Decades of Data

Global Markets 1900–2015

CAMBRIDGE ASSOCIATES

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Introduction

In this year's edition of Decades of Data, we revisit our regular historical analysis of markets by looking at an exhaustive history of valuations and returns in key regions. Depending on the region and data type, historical series go back as far as 1900. This analysis helps place current returns and valuations into historical context, showing patterns that are consistent across regions, and places where they differ. Shifting market cycles are another important element of analyzing long-term market trends. For investors seeking more background on secular and cyclical market cycles in the US, please refer to our November 2015 Research Note, "A Closer Look at the US Equity Bull Market."

"Know the history" is a key tenet of our research process, and the insight we have gained from conducting this analysis over many years underpins the investment philosophy at Cambridge Associates.

The analysis presented in this chart book is organized into five sections:

- Historical returns
- Components of equity returns
- Equity mean reversion
- Equity valuations
- Bond yields and future returns

New to this year's report are charts that show performance of bonds over cash and the range of returns for equities over one-, five-, ten-, and 15-year periods given a starting valuation decile. In addition, this year's report includes a separate appendix showing year-by-year returns for equities, bonds, and money market instruments for Australia, Japan, the UK, and the US.

Executive Summary

- **Basing investment decisions on the extrapolation of capital market 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.

- **Recent equity returns have been lower than returns over the very long term.** Over the past ten years, US equities have posted a nominal average annual compound return (AACR) of 7.3%; UK equities, 5.6%; Australian equities, 5.2%; and Japanese equities, 1.1%. Each of these returns is well below very long-term averages, reminding investors that even over periods as long as ten years, the "average" may not be experienced, and that averages are sensitive to beginning and end points. For the full period analyzed, investors in US equities (1900–2015) earned a 9.5% AACR; UK equities (1900–2015), 8.7%; Australian equities (1912–2015), 10.8%; and Japanese equities (1921–2015), 11.4%.

- **Across regions, equities are most likely to post very long-term annualized returns greater than annual inflation.** Over the full historical period for each country, the return for equities was significantly higher than the AACR for benchmark government bonds (which ranged from 4.8% to 7.0%) and cash (which ranged from 3.9% to 4.9%), and also higher than the rate of inflation. The US has had the lowest level of inflation, averaging 3.0% annually, while the UK has averaged 3.7% annually, and Australia, 4.2%. Japan presents a special case for several reasons. For the full period (1921–2015), inflation has averaged 7.0% annually in Japan, but this includes a period of hyperinflation between 1944 and 1948, when prices rose a cumulative 6,000%. Excluding these years, Japan has averaged annual inflation of 2.6%, just below the US. Japan's "lost decade" has also had a major impact on equity returns. Since 1990, Japan has returned -1.1% annually, while the US, UK, and Australia have all realized AACRs more in line with their long-term historical averages.

Executive Summary

(continued)

- **Still, in any given year equity returns can be poor, as the equity risk premium is unstable.** Coming off a solid year in 2014, global equity returns for 2015 were generally muted: 1.4% for the US, 1.3% for Australia, and 1.0% for the UK. Japan was the exception, posting a more robust nominal return of 9.9%. Excluding the impact of dividends, the US finished 2015 down 0.7%, its first down year since 2008. Over the seven-year period starting in 2009, US equities have seen annualized price returns of 12.4%. Including dividends, the annualized return is even stronger, at 14.8%.

- **Over the long term, equity investors are generally compensated for their risk taking, although regional variations exist.** Since 1900, US equity returns have exceeded bond returns during 75% of all five-year periods, 85% of all ten-year periods, and ~100% of all 25-year periods (calculated on a nominal basis using rolling monthly data). UK equities and bonds show a similar pattern. In Australia, where data begin in 1912, the likelihood of equity outperformance is less over the 25-year time horizon at 82%. Japan, where data begin in 1921, shows the lowest likelihood of equity outperformance in every period, with equities outperforming bonds 74% of the time in rolling monthly 25-year periods. Investors should also be cognizant that equities are subject to larger losses than bonds, particularly over shorter time horizons.

- **The most important factors for total return over time are growth in earnings and dividends, as the impact of multiple expansion/contraction is negligible given its mean-reverting nature.** Since 1900, two-thirds of US equities' real total return and more than 90% of UK equities' real total return has come from reinvesting dividends. Although dividends vary year to year, the compounding of dividends over time is incredibly important (especially during periods of economic decline), as it produces a steady stream of reliable income. For Australian equities, over the period for which we have the requisite component data (1970–2015), dividends contributed the entire total return as price returns were slightly negative in real terms. In Japan, low dividend yields for most of recent history have made dividends less impactful, accounting for just 37% of total real returns.

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- **Starting valuations and subsequent returns are related, though for shorter periods (one, three, even five years), the relationship is weak.** Normalized valuations and subsequent returns show stronger relationships over longer time periods (e.g., 15-year subsequent returns), and the relationship is strongest in Australia and the UK, which show R2 values of 0.82 and 0.84, respectively. At December 31 valuations, the average subsequent 15-year real return for US equities has been about 3%; for UK equities, 7%; and for Australian equities, 5%.
- **Given that the presence of relatively high or low valuations alone does not cause markets to reverse course, waiting for valuations to revert to the 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, provide little room for error, informing the aggressiveness of one's investment stance. Though the timing and catalysts for change vary, the historical record across regions presented in this report is clear—periods of low valuations have been followed by higher long-term subsequent returns, while periods of high valuations have been followed by poorer long-term returns.
- **Dividend yields on stocks have also shown a relationship to subsequent returns**, with high dividend yields in the US and Australia typically leading to above-average subsequent 15-year returns. The relationship is stronger for Japanese equities and noticeably weaker for UK equities. Dividend yields in the UK and US are currently within the second quartile of historical values, suggesting potentially below-median future returns. Dividend yields fail to capture the whole picture, however, as companies can also return excess cash to investors by buying back stock, a strategy which US companies in particular have made great use of in recent years.

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- **The relationship between stock market returns and periods of economic expansion and contraction remains uncertain.** Many investors equate strong economic growth with strong stock performance and vice versa. However, the stock market is effectively a discounting mechanism that moves in anticipation of (though not always ahead of) changes in economic growth and is subject to the whims of investor sentiment and psychology. Extreme valuations are a better predictor of subsequent returns than measures of economic growth.
- **Although rising interest rates are popularly regarded as detrimental to equity prices, this is not necessarily so**—the drivers of change in interest rates rather than their outright levels are what impact equity returns. Stocks can rise amid rising bond yields if such yields reflect improving growth conditions or increasing consumer confidence. The very weak statistical link between short-term interest rates and subsequent five-year returns across all regions reinforces the conclusion that the reason for changes in rates matters more than the level of rates.
- **The entry yield is the strongest predictor of subsequent nominal ten-year bond returns**, and with bond yields at or near all-time lows across all four regions, the outlook for future bond returns is decidedly low. While falling yields have been a boon for Australian, UK, and US bond investors for the past 30-plus years, with bonds posting strong returns across all these markets (AACRs of 10.6%, 10.4%, and 8.6%, respectively, since 1981), future returns are likely to be capped. Japan's experience, where bond yields have been below 5% since November 1992, may serve as a guide. Since July 1993, no rolling monthly trailing nominal ten-year return on Japanese bonds has exceeded 5%, and nearly half of these 149 observations have been nominal trailing ten-year returns of less than 2%.

Equity Returns Data

- **US:** From 1900 to 1968, US equity series returns come from the Global Financial Data S&P 500 Index. This uses data from the Cowles/Standard & Poor's Index of stocks through 1918 and then the Standard Composite after 1918. This index was calculated by the Standard Statistics Company and initially consisted of a 90-stock average, which included 50 industrial, 20 rails, and 20 utilities. The 90-share index was used through 1957, when S&P introduced the S&P 500 stock average, including 425 industrials, 25 rails, and 50 utilities. From 1969 to the present, the data cited come directly from the S&P 500 Index.[1]
- **UK:** Data from 1900 to June 1962 are based on the historical total return index of UK shares compiled by Global Financial Data, Inc. Returns from September 1962 to September 1964 are calculated for the FT-500 Non-Financials Index provided by data from the FT Actuaries Library. Total returns from December 1964 to December 1992 are based on the FTSE® Total Non-Financial Index calculated by Thomson Reuters Datastream, while from 1993 to the present, returns are based on the FTSE® All-Share Index, as calculated by FTSE®.
- **Japan:** From 1921 to 1968, Japan equity series returns come from Global Financial Data, Inc. The National Bank Index is used from July 1914 through December 1932, and the Oriental Economist Index is used from 1933 through September 1948. The Fisher Index is used from September 1948 through April 1949. The Tokyo stock exchange officially reopened in May 1949, and the Nikkei 225 Index is used from May 1949 until 1969. From 1969 on, the MSCI Japan Index is used and the data cited come from MSCI Inc.
- **Australia:** From 1912 to 1968, Australia equity series returns come from Global Financial Data, Inc. The All Ordinaries Index is used over this time frame as it is Australia's premier market indicator. The index represents the 500 largest companies listed on the Australian Stock Exchange. From 1969 on, the MSCI Australia Index is used and the data cited come from MSCI Inc.

[1] As of January 1, 1988, S&P 500 total return calculations are based on daily reinvestment of accrued dividends on ex-date.

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Equity Valuations Data

- **US:** Earnings data and dividend yields from 1900 to 1926 are provided by Professor Robert J. Shiller.[2] Earnings and dividend yields after 1927 are provided by Standard & Poor's. Graphs using MSCI price-earnings ratios come from MSCI Inc. from 1969 to present.

- **UK:** Earnings and dividend yield data from 1962 through the present are calculated based on data provided by MSCI Inc.

- **Japan:** Earnings and dividend yield data from 1969 through the present are calculated based on data provided by MSCI Inc.

- **Australia:** Earnings and dividend yield data from 1969 through the present are calculated based on data provided by MSCI Inc.

- When analyzing equity markets, a common valuation metric is the normalized price-earnings (P/E) ratio. One well-known normalized P/E ratio is the Shiller P/E, which is calculated by dividing the real index price level by the ten-year average real earnings.[2] For most equity markets, Cambridge Associates evaluates valuations using our composite normalized P/E ratio, which is calculated by dividing the inflation-adjusted index price by the simple average of three normalized earnings metrics: ten-year average real earnings (i.e., Shiller earnings), trend-line earnings, and return on equity–adjusted earnings.

[2] Page 48 of this report shows a Shiller P/E chart back to 1880 using data provided by Professor Robert J. Shiller before 1936.

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Bond Data

The long-term bond series for each region is calculated and provided by Global Financial Data, Inc. and in the case of the UK, Thomson Reuters Datastream (post 1980).

- **US:** From 1900 to September 1917, the 4% US Government Bonds of 1925 are used. Where no trades were recorded during a given month, the previous month's yield was used. The sources for this data is William B. Dana Co., *The Financial Review*, New York: William B. Dana Co. (1872–1921), which reprinted data published by *The Commercial and Financial Chronicle*. The 4% Liberty Bonds are used from October 1917 through December 1918, and beginning in 1919, the Federal Reserve Board's 10–15 Year Treasury Bond Index is used. Ten-year bonds are used beginning in 1941.

- **UK:** The 20-year government bond index from Global Financial Data, Inc. is used as a proxy until 1980 at which point returns and yields are provided by Thomson Reuters Datastream.

- **Japan:** The Empire of Japan 4% Sterling Bonds of 1899 is used from 1900 to 1930. Tokyo quotes begin in 1931. Tokyo quotes for the 5% Japanese Bond are used from 1931 through 1946. No data are available from January 1947 until November 1948. The data from 1948 until September 1961 represent the yields on bonds newly issued during that month. When no bonds were issued, the previous month's yield was used. The series from October 1961 to December 1971 is for seven-year government bonds. Separate series are provided for the two-year, five-year, ten-year, and 20-year bonds based upon auction rates by the Bank of Japan.

- **Australia:** The South Australia 4% Inscribed Bonds of 1886 Redeemable 1917–36 is used from March 1900 to June 1917, the Australia 5.50% Registered Bonds Redeemable 1922–27 from July 1917 to June 1922, and the Australia 5% Registered Stock of 1925–29 from July 1922 to June 1932 quoted in London and quoted in Sydney from July 1932 to July 1933. From July 1933 to December 1936, 4% bonds are used, and starting in January 1937, a weighted average of ten-year bonds through 1940, 12-year bonds from 1941 to May 1959, 20-year bonds from June 1959 through 1980, 15-year bonds from 1981 through 1990, and ten-year bonds since 1991 to produce the theoretical yield on a perpetual ten-year bond.

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Cash Data

- **US:** The money market instrument return series is composed of the Global Financial Data USA Total Return Commercial/T-Bill Index from 1900 to March 1970, which used commercial bills from 1900 to 1918 and Treasury bills from 1918 on. From April 1970 to December 1977, T-bill data were sourced directly from the Federal Reserve. From January 1978 to the present, the BofA Merrill Lynch 91-Day Treasury Bill Index total return is used.

- **UK:** To calculate total returns, the index uses the yield on Treasury bills from 1900 on.

- **Japan:** To calculate total returns, the Bank of Japan Discount Rate is used from 1900 to 1913, the Overnight Call Money rate from 1914 to January 1945, the Bank of Japan Discount Rate from February 1945 to 1948, the overnight call money rate from 1949 to 1959 and Treasury bill yields from 1960 on.

- **Australia:** To calculate total returns, the index uses the bank deposit rate from 1900 until June 1928 and Treasury bill yields thereafter.

Historical Returns

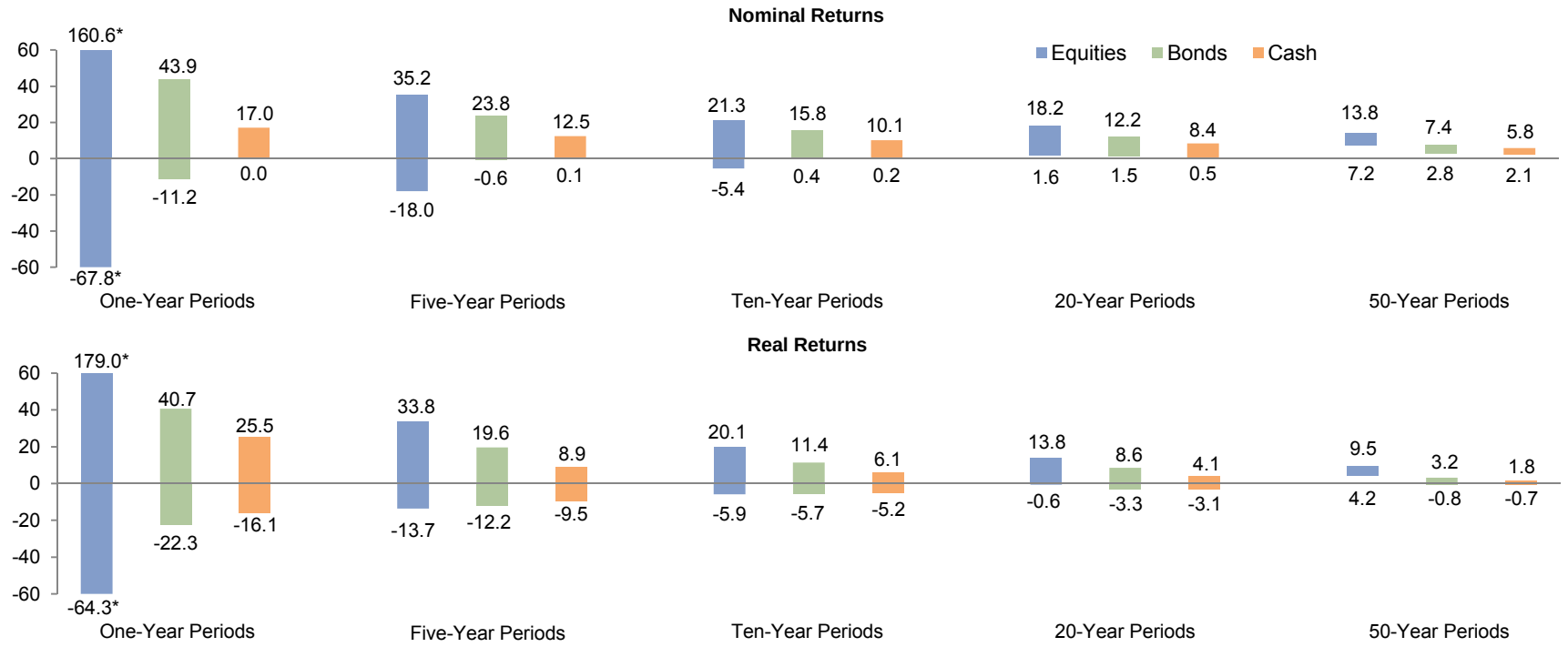
Equity, bond, and cash returns can vary dramatically from year to year, but no matter the asset class or the region, the range of returns narrows as the holding period increases. Equities are considered the riskiest of these three asset classes and therefore carry a risk premium, which varies over time and depending on the region. On a rolling three-year basis, average equity outperformance of bonds has ranged from 3.0% (UK) to 5.0% (Japan). Over the long term, equity returns have exceeded those of bonds and cash, though regional differences exist, with US and UK equities most likely to outperform bonds over long time horizons. Over rolling three-year periods, global bonds have outperformed cash by an average margin of between 0.9% (US) and 2.6% (Japan). However, cash can outperform bonds, particularly during periods of unexpected inflation and rising rates.

Investments become more range bound as holding periods increase

Time increases the probability of earning positive returns, and the range of possible returns narrows as the holding period increases. Equities have the widest range of returns for each period, while cash has the narrowest range. In the US, rolling 50-year periods show a minimum real equity AACR of 4.2%, greater than both the maximum bond (3.2%) and cash (1.8%) AACRs.

Range of Equity, Bond, and Cash Returns for Various Rolling Monthly Time Horizons: US

1900–2015 • Average Annual Compound Return (%)



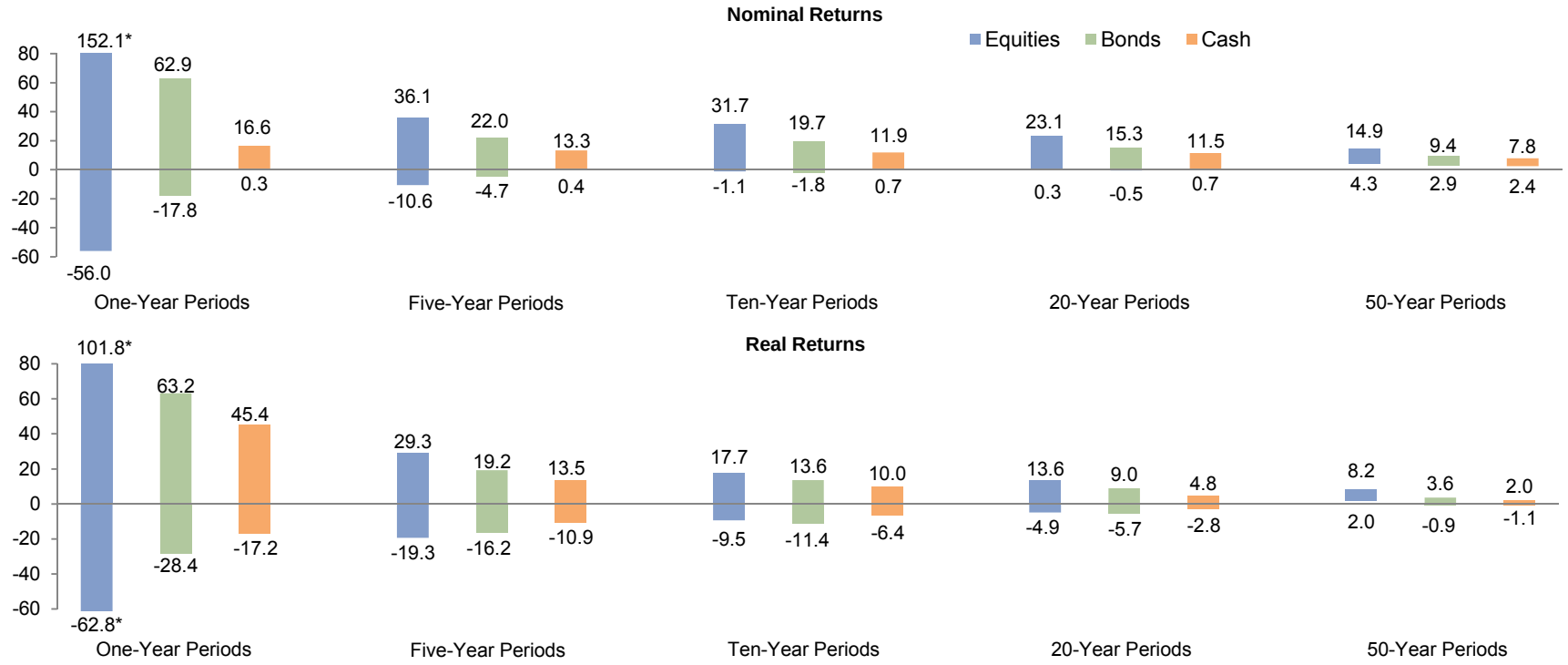
Sources: Global Financial Data, Inc., Standard & Poor's, and Thomson Reuters Datastream.

* Graph capped for scale purposes.

Investments become more range bound as holding periods increase

In the UK, return ranges show similar outcomes to those of US investments. However, real UK equity returns are lower due to higher inflation. Over prolonged time periods, equities prevail; in every rolling 50-year period since 1900, UK equities have outperformed bonds and cash on a real annualized basis.

Range of Equity, Bond, and Cash Returns for Various Rolling Monthly Time Horizons: UK
1900–2015 • Average Annual Compound Return (%)

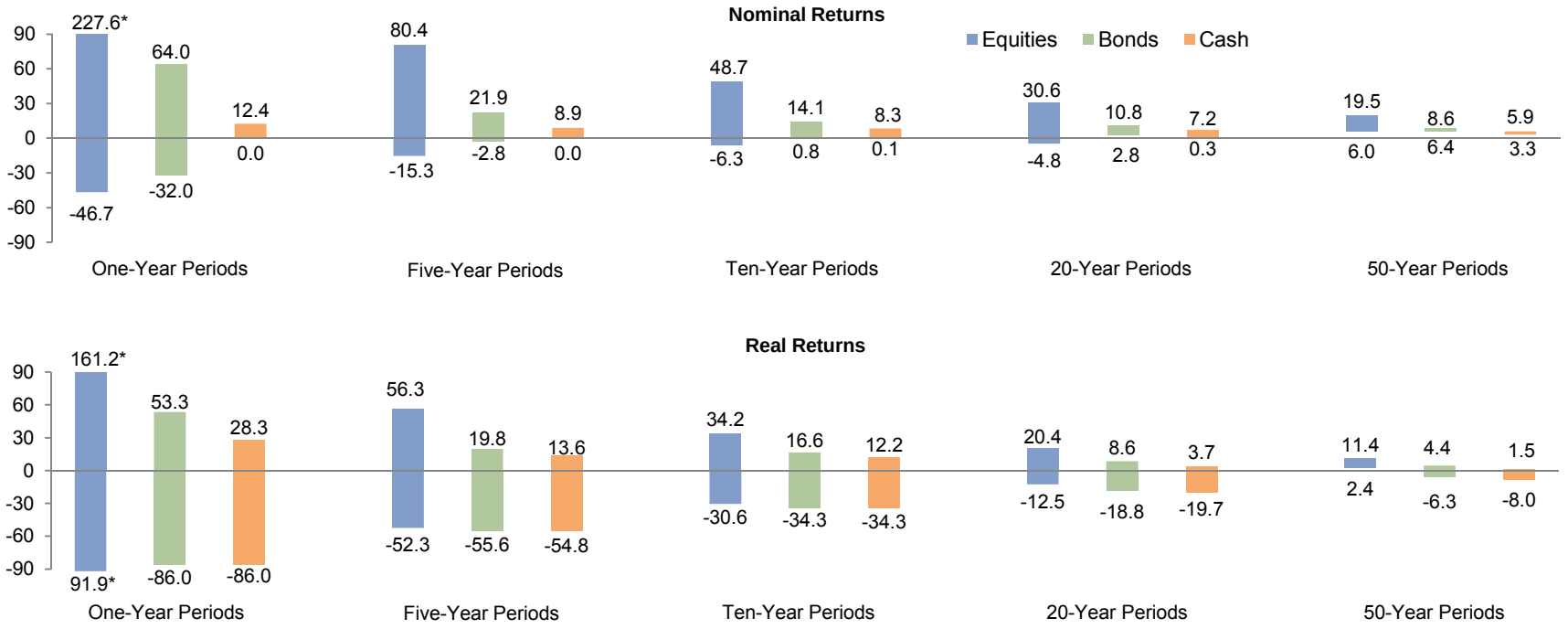


Sources: FTSE International Limited, Global Financial Data, Inc., and Thomson Reuters Datastream.
Note: The one-year high real cash return of 45.4% occurred in 1921, and was caused primarily by severe deflation in the post-war period, rather than high cash yields, which yielded an average of 5% during the year.
* Graph capped for scale purposes.

Investments become more range bound as holding periods increase

Top-end nominal equity return ranges for Japan are the highest of all countries in our analysis partly due to occasional periods of extreme inflation. Real equity returns show lower troughs than the other countries for the same reason. While Japanese equities show the highest nominal and real AACRs of the four countries in our analysis, Japan is the only country where bonds have occasionally outperformed equities over 50-year periods.

Range of Equity, Bond, and Cash Returns for Various Rolling Monthly Time Horizons: Japan
1921–2015

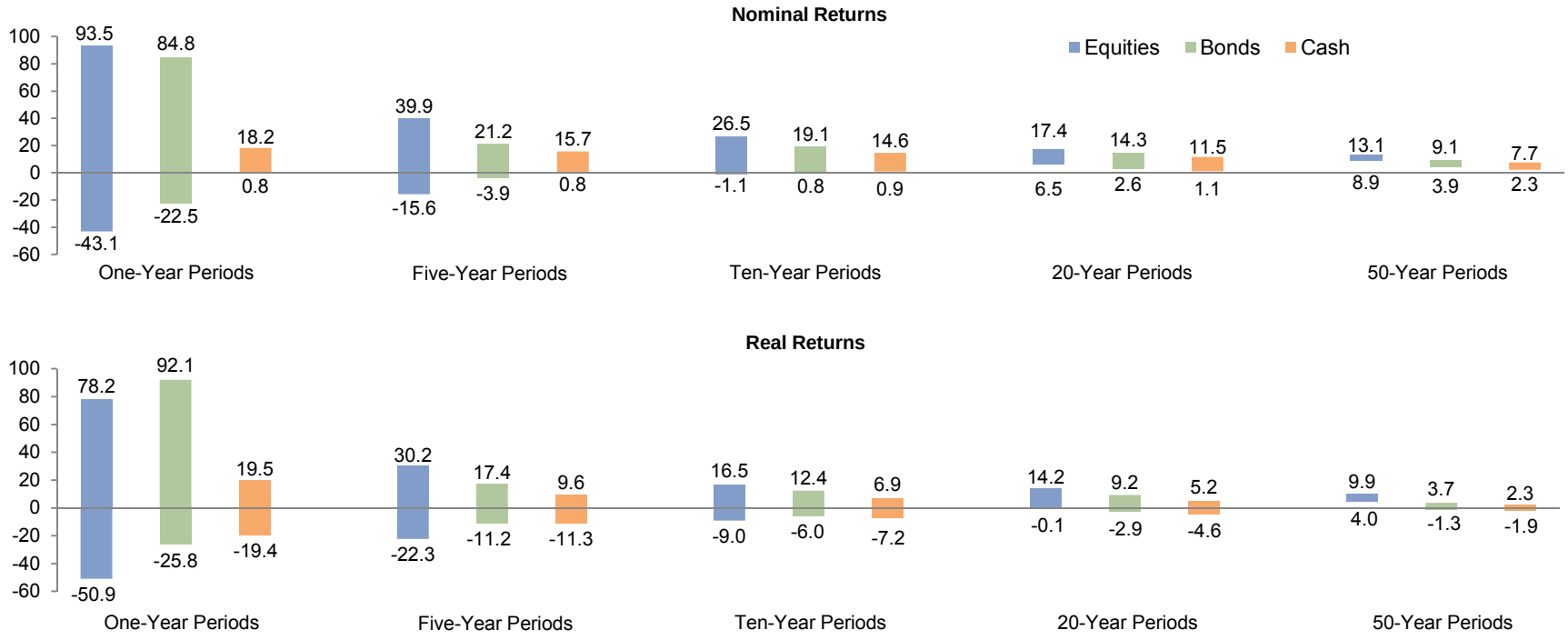


Sources: Global Financial Data, Inc. and Thomson Reuters Datastream.
* Graph capped for scale purposes.

Investments become more range bound as holding periods increase

Australia is the only country in our analysis where the top equity return was not higher than bonds and cash, with bonds returning 92% real from October 1931 to September 1932. Excluding this outlier or looking at medians, the return trends mimic those of other countries. Like in the US, real rolling 50-year periods show a minimum real equity AACR (4.0%) greater than both the maximum bond (3.7%) and cash (2.3%) AACRs.

Range of Equity, Bond, and Cash Returns for Various Rolling Monthly Time Horizons: Australia
1912–2015



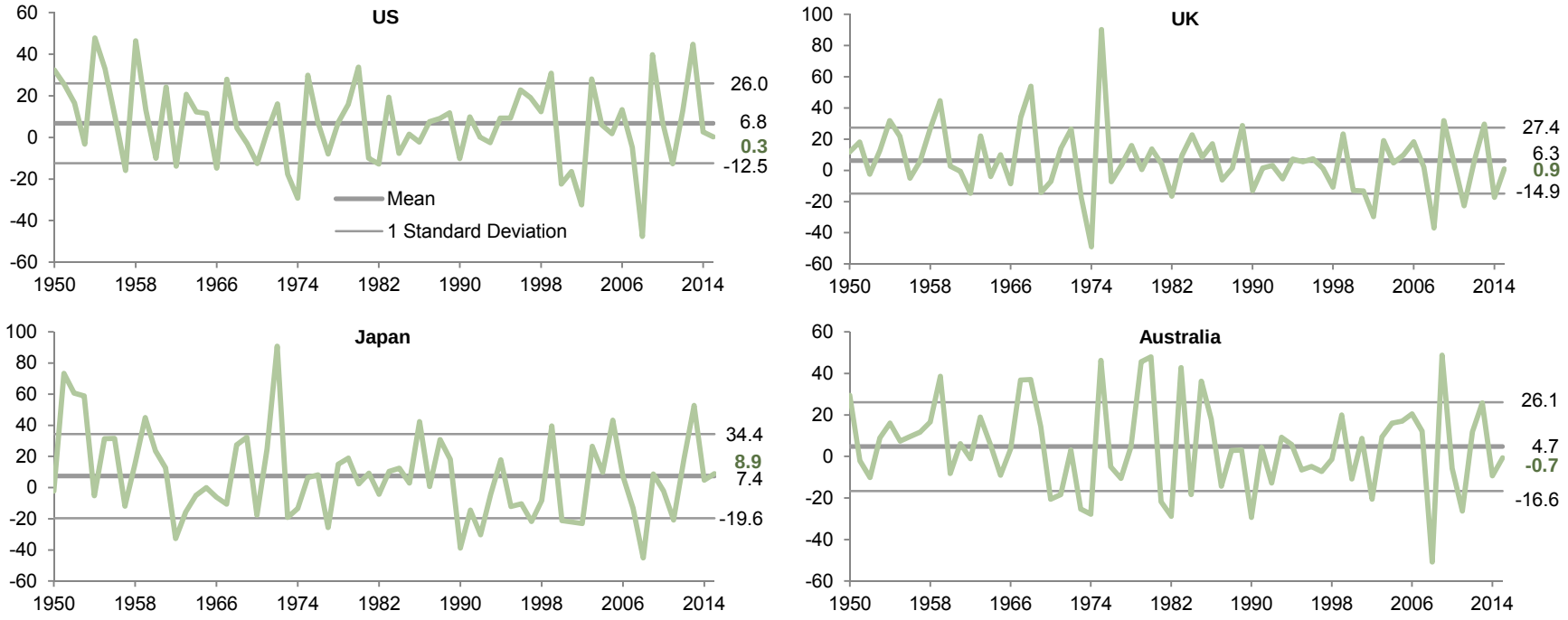
Sources: Global Financial Data, Inc. and Thomson Reuters Datastream.

The equity risk premium is volatile but mean reverting over time

Since 1950, equities have outperformed bonds by an average of ~5% to ~7% annually, depending on the region. This premium is quite volatile, particularly in periods of market stress. In the US, UK, and Australia, equities have outperformed bonds roughly two-thirds of the time. In Japan, that figure is lower at 55%.

Realized Annual Excess Returns of Equities Over Bonds

1950–2015 • Percent (%)



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.

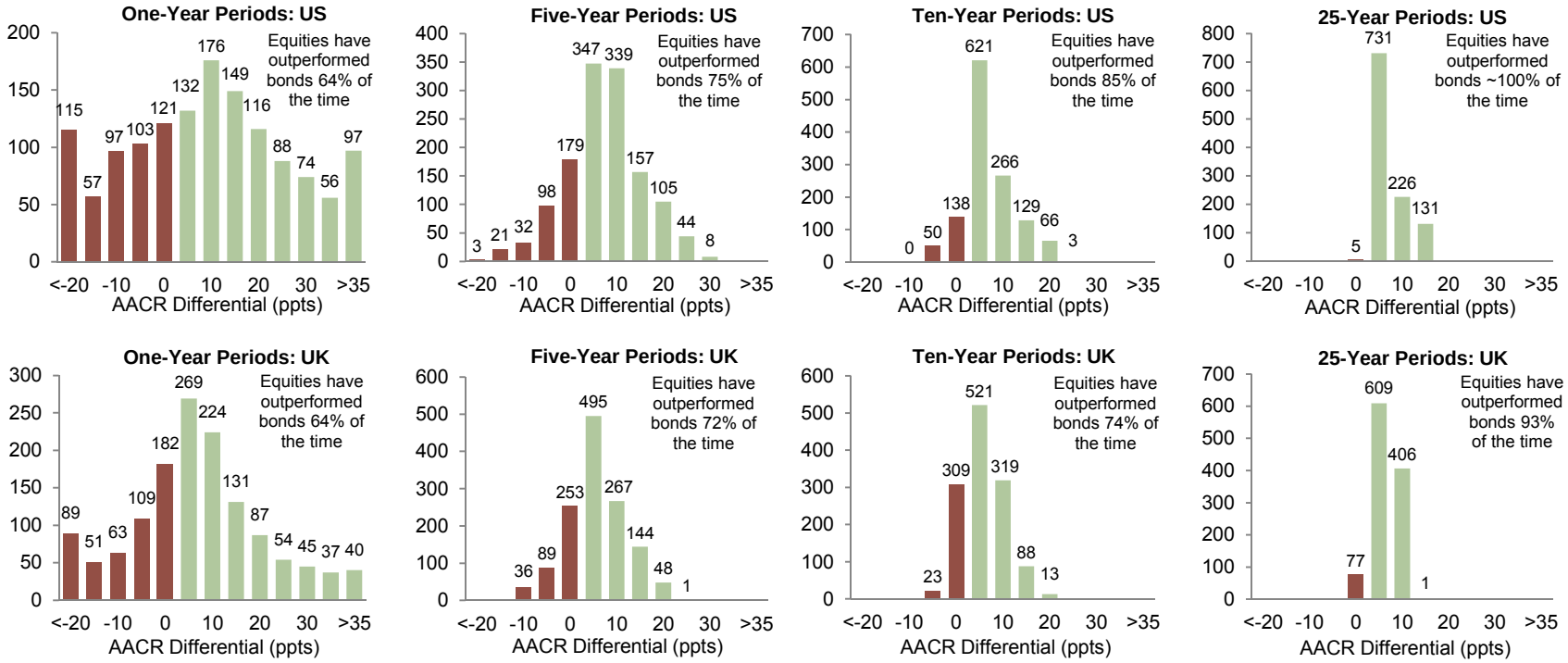
Note: Realized annual excess return is based on the geometric difference between equities and bonds.

Equities are consistently attractive relative to bonds over the long term

In the US, equities have outperformed bonds over the long term virtually 100% of the time. In the UK, the same strong outperformance occurs, at 93% of the time. Over five- and ten-year time horizons, excess equity returns tend to follow a normal distribution. However, over one-year time horizons, fat tails exist on both the left and right extremes, particularly in the US.

Excess Returns of Equities Over Bonds

1900–2015 • Number of Rolling Monthly Periods



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

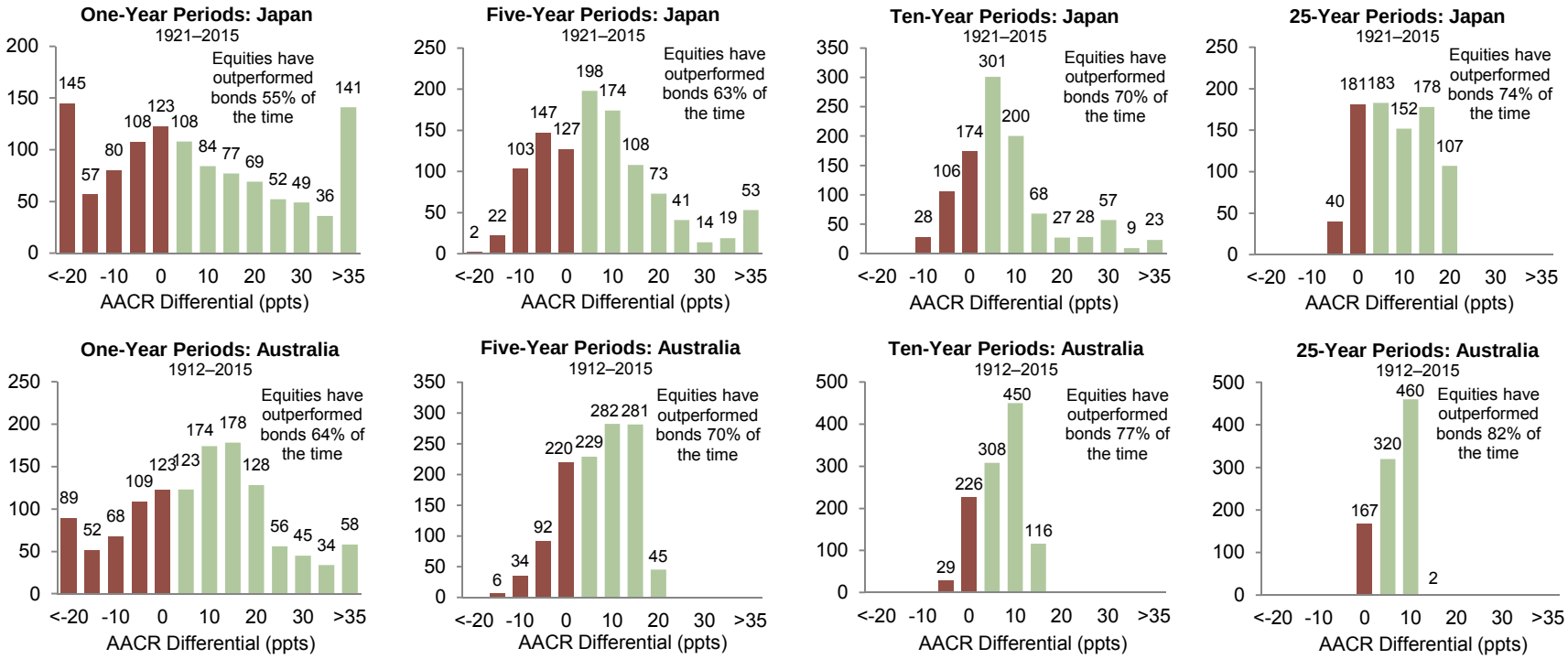
Notes: Buckets represent ranges of 5 ppts each with the label denoting the high end of the range, inclusive. For example, the "0" bucket corresponds to the number of rolling monthly periods in which the excess return of equities over bonds was greater than -5 but equal to or less than zero.

Equities are consistently attractive relative to bonds over the long term

Australian equity/bond excess returns have a similar profile to the UK and the US. Excess Japanese equity returns display greater upside and downside over the long term: over rolling monthly 25-year periods, equities underperformed bonds by more than 5 ppts nearly 5% of time and outperformed bonds by more than 20 ppts nearly 13% of the time, values not seen in other countries. Similarly, the left- and right-hand tails for one-year excess returns are much larger for Japan than for the other three countries.

Excess Returns of Equities Over Bonds

Number of Rolling Monthly Periods



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

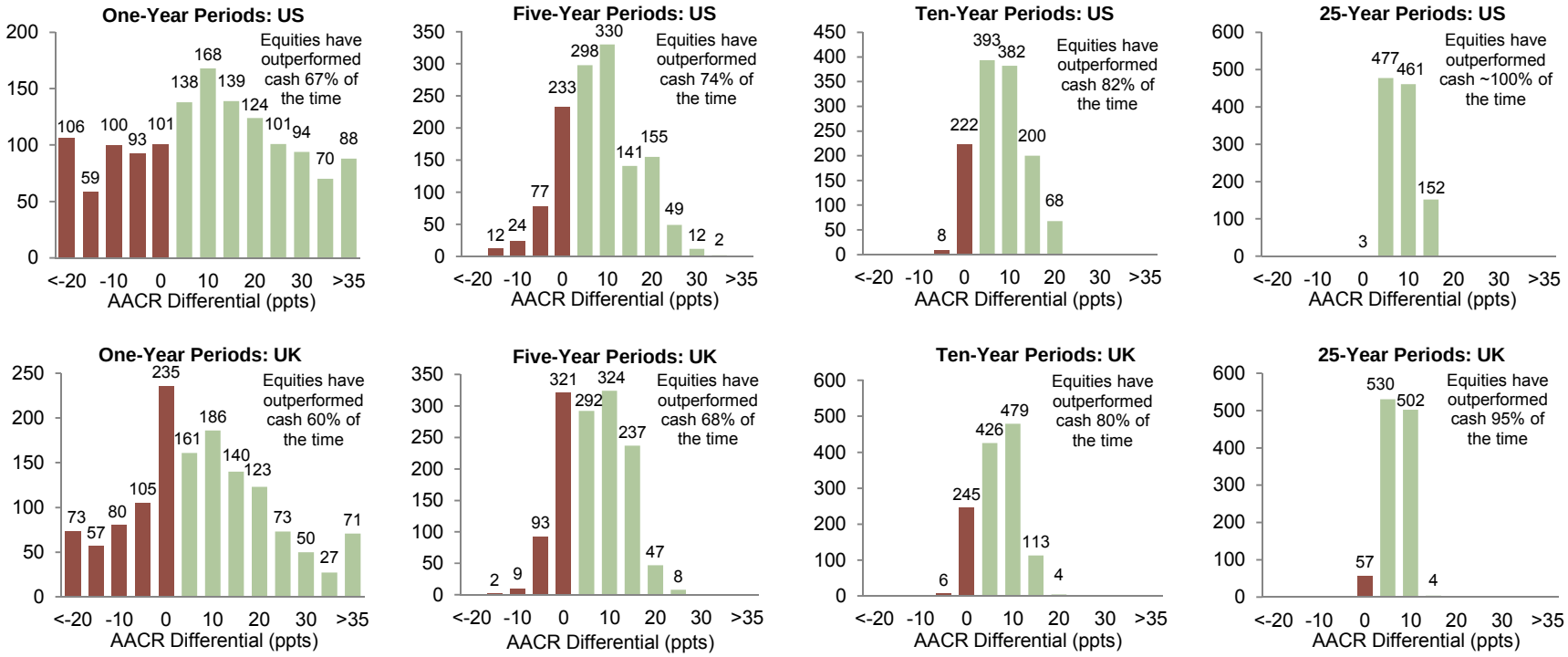
Notes: Buckets represent ranges of 5 ppts each with the label denoting the high end of the range, inclusive. For example, the "0" bucket corresponds to the number of rolling monthly periods in which the excess return of equities over bonds was greater than -5 but equal to or less than zero.

Equities are consistently attractive relative to cash over the long term

Excluding three periods in the first decade of the twentieth century, US equity returns have beaten cash in 100% of rolling monthly 25-year periods. In the UK, equity returns have exceeded cash returns in 95% of rolling monthly 25-year periods. This relationship weakens as the time frame shortens—over ten-year windows, US and UK equities outperform cash 82% and 80% of the time, respectively.

Excess Returns of Equities Over Cash

1900–2015 • Number of Rolling Monthly Periods



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

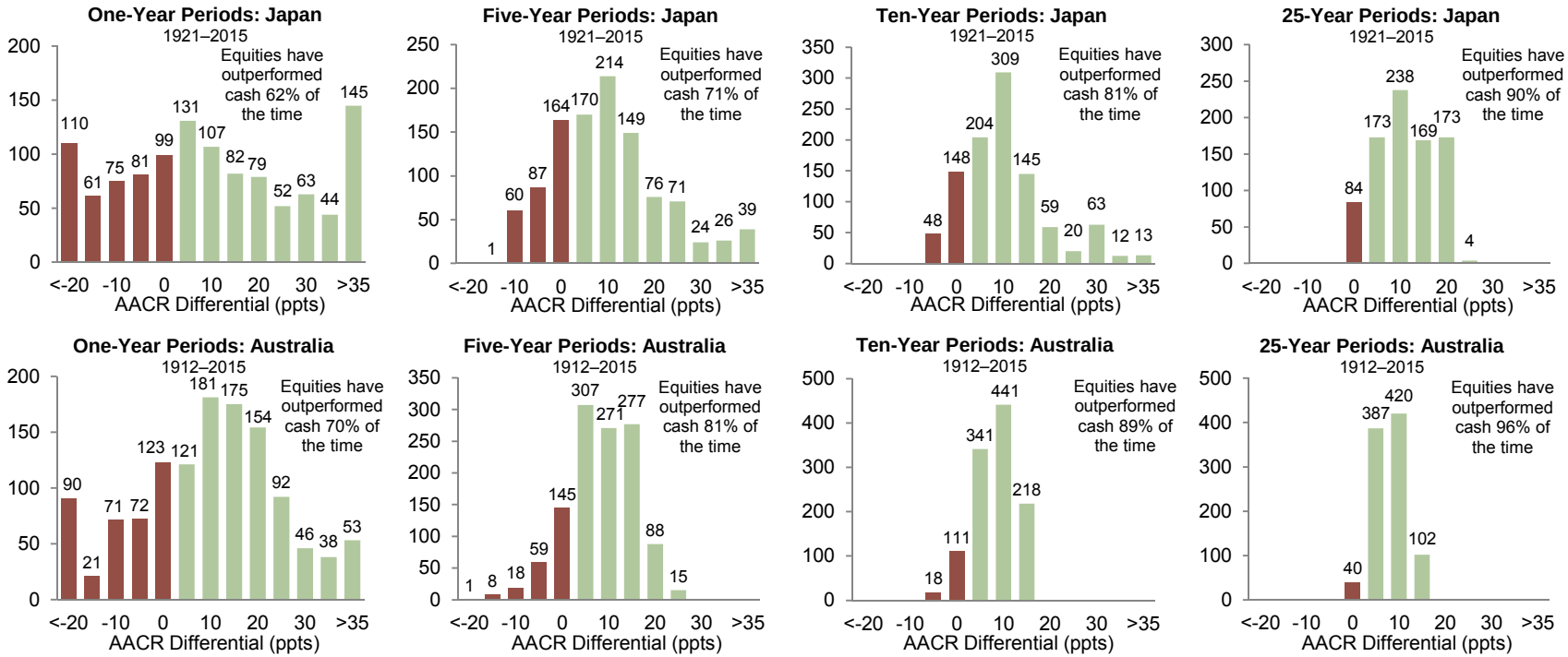
Notes: Buckets represent ranges of 5 ppts each with the label denoting the high end of the range, inclusive. For example, the "0" bucket corresponds to the number of rolling monthly periods in which the excess return of equities over cash was greater than -5 but equal to or less than zero.

Equities are consistently attractive relative to cash over the long term

Australian and Japanese equities have also beaten cash in at least 90% of the long-term periods. Japan again shows a distribution of excess equity returns over cash with greater upside and downside in both long and short time horizons.

Excess Returns of Equities Over Cash

Number of Rolling Monthly Periods



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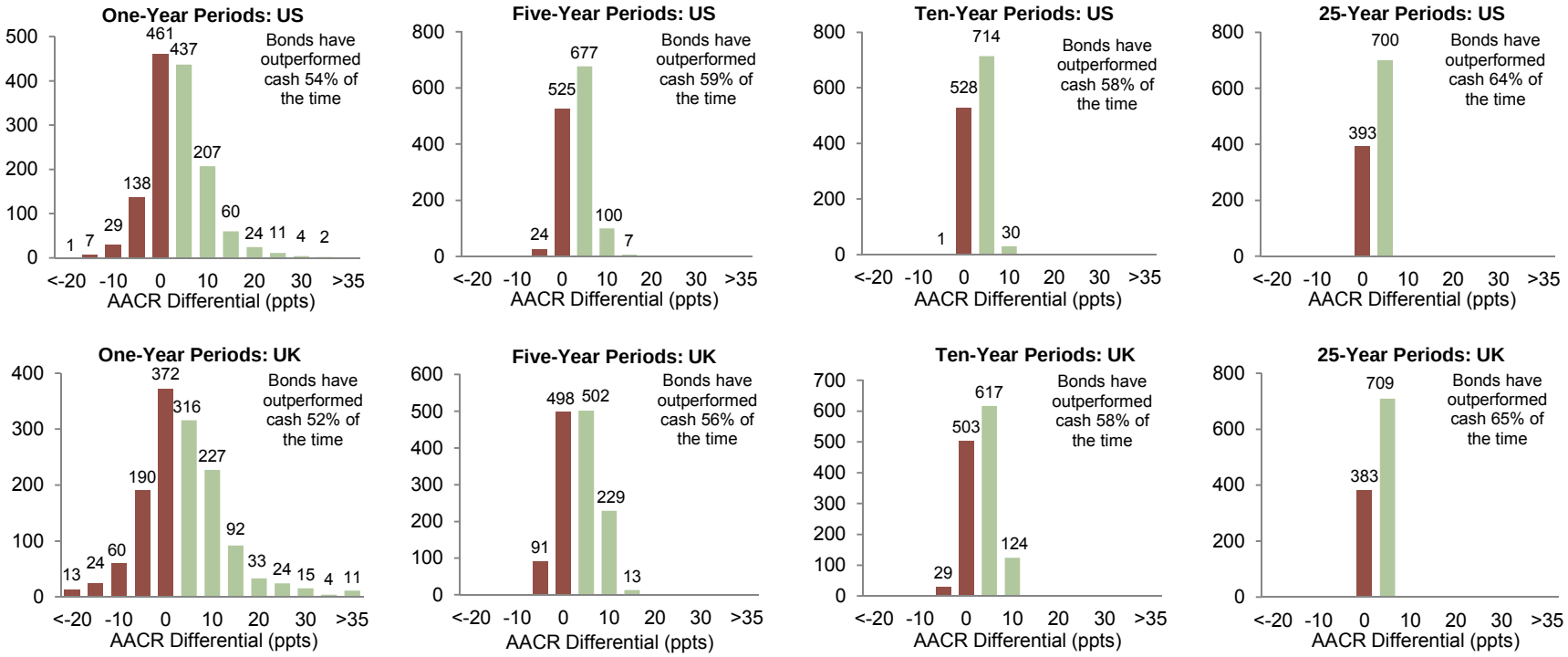
Notes: Buckets represent ranges of 5 ppts each with the label denoting the high end of the range, inclusive. For example, the "0" bucket corresponds to the number of rolling monthly periods in which the excess return of equities over cash was greater than -5 but equal to or less than zero.

Bonds' outperformance of cash varies dramatically by country

In the US and UK, bonds have outperformed cash about two-thirds of the time over 25-year rolling monthly time periods. However, in shorter term periods, this relationship is closer to 50/50. While cash faces constant inflationary risks, bonds face interest rate risk that can impair their performance relative to cash.

Excess Returns of Bonds Over Cash

1900–2015 • Number of Rolling Monthly Periods



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

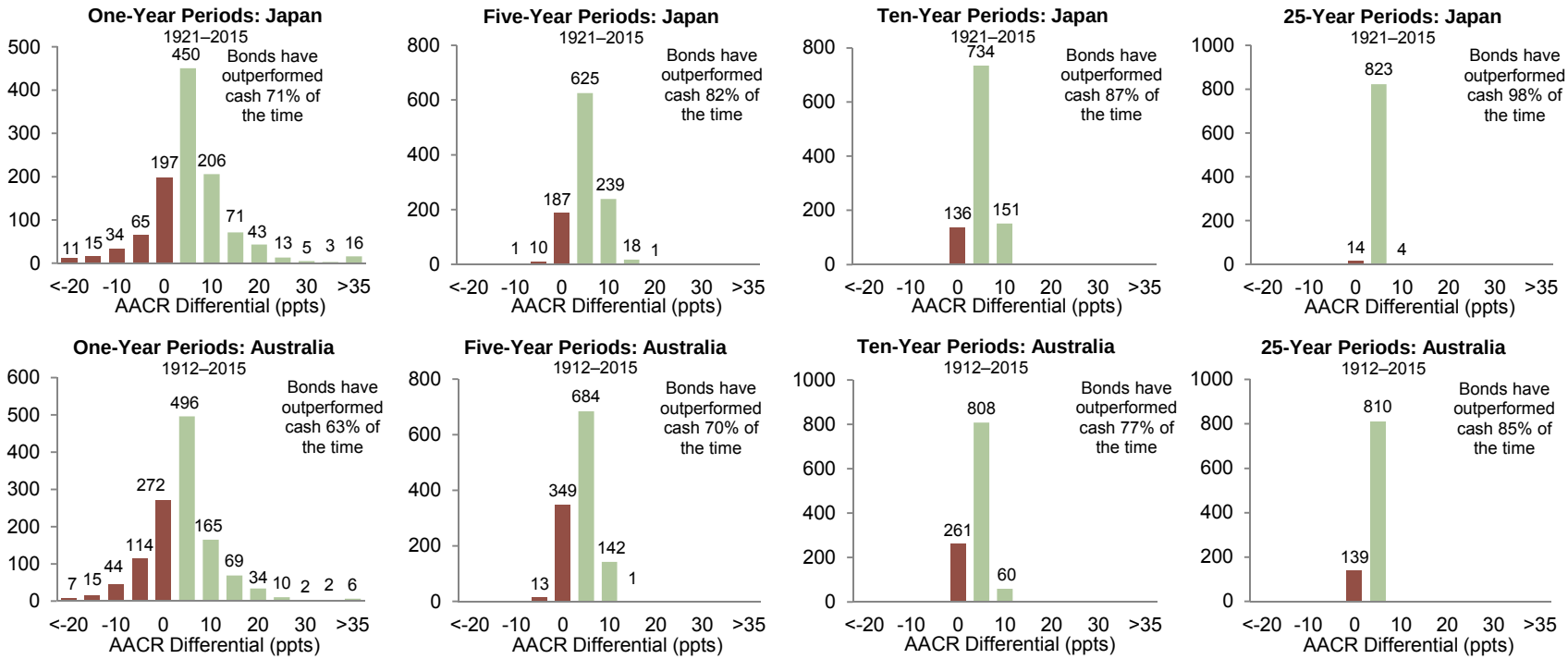
Notes: Buckets represent ranges of 5 ppts each with the label denoting the high end of the range, inclusive. For example, the "0" bucket corresponds to the number of rolling monthly periods in which the excess return of equities over cash was greater than -5 but equal to or less than zero.

Bonds' outperformance of cash varies dramatically by country

Japan and Australia show a different experience from the UK and US. In Japan, bonds have outperformed cash in nearly 100% of all 25-year rolling monthly observations. High inflationary periods coupled with paltry cash yields have driven this dispersion. Australian investors have also been compensated for risk over long-term periods, as bonds have outperformed cash 85% of the time over rolling 25-year periods.

Excess Returns of Bonds Over Cash

Number of Rolling Monthly Periods



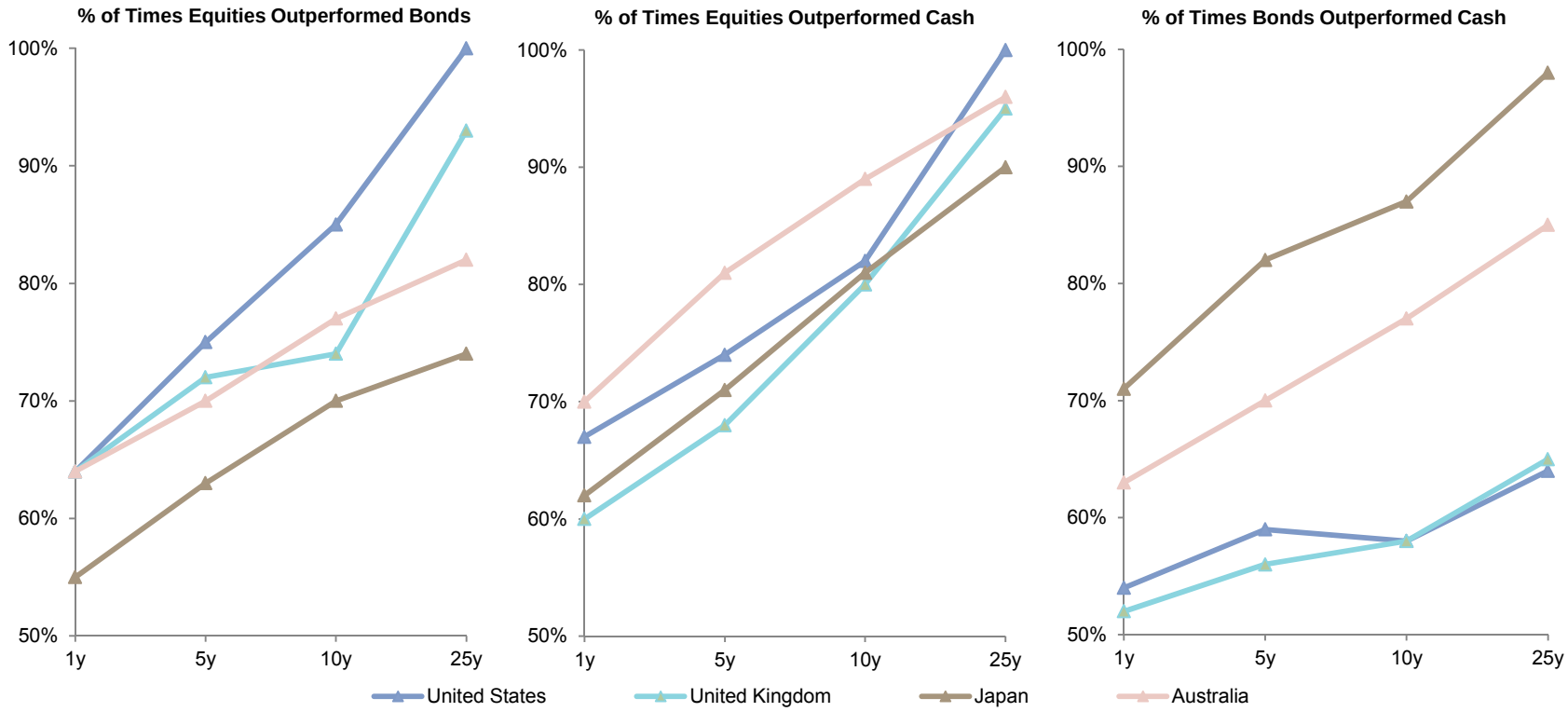
Sources: Global Financial Data, Inc. and Thomson Reuters Datastream.

Notes: Buckets represent ranges of 5 ppts each with the label denoting the high end of the range, inclusive. For example, the "0" bucket corresponds to the number of rolling monthly periods in which the excess return of equities over cash was greater than -5 but equal to or less than zero.

Risk assets outperform more frequently in the long run

The benefits of holding equities over bonds and cash are clear in the long run. In the US, equities outperformed bonds and cash in nearly 100% of rolling 25-year periods since 1900. In other regions, the outperformance is strong, but not a certainty. The relationship between bonds and cash, however, is not as clear. Shifting macroeconomic factors—particularly interest rates and inflation—affect the relative returns of bonds versus cash over time.

Relative Performance of Equities, Bonds, and Cash Across Regions
1900–2015

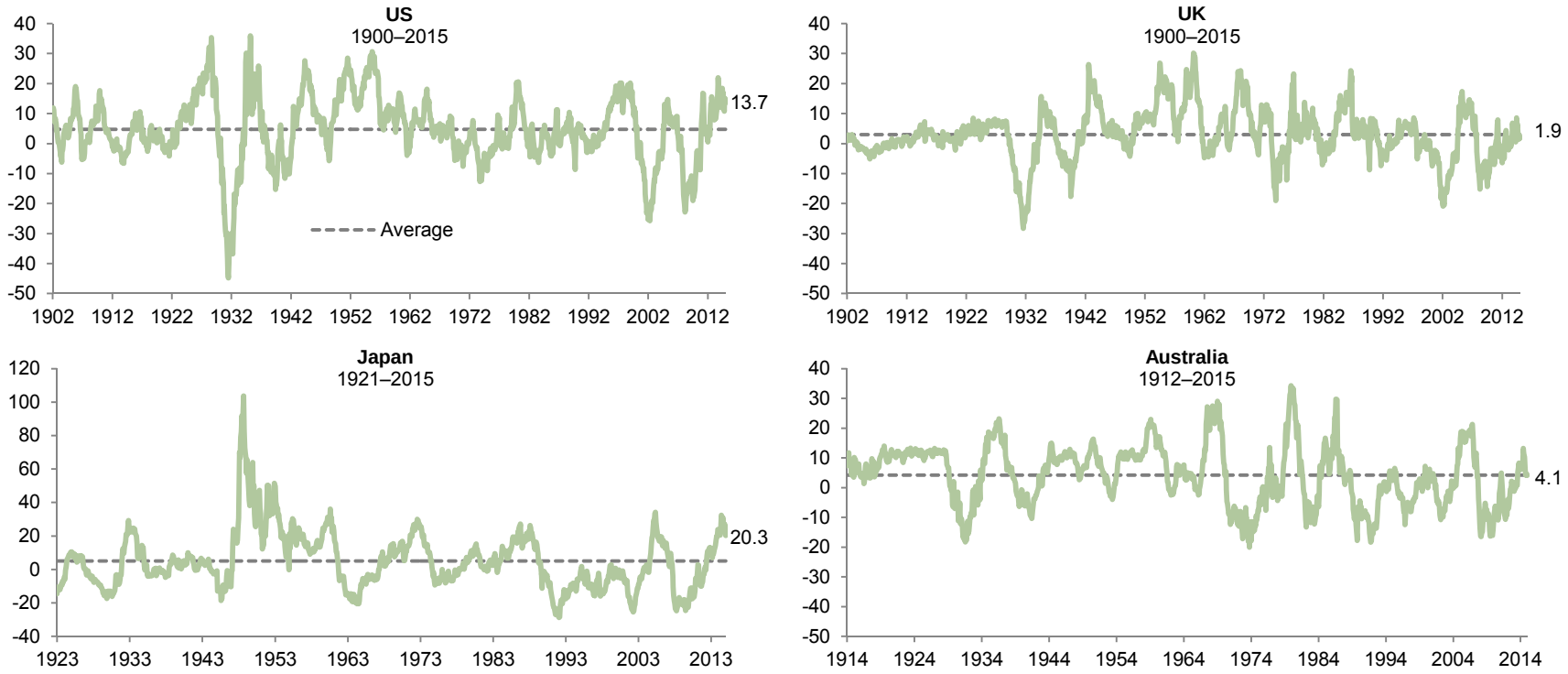


Sources: FTSE International Limited, Global Financial Data, Inc., MSCI Inc., Standard & Poor's, and Thomson Reuters Datastream. MSCI data provided "as is" without any express or implied warranties.

Historically, equities have outperformed bonds by a wide margin

Over rolling three-year periods, global equities have outperformed bonds by an average annualized margin of between 3.0% (UK) and 5.0% (Japan). Compounded over 115 years, a 3.0% margin equates to an equity return 27 times that of bonds. That said, bonds can outperform equities for a sustained period of time. In the US, bonds have slightly outperformed equities on a cumulative basis since 1997. In Japan, bonds have outperformed equities on a cumulative basis since early 1978.

AACR of Three-Year Rolling Return Differential Between Equity and Bond Returns

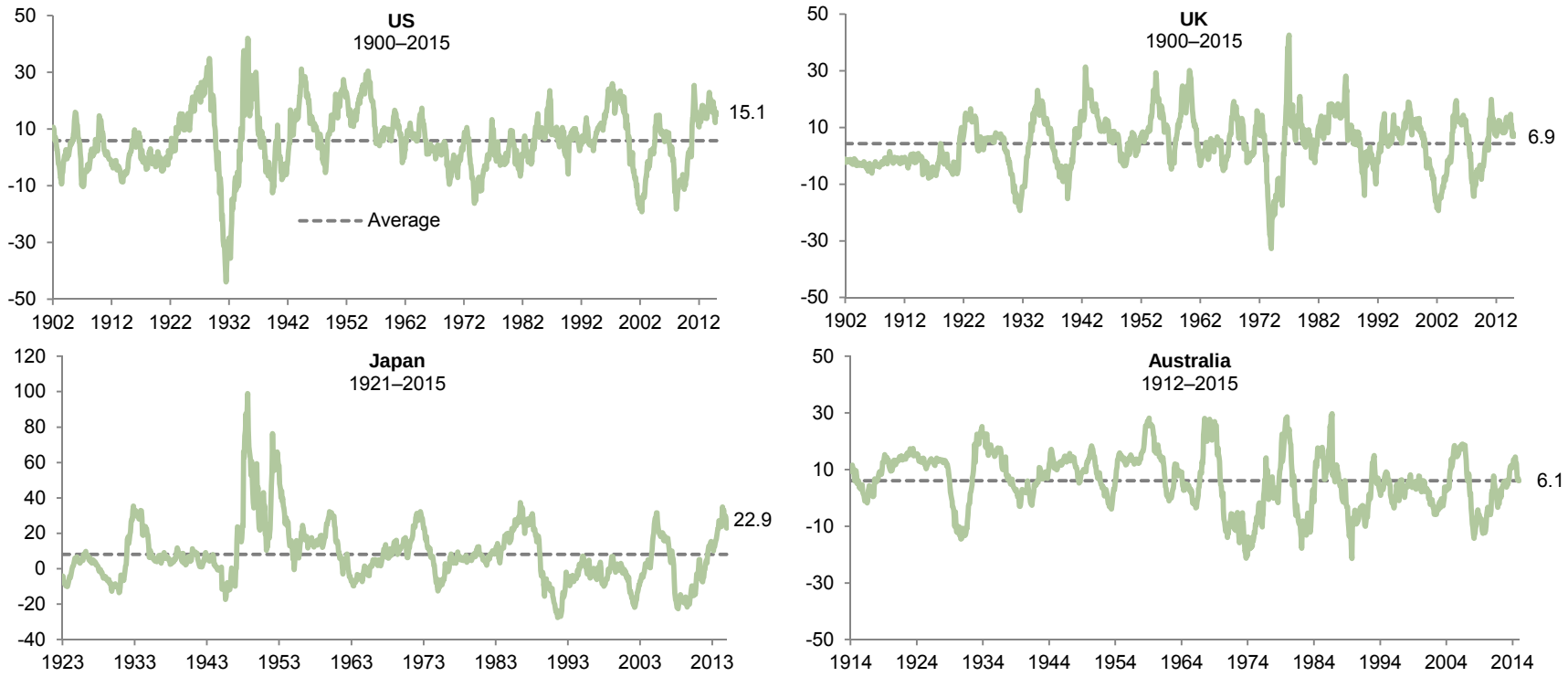


Sources: FTSE International Limited, Global Financial Data, Inc., MSCI Inc., Standard & Poor's, and Thomson Reuters Datastream. MSCI data provided "as is" without any express or implied warranties.

Historically, equities have also outperformed cash by a wide margin

The difference between equity and cash returns is even greater, ranging from an average annualized margin of 4.4% (UK) to 8.2% (Japan). As with bonds, cash can outperform equities, although the timeframes tend to be shorter due to the lower yield (and hence returns) associated with cash versus bonds.

AACR of Three-Year Rolling Return Differential Between Equity and Cash Returns

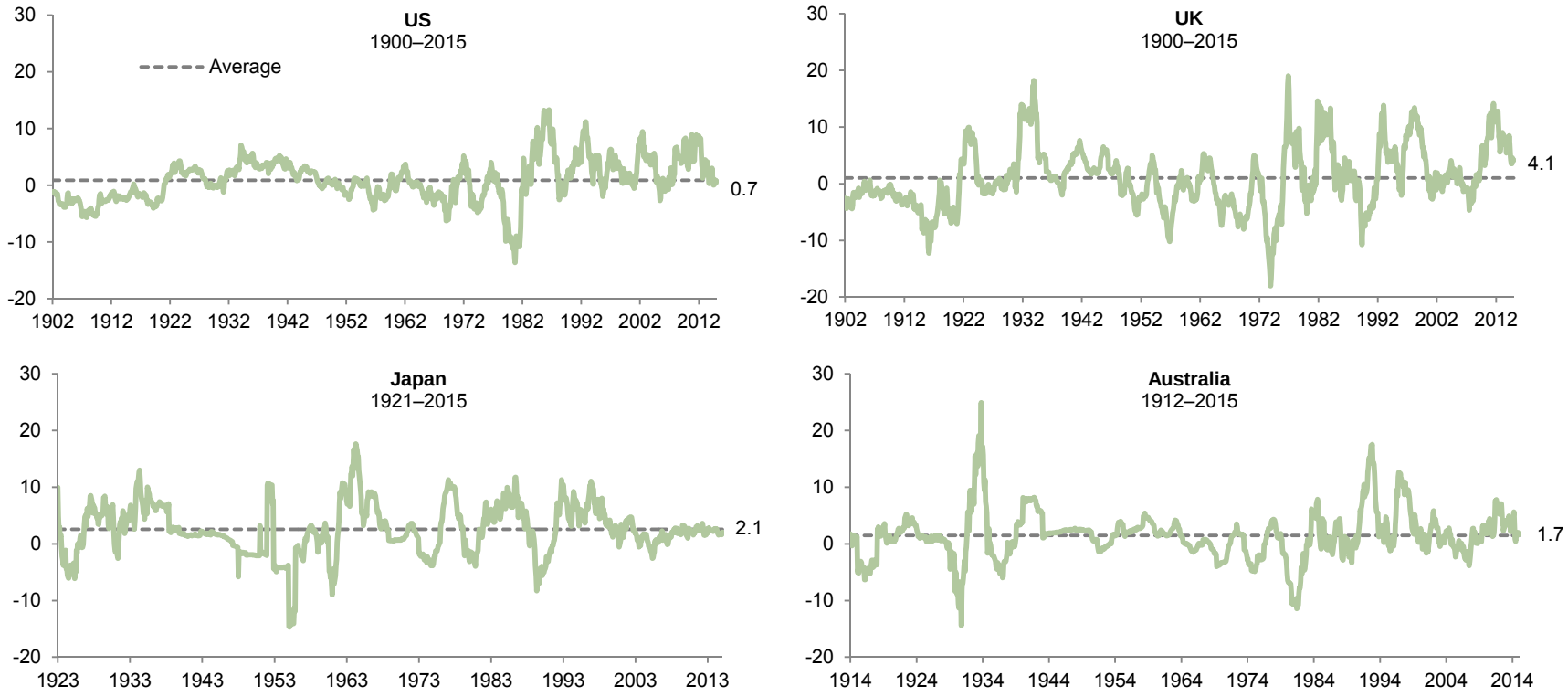


Sources: FTSE International Limited, Global Financial Data, Inc., MSCI Inc., Standard & Poor's, and Thomson Reuters Datastream. MSCI data provided "as is" without any express or implied warranties.

Bonds have outperformed cash, but less dramatically

Over rolling three-year periods, bonds have outperformed cash by an average annualized margin of between 0.9% (US) and 2.6% (Japan). However, cash can outperform bonds for sustained periods of time, particularly driven by unexpected inflation and rising rates.

AACR of Three-Year Rolling Return Differential Between Bond and Cash Returns



Sources: Global Financial Data, Inc. and Thomson Reuters Datastream.

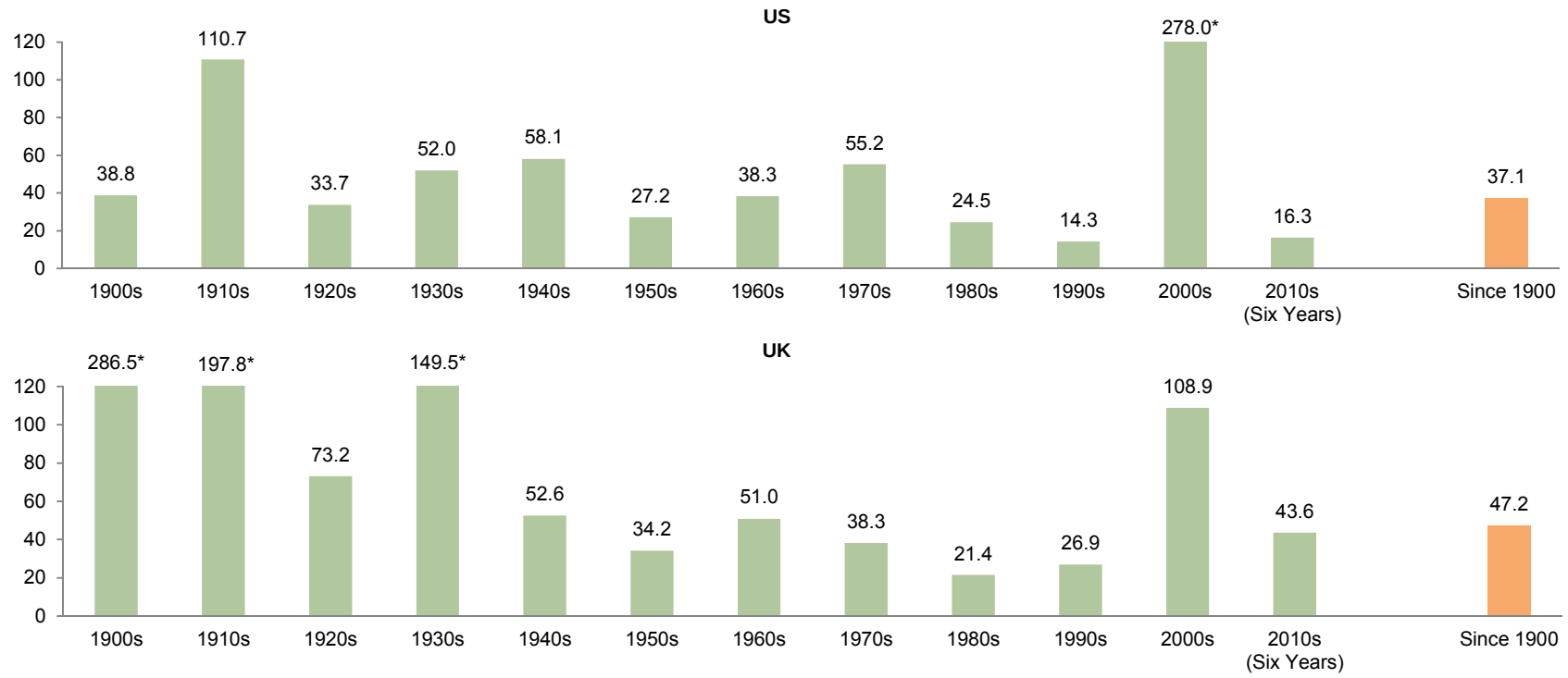
Components of Equity Returns

The outlook for future equity returns is a function of earnings growth, dividends, and changes in valuations, with the first two the most important over the very long term as the impact of multiple expansion is negligible given its mean-reverting nature. While dividends may vary from year to year, they are the only contributor to returns that is always positive. Thus, the compounding of dividends provides a steady stream of income when compared to the volatile nature of earnings and market cycles. However, as the exhibits in this section demonstrate, some markets have historically been more reliant on dividends for returns than others.

Dividends are an important component of total return

In the US and UK, over one-third to nearly one-half of nominal returns has come from the reinvestment of dividends since 1900. In a number of decades, dividends were the only driver of positive total returns, with price declines seen throughout the ten-year period.

Dividend Income as a Percentage of Total Return
1900–2015 • Percent (%)

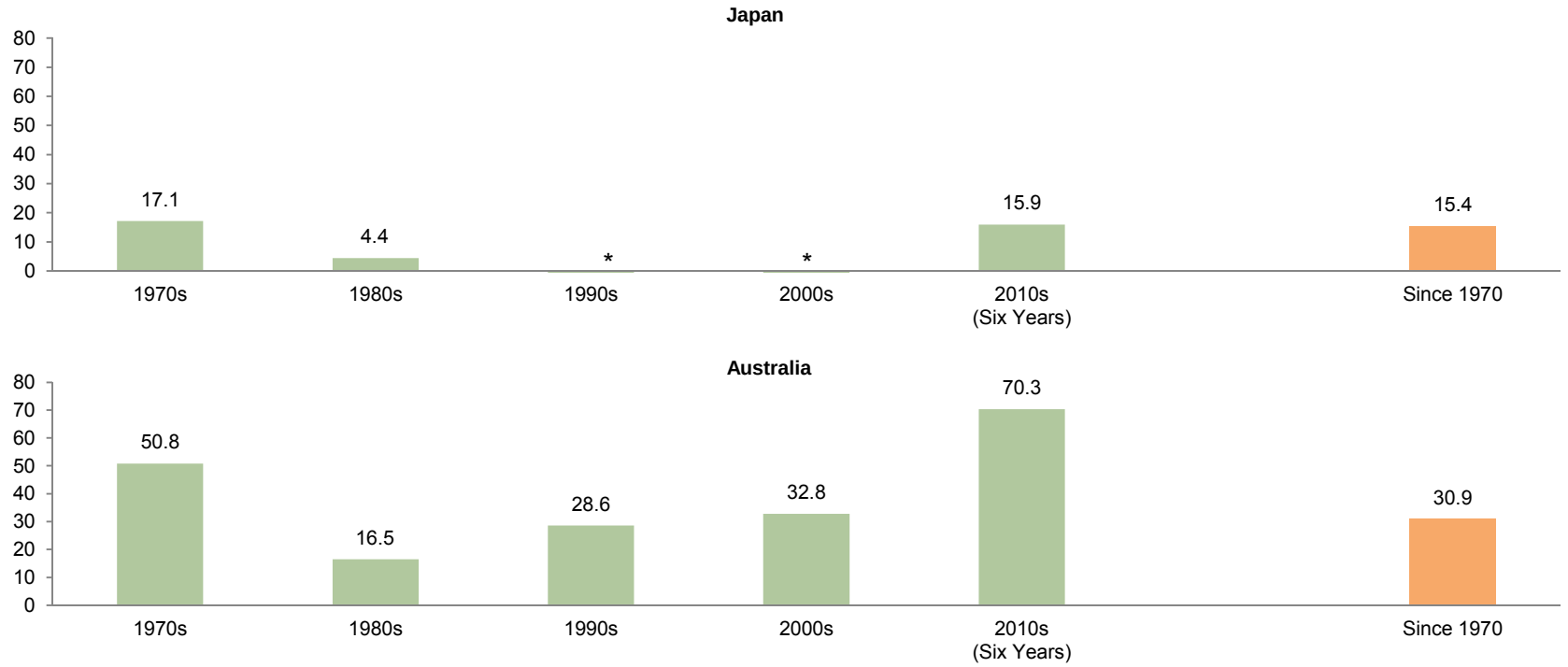


Sources: FTSE International Limited, Global Financial Data, Inc., Standard & Poor's, and Thomson Reuters Datastream.
* Graph capped at 120% for scale purposes.

Dividends are an important component of total return

Since 1970, dividends have contributed nearly one-third of the total nominal return of Australian equities. Low dividend yields in Japan have made them less impactful on total Japanese returns. During the 1990s and 2000s, Japanese dividends could not overcome the declines seen in equity prices, resulting in negative total returns for those decades.

Dividend Income as a Percentage of Total Return
1970–2015 • Percent (%)

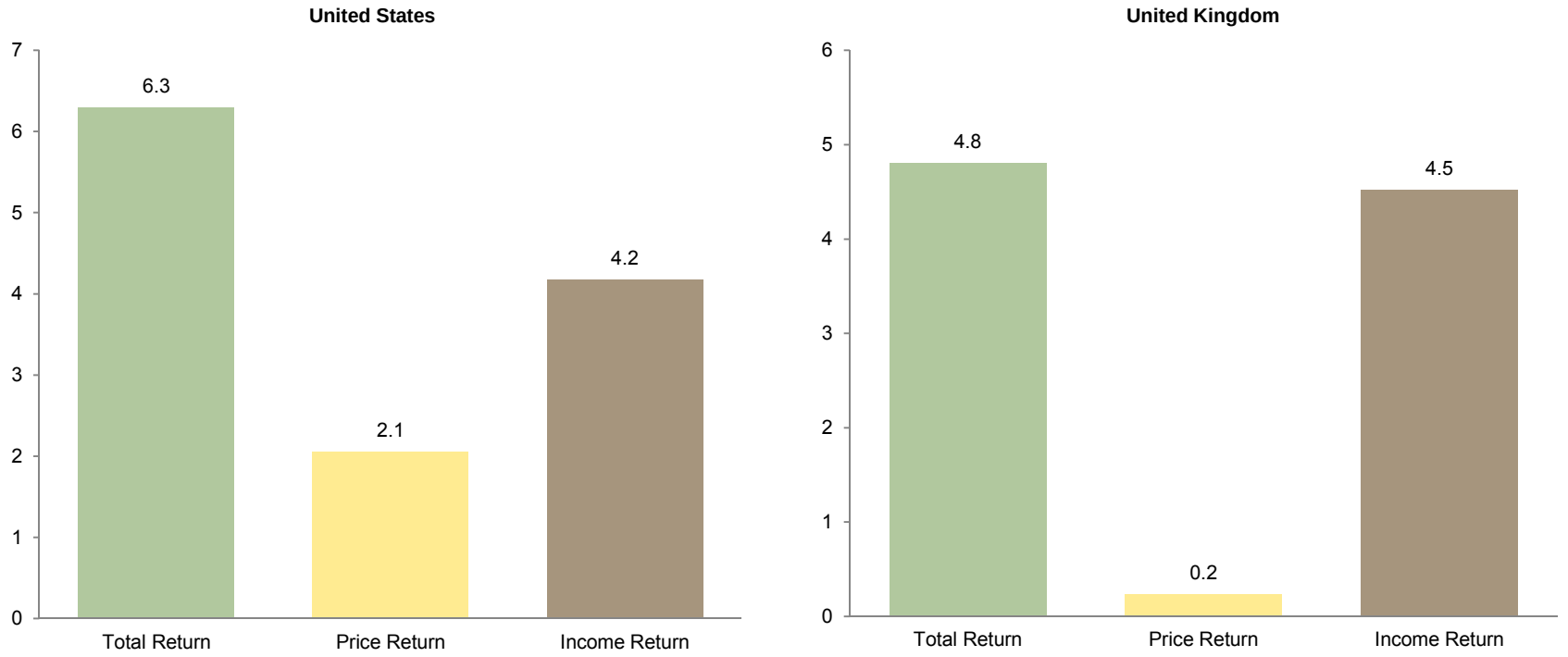


Sources: MSCI Inc. and Thomson Reuters Datastream. MSCI data provided "as is" without any express or implied warranties.
* Average quarterly dividend income for Japan for the 1990s and 2000s was 0.16% and 0.27%, respectively, but average quarterly total returns for each decade were negative.

The compounding of dividends noticeably boosts total returns

Without reinvesting dividends, the S&P 500 would only have returned 2.1% (real) per year since 1900 versus 6.3% when including dividends. In the UK, dividends have had an even more pronounced effect, contributing over 90% of the real AACR of equities.

Real Average Annual Compound Returns of Equities
1900–2015 • Percent (%)

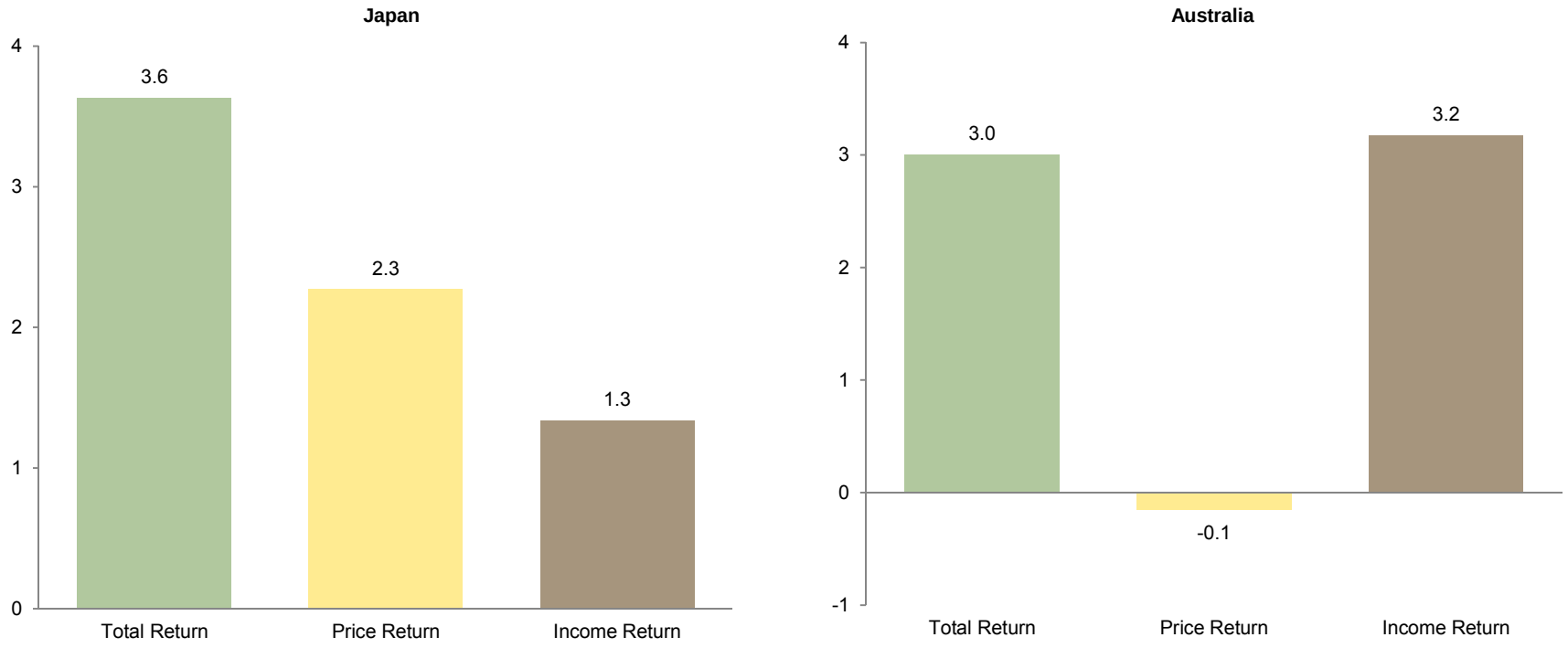


Sources: FTSE International Limited, Global Financial Data, Inc., Standard & Poor's, and Thomson Reuters Datastream.
Note: Data for United Kingdom start in second quarter 1900.

The compounding of dividends noticeably boosts total returns

Of the four developed countries we analyzed, only in Japan (where our data begin in 1970) have real price returns outstripped dividend returns. Japanese dividend yields spent much of the 1980s, 1990s, and 2000s below 1.0%. In Australia, cumulative real price returns were slightly negative over the last 46 years, with all positive real returns attributable to dividends.

Real Average Annual Compound Returns of Equities
1970–2015 • Percent (%)

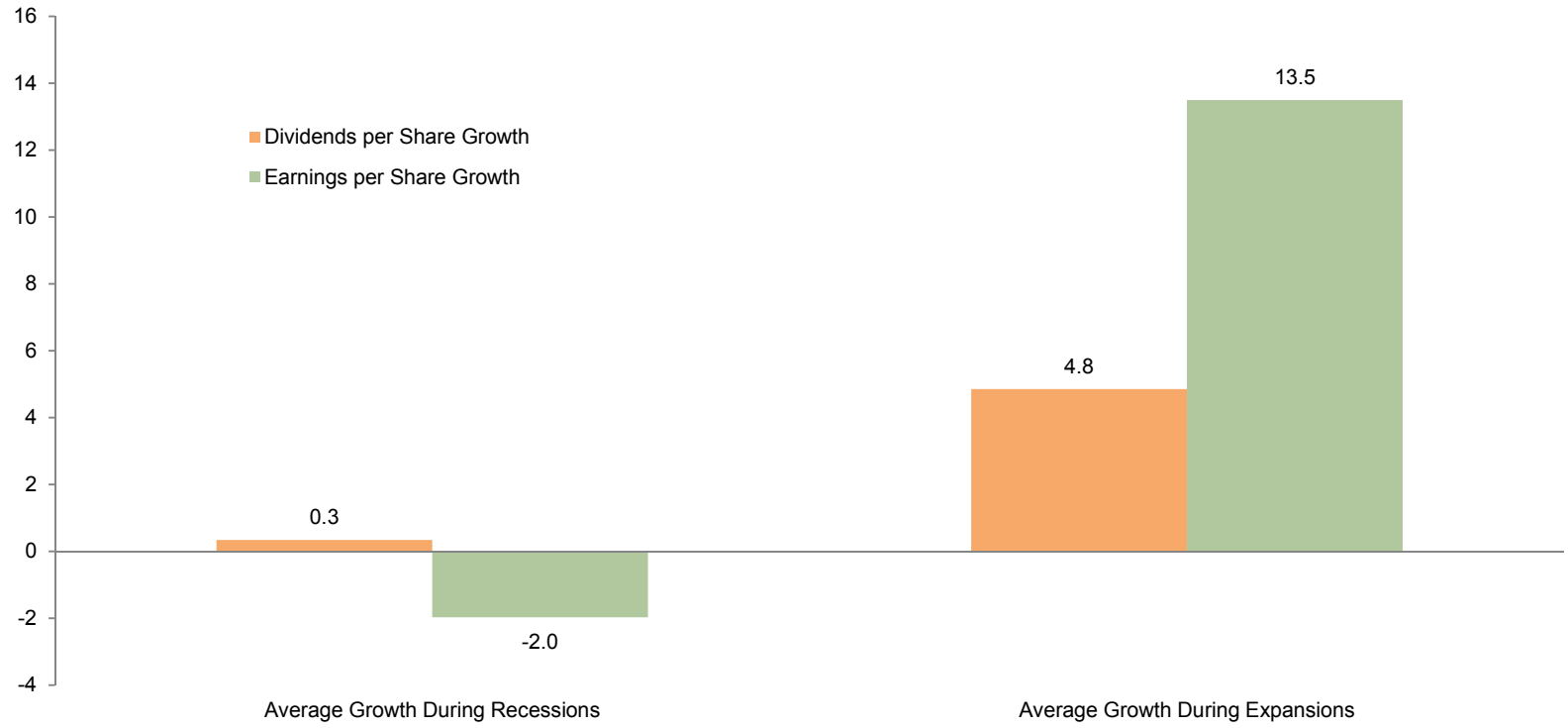


Sources: MSCI Inc. and Thomson Reuters Datastream. MSCI data provided "as is" without any express or implied warranties.

Dividends provide an extra boost during recessions or economic downturns

During periods of economic contraction, earnings generally decline first, preceding any decline in dividends, a reactionary move as companies adjust to diminishing fiscal health. Since 1900, US companies have managed to maintain a net positive average dividend growth rate during recessions, albeit one much lower than that seen during economic expansions.

S&P 500 Earnings per Share and Dividends per Share Year-Over-Year Change
1900–2015 • Percent (%)



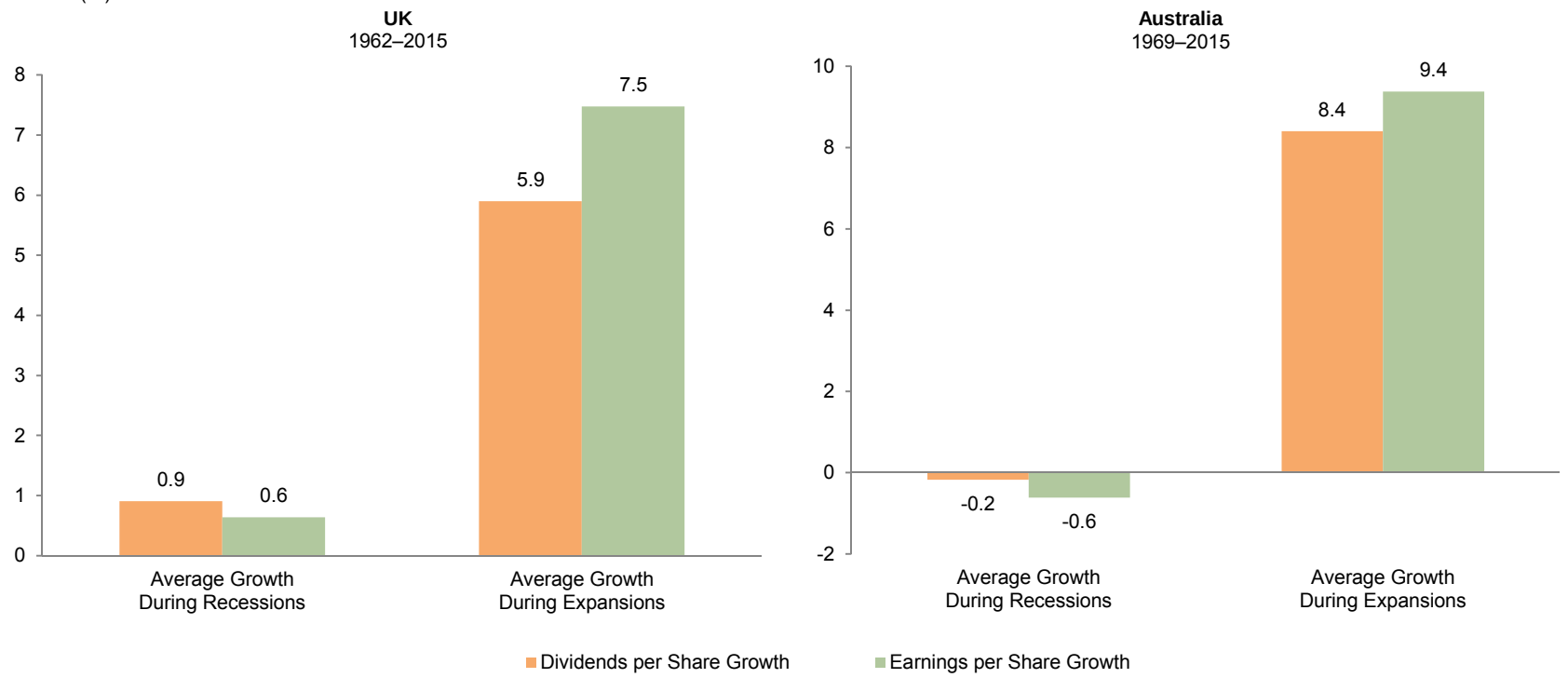
Sources: Ned Davis Research, Inc., Standard & Poor's, and *The Wall Street Journal.*

Dividends provide an extra boost during recessions or economic downturns

UK companies have also maintained an average net positive dividend growth rate during both expansionary and contractionary periods since 1962. Our data for Australia begin in 1969 and show an average decline in both annual dividend and earnings per share growth during recessionary periods.

Earnings per Share and Dividends per Share Year-Over-Year Change

Percent (%)

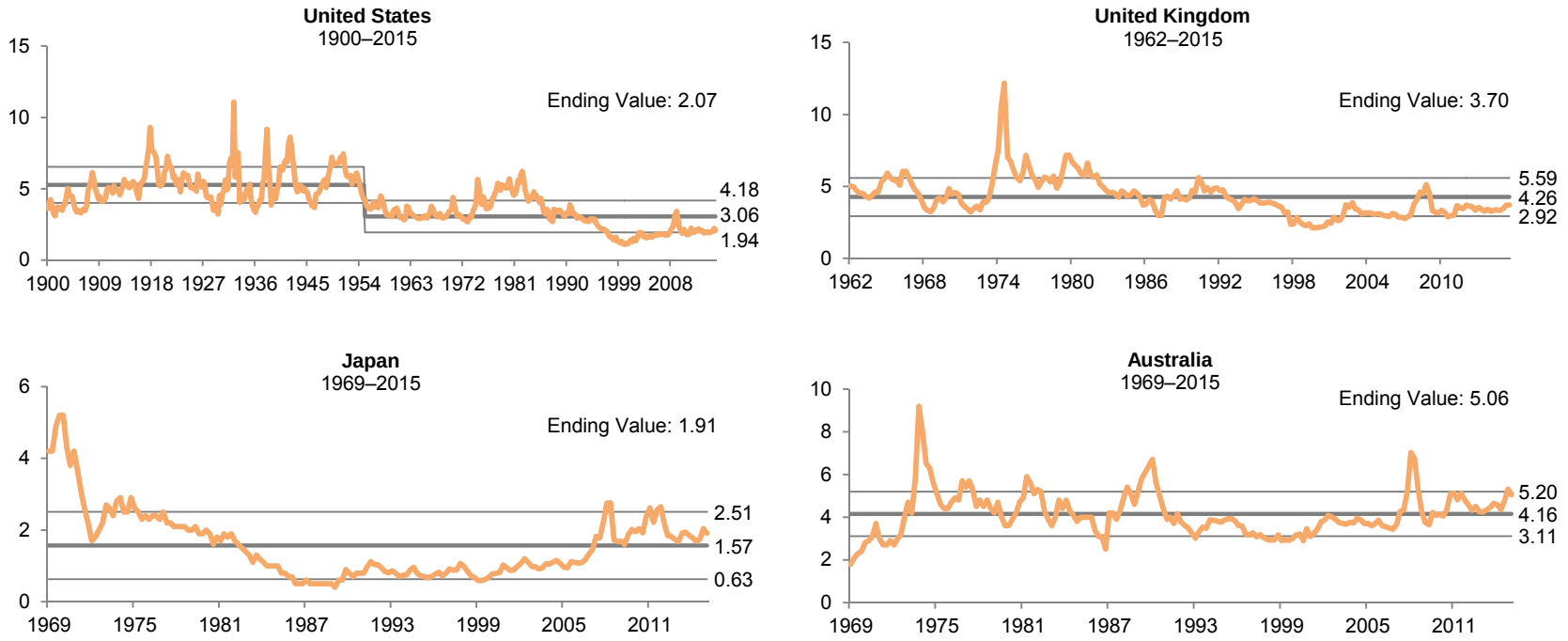


Sources: FTSE International Limited, MSCI Inc., and Thomson Reuters Datastream. MSCI data provided "as is" without any express or implied warranties.

Current dividend yields are in line with more recent history

US and UK dividend yields are both nearly 1 standard deviation below their averages since 1955 and 1962, respectively, although their current levels are in line with their more recent 20-year averages. After spending the better part of two decades below 1%, Japanese yields began to rise in the mid-2000s and are now slightly above their long-term average. Outside of a blip in 2008, Australian dividend yields have largely been range bound for the last 20+ years.

Trailing 12-Month Dividend Yields



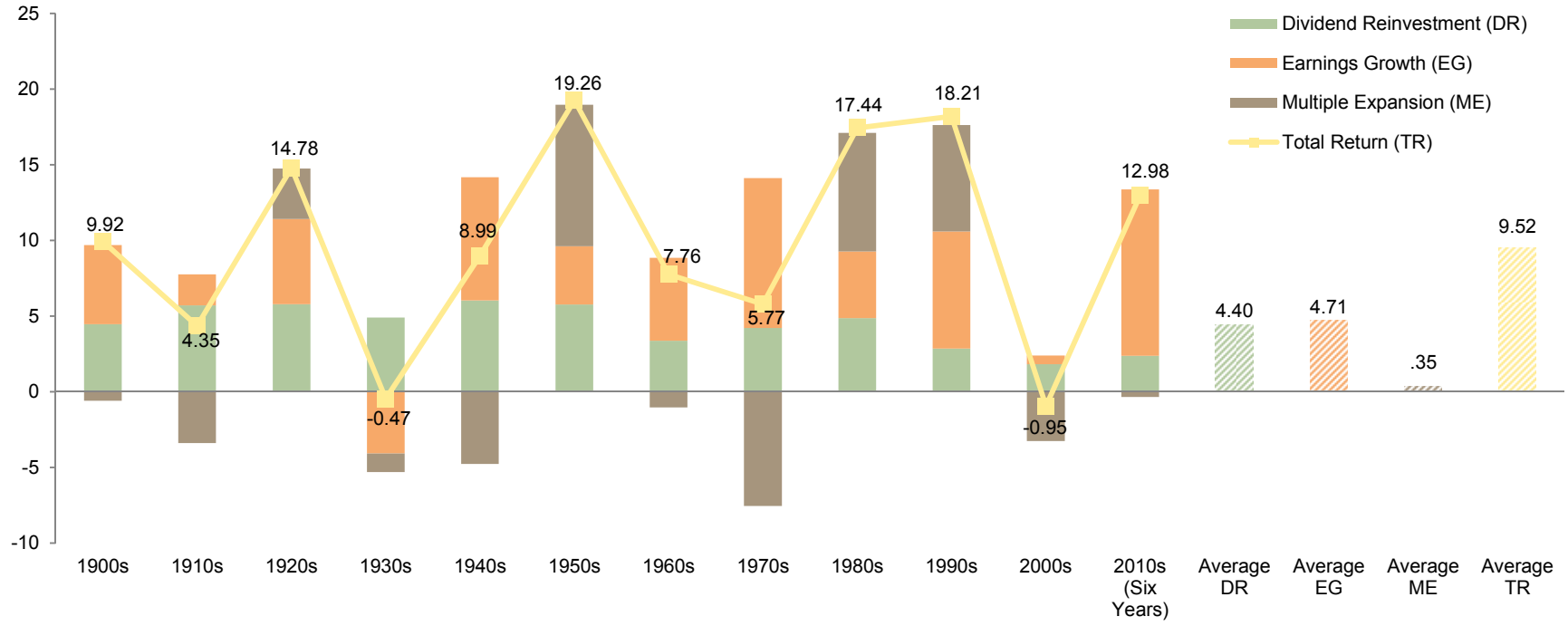
Sources: FTSE International Limited, Global Financial Data, Inc., MSCI Inc., Standard & Poor's, Thomson Reuters Datastream, and *The Wall Street Journal.* MSCI data provided "as is" without any express or implied warranties.
Note: For the United States, the calculated mean from 1900 to 1954 is 5.40 with 1 standard deviation above and below at 6.69 and 4.11, respectively.

Impact of earnings growth and multiple changes less consistent than dividends

Dividends remain the most consistent positive influence on total returns, while the importance of earnings has swung wildly. Although multiple expansion has played a role in driving returns, over the long term the impact becomes negligible as multiple expansion is a mean-reverting time series. In the US, dividends (4.4%) have contributed nearly as much to total annualized returns as earnings growth has (4.7%).

Breakdown of Total Return AACR Over Time: US

1900–2015 • Percent (%)

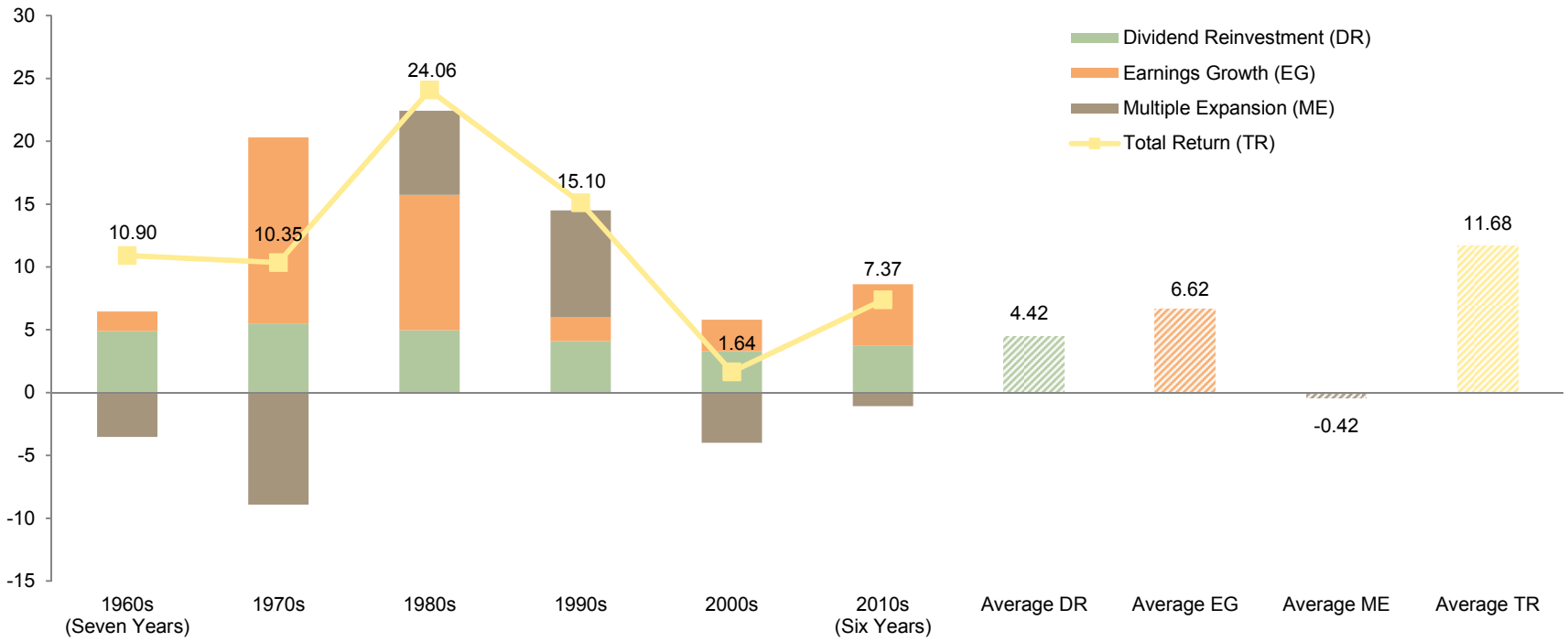


Sources: Global Financial Data, Inc., Standard & Poor's, and *The Wall Street Journal.*
Note: Figures will not sum exactly to total return calculation due to the effect of combining cross terms.

Impact of earnings growth and multiple changes less consistent than dividends

UK dividends have consistently contributed 3.3 ppts to 5.5 ppts of return annually each decade. Multiple contraction has reduced returns in three different decades as well as the most recent period.

Breakdown of Total Return AACR Over Time: UK
1963–2015 • Percent (%)

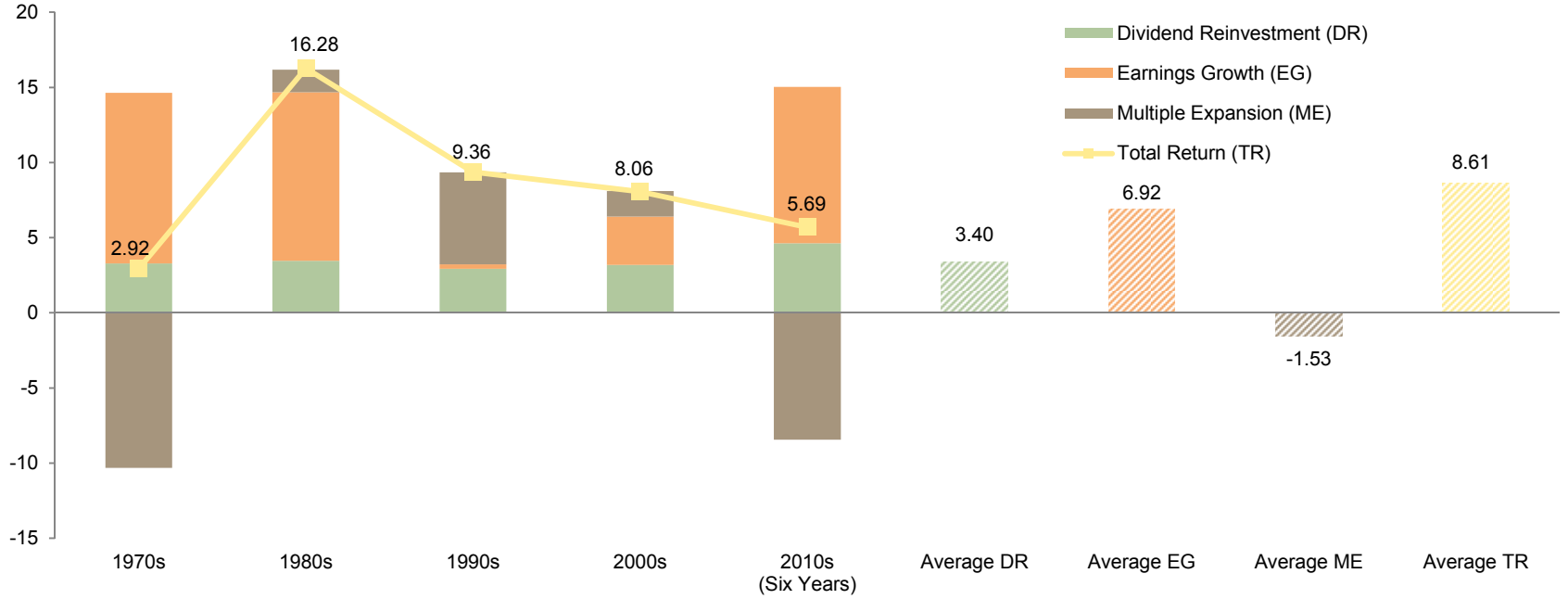


Sources: FTSE International Limited, Global Financial Data, Inc., and Thomson Reuters Datastream.
Note: Figures will not sum exactly to total return calculation due to the effect of combining cross terms.

Impact of earnings growth and multiple changes less consistent than dividends

In Australia, dividends and earnings growth have consistently helped deliver positive returns measured over each period. Since 1970, dividends have steadily contributed 2.9% to 3.5% annually of each decade's total return. For the six years so far this decade, dividends have contributed 4.6%.

Breakdown of Total Return AACR Over Time: Australia
1970–2015 • Percent (%)



Sources: MSCI Inc. and Thomson Reuters Datastream. MSCI data provided "as is" without any express or implied warranties.
Note: Figures will not sum exactly to total return calculation due to the effect of combining cross terms.

Equity Mean Reversion

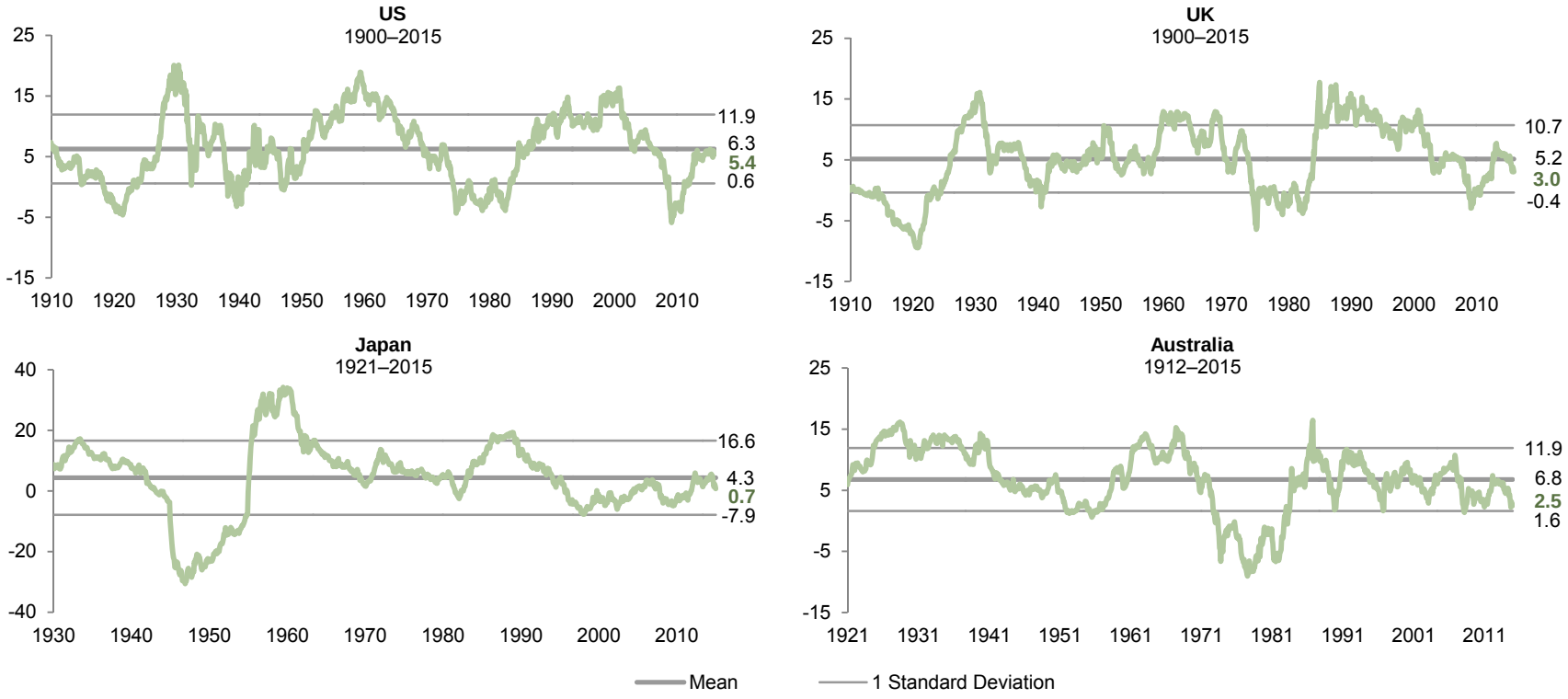
Equity returns tend to revert to a long-term average over time, although the process of mean reversion is not smooth and the impact of inflation matters more in some countries than others. Still, across regions, periods of underperformance relative to the mean follow periods of outperformance and vice versa. While this pattern is evident over shorter time horizons, it is much more distinct over long time horizons.

Real returns revert to their long-term averages over time

Rolling returns exhibit the qualities of a mean-reverting time series, though such reversion can be over very short or quite long periods. At the end of 2015, rolling monthly real ten-year AACRs for the UK and US were slightly below their historical averages, while the AACRs for Australia and Japan were much further below average.

Rolling Monthly Total Return Real Ten-Year AACR

Percent (%)

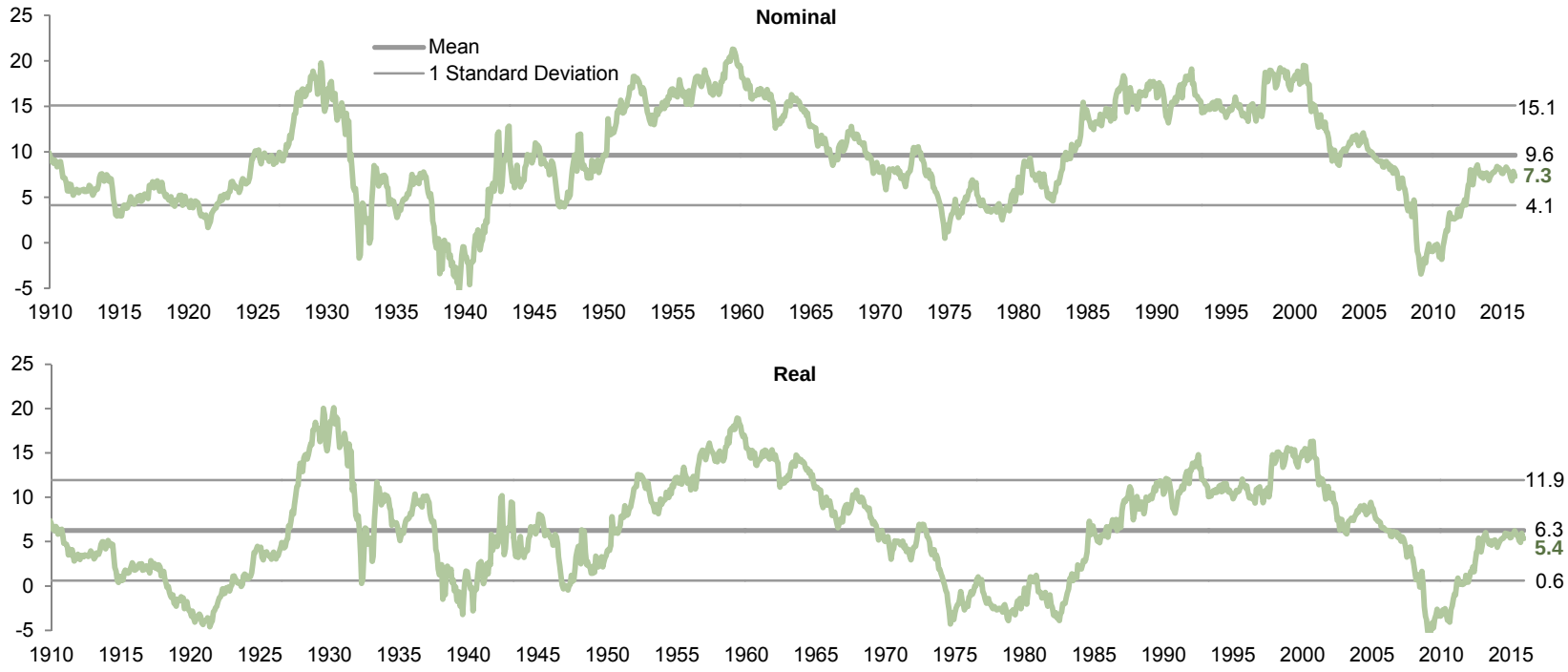


Sources: FTSE International Limited, Global Financial Data, Inc., MSCI, Inc., Standard & Poor's, Thomson Reuters Datastream, and Tokyo Stock Exchange. MSCI data provided "as is" without any express or implied warranties.

Mean reversion is not a smooth process

AACRs have remained above and below average for extended periods. At the end of 2015, the nominal ten-year AACR of 7.3% for US equities remained well below average, while the real ten-year AACR of 5.4% was closer to the historical average.

Rolling Monthly Total Return Ten-Year AACR: US
1900–2015 • Percent (%)



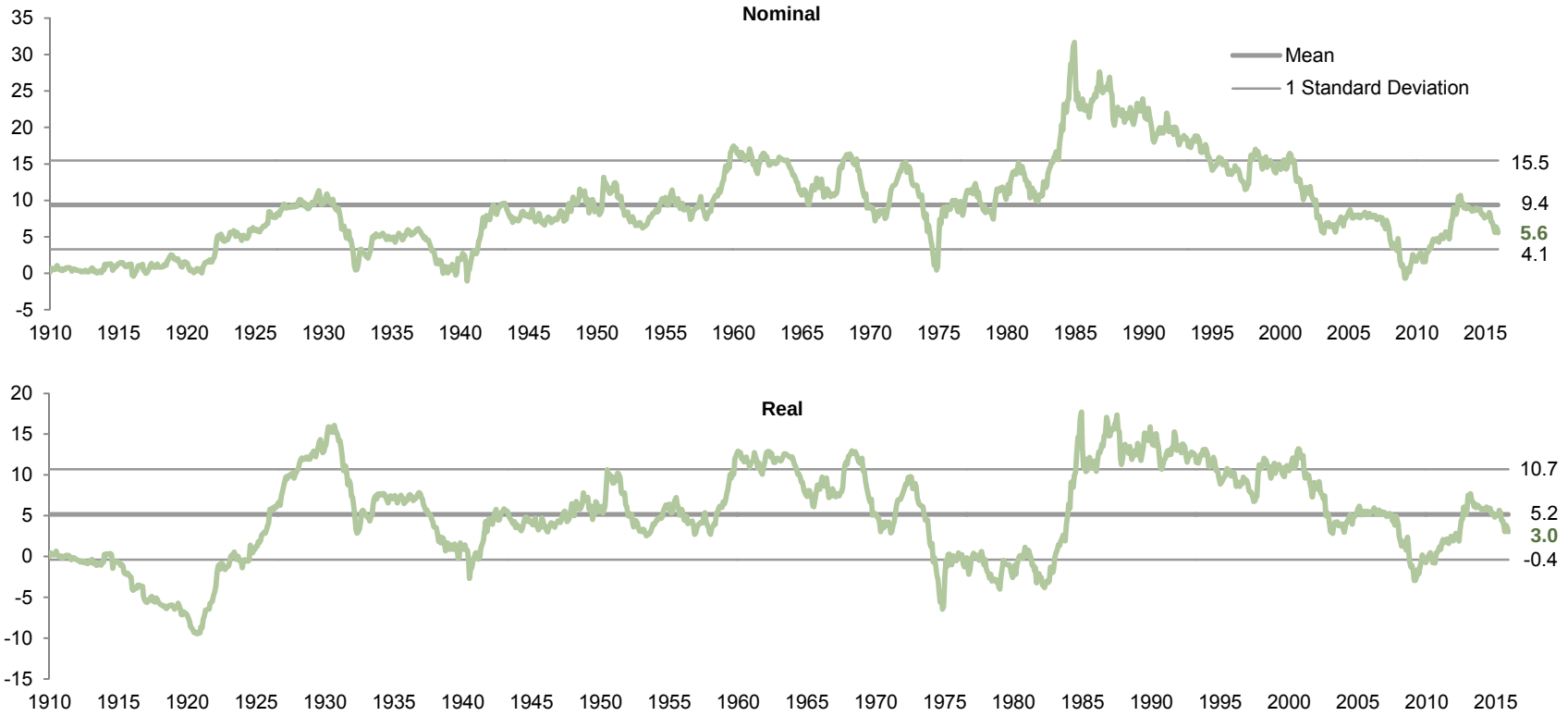
Sources: Global Financial Data, Inc., Standard & Poor's, and Thomson Reuters Datastream.

Mean reversion is not a smooth process

Means can also shift dramatically over time. Prior to 1982, the average nominal ten-year AACR for UK equities was 7.5%. Since then, the average nominal ten-year AACR has been 13.3%, while the full period average is 9.4%. The nominal ten-year AACR of 5.6% as of 2015 is less than half the average AACR since 1982.

Rolling Monthly Total Return Ten-Year AACR: UK

1900–2015 • Percent (%)



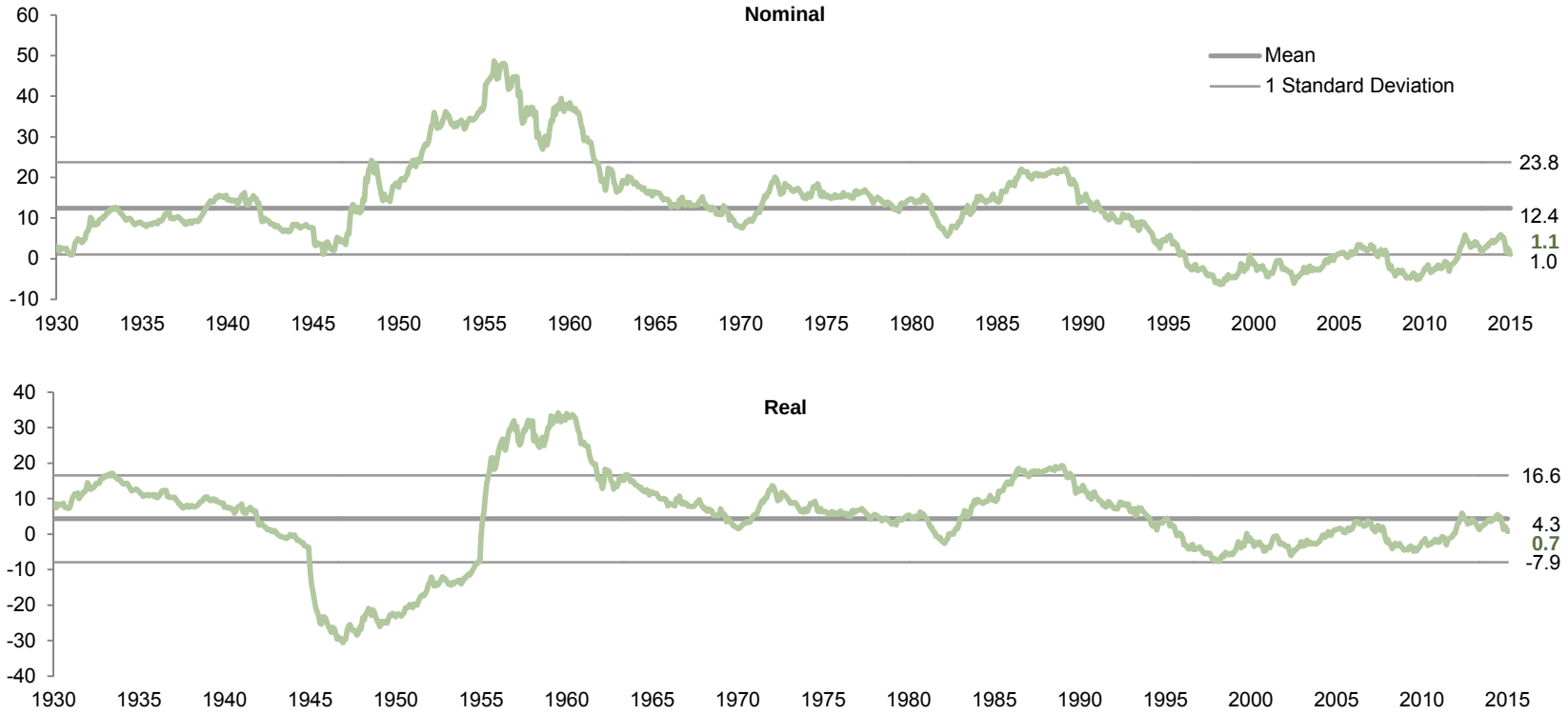
Sources: FTSE International Limited, Global Financial Data, Inc., and Thomson Reuters Datastream.

Mean reversion is not a smooth process

Japan's experience with inflation creates more dissonance between its returns in nominal and real terms compared to the other countries in this analysis. And its ten-year nominal AACRs really fall into two distinct periods: an average of 18.2% pre-1970 and an average of 7.5% from 1970 to today. On a real basis the average has been steady around 4%.

Rolling Monthly Total Return Ten-Year AACR: Japan

1930–2015 • Percent (%)



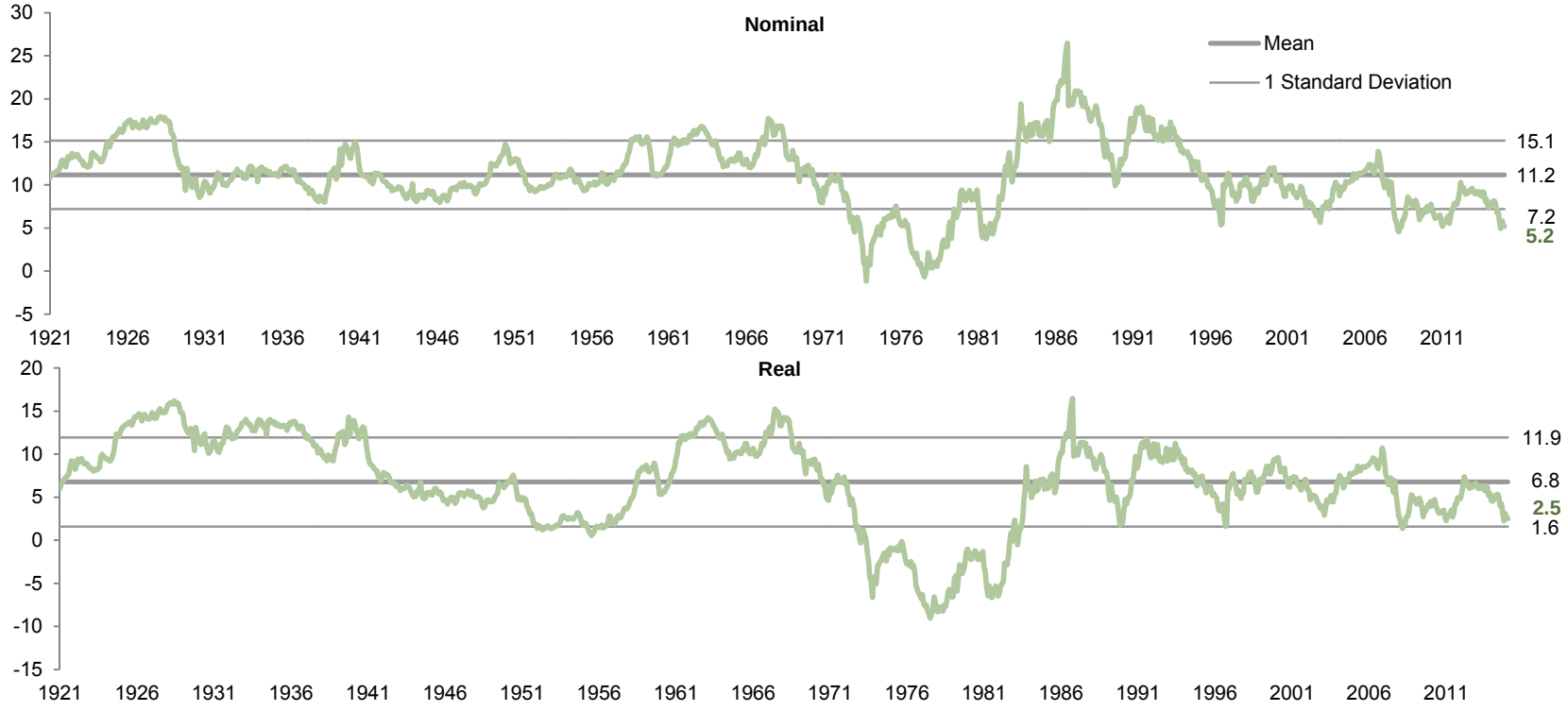
Sources: Global Financial Data, Inc. and Thomson Reuters Datastream.

Mean reversion is not a smooth process

Australia's most recent nominal ten-year AACR is the furthest below average of the four countries in this analysis. At 5.2%, the current value is 1.5 standard deviations below its historical average of 11.2%. Real returns for Australian equities are similarly furthest below average on a standard deviation basis of the four regions.

Rolling Monthly Total Return Ten-Year AACR: Australia

1921–2015 • Percent (%)

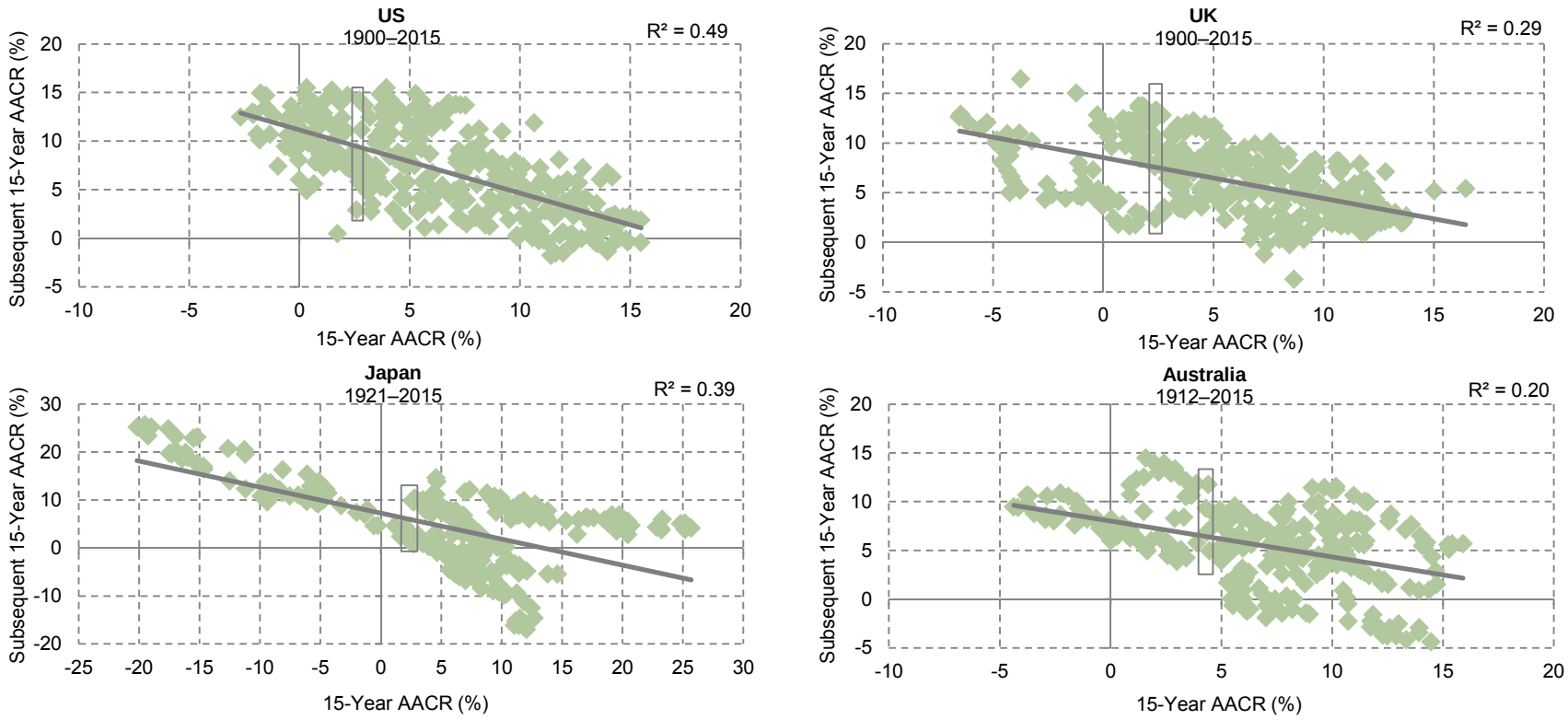


Sources: Global Financial Data, Inc. and Thomson Reuters Datastream.

Periods of poor performance generally followed by better returns and vice versa

The relationship is weak, with US equities showing the strongest relationship at an R^2 of 0.49. However, it is much stronger at the extremes. Across all four countries, periods of double-digit returns are followed by double-digit returns only 2% or less of the time. At the current values for 15-year real AACRs (between 2% and 5% for the four countries), historical data show subsequent returns have been mixed across regions.

Relationship Between Rolling Quarterly 15-Year Equity Real AACR and Subsequent 15-Year Equity Real AACR



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.

Periods of poor performance generally followed by better returns and vice versa

Current trailing 15-year real AACRs for the US (2.9%), UK (2.1%), and Australia (4.5%) fall within their respective second quartiles, meaning real returns over the next 15 years for these regions may be above average, though the range of returns is wide. With a current trailing 15-year real AACR in the first quartile (2.4%), Japan's future returns may be higher than historical norms.

Relationship Between Rolling Quarterly 15-Year Equity Real AACR and Subsequent 15-Year Equity Real AACR

US 1900–2015

AACR Quartiles	Beginning Period 15-Year AACR (%)				Subsequent 15-Year AACR (%)			
	Mean	High	Low	Std Dev	Mean	High	Low	Std Dev
First	0.54	2.38	-2.67	1.25	10.42	15.49	0.49	2.76
Second	4.25	5.91	2.59	1.02	8.78	15.49	1.09	3.77
Third	8.16	10.43	5.92	1.25	6.23	13.97	0.08	3.44
Fourth	12.68	15.49	10.47	1.35	2.48	11.88	-1.76	2.55
Overall	**6.45**	**15.49**	**-2.67**	**4.68**	**6.95**	**15.49**	**-1.76**	**4.35**

UK 1900–2015

AACR Quartiles	Beginning Period 15-Year AACR (%)				Subsequent 15-Year AACR (%)			
	Mean	High	Low	Std Dev	Mean	High	Low	Std Dev
First	-0.81	1.93	-6.52	2.52	8.69	16.45	1.64	3.71
Second	3.57	5.04	1.97	0.89	7.87	13.26	2.35	2.93
Third	7.04	8.66	5.06	1.09	4.99	10.71	-3.74	3.30
Fourth	11.12	16.45	8.68	1.54	3.96	8.32	0.25	2.12
Overall	**5.31**	**16.45**	**-6.52**	**4.71**	**6.34**	**16.45**	**-3.74**	**3.63**

Japan 1921–2015

AACR Quartiles	Beginning Period 15-Year AACR (%)				Subsequent 15-Year AACR (%)			
	Mean	High	Low	Std Dev	Mean	High	Low	Std Dev
First	-8.93	2.76	-20.15	6.74	13.79	25.69	0.80	6.40
Second	5.23	6.79	2.80	1.11	3.43	14.63	-6.02	5.32
Third	8.33	10.33	6.80	1.14	-0.33	12.10	-9.89	5.94
Fourth	15.25	25.69	10.36	4.62	1.39	9.80	-17.00	7.73
Overall	**5.01**	**25.69**	**-20.15**	**9.75**	**4.56**	**25.69**	**-17.00**	**8.41**

Australia 1912–2015

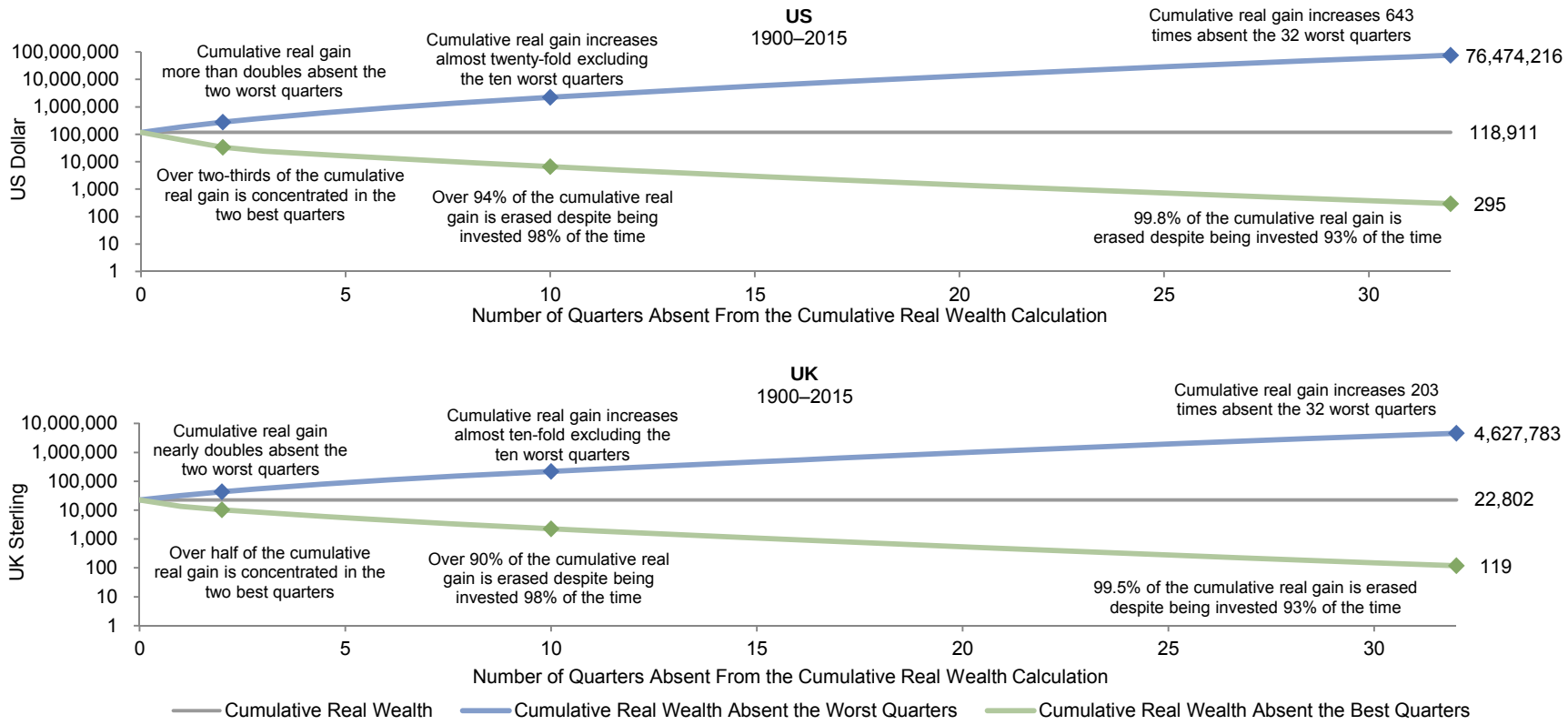
AACR Quartiles	Beginning Period 15-Year AACR (%)				Subsequent 15-Year AACR (%)			
	Mean	High	Low	Std Dev	Mean	High	Low	Std Dev
First	0.37	3.65	-4.37	2.25	8.50	14.46	3.86	2.57
Second	5.79	7.29	3.87	0.83	4.89	11.84	-1.90	3.30
Third	8.65	10.17	7.29	0.84	5.00	11.45	-1.53	3.19
Fourth	12.32	15.91	10.18	1.58	3.70	11.53	-4.37	4.15
Overall	**6.80**	**15.91**	**-4.37**	**4.62**	**5.51**	**14.46**	**-4.37**	**3.79**

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.

Market returns: the best and worst case scenarios

One of the interesting uses of historical data is to calculate the degree to which a successful market-timing strategy could have added to achieved returns during particular periods. While it is hard to estimate what an "average" market timer might achieve, the risks are apparent: missing out on some of the best months of any market's performance severely diminishes returns.

Cumulative Real Wealth Absent the Best and Worst Quarters for Equities

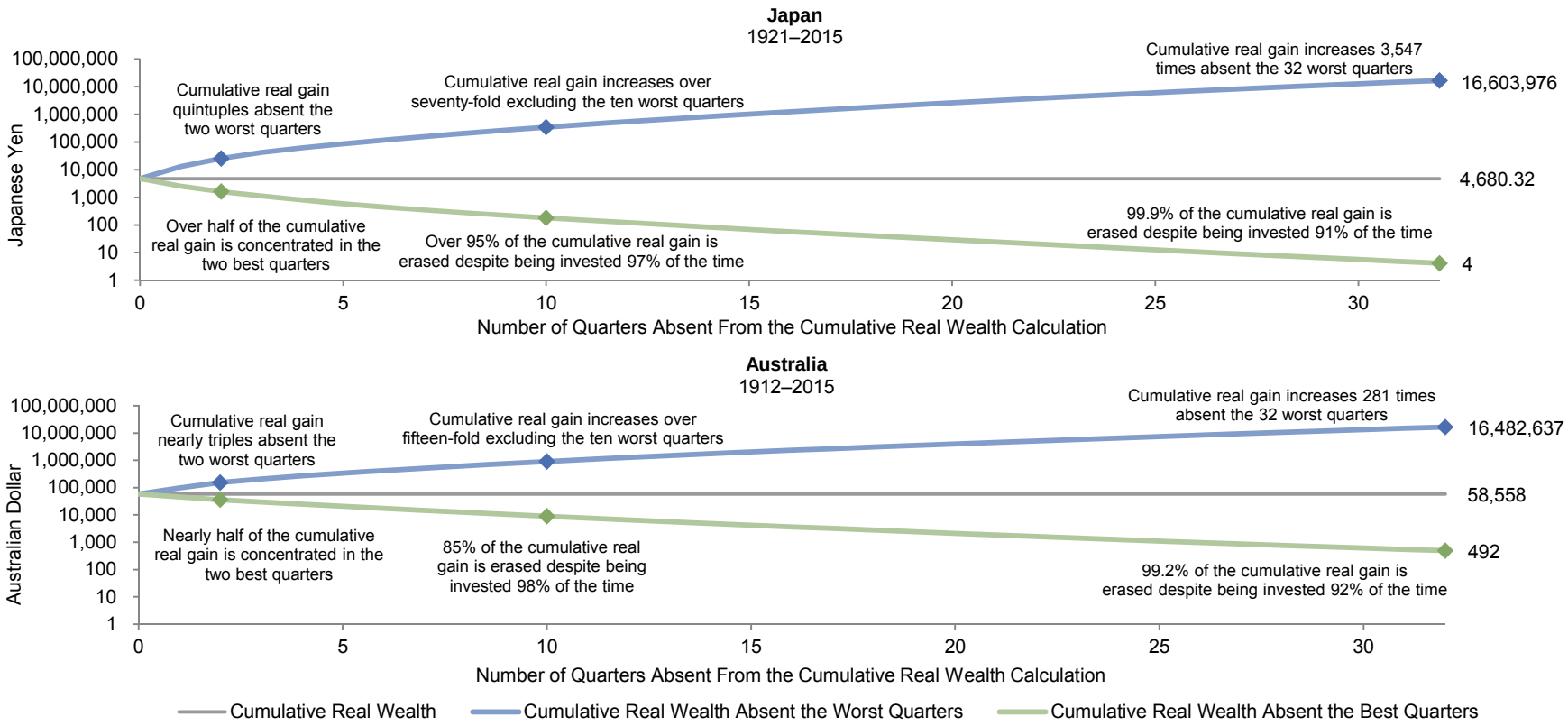


Sources: FTSE International Limited, Global Financial Data, Inc., and MSCI Inc. MSCI data provided "as is" without any express or implied warranties.
Notes: Index rebased to 100 as of January 1, 1900. Cumulative real wealth is shown on a logarithmic scale.

Market returns: the best and worst case scenarios

Across all four countries, avoiding the worst two quarters would have improved cumulative returns between two and five fold. At the same time, missing the best two quarters would have reduced cumulative returns by around one-half. These effects quickly compound over successive quarters to the point where 85%+ of cumulative returns are driven by ten or fewer quarters.

Cumulative Real Wealth Absent the Best and Worst Quarters for Equities



Sources: Global Financial Data, Inc. and MSCI Inc. MSCI data provided "as is" without any express or implied warranties.
Notes: Index rebased to 100 as of January 1, 1921, for Japan and January 1, 1912, for Australia. Cumulative real wealth is shown on a logarithmic scale.

Equity Valuations

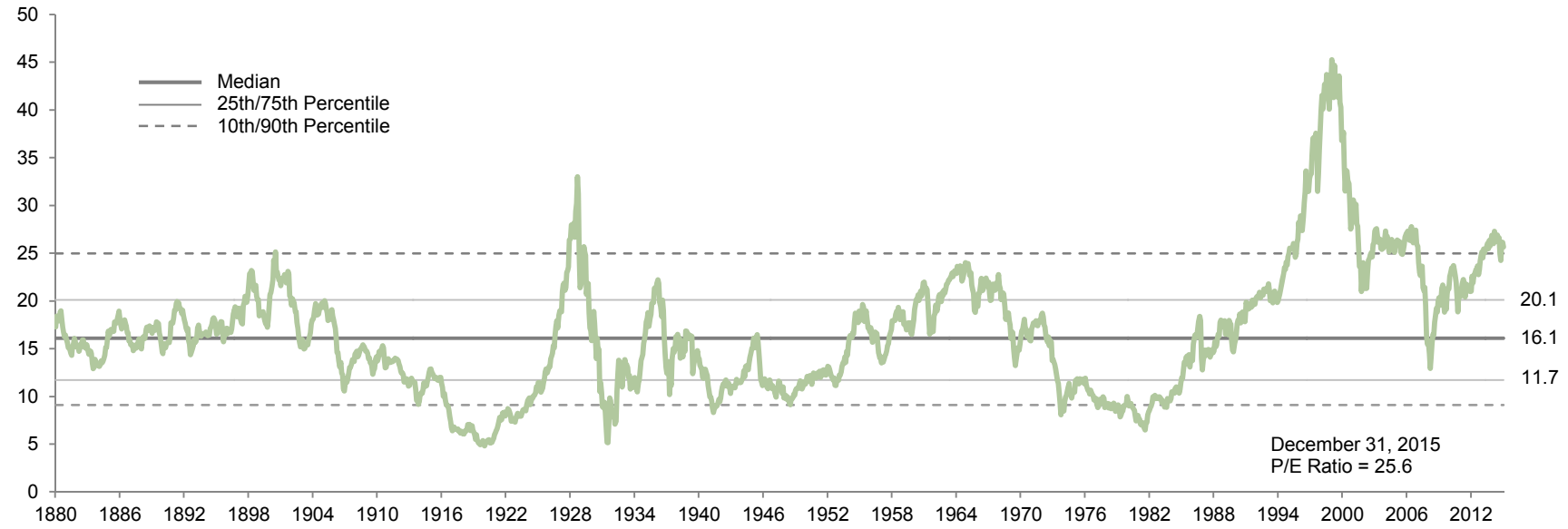
Equity valuations, though a mean-reverting series, rarely hover around their averages very long. Valuations can depart from the mean for extended periods of time, seen consistently across the markets we analyzed, and the valuation adjustment can be relatively quick. Given this trending nature, lights flash and sirens wail only at the extremes. The longer unusually high or low valuations persist, the greater the probability investors will be caught off guard when the cycle changes.

We review the historical record of US equity valuations using both S&P and MSCI data. S&P has a much longer history, although this history is a compilation of historical data (as detailed in Notes on the Data) and underlying companies have changed over time, as have accounting standards and the macro environment. When comparing the US with other regions, we consistently use MSCI data that begin in 1969—nearly five decades of data.

P/E multiples trend from depressed lows to overvalued peaks

Our longest data set for normalized P/E ratios is the Shiller P/E for the S&P 500, which shows that valuations rarely hover around their historical medians for very long. From 1929 to 1932, the Shiller P/E cratered from 33.0 to 5.2, and from 1999 to 2002 it plunged from 45.2 to 21.0. Slow, grinding de-ratings (1901–20 and 1966–82) are also possible, as are multi-decade run-ups (1982–2000).

S&P 500 Normalized Real Price-Earnings Ratios
1880–2015



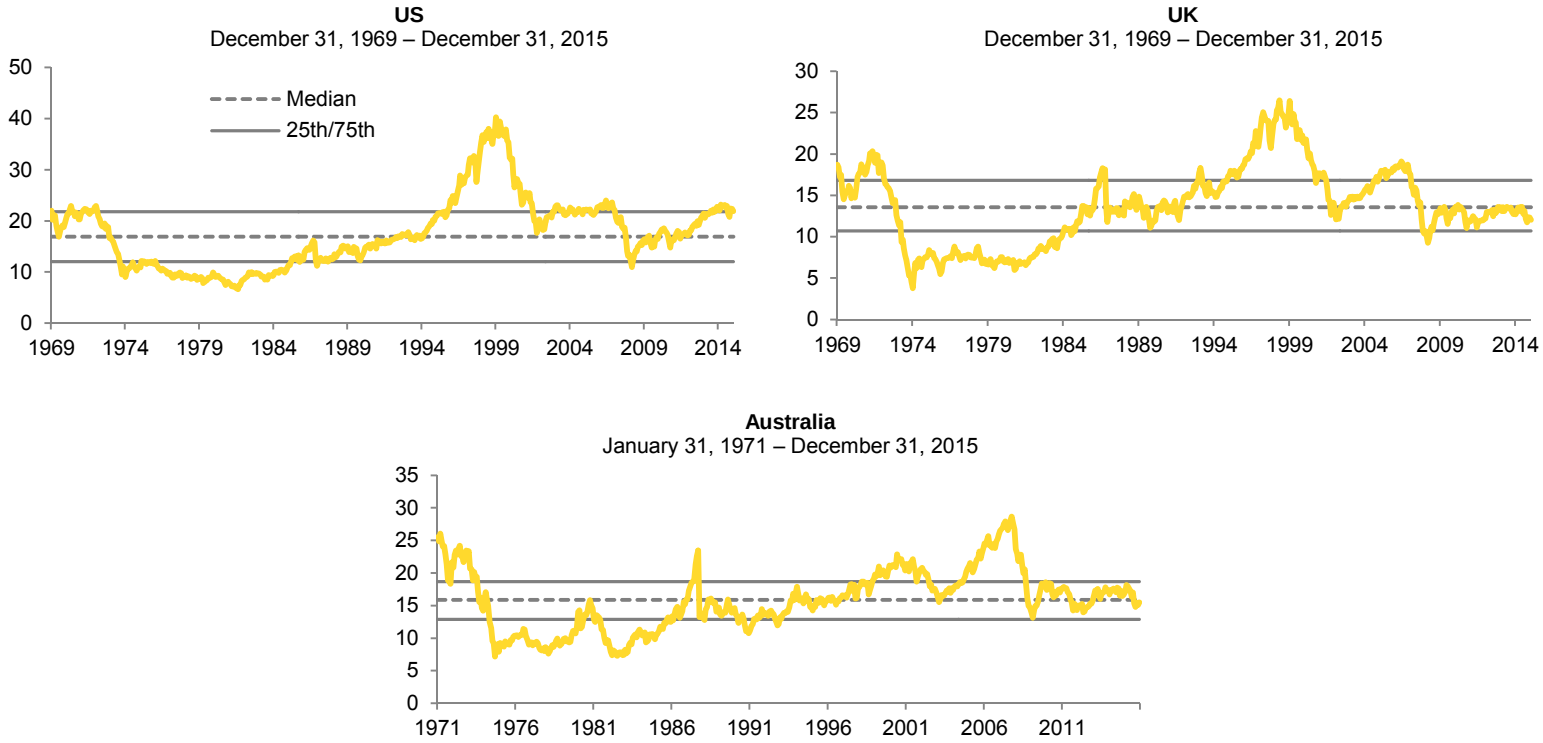
Sources: Robert J. Shiller, Standard & Poor's, and Thomson Reuters Datastream.
Notes: Graph is based on monthly data; most recent data point uses daily price change and interpolated monthly earnings. Normalized real P/E ratios (Shiller P/E ratio) for the S&P 500 Index are calculated by dividing the current index value by the rolling ten-year average of inflation-adjusted earnings. Monthly earnings are interpolated from actual quarterly reported earnings per share. Real earnings are deflated in terms of December 31, 2015, dollars. Current earnings are based on December 31, 2015, estimates from Standard & Poor's. Historical data before 1926 are provided by Professor Robert Shiller.

1852m

P/E multiples trend from depressed lows to overvalued peaks

Composite normalized P/E ratios using MSCI indexes allow us to compare similar data across markets. In the US, the longest continual streak in which the composite normalized P/E remained within our fair value range (25th–75th percentile) was for just over eight years, from 1988 to 1996. Such streaks have been shorter for both the UK and Australia; however, given the nature of percentiles, each region will cumulatively spend the same amount of time in the "fair value" category.

Composite Normalized Price-Earnings Ratios

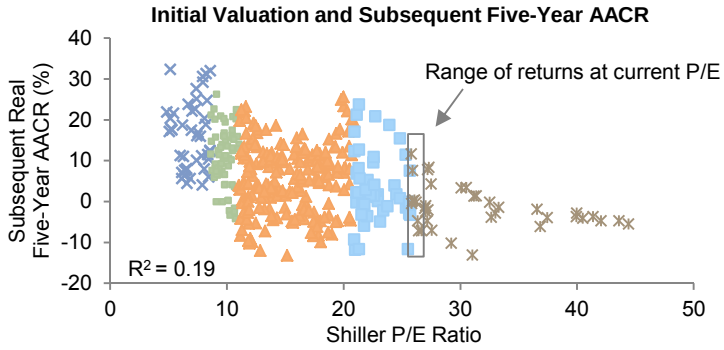


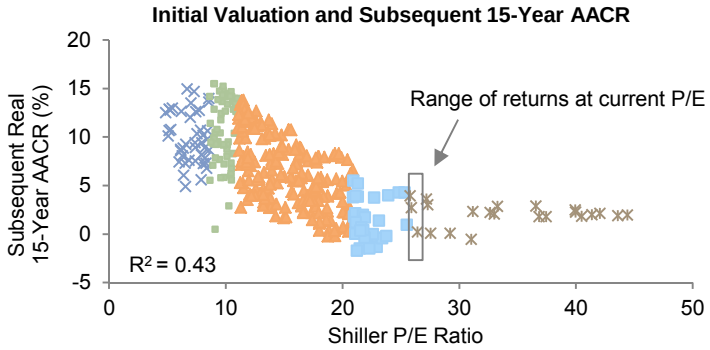
Sources: MSCI Inc. and Thomson Reuters Datastream. MSCI data provided "as is" without any express or implied warranties.
Notes: The composite normalized price-earnings (P/E) is calculated by dividing the inflation-adjusted index price by the simple average of three normalized earnings metrics: ten-year average real earnings (i.e., Shiller earnings), trend-line earnings, and return on equity–adjusted earnings.

Strong returns usually follow years with low P/E ratios

While valuations (and mean reversion) can hold sway on subsequent returns in periods as short as five years, the longer the holding period, the more likely that starting valuations will impact realized real returns. Between five- and 15-year periods for data based on the S&P 500, the R^2 more than doubles from 0.19 to 0.43.

Relationship Between Shiller Price-Earnings Ratios and Subsequent Real 5- and 15-Year AACRs: US
First Quarter 1910 – Fourth Quarter 2015





P/E Ratio Percentile	Begin Period Shiller US P/E Ratio			Subsequent Real Five-Year AACR (%)		
	Median	High	Low	Median	High	Low
0–10	7.3	8.6	4.8	16.9	32.3	4.0
10–25	9.8	11.0	8.6	11.3	26.3	-4.2
25–75	14.9	20.9	11.0	6.3	25.6	-13.2
75–90	22.4	25.7	20.9	1.9	23.7	-11.8
90–100	29.7	44.4	25.8	-2.3	11.6	-13.1
Overall	**14.4**	**45.0**	**4.8**	**6.8**	**32.3**	**-13.2**

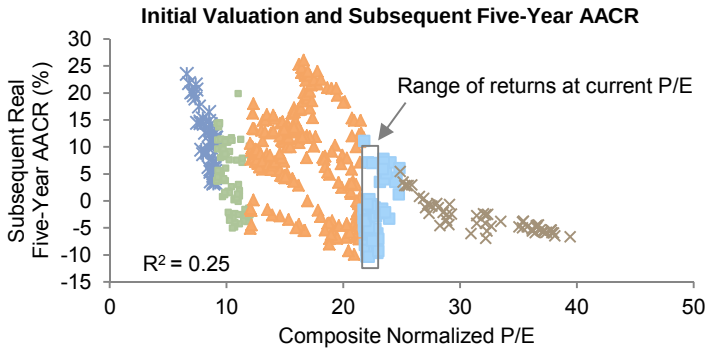
	Begin Period Shiller US P/E Ratio			Subsequent Real 15-Year AACR (%)		
	Median	High	Low	Median	High	Low
0–10	7.3	8.6	4.8	9.4	14.9	4.9
10–25	9.8	11.0	8.6	10.5	15.5	0.5
25–75	14.7	20.9	11.0	6.2	13.8	-0.2
75–90	21.9	25.5	20.9	0.5	5.5	-1.8
90–100	33.1	44.4	25.8	2.1	3.9	-0.6
Overall	**13.6**	**45.0**	**4.8**	**7.2**	**15.5**	**-1.8**

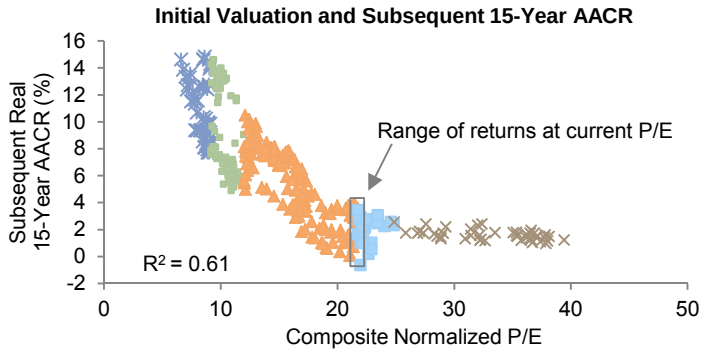
Sources: Standard & Poor's, Standard & Poor's Compustat, Thomson Reuters Datastream, US Department of Labor - Bureau of Labor Statistics, and *The Wall Street Journal.*
Notes: Data are quarterly. Normalized real price-earnings ratios for the S&P 500 Index are calculated by dividing the current index value by the rolling ten-year average of inflation-adjusted earnings. The last full five-year period was first quarter 2011 to fourth quarter 2015, and the last full 15-year period was first quarter 2001 to fourth quarter 2015.

The relationship is even stronger in more recent historical data

For the shorter 45-year history of the MSCI US Index, the R^2 is 0.61 for the relationship of the beginning P/E ratio to subsequent 15-year AACRs. In this data set, all of the composite normalized P/Es above 25 occurred during the run up to and fall out from the 1997–2002 tech bubble. Excluding these P/Es, the R^2 increases to 0.69. At December 31 valuations the range of subsequent 15-year AACRs is -0.7% to 3.4%.

Relationship Between Composite Normalized Price-Earnings Ratios and Subsequent Real 5- and 15-Year AACRs: US
December 31, 1969 – December 31, 2015





P/E Ratio Percentile	Begin Period Comp Norm US P/E Ratio			Subsequent Real Five-Year AACR (%)		
	Median	High	Low	Median	High	Low
0–10	8.7	9.1	6.6	10.7	23.5	3.2
10–25	10.2	12.0	9.2	4.4	19.9	-5.0
25–75	16.5	21.7	12.0	8.8	26.0	-10.0
75–90	22.4	24.8	21.8	-2.4	11.1	-10.4
90–100	32.2	39.4	24.9	-4.2	5.4	-7.0
Overall	**16.2**	**40.3**	**6.6**	**5.4**	**26.0**	**-10.4**

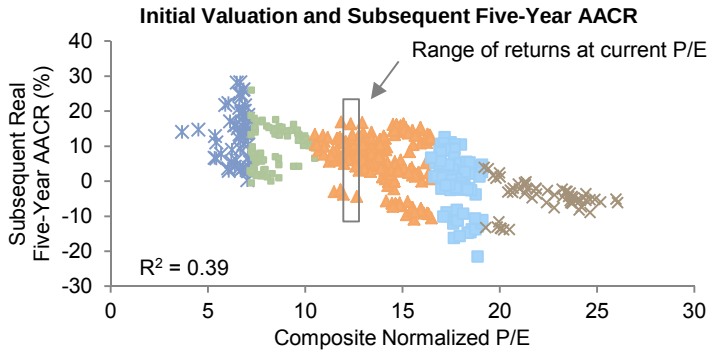
	Begin Period Comp Norm US P/E Ratio			Subsequent Real 15-Year AACR (%)		
	Median	High	Low	Median	High	Low
0–10	8.7	9.1	6.6	10.0	14.8	7.7
10–25	10.2	12.0	9.2	7.6	14.6	4.9
25–75	16.0	21.7	12.0	6.0	10.5	0.0
75–90	22.2	24.8	21.8	2.1	3.4	-0.7
90–100	34.3	39.4	24.9	1.6	2.5	1.0
Overall	**14.4**	**40.3**	**6.6**	**6.8**	**14.8**	**-0.7**

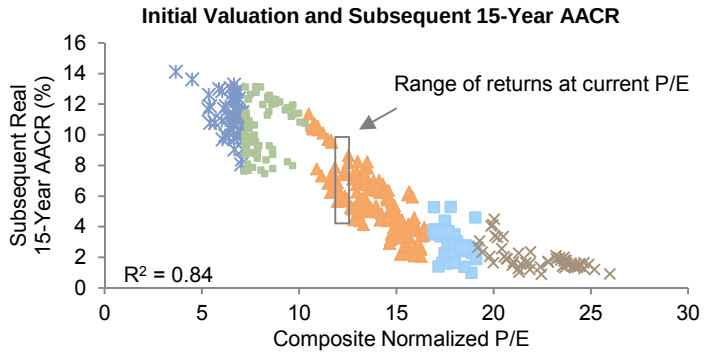
Sources: MSCI Inc., Thomson Reuters Datastream, and US Department of Labor - Bureau of Labor Statistics. MSCI data provided "as is" without any express or implied warranties.
Notes: Data are monthly. The composite normalized price-earnings (P/E) is calculated by dividing the inflation-adjusted index price by the simple average of three normalized earnings metrics: ten-year average real earnings (i.e., Shiller earnings), trend-line earnings, and return on equity–adjusted earnings. The last full five-year period was January 1, 2011, to December 31, 2015, and the last full 15-year period was January 1, 2001, to December 31, 2015.

The relationship is even stronger in more recent historical data

The MSCI UK Index has shown an even stronger valuation/return relationship, with the R^2 reaching 0.84 for 15-year subsequent returns. At December 31, UK equities were fairly valued, with a wide range of subsequent 15-year AACRs from 2.1% to 11.4%.

Relationship Between Composite Normalized Price-Earnings Ratios and Subsequent Real 5- and 15-Year AACRs: UK
December 31, 1969 – December 31, 2015





P/E Ratio Percentile	Begin Period Comp Norm UK P/E Ratio			Subsequent Real Five-Year AACR (%)		
	Median	High	Low	Median	High	Low
0–10	6.7	7.2	3.7	13.9	28.2	0.2
10–25	7.9	10.5	7.2	8.5	26.0	-0.5
25–75	13.7	16.5	10.5	7.4	16.8	-10.9
75–90	17.7	19.1	16.5	0.2	12.5	-21.6
90–100	22.2	26.1	19.2	-4.4	3.9	-13.9
Overall	**13.8**	**26.1**	**3.7**	**5.9**	**28.2**	**-21.6**

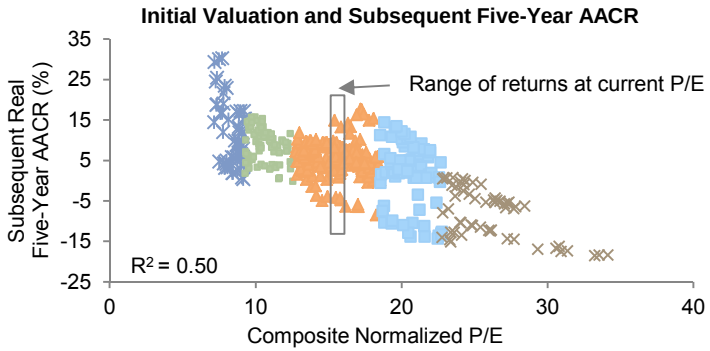
	Begin Period Comp Norm UK P/E Ratio			Subsequent Real 15-Year AACR (%)		
	Median	High	Low	Median	High	Low
0–10	6.7	7.2	3.7	11.2	14.1	8.0
10–25	7.8	10.5	7.2	10.2	13.2	7.5
25–75	13.6	16.5	10.5	5.5	11.4	2.1
75–90	17.8	19.1	16.9	2.9	5.3	1.0
90–100	22.4	26.0	19.2	1.7	4.5	0.9
Overall	**13.2**	**26.1**	**3.7**	**6.2**	**14.1**	**0.9**

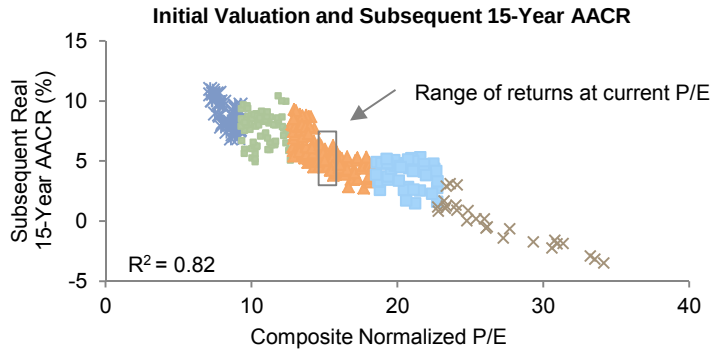
Sources: MSCI Inc., Thomson Reuters Datastream, and US Department of Labor - Bureau of Labor Statistics. MSCI data provided "as is" without any express or implied warranties.
Notes: Data are monthly. The composite normalized price-earnings (P/E) is calculated by dividing the inflation-adjusted index price by the simple average of three normalized earnings metrics: ten-year average real earnings (i.e., Shiller earnings), trend-line earnings, and return on equity–adjusted earnings. The last full five-year period was January 1, 2011, to December 31, 2015, and the last full 15-year period was January 1, 2001, to December 31, 2015.

The relationship is even stronger in more recent historical data

Of the three country MSCI indexes analyzed, the Australian index showed the highest R^2 across both five- and 15-year periods of subsequent returns, at 0.50 and 0.82, respectively. At December 31, Australian equities were fairly valued, with a range of subsequent 15-year AACRs from 2.7% to 9.3%.

Relationship Between Composite Normalized Price-Earnings Ratios and Subsequent Real 5- and 15-Year AACRs: Australia
December 31, 1969 – December 31, 2015





P/E Ratio Percentile	Begin Period Comp Norm Australia P/E Ratio			Subsequent Real Five-Year AACR (%)		
	Median	High	Low	Median	High	Low
0–10	8.6	9.3	7.2	9.8	30.2	0.4
10–25	10.6	12.7	9.3	8.8	15.8	-0.1
25–75	15.6	18.5	12.8	6.0	17.6	-8.5
75–90	20.6	22.8	18.6	3.3	14.3	-14.4
90–100	25.4	34.1	22.8	-6.7	0.7	-18.6
Overall	**15.6**	**35.5**	**7.2**	**5.4**	**30.2**	**-22.0**

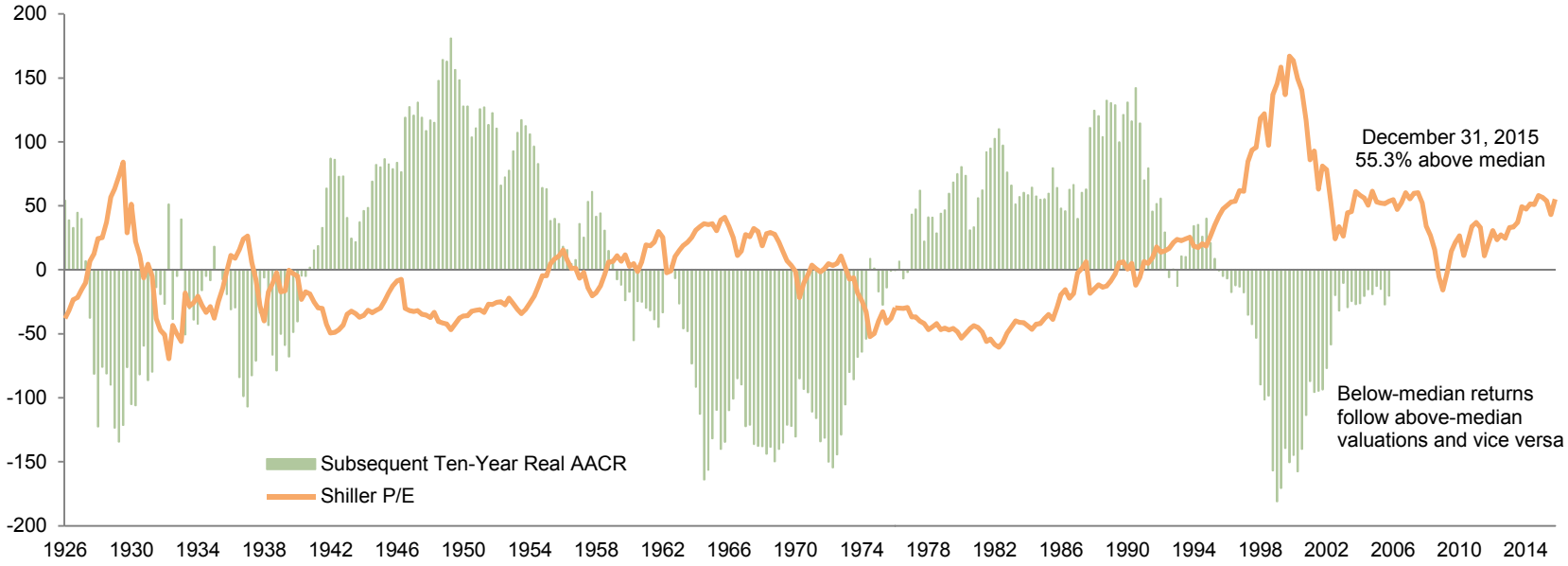
P/E Ratio Percentile	Begin Period Comp Norm Australia P/E Ratio			Subsequent Real 15-Year AACR (%)		
	Median	High	Low	Median	High	Low
0–10	8.6	9.3	7.2	8.5	11.0	6.9
10–25	10.6	12.7	9.3	8.0	10.4	5.0
25–75	15.0	18.5	12.8	5.3	9.3	2.7
75–90	20.7	22.8	18.6	4.3	5.3	1.4
90–100	25.7	34.1	22.8	0.1	3.1	-3.5
Overall	**13.9**	**35.5**	**7.2**	**5.8**	**11.0**	**-4.2**

Sources: MSCI Inc., Thomson Reuters Datastream, and US Department of Labor - Bureau of Labor Statistics. MSCI data provided "as is" without any express or implied warranties.
Notes: Data are monthly. The composite normalized price-earnings (P/E) is calculated by dividing the inflation-adjusted index price by the simple average of three normalized earnings metrics: ten-year average real earnings (i.e., Shiller earnings), trend-line earnings, and return on equity–adjusted earnings. The last full five-year period was January 1, 2011, to December 31, 2015, and the last full 15-year period was January 1, 2001, to December 31, 2015.

Higher starting P/E ratios indicate lower subsequent returns

Historically, normalized P/E ratios above their long-term average have typically led to below average subsequent ten-year returns; normalized P/E ratios below the long-term average have been associated with above average subsequent ten-year returns. If history is any guide, elevated valuations in the US in recent years may mean ten-year returns from this starting point are below average.

US Shiller Price-Earnings Ratios and Subsequent Real Ten-Year AACRs
First Quarter 1926 – Fourth Quarter 2015 • Shown as Percent Above/Below Respective Long-Term Median

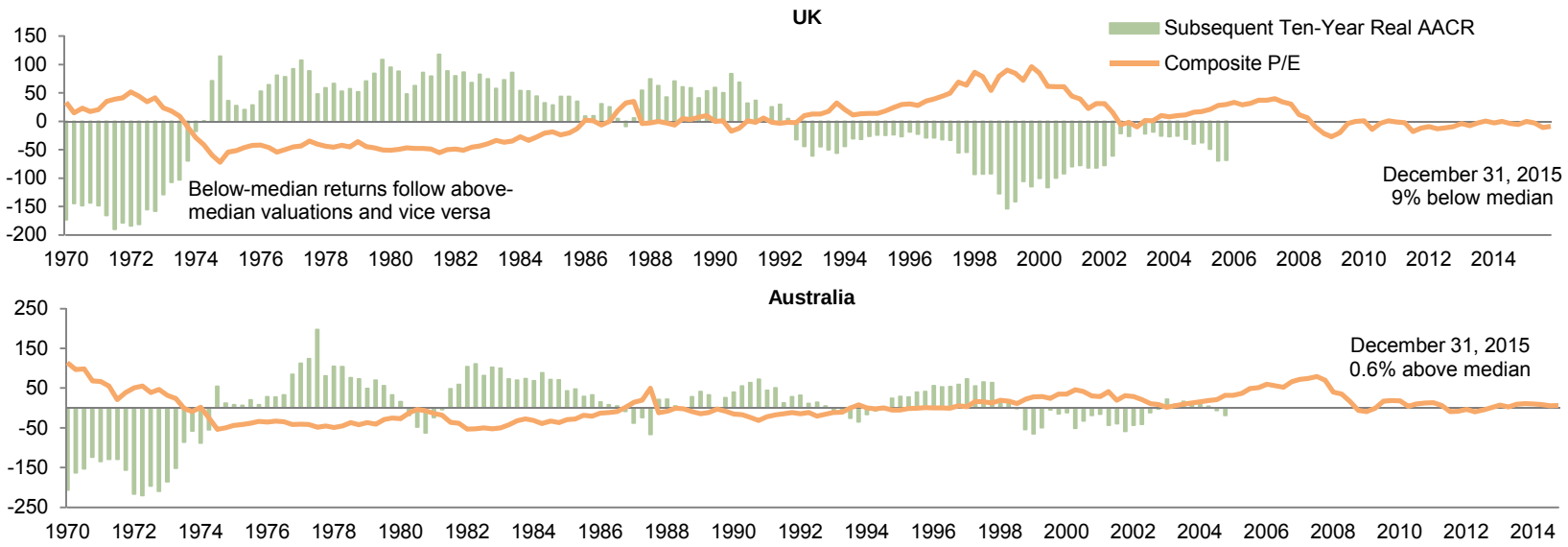


Sources: Robert J. Shiller, Standard & Poor's, Thomson Reuters Datastream, and US Department of Labor - Bureau of Labor Statistics.
Notes: Graph shows percent above/below median for returns and valuations. Line shows point-in-time normalized real price-earnings (P/E) ratios. Normalized real P/E ratios 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 6.8% since 1926. For example, the first data point shows that the real AACR for the period 1926–35 was 52.0% above the median ten-year real return.

Higher starting P/E ratios indicate lower subsequent returns

Normalized valuations for UK and Australian equities have also been fairly reliable counter-indicators of future return trends. Based on their near average current valuations, investors may infer a higher likelihood of achieving historically average real returns over the coming decade.

Composite Normalized Price-Earnings Ratios and Subsequent Real Ten-Year AACRs
First Quarter 1970 – Fourth Quarter 2015 • Shown as Percent Above/Below Respective Long-Term Median

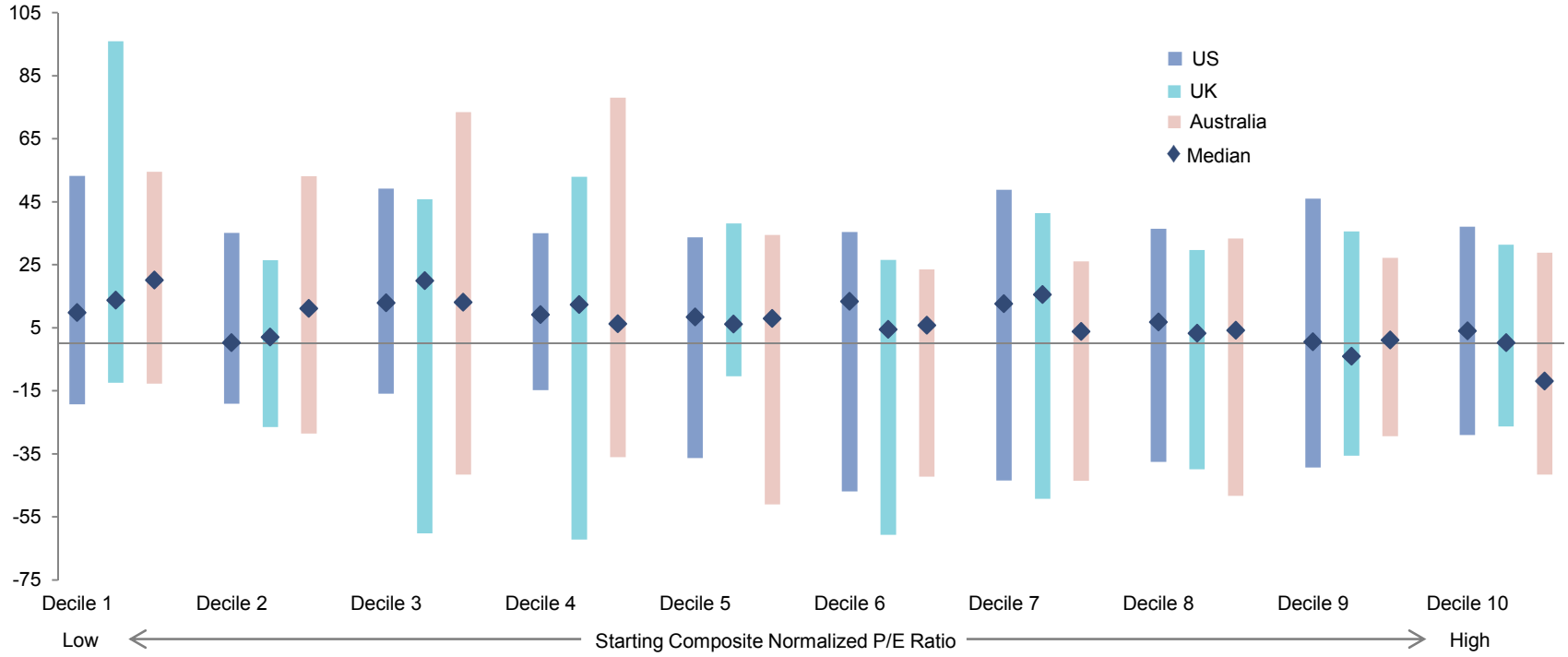


Sources: MSCI Inc. and Thomson Reuters Datastream. MSCI data provided "as is" without any express or implied warranties.
Notes: Graph shows percent above/below median for returns and valuations. Line shows point-in-time composite normalized real price-earnings (P/E) ratios. Bars are based on quarterly 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 each region of 5.5% and 6.8% for Australia and the United Kingdom, respectively. For example, the first data point shows that the real AACR for the period 1970–79 was 205.1% below the median ten-year real return for Australia and was 171.5% below the median ten-year real return for the United Kingdom.

Normalized valuations are not a good guide to short-term returns

For investors with a short-term (one-year) time horizon, starting valuations provide little guidance for future returns. High and low starting valuations are not universally disastrous nor advantageous in the short run, as investors have seen positive subsequent returns from the highest starting composite normalized P/E ratio decile and negative returns from the lowest decile. The wide return dispersion serves as a reminder that valuations are an imperfect guide to subsequent returns in the short term.

Range of Subsequent One-Year Real Returns From Starting Composite Normalized P/E Deciles: US, UK, and Australia
December 31, 1969 – December 31, 2015 • Percent (%)



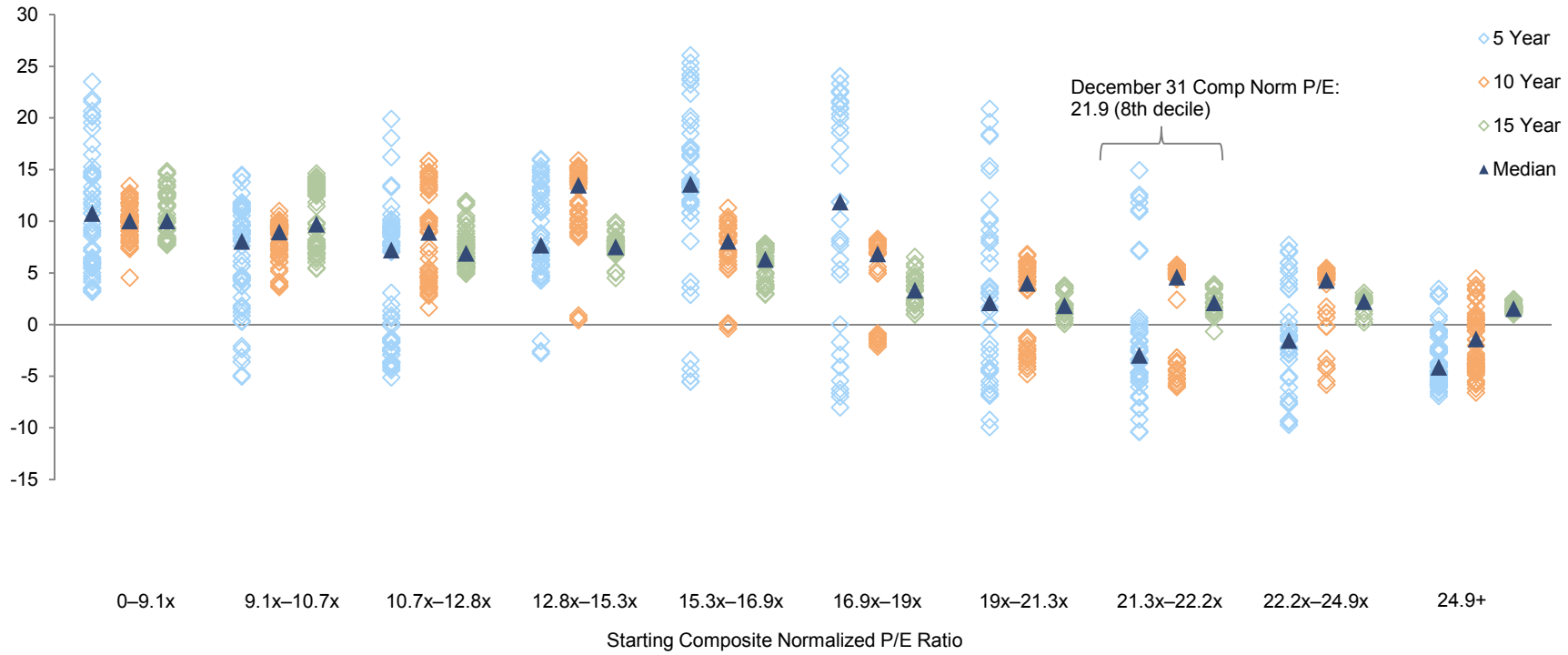
Source: MSCI Inc. MSCI data provided "as is" without and express or implied warranties.
Note: The composite normalized price-earnings (P/E) is calculated by dividing the inflation-adjusted index price by the simple average of three normalized earnings metrics: ten-year average real earnings (i.e., Shiller earnings), trend-line earnings, and return on equity–adjusted earnings.

Over longer periods, elevated valuations portend lower returns (and vice versa)

The longer the holding period, the more certain that starting valuations will impact realized real return. In the US, the composite normalized P/E ratio of 21.9 at December 31 lies in the 8th decile of historical observations. From this decile, the median subsequent 15-year real AACR is just 2%, with a max of 4%. From the lowest decile, there were no periods of subsequent negative returns across any time horizon examined.

Distribution of Subsequent Real Returns From Starting Composite Normalized P/E Deciles: US

December 31, 1969 – December 31, 2015 • Subsequent Real Return AACR (%)



Source: MSCI Inc. MSCI data provided "as is" without and express or implied warranties.

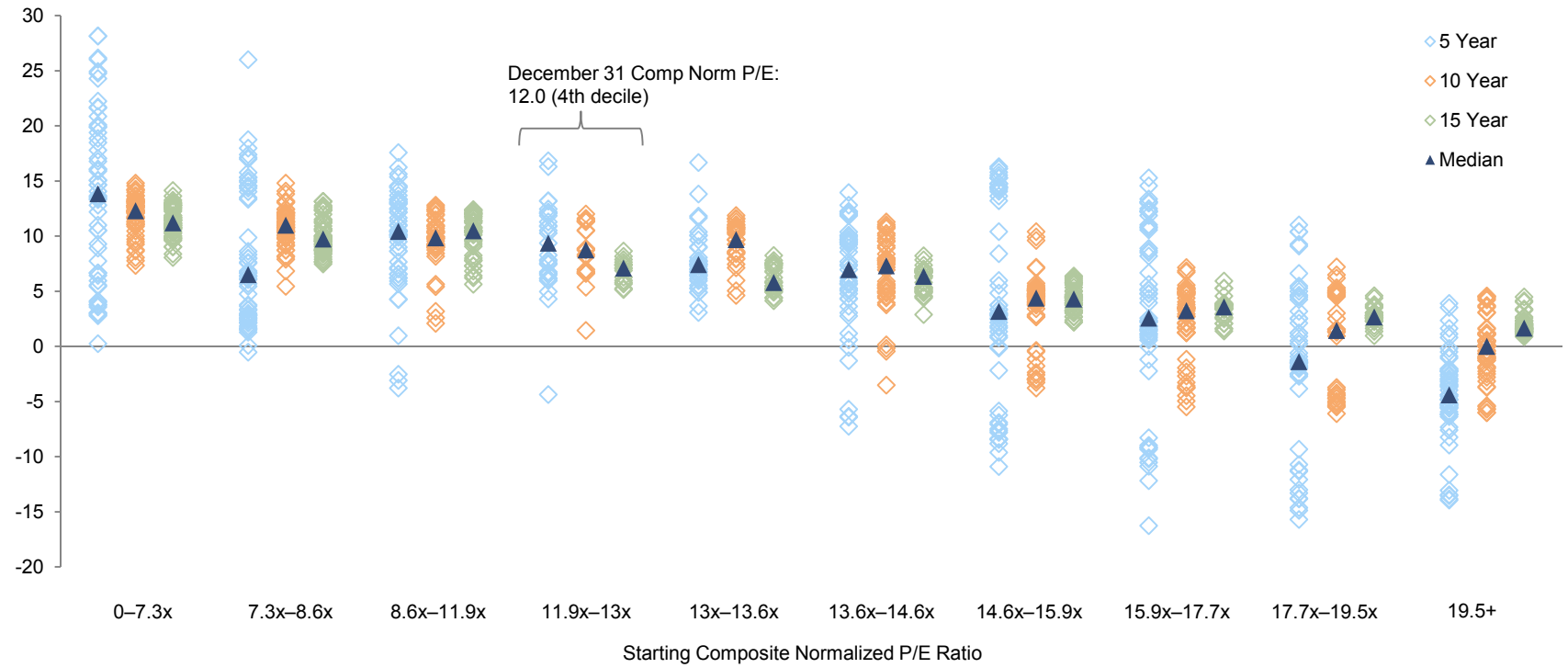
Note: The composite normalized price-earnings (P/E) is calculated by dividing the inflation-adjusted index price by the simple average of three normalized earnings metrics: ten-year average real earnings (i.e., Shiller earnings), trend-line earnings, and return on equity–adjusted earnings.

Over longer periods, elevated valuations portend lower returns (and vice versa)

In the UK, the current composite normalized P/E ratio of 12.0 lies in the 4th decile of historical observations. From this decile, the median subsequent 15-year real AACR is about 7%. The only negative observation from the current decile was the five-year subsequent real return from November 1973 (due to double-digit inflation during the decade).

Distribution of Subsequent Real Returns from Starting Composite Normalized P/E Deciles: UK

December 31, 1969 – December 31, 2015 • Subsequent Real Return AACR (%)



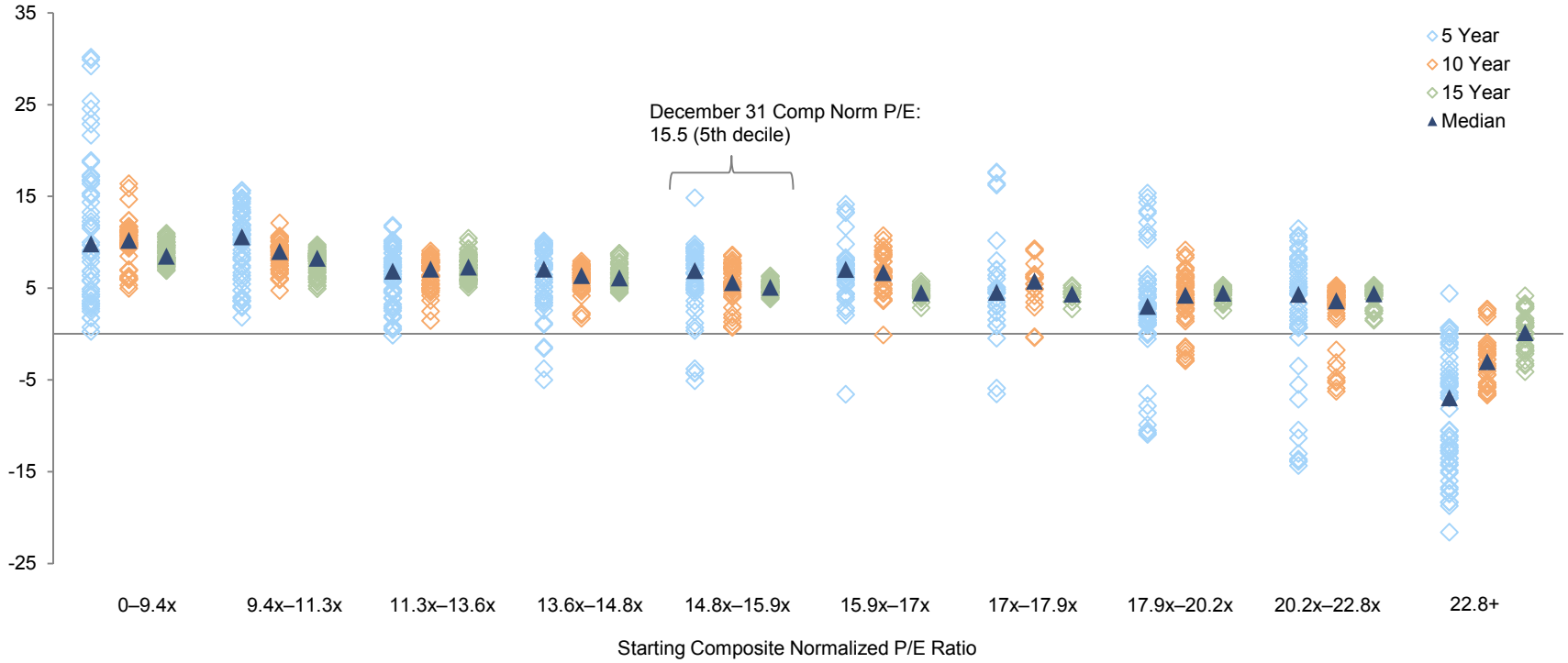
Source: MSCI Inc. MSCI data provided "as is" without and express or implied warranties.

Note: The composite normalized price-earnings (P/E) is calculated by dividing the inflation-adjusted index price by the simple average of three normalized earnings metrics: ten-year average real earnings (i.e., Shiller earnings), trend-line earnings, and return on equity–adjusted earnings.

Over longer periods, elevated valuations portend lower returns (and vice versa)

In Australia, the current composite normalized P/E ratio of 15.5 sits in the 5th decile of historical observations. From this decile, the median subsequent real 15-year AACR has delivered mid-single digit returns.

Distribution of Subsequent Real Returns From Starting Composite Normalized P/E Deciles: Australia
December 31, 1969 – December 31, 2015 • Subsequent Real Return AACR (%)

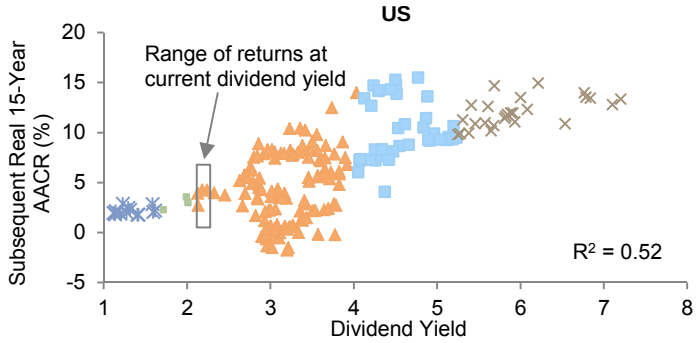


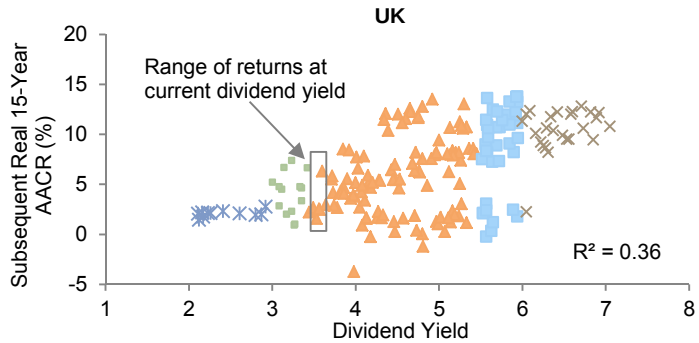
Source: MSCI Inc. MSCI data provided "as is" without and express or implied warranties.
Note: The composite normalized price-earnings (P/E) is calculated by dividing the inflation-adjusted index price by the simple average of three normalized earnings metrics: ten-year average real earnings (i.e., Shiller earnings), trend-line earnings, and return on equity–adjusted earnings.

Dividend yields can be a useful indicator of subsequent equity returns

In addition to the P/E ratio, dividend yields are a useful historical indicator of subsequent returns, with high dividend yields typically leading to above average returns. The current dividend yields for both the US (2.1%) and the UK (3.7%) fall within their respective bottom halves, meaning future returns may be below median, although the relationship is noticeably weaker in the UK.

Relationship Between Dividend Yields and Subsequent Real 15-Year AACRs
First Quarter 1950 – Fourth Quarter 2015





Dividend Yield Percentile	Beginning Period US Dividend Yield (%)			Subsequent Real 15-Year AACR (%)		
	Median	High	Low	Median	High	Low
0–10	1.3	1.6	1.1	2.0	2.9	1.8
10–25	2.0	2.0	1.7	3.0	3.6	2.3
25–75	3.2	4.0	2.1	4.1	14.0	-1.8
75–90	4.5	5.2	4.1	9.3	15.5	4.1
90–100	5.8	7.2	5.3	11.9	14.9	9.8
Overall	**3.4**	**7.4**	**1.1**	**6.2**	**15.5**	**-1.8**

	Beginning Period UK Dividend Yield (%)			Subsequent Real 15-Year AACR (%)		
	Median	High	Low	Median	High	Low
0–10	2.3	2.9	2.1	2.1	2.8	1.4
10–25	3.2	3.4	3.0	4.6	7.4	0.9
25–75	4.5	5.5	3.4	5.4	13.5	-3.7
75–90	5.7	6.0	5.5	9.7	13.8	-0.3
90–100	6.5	12.0	6.0	10.8	16.5	2.3
Overall	**4.8**	**12.0**	**2.1**	**6.4**	**16.5**	**-3.7**

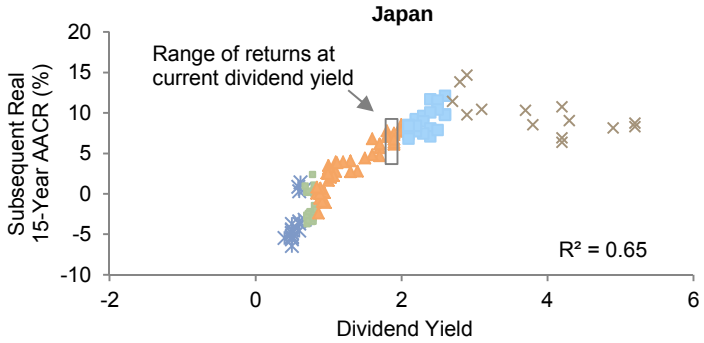
Sources: FTSE International Limited, Global Financial Data, Inc., Standard & Poor's, Thomson Reuters Datastream, US Department of Labor - Bureau of Labor Statistics, and *The Wall Street Journal* .

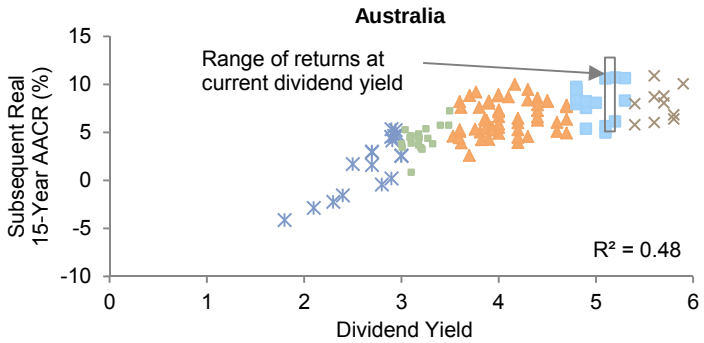
Notes: Data are quarterly. The last full 15-year period was first quarter 2001 through fourth quarter 2015. Outliers are not shown on graph but are included in R^2.

However, this does not hold true for all regions

Japanese dividend yields show the highest correlation with subsequent returns, with an R^2 of 0.65, likely due to the very narrow range for Japanese dividend yields. At 2%, the current dividend yield in Japan is elevated relative to history (70th percentile). In Australia, the current dividend yield of 5% is near the high end of its long-term distribution, currently in the 83rd percentile.

Relationship Between Dividend Yields and Subsequent Real 15-Year AACRs
Fourth Quarter 1969 – Fourth Quarter 2015





Dividend Yield Percentile	Beginning Period Japan Dividend Yield (%)			Subsequent Real 15-Year AACR (%)		
	Median	High	Low	Median	High	Low
0–10	0.5	0.7	0.4	-4.5	1.4	-6.4
10–25	0.8	0.8	0.7	-2.2	2.4	-3.7
25–75	1.2	2.0	0.8	3.7	8.5	-2.4
75–90	2.3	2.6	2.1	8.9	12.1	6.8
90–100	4.0	5.2	2.7	9.4	14.6	6.3
Overall	**1.1**	**5.2**	**0.4**	**2.7**	**14.6**	**-6.4**

	Beginning Period Australia Dividend Yield (%)			Subsequent Real 15-Year AACR (%)		
	Median	High	Low	Median	High	Low
0–10	2.9	3.0	1.8	2.6	5.3	-4.2
10–25	3.2	3.5	3.0	4.4	7.3	0.8
25–75	4.0	4.7	3.5	6.3	10.0	2.6
75–90	5.0	5.3	4.8	8.2	10.7	5.0
90–100	5.8	9.2	5.4	8.0	10.9	5.8
Overall	**4.0**	**9.2**	**1.8**	**5.8**	**10.9**	**-4.2**

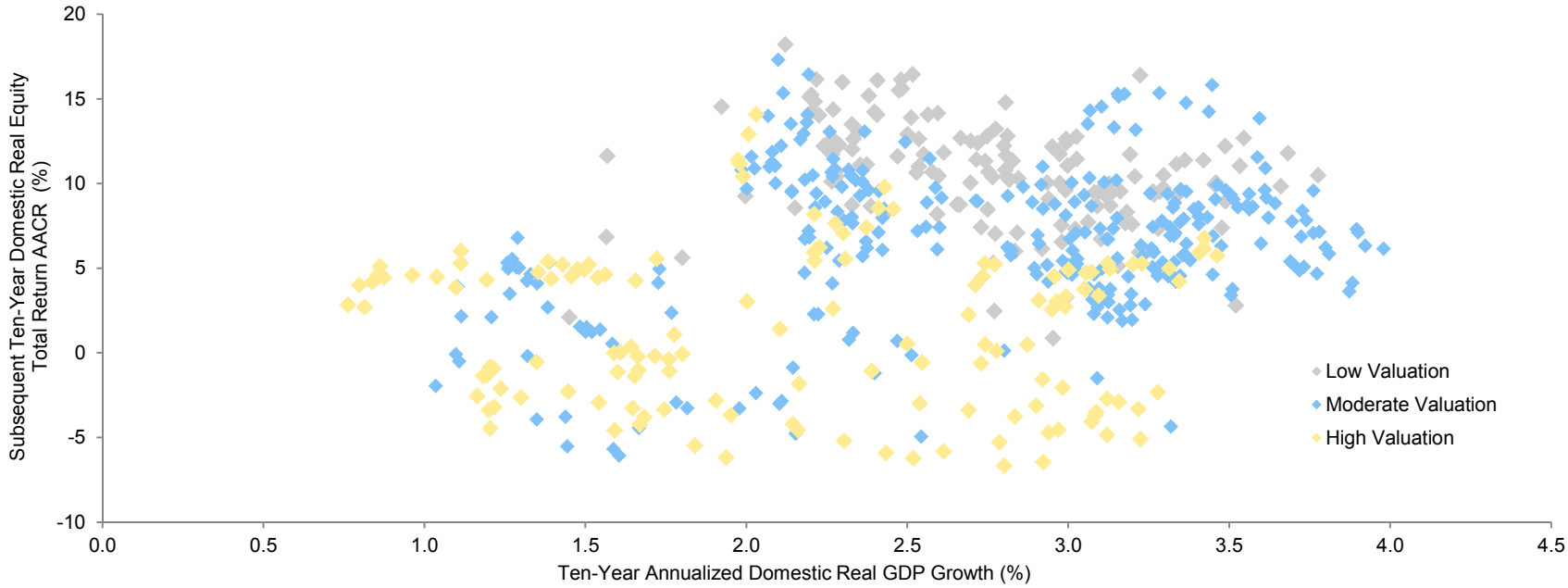
Sources: MSCI Inc. and Thomson Reuters Datastream. MSCI data provided "as is" without any express or implied warranties.
Notes: Data are quarterly. The last full 15-year period was first quarter 2001 through fourth quarter 2015. Outliers are not shown on graph but are included in R^2.

GDP growth and equity returns have little relationship

Comparing data from four developed markets over nearly 50 years, measuring ten-year annualized GDP growth and comparing that to subsequent ten-year real equity AACRs shows no meaningful relationship. Valuations are a better guide, with extreme lows and extreme highs the best indictors of what subsequent returns will look like.

Relationship Between Ten-Year Real GDP Growth and Rolling Ten-Year MSCI Real Total Return AACRs

Second Quarter 1970 – Fourth Quarter 2015 • Local Currency



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

Notes: Data are quarterly. The following countries are included in the analysis: Australia, France, the UK, and the US. The composite normalized P/E is calculated by dividing the inflation-adjusted index price level by the simple average of three normalized earnings metrics: ten-year average real earnings (i.e., Shiller earnings), trend-line earnings, and return on equity–adjusted earnings. Low initial valuation represents the bottom 25% of all composite normalized P/E observations, moderate represents the middle 50%, and high represents the top 25%.

5101q (mod)

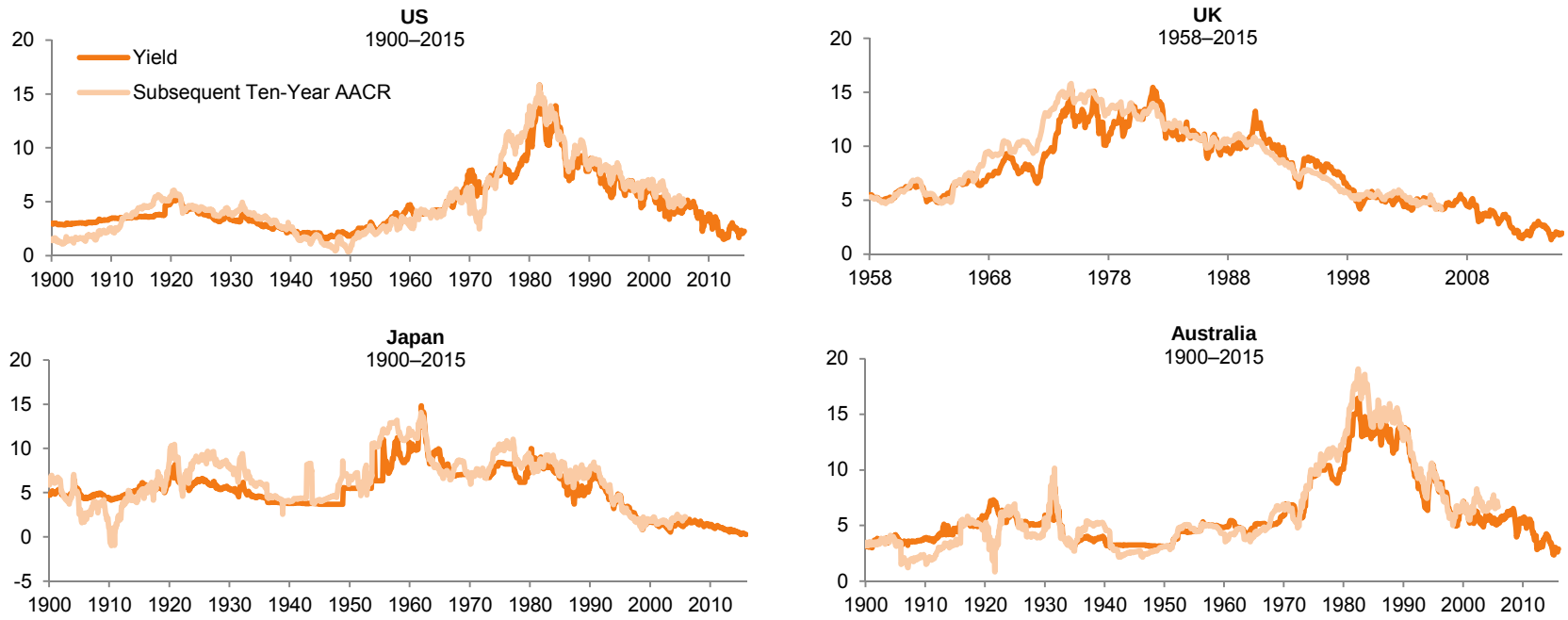
Bond Yields and Future Returns

History and basic bond math have shown that the entry yield of a bond or portfolio of bonds is likely to be the overwhelming determinant of future returns. Given today's low-yield environment—in some cases record low yield—the outlook for future bond returns is muted at best. Japan's experience, where bond yields have been below 5% since November 1992, may serve as a guide. Since July 1993, no rolling monthly trailing nominal ten-year return on Japanese bonds has exceeded 5%, and nearly half of these 149 observations have been nominal trailing ten-year returns of less than 2%.

Subsequent bond returns largely track the starting yield

Historically, current bond yields have been a very good predictor of future returns, with correlations in excess of 90% for the US, UK, and Australia. In Japan, the correlation is only slightly weaker at 86%. With current yields at or near all-time lows, the outlook for future bond returns is decidedly low.

Government Bond Yields and Subsequent Returns
Percent (%)

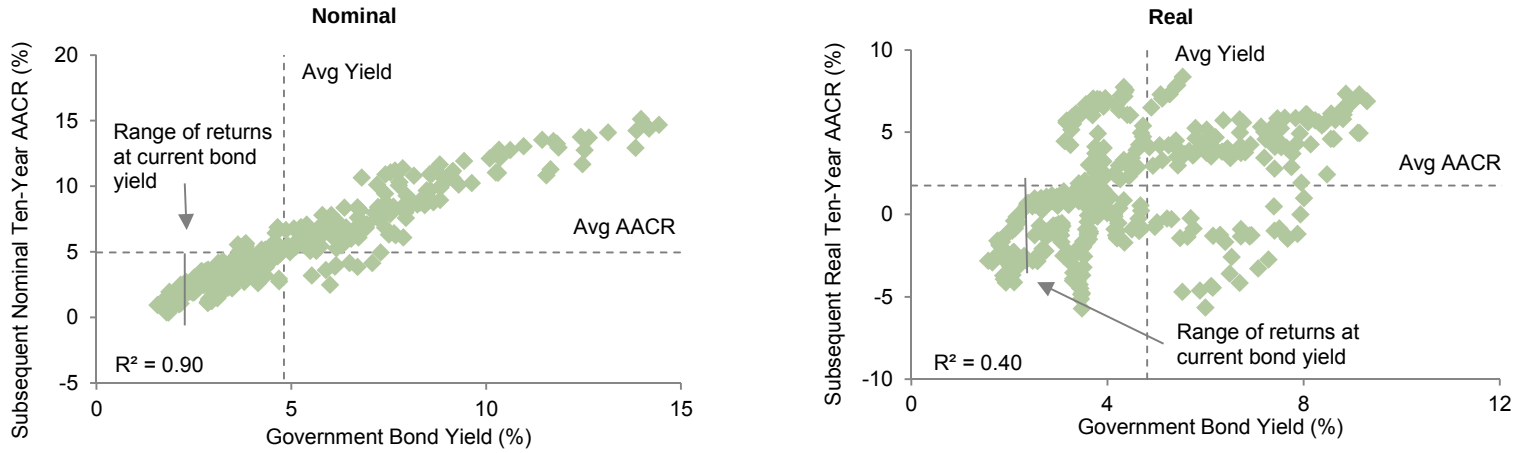


Sources: Global Financial Data, Inc., MSCI Inc., and Thomson Reuters Datastream. MSCI data provided "as is" without any express or implied warranties.
Notes: Data are monthly. The last full ten-year period was January 1, 2006, to December 31, 2015.

Initial bond yields are strongly correlated to subsequent nominal returns

Initial yields and subsequent nominal ten-year returns on US government bonds have an R^2 of 0.90. This is largely due to the effect of rising bond prices offsetting lower interest payments during periods of falling yields and vice versa. While inflation weakens this relationship, initial yields are still a decent predictor of real returns over time.

Relationship Between US Government Bond Yields and Subsequent Ten-Year AACRs
1900–2015



Yield Quartiles	Beginning Period Government Bond Yields			Subsequent Nominal Ten-Year AACR (%)			
	Mean	High	Low	Mean	High	Low	Std Dev
First	2.42	3.00	1.57	1.92	3.64	0.37	0.81
Second	3.45	3.84	3.01	3.55	5.66	1.45	1.13
Third	4.74	6.15	3.84	4.92	7.80	2.48	1.20
Fourth	8.64	15.84	6.16	9.40	15.82	3.86	2.67
Overall	**4.81**	**15.84**	**1.57**	**4.95**	**15.82**	**0.37**	**3.22**

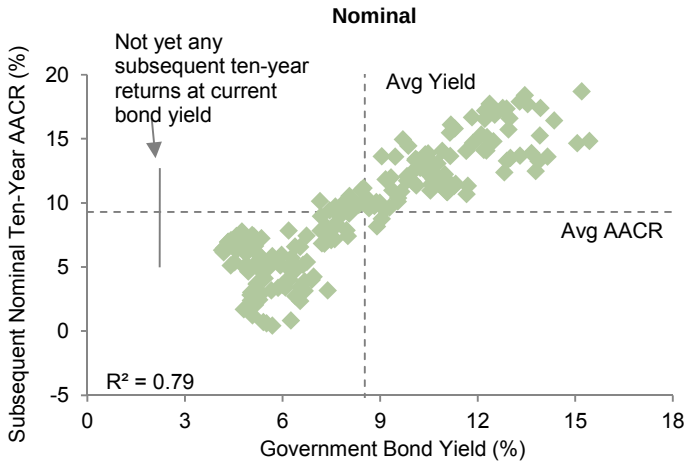
	Beginning Period Government Bond Yields			Subsequent Real Ten-Year AACR (%)			
	Mean	High	Low	Mean	High	Low	Std Dev
First	2.42	3.00	1.57	-1.13	1.16	-4.14	1.51
Second	3.45	3.84	3.01	0.96	7.03	-5.72	3.51
Third	4.74	6.15	3.84	2.62	8.34	-5.65	3.30
Fourth	8.64	15.84	6.16	4.53	11.43	-4.15	3.57
Overall	**4.81**	**15.84**	**1.57**	**1.75**	**11.43**	**-5.72**	**3.72**

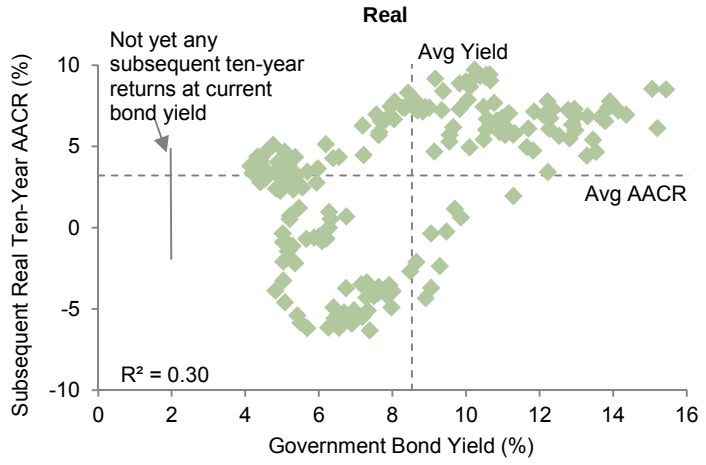
Sources: Global Financial Data, Inc. and Thomson Reuters Datastream.
Notes: Data are quarterly. The last full ten-year period was first quarter 2005 through fourth quarter 2015.

Initial bond yields are strongly correlated to subsequent nominal returns

UK bond yields have been a strong predictor of future nominal ten-year returns, but less so for real returns. With the year-end nominal yield of 2.0% not far from the all-time low, future returns for UK bonds are highly likely to be below historical averages.

Relationship Between UK Government Bond Yields and Subsequent Ten-Year AACRs
1958–2015





Yield Quartiles	Beginning Period Government Bond Yields			Subsequent Nominal Ten-Year AACR (%)			
	Mean	High	Low	Mean	High	Low	Std Dev
First	5.00	5.69	4.14	4.76	7.76	0.41	2.11
Second	6.96	8.01	5.87	6.35	10.19	0.83	2.48
Third	9.62	10.86	8.05	11.54	14.94	8.16	1.63
Fourth	12.53	15.44	10.92	14.56	18.69	10.68	2.31
Overall	**8.53**	**15.44**	**4.14**	**9.30**	**18.69**	**0.41**	**4.49**

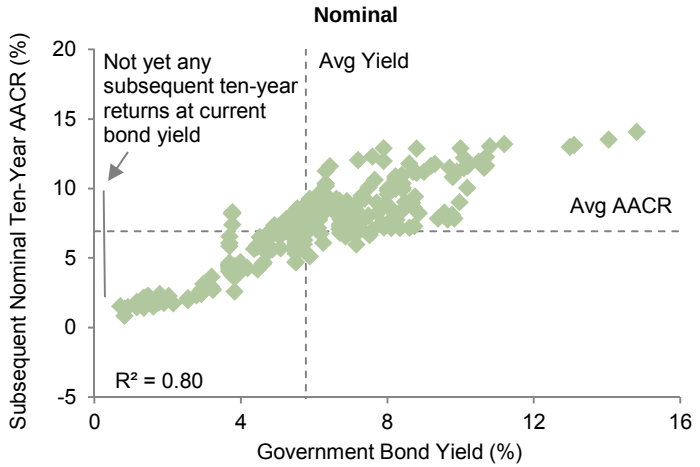
	Beginning Period Government Bond Yields			Subsequent Real Ten-Year AACR (%)			
	Mean	High	Low	Mean	High	Low	Std Dev
First	5.00	5.69	4.14	1.41	5.09	-6.19	3.16
Second	6.96	8.01	5.87	-1.14	7.45	-6.34	4.49
Third	9.62	10.86	8.05	5.83	9.71	-4.35	3.88
Fourth	12.53	15.44	10.92	6.66	11.09	1.94	1.73
Overall	**8.53**	**15.44**	**4.14**	**3.19**	**11.09**	**-6.34**	**4.71**

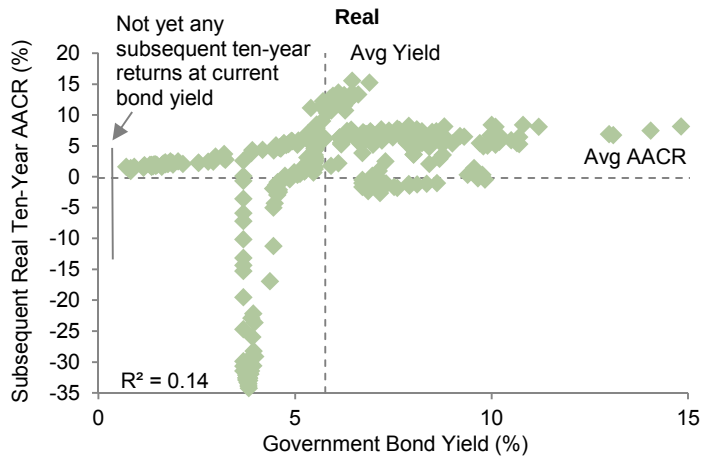
Sources: Global Financial Data, Inc. and Thomson Reuters Datastream.
Notes: Data are quarterly. The last full ten-year period was first quarter 2006 through fourth quarter 2015.

Initial bond yields are strongly correlated to subsequent nominal returns

While still high at 0.80, the R^2 of Japanese nominal bond yields to subsequent nominal ten-year returns is lower than that for the other countries in our analysis. On a real basis, the R^2 came out at a low 0.14. Japan's triple-digit annual inflation during World War II pushed real returns into deep negative territory. Nonetheless, even stripping out these particular returns results in a weaker relationship than that seen in the other countries.

Relationship Between Japan Government Bond Yields and Subsequent Ten-Year AACRs
1921–2015





Yield Quartiles	Beginning Period Government Bond Yields			Subsequent Nominal Ten-Year AACR (%)			
	Mean	High	Low	Mean	High	Low	Std Dev
First	2.75	3.86	0.71	3.31	8.29	0.84	1.65
Second	4.96	5.61	3.87	6.38	8.57	3.76	1.27
Third	6.51	7.23	5.64	8.12	12.03	5.11	1.23
Fourth	8.86	14.82	7.24	9.83	14.06	6.62	1.94
Overall	**5.77**	**14.82**	**0.71**	**6.91**	**14.06**	**0.84**	**2.86**

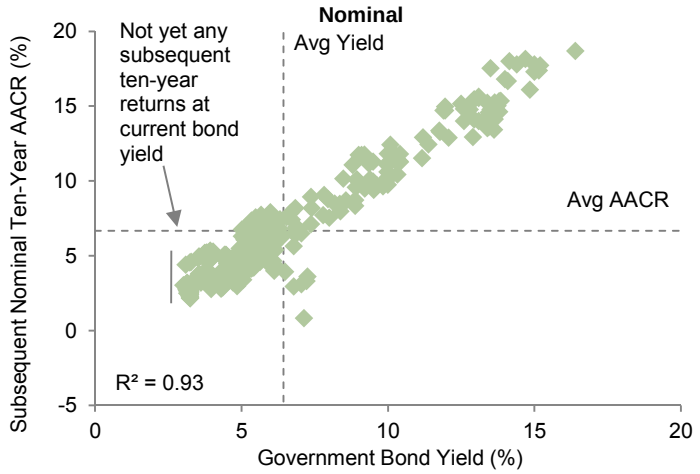
	Beginning Period Government Bond Yields			Subsequent Real Ten-Year AACR (%)			
	Mean	High	Low	Mean	High	Low	Std Dev
First	2.75	3.86	0.71	-11.19	3.66	-34.25	15.93
Second	4.96	5.61	3.87	-0.30	11.11	-31.97	10.22
Third	6.51	7.23	5.64	6.02	15.52	-2.64	5.29
Fourth	8.86	14.82	7.24	4.74	8.40	-1.82	3.11
Overall	**5.77**	**14.82**	**0.71**	**-0.19**	**15.52**	**-34.25**	**12.01**

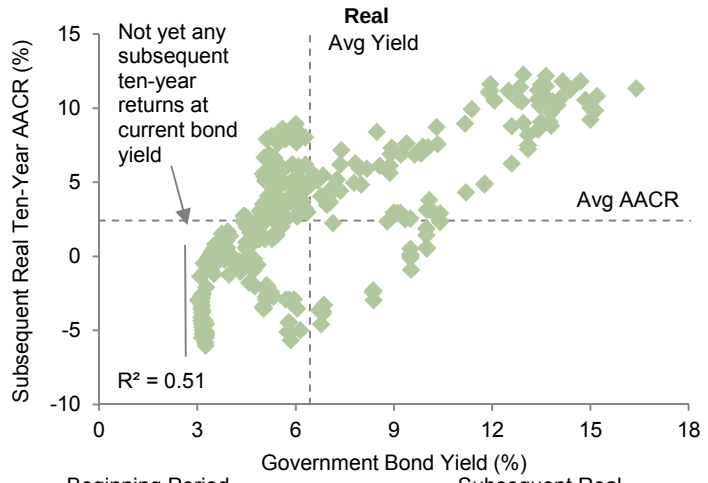
Sources: Global Financial Data, Inc. and Thomson Reuters Datastream.
Notes: Data are quarterly. The last full ten-year period was first quarter 2006 through fourth quarter 2015.

Initial bond yields are strongly correlated to subsequent nominal returns

Bond yields and nominal ten-year returns showed the highest R^2 for Australia at 0.93. This fell to 0.51 on a real return basis, but was still the highest of the four regions examined. With Australian government bonds yielding an all-time low of 2.9%, future returns are likely to be sub-par.

Relationship Between Australia Government Bond Yields and Subsequent Ten-Year AACRs
1912–2015





Yield Quartiles	Beginning Period Government Bond Yields			Subsequent Nominal Ten-Year AACR (%)			
	Mean	High	Low	Mean	High	Low	Std Dev
First	3.59	4.47	3.02	3.52	5.33	2.15	1.00
Second	4.94	5.28	4.48	4.75	6.93	2.96	0.84
Third	5.97	7.37	5.29	5.89	8.93	0.84	1.30
Fourth	11.25	16.40	7.37	12.51	18.68	7.12	2.98
Overall	**6.44**	**16.40**	**3.02**	**6.67**	**18.68**	**0.84**	**3.89**

	Beginning Period Government Bond Yields			Subsequent Real Ten-Year AACR (%)			
	Mean	High	Low	Mean	High	Low	Std Dev
First	3.59	4.47	3.02	-1.81	2.73	-6.04	2.66
Second	4.94	5.28	4.48	1.71	8.11	-3.54	2.76
Third	5.97	7.37	5.29	3.03	8.91	-5.67	3.82
Fourth	11.25	16.40	7.37	6.75	12.24	-2.98	4.00
Overall	**6.44**	**16.40**	**3.02**	**2.42**	**12.24**	**-6.04**	**4.54**

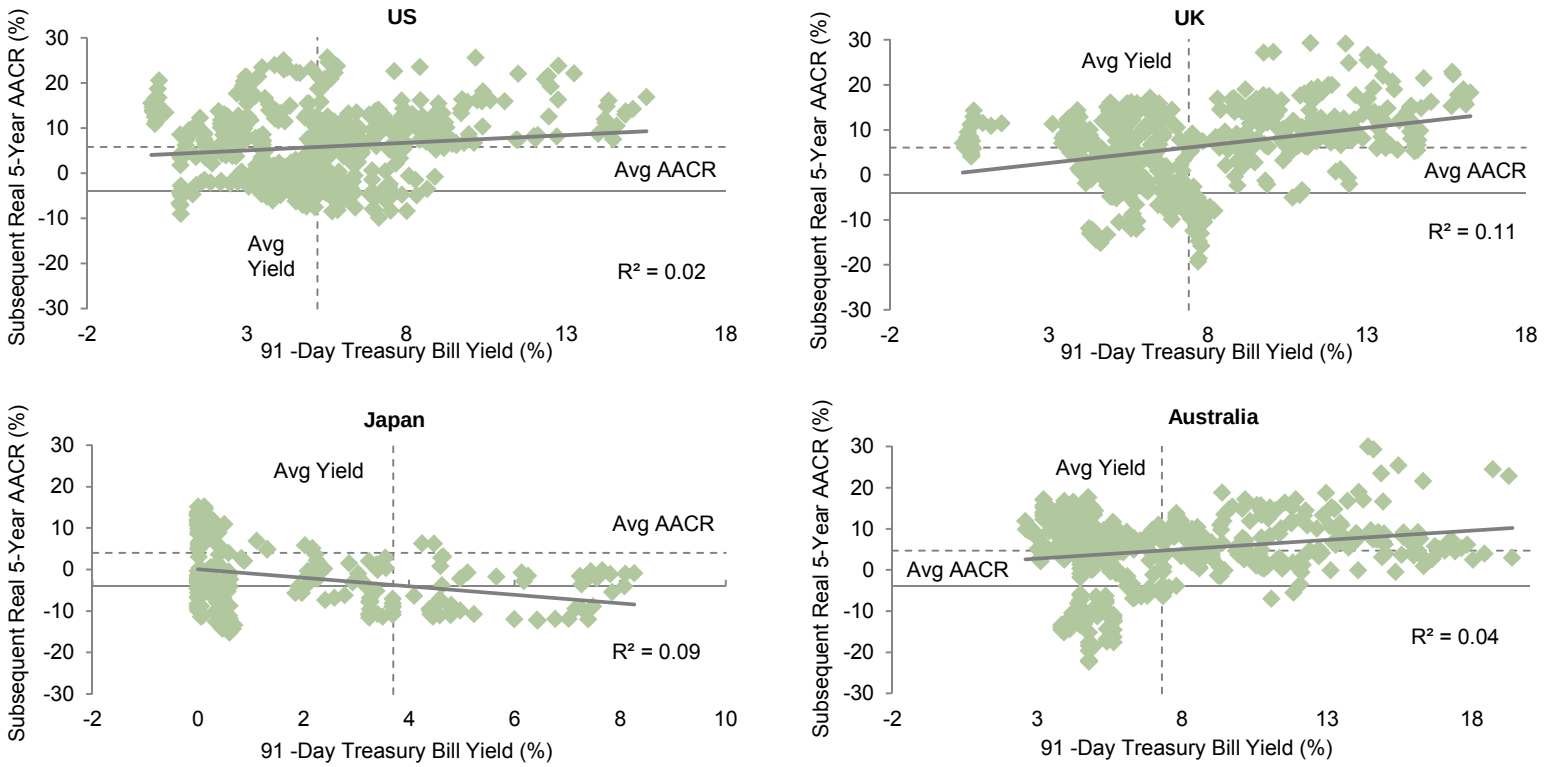
Sources: Global Financial Data, Inc. and Thomson Reuters Datastream.
Notes: Data are quarterly. The last full ten-year period was first quarter 2006 through fourth quarter 2015.

No meaningful relationship between interest rates and equity returns

The very weak relationship between short-term rates and subsequent five-year returns shows that the level of rates has little impact. The observed R^2 ranges from .02 (US) to .11 (UK). Stock valuations and stocks themselves can rise amid rising bond yields if such yields reflect improved growth conditions, or increasing consumer confidence. As such, interest rates themselves have a less clear impact on equities than the factors driving the changes in yields.

Relationship Between Treasury Bill Yields and Subsequent Real Five-Year Equity AACRs

January 31, 1960 – December 31, 2015



Sources: Global Financial Data, Inc., Thomson Reuters Datastream, and US Department of Labor - Bureau of Labor Statistics.
Notes: Data are monthly. Japan data begin January 1, 1987. The last full five-year period was fourth quarter 2010 to fourth quarter 2015.