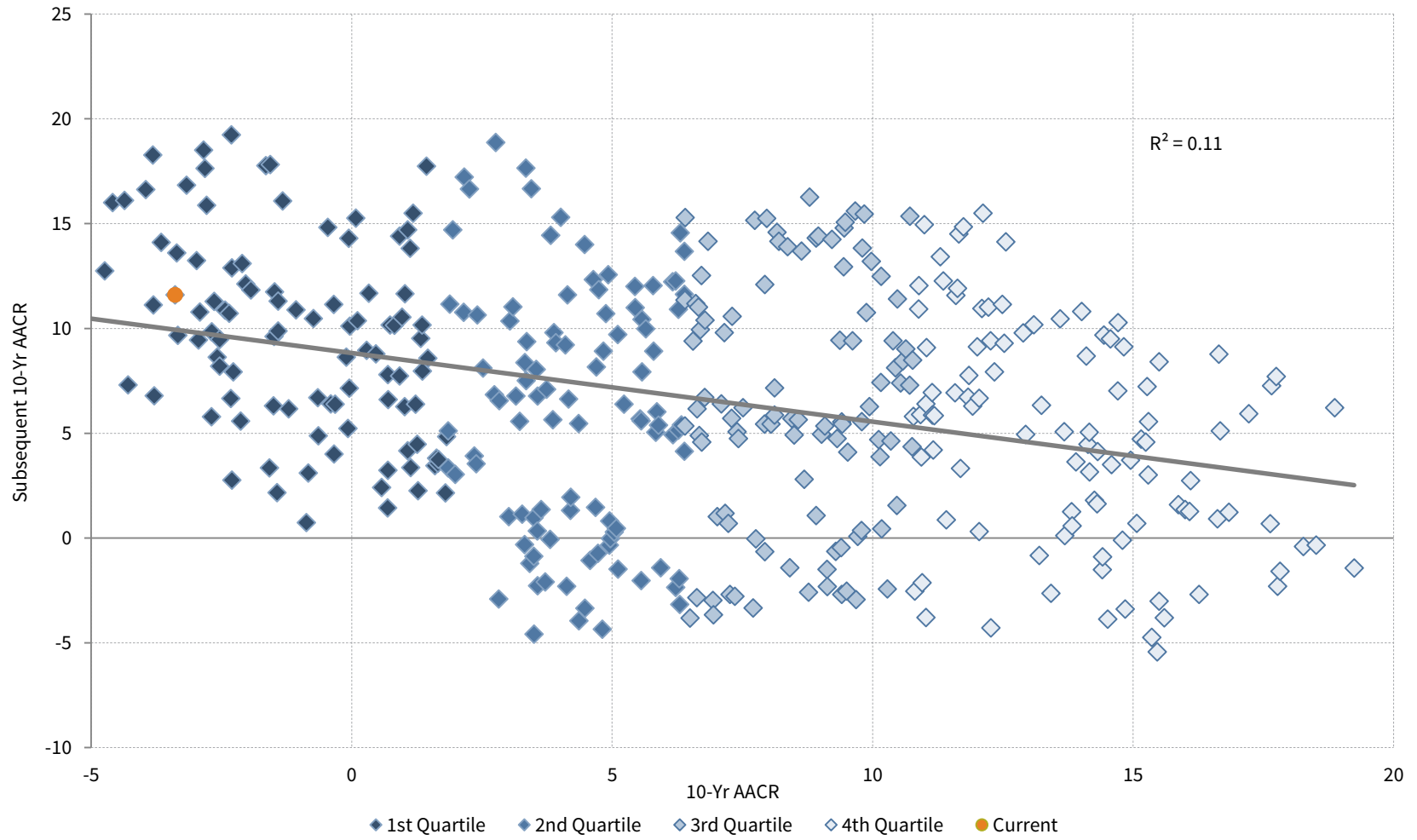
Real Returns



— Mean — +/- 1 Standard Deviation

There is a weak but slightly inverse relationship between past and future performance

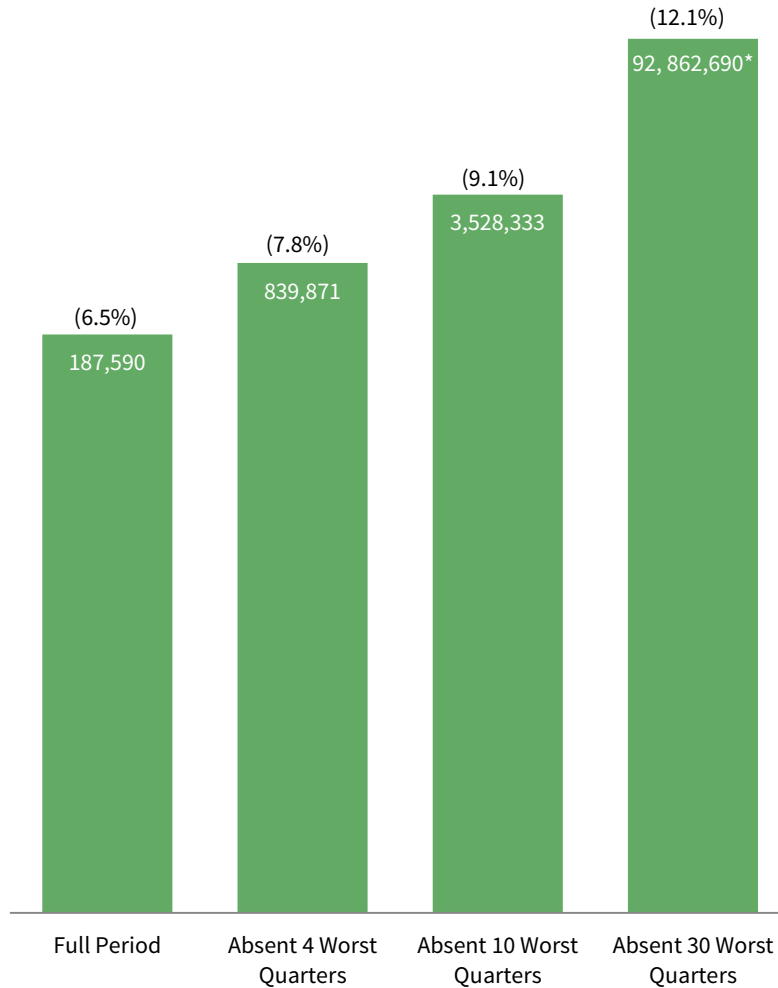
RELATIONSHIP BETWEEN ROLLING QUARTERLY 10-YR EQUITY REAL AACR AND SUBSEQUENT 10-YR EQUITY REAL AACR
1900–2019 • Percent (%)



Attempting to time the market carries significant risk

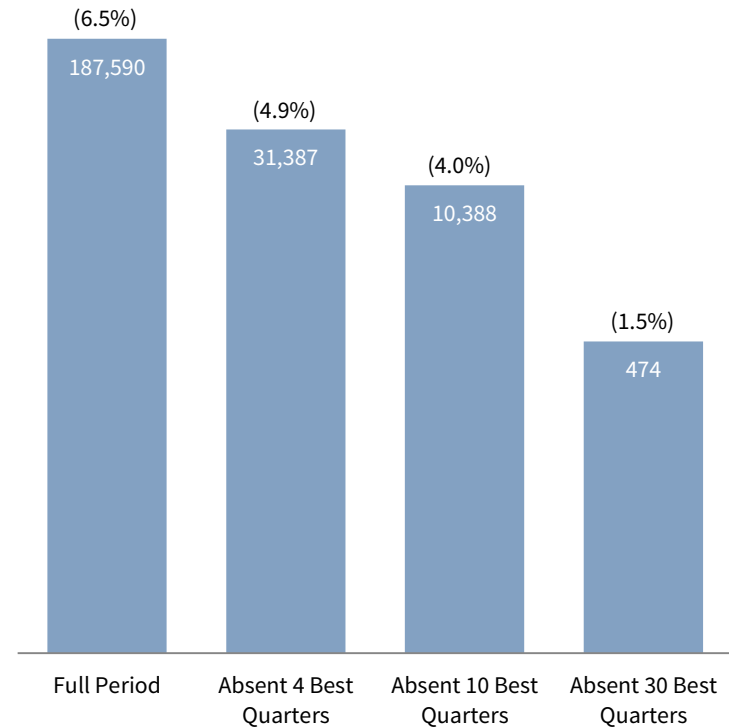
CUMULATIVE REAL WEALTH ABSENT WORST QUARTERS

1900–2019 • January 1, 1900 = 100 • AACR (%) in Parentheses



CUMULATIVE REAL WEALTH ABSENT BEST QUARTERS

1900–2019 • January 1, 1900 = 100 • AACR (%) in Parentheses



* Axis capped for scaling purposes.

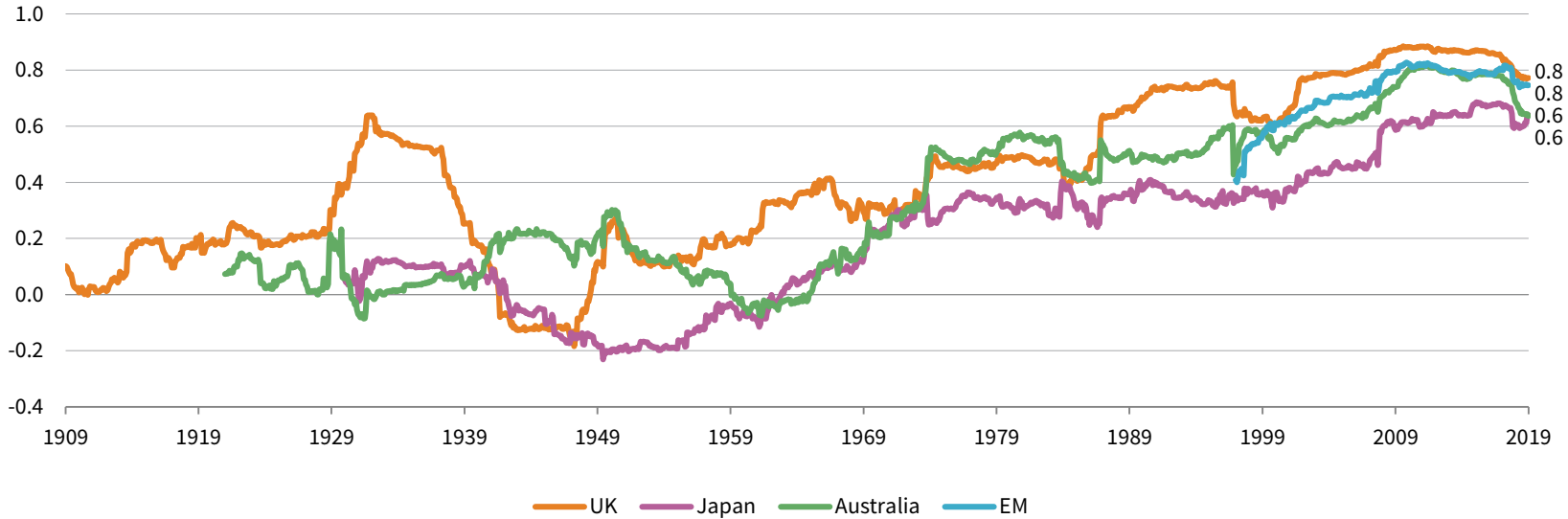
Sources: Global Financial Data, Inc., Standard & Poor's, and Thomson Reuters Datastream.

Note: Cumulative real wealth is shown on a logarithmic scale.

US equity market correlations with other regions increased in recent decades

ROLLING 10-YR CORRELATIONS: US EQUITY VS GLOBAL PEERS

December 31, 1909 – December 31, 2019 • Correlation Coefficient



CORRELATION MATRIX

January 31, 1900 – December 31, 1969

	US	UK	Japan	Australia
US	1.00			
UK	0.20	1.00		
Japan	-0.02	0.01	1.00	
Australia	0.08	0.24	0.02	1.00

CORRELATION MATRIX

January 31, 1970 – December 31, 2019

	US	UK	Japan	Australia	EM
US	1.00				
UK	0.62	1.00			
Japan	0.44	0.38	1.00		
Australia	0.55	0.52	0.34	1.00	
EM	0.67	0.62	0.50	0.58	1.00

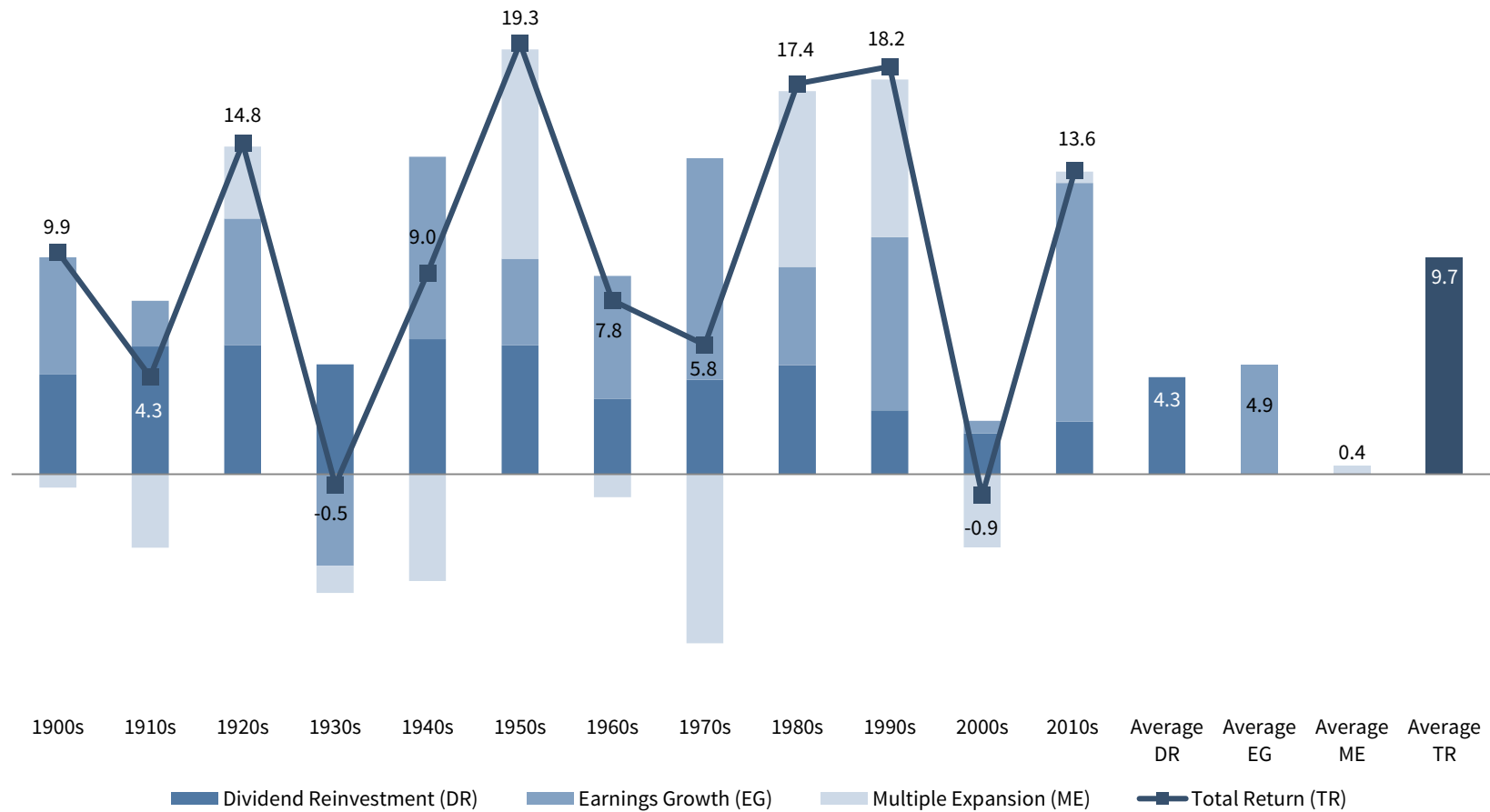
Sources: FTSE International Limited, Global Financial Data, Inc, MSCI Inc., Standard & Poor's, and Thomson Reuters Datastream. MSCI data provided "as is" without any express or implied warranties.

Notes: Data for the US and UK begin on January 31, 1900. Data for Australia begin on January 31, 1912. Data for Japan begin on January 31, 1921. Data for EM begin on January 31, 1988. All return data are monthly. EM returns are in USD terms. All other returns are in local currency.

Earnings growth and valuation multiple re-rating vary over time; dividends are more stable

BREAKDOWN OF TOTAL RETURN AACR OVER TIME

1900–2019 • Percent (%)

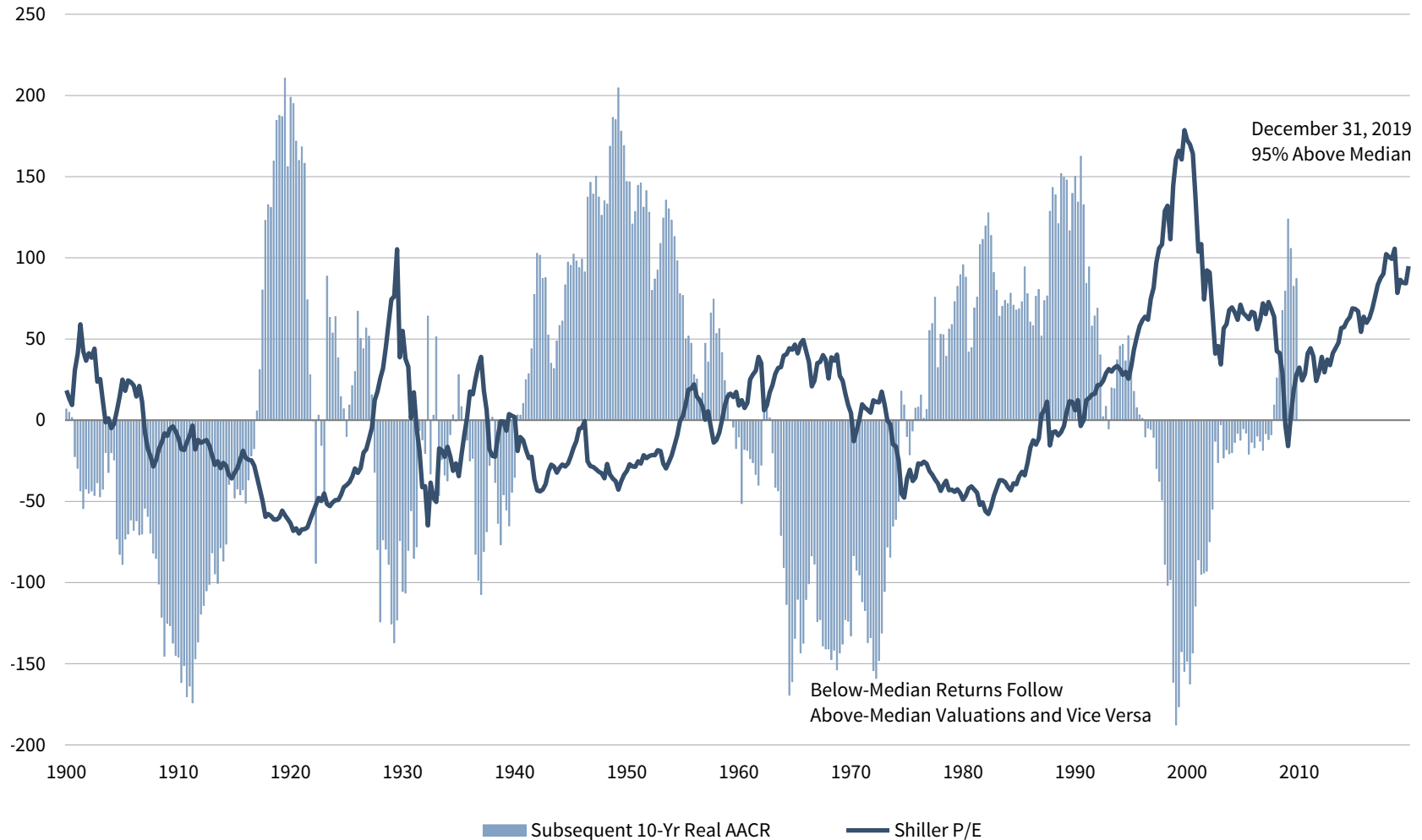


Sources: Global Financial Data, Inc., Standard & Poor's, and *The Wall Street Journal*.
 Note: Figures will not sum exactly to total return calculation due to the effect of combining cross terms.

Elevated starting valuations portend weak subsequent returns and vice versa

SHILLER PRICE-EARNINGS RATIOS AND SUBSEQUENT REAL 10-YR AACRS

First Quarter 1900 – Fourth Quarter 2019 • Shown as Percent Above/Below Respective Long-Term Median (%)



Sources: Robert J. Shiller, Standard & Poor's, Thomson Reuters Datastream, and US Department of Labor - Bureau of Labor Statistics.

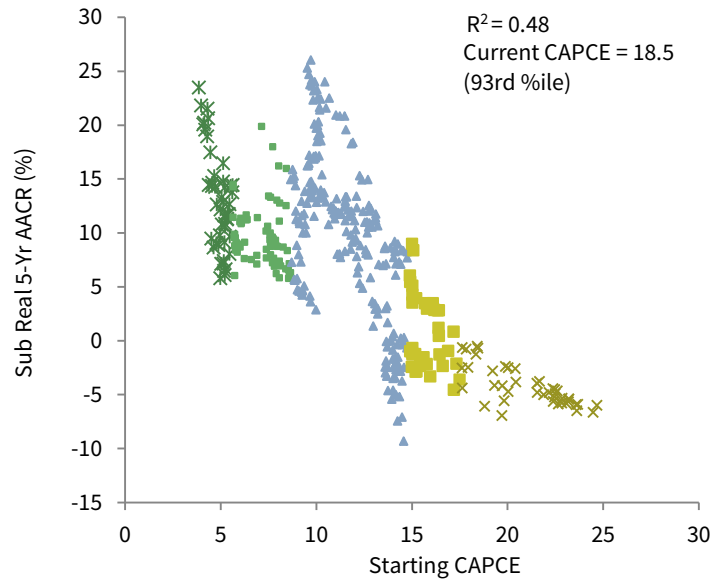
Notes: Chart shows percent above/below median for returns and valuations. Line shows point-in-time normalized real price-earnings (P/E) ratios. Normalized real P/E ratios for the S&P 500 Index are calculated by dividing the current index value by the rolling ten-year average of inflation-adjusted earnings. Bars are based on quarterly data and show subsequent rolling ten-year real average annual compound returns (AACRs) as a percentage above/below the long-term median ten-year real return of 6.2% since 1900. For example, the first data point shows that the real AACR for the period 1900–09 was 7.0% above the median ten-year real return.

Current starting valuations may pose a challenge for future real US equity returns

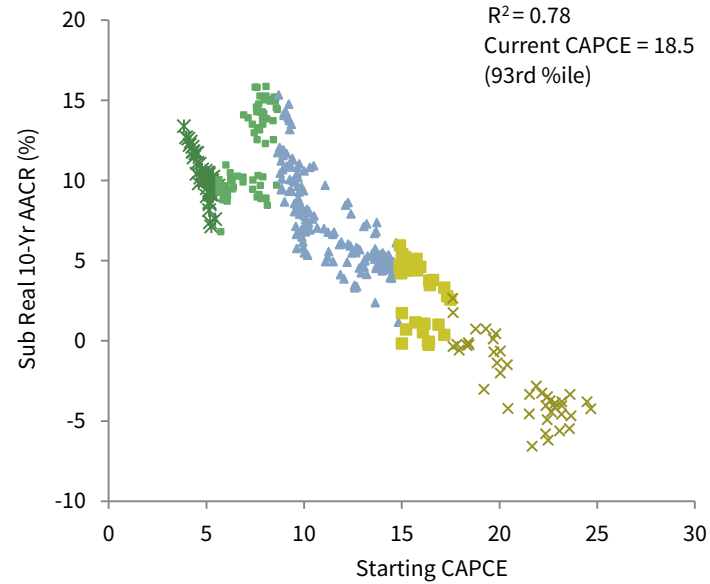
RELATIONSHIP BETWEEN CYCLICALLY ADJUSTED PRICE-TO-CASH EARNINGS RATIOS AND SUBSEQUENT REAL AACRS

December 31, 1979 – December 31, 2019

Initial Valuation and Subsequent 5-Yr AACR



Initial Valuation and Subsequent 10-Yr AACR



CAPCE Percentile	Starting Period Cyclically Adjusted Price-to-Cash Earnings Ratio			Subsequent Real 5-Yr AACR (%)			Starting Period Cyclically Adjusted Price-to-Cash Earnings Ratio			Subsequent Real 10-Yr AACR (%)		
	Median	High	Low	Median	High	Low	Median	High	Low	Median	High	Low
	0-10	5.0	5.6	3.9	12.4	23.5	5.8	5.0	5.6	3.9	10.1	13.4
10-25	7.6	8.6	5.6	9.1	19.9	5.8	7.6	8.6	5.6	10.4	15.9	6.8
25-75	11.5	14.8	8.6	10.7	26.0	-9.3	11.1	14.8	8.6	6.8	15.3	1.1
75-90	15.6	17.5	14.9	-1.0	9.0	-4.6	15.6	17.5	14.9	4.2	5.9	-0.3
90-100	21.6	24.7	17.6	-4.8	-0.5	-7.0	21.6	24.7	17.6	-3.3	2.6	-6.6
Overall	11.8	24.7	3.9	8.8	26.0	-9.3	11.8	24.7	3.9	7.6	15.9	-6.6

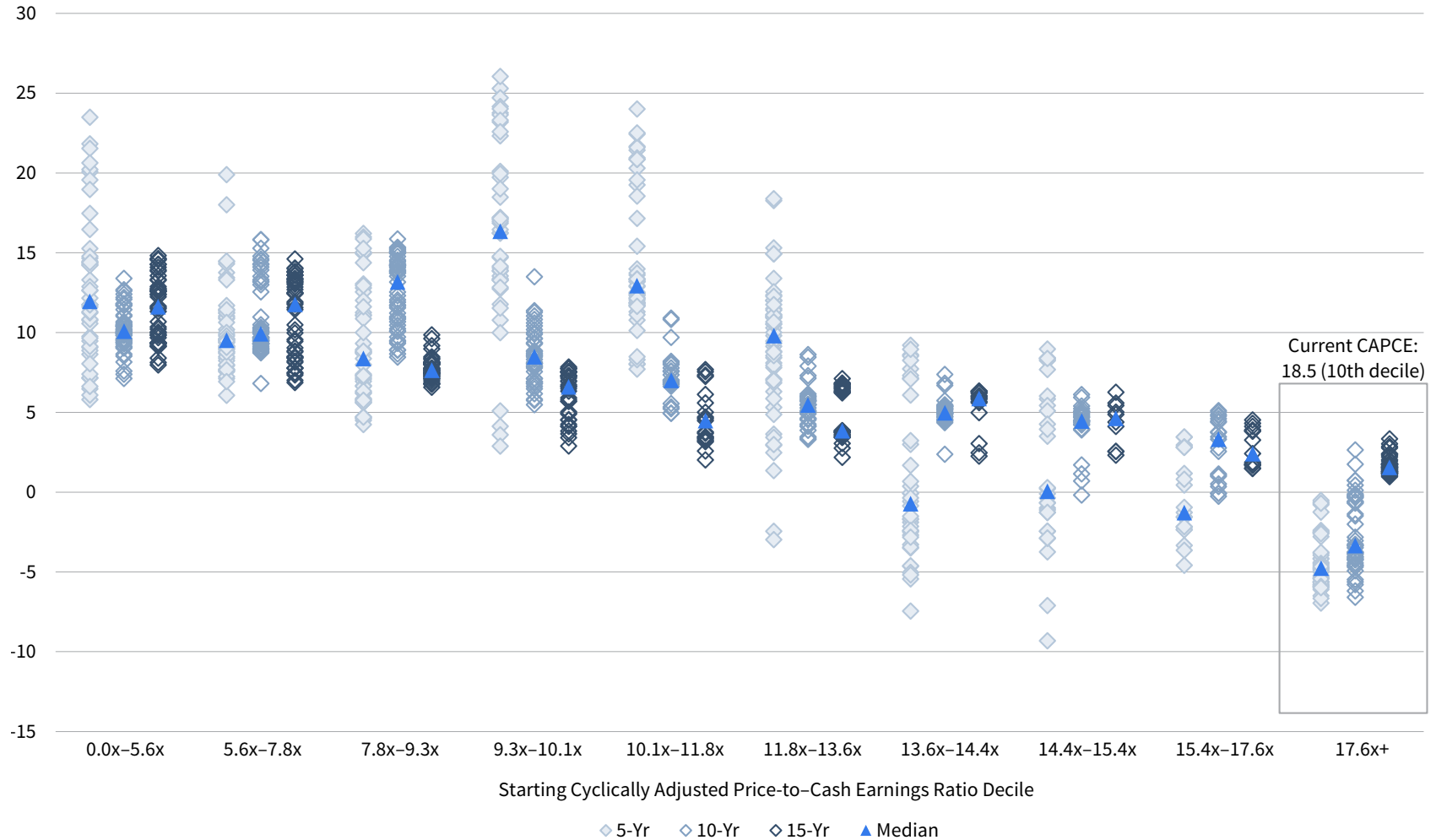
Sources: MSCI Inc. and Thomson Reuters Datastream. MSCI data provided "as is" without any express or implied warranties.

Notes: Data are monthly. The last full five-year period was January 1, 2015, to December 31, 2019, and the last full ten-year period was January 1, 2010, to December 31, 2019.

Starting normalized valuations are more meaningful as holding periods increase

DISTRIBUTION OF SUBSEQUENT REAL RETURNS FROM STARTING NORMALIZED VALUATION DECILES

December 31, 1979 – December 31, 2019 • Subsequent Real Return AACR (%)



Sources: MSCI Inc. and Thomson Reuters Datastream. MSCI data provided "as is" without and express or implied warranties.

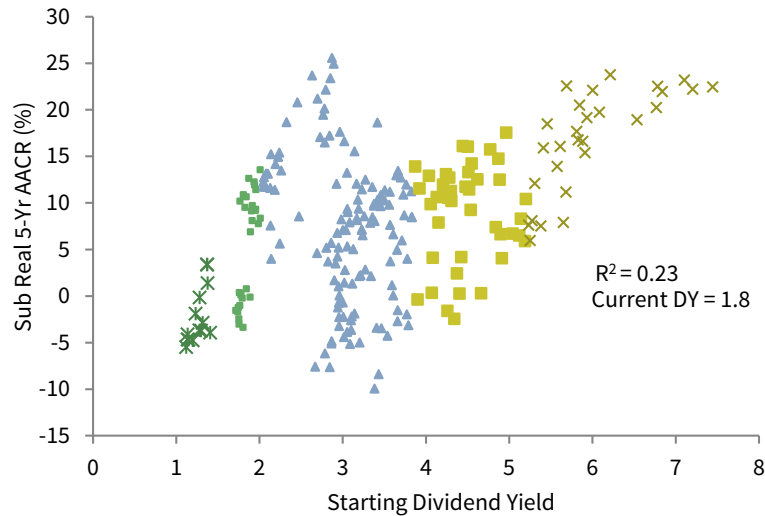
Notes: Data are monthly. The last full five-year period was January 1, 2015, to December 31, 2019, the last full ten-year period was January 1, 2010, to December 31, 2019, and the last full 15-year period was January 1, 2005, to December 31, 2019.

Dividend yields exhibit positive relationship with subsequent returns, but statistical fit is weak

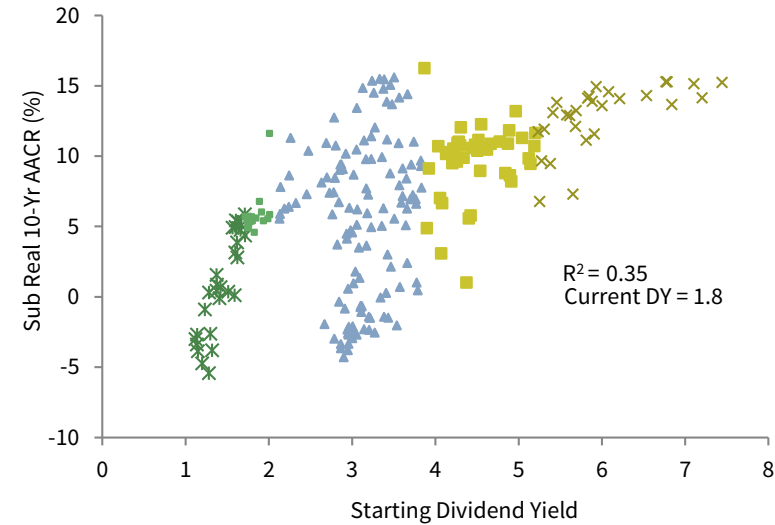
RELATIONSHIP BETWEEN DIVIDEND YIELDS AND SUBSEQUENT REAL AACRS

Fourth Quarter 1950 – Fourth Quarter 2019

Dividend Yield and Subsequent 5-YR AACR



Dividend Yield and Subsequent 10-YR AACR

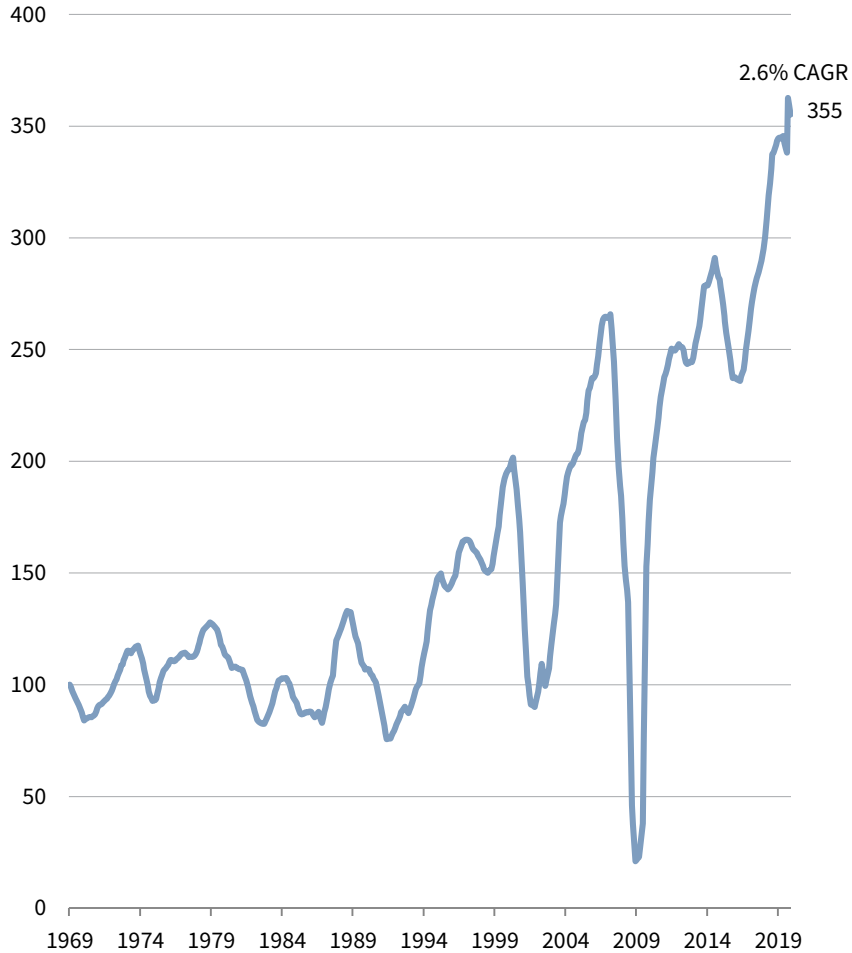


Dividend Yield Percentile	Starting Period Dividend Yield (%)			Subsequent Real 5-Yr AACR (%)			Starting Period Dividend Yield (%)			Subsequent Real 10-Yr AACR (%)		
	Median	High	Low	Median	High	Low	Median	High	Low	Median	High	Low
0-10	1.3	1.4	1.1	-3.7	3.4	-5.5	1.4	1.7	1.1	0.6	5.9	-5.4
10-25	1.8	2.0	1.7	8.1	13.5	-3.4	1.8	2.0	1.7	5.6	11.6	4.6
25-75	3.1	3.8	2.0	8.0	25.6	-9.9	3.1	3.8	2.1	6.3	15.6	-4.3
75-90	4.4	5.2	3.9	10.5	17.5	-2.4	4.4	5.2	3.9	10.5	16.3	1.0
90-100	5.8	7.4	5.2	18.1	23.8	6.0	5.8	7.4	5.2	13.6	15.3	6.8
Overall	3.1	7.4	1.1	8.1	25.6	-9.9	3.2	7.4	1.1	6.9	16.3	-5.4

Real earnings are volatile, but trend higher over time; return on equity cycles about its median

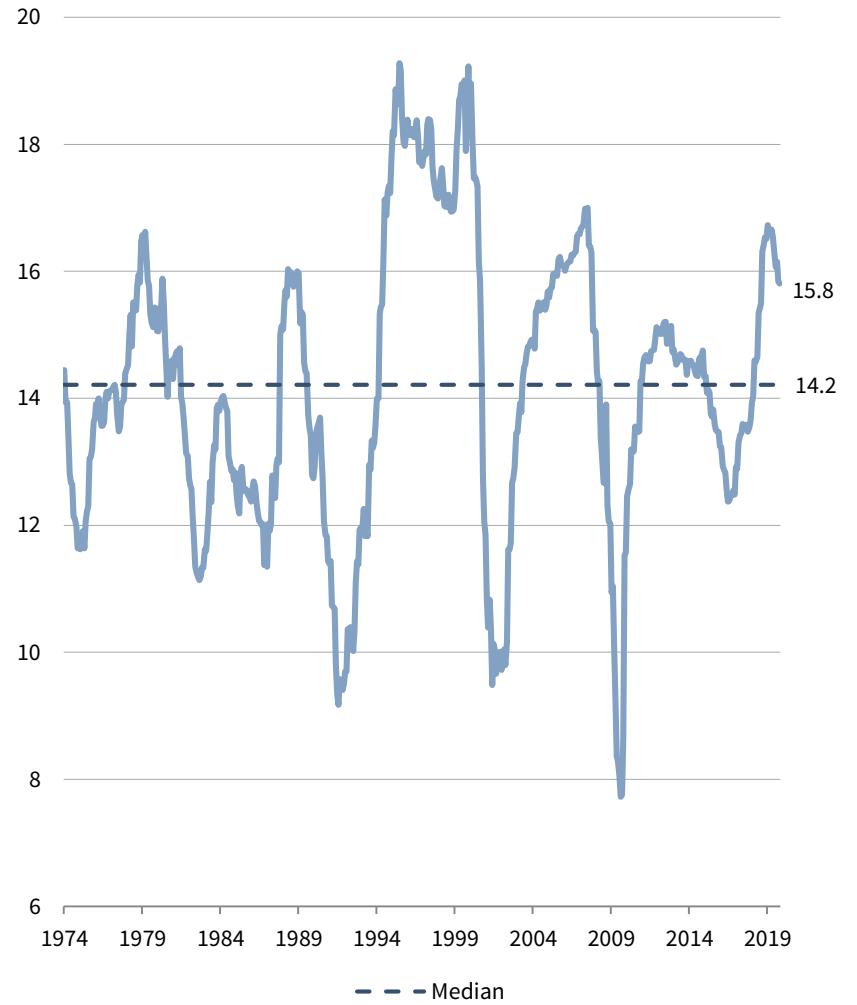
REAL EARNINGS PER SHARE OVER TIME

December 31, 1969 – December 31, 2019 • December 31, 1969 Cumulative Wealth = 100



RETURN ON EQUITY

December 31, 1974 – December 31, 2019 • Percent (%)



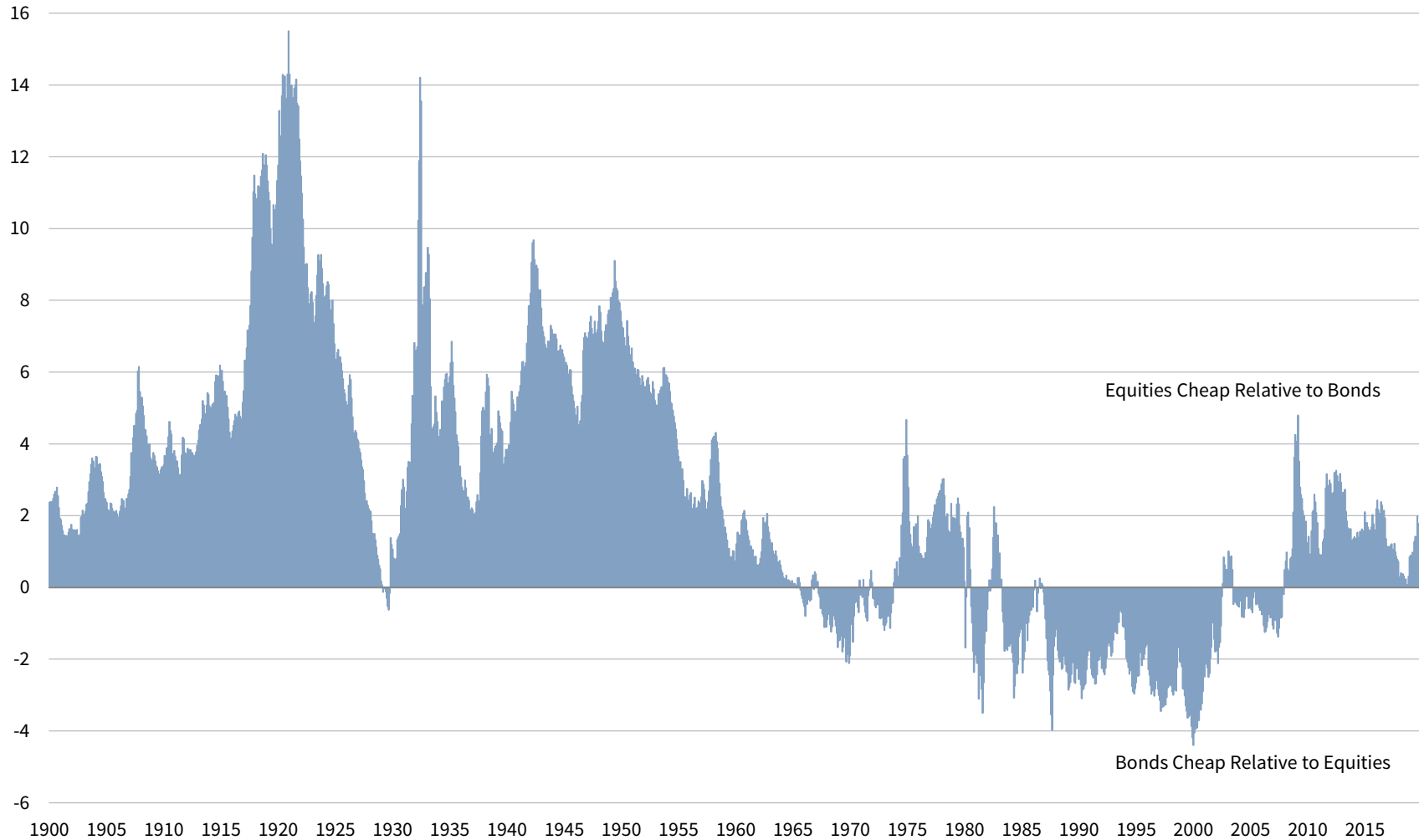
Sources: MSCI Inc., Standard & Poor's, and Thomson Reuters Datastream. MSCI data provided "as is" without any express or implied warranties.

Note: Real earnings per share is based on the S&P 500 Index and return on equity is based on the MSCI US Index.

Relationship between equity and bond valuations has shifted over time

SHILLER EARNINGS YIELDS VERSUS 10-YR BOND YIELDS

1900–2019



Sources: Global Financial Data, Inc., Robert J. Shiller, and Standard & Poor's.

Notes: Data are monthly. Chart shows the spread between the normalized earnings yields and ten-year bond yields calculated as earnings yield minus bond yield. Normalized earnings yields are based on the Shiller P/E ratio.

A tight relationship exists between starting bond yields and future returns

RELATIONSHIP BETWEEN TREASURY BOND YIELDS AND SUBSEQUENT 10-YR AACRS

1900–2019 • Percent (%)

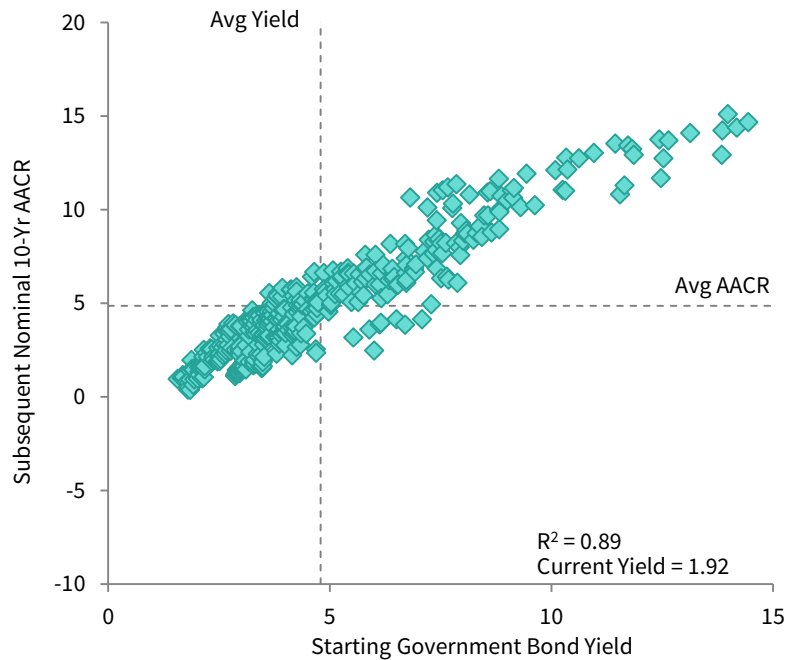


Low starting yields imply low subsequent nominal and real returns for bonds

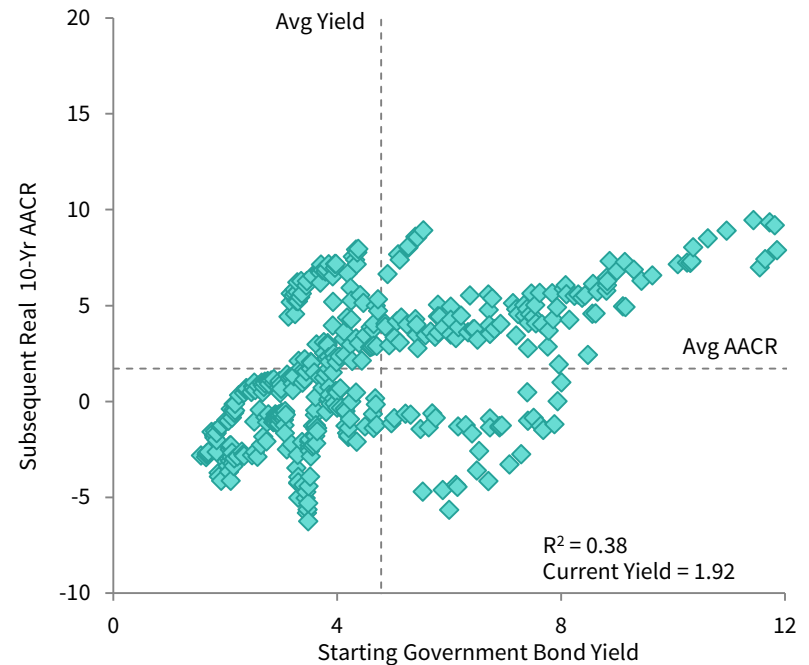
RELATIONSHIP BETWEEN GOVERNMENT BOND YIELDS AND SUBSEQUENT 10-YR AACRS

1900–2019 • Percent (%)

Nominal Returns



Real Returns



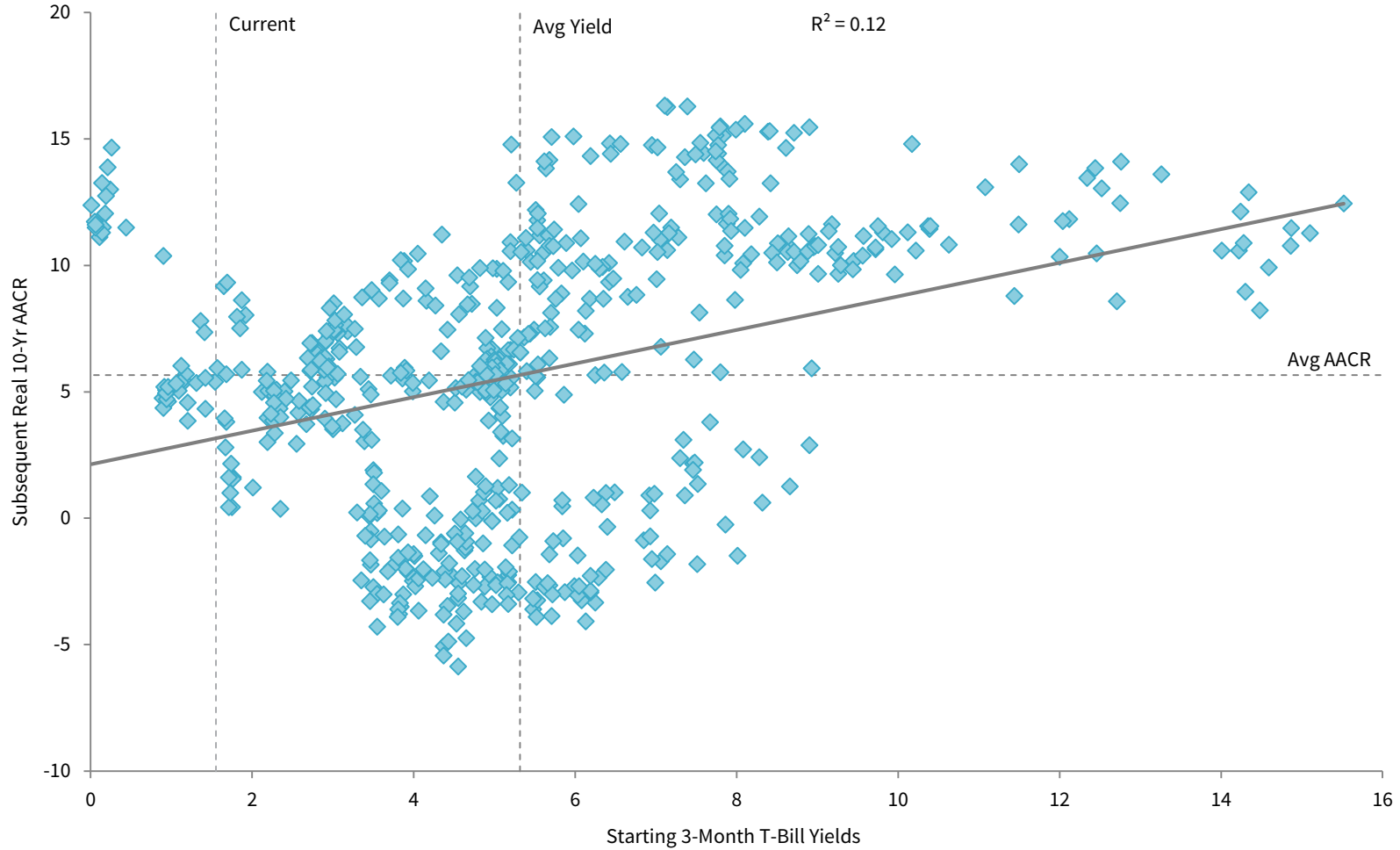
Yield	Beginning Period			Subsequent Nominal			
	Government Bond Yields			10-Yr AACR (%)			
Quartiles	Mean	High	Low	Mean	High	Low	Std Dev
First	2.43	3.01	1.57	1.96	3.92	0.37	0.87
Second	3.47	3.86	3.01	3.37	5.55	1.47	1.10
Third	4.71	6.03	3.88	4.91	7.60	2.22	1.26
Fourth	8.55	15.84	6.03	9.20	15.82	3.86	2.78
Overall	4.79	15.84	1.57	4.86	15.82	0.37	3.19

Yield	Beginning Period			Subsequent Real			
	Government Bond Yields			10-Yr AACR (%)			
Quartiles	Mean	High	Low	Mean	High	Low	Std Dev
First	2.43	3.01	1.57	-1.05	1.16	-4.14	1.52
Second	3.47	3.86	3.01	0.81	7.15	-6.26	3.62
Third	4.71	6.03	3.88	2.79	8.93	-5.65	3.24
Fourth	8.55	15.84	6.03	4.32	11.43	-4.46	3.70
Overall	4.79	15.84	1.57	1.72	11.43	-6.26	3.73

Higher cash yields associated with higher equity returns historically, but relationship is weak

RELATIONSHIP BETWEEN TREASURY BILL YIELDS AND SUBSEQUENT REAL 10-YR EQUITY AACRS

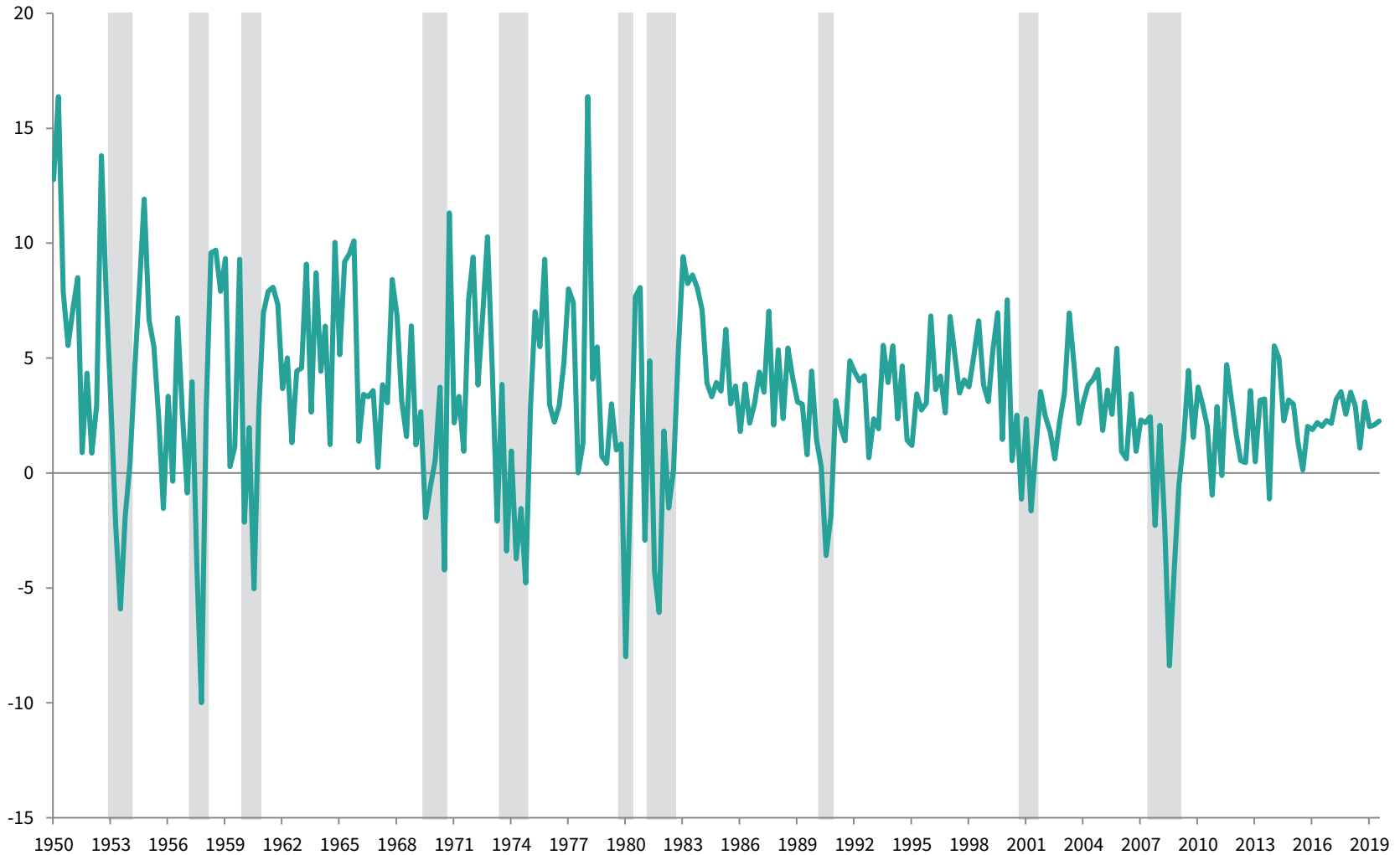
January 31, 1960 – December 31, 2019 • Percent (%)



Current economic expansion is now longest on record

US REAL GDP

1950–2019 • Annualized, Quarter-Over-Quarter (%)



US yield curve inverts prior to economic recessions, and did so in 2019

10-YR/3-MONTH YIELD SPREAD

1940–2019 • Percent (%)

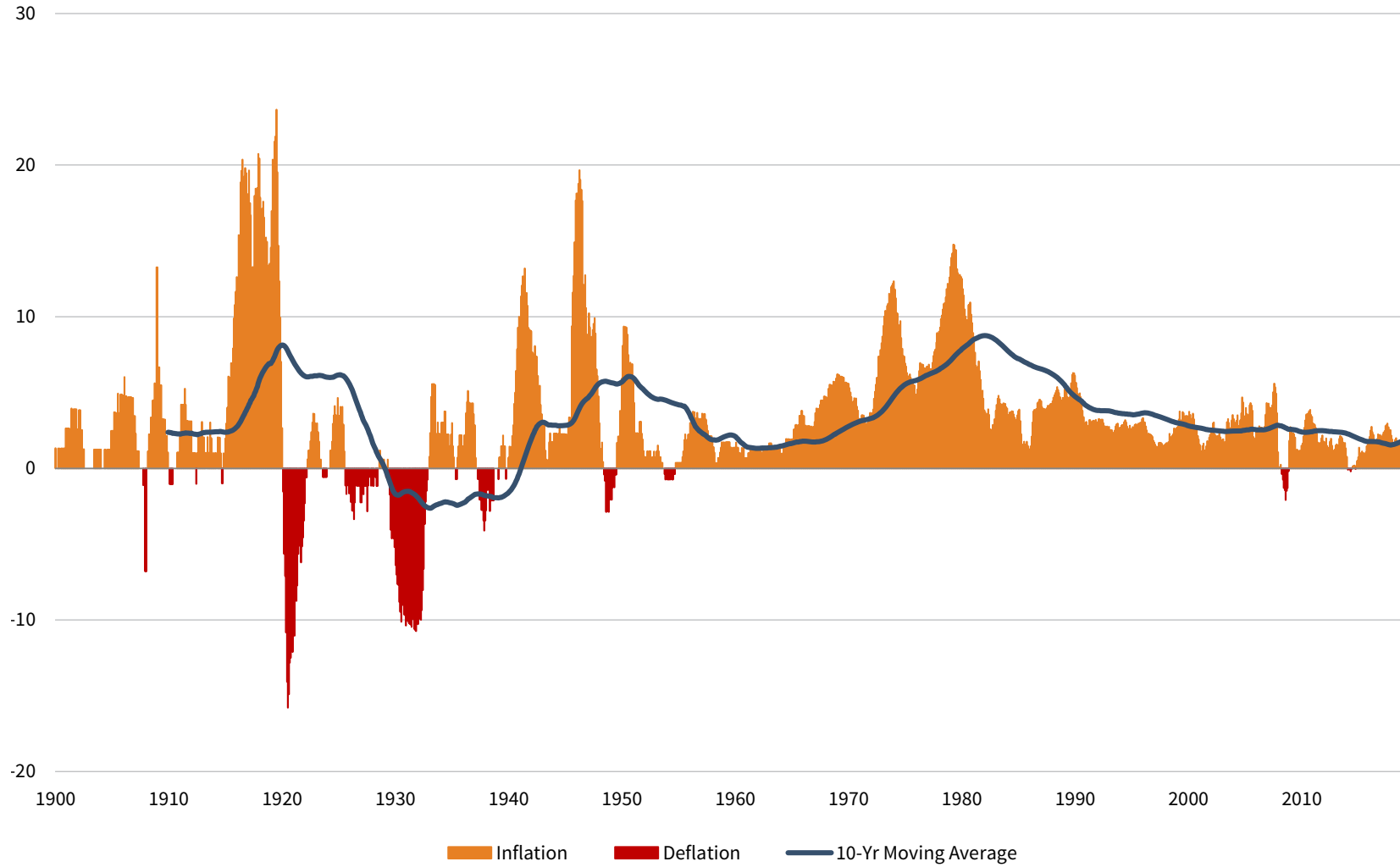


Sources: Economic Cycle Research Institute, Global Financial Data, Inc., and National Bureau of Economic Research.
Notes: Data are monthly. Gray bars represent NBER-defined US recessions.

Inflation has stabilized and trended downward in recent years relative to volatile history

US INFLATION

1900–2019 • Year-Over-Year (%)





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