



U.K. Historical Capital Market Returns
1900–2012

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- ◆ U.K. equity markets rallied in 2012, with the FTSE® All-Share Index returning 12.3%. Despite continued concerns over the European debt crisis, equities returned 8.7% in the second half of the year thanks in large part to central bank actions and Mario Draghi's late July 2012 pledge to do "whatever it takes" to save the euro. Overall, share prices rebounded to within 11.1% of their June 2007 nominal peak. After a remarkable 2011 that saw returns soar to 24.7%, gilts returned a modest 6% for 2012. Since the end of the equity bear market (15 quarters ending fourth quarter 2012), gilts have returned 40.8%. Interestingly, gilts continued to post gains in 2012, with steady or falling yields sending a conflicting signal when compared to the rising price in equities. Turning to cash, Treasury bills posted a meager gain of 0.3% in 2012 thanks to government-suppressed interest rates. Inflation, meanwhile, was 2.7% in 2012, well below its historical average rate of roughly 4% since 1900.
- ◆ No mistake is more common among investors than basing investment decisions on the extrapolation of capital market returns from recent, relatively short periods. Useful conclusions cannot be drawn from return data for periods shorter than several decades other than that short-term returns are irregular and unpredictable, and that over periods of ten years or more equity returns tend to revert toward their long-term mean. This relationship was tested most recently by the consistently above average returns of the 1980s and 1990s, during which equities achieved a real (i.e., inflation-adjusted) average annual compound return (AACR) of 13.6% over the 20-year period ending in 1999. However, the strong performance over those 20 years, while far above the long-term mean of 5.6%, is not completely without precedent: the 20-year period July 1953 to June 1972 resulted in an average annual real return of 10.6%. In the subsequent decade (July 1972 to June 1982), however, the average annual real return of equities was -2.0%. And so history again begins to rhyme, reminding us that stretches of exceptional performance are often followed by lackluster returns. Indeed, U.K. equities have posted an average real return of just 1.9% since 2000.
- ◆ For much of the past century, investors in fixed income securities have persistently underestimated future rates of inflation (in other words, overestimated the government's fiscal probity) and have paid dearly for the miscalculation. Over most of the postwar years, real returns on long gilts are negligible or negative. Only during the periods 1921–34 and 1982–2012 have investors been well rewarded for holding such securities. With gilts currently yielding around 2.6, priced well below the long-term average level of inflation (4.0%), investors are placing great faith in the ability of fiscal and monetary policymakers to keep inflation suppressed over the next few years.
- ◆ Even when averaged over very long time periods, capital market returns are significantly influenced by beginning and ending dates, which suggests that one should not assume that any single number can be regarded as some sort of "normal" or "expected" long-term average annual return. There are 757 rolling monthly 50-year periods since 1900 (and surely most investors would agree that 50 years qualifies as long term); the highest

nominal AACR on equities for any one of these 50-year periods is 15.0% (January 1950 to December 1999) and the lowest is 4.3% (February 1900 to January 1950), a spread of 10.7 percentage points. A large spread remains even when these returns are adjusted for inflation: the highest 50-year real AACR is 8.3% (January 1950 to December 1999) while the lowest is less than one-quarter of this, at 2.0% (July 1903 to June 1952).

- ◆ When the average annual real return on equities for a ten-year period has exceeded 15.3% (i.e., the top 2% of all such returns), results for the subsequent ten years have almost always been significantly lower (mean annual real return of 6.1%). Conversely, unusually bad ten-year periods with returns below -6.5% (i.e., the bottom 2%) have typically been followed by a decade of above average results (mean annual real return of 14.4%).
- ◆ The average annual ten-year return ending in 2012 rebounded from its recent lows to 0.6% above its real long-term average. The dismal rolling ten-year AACRs of 2008 and 2009, while uncommon, are not unprecedented even for the postwar period. Many of the worst real rolling monthly ten-year periods were those that ended during 1910–20 and 1970–80, as high inflation spoiled equity returns. Importantly, subsequent ten-year returns from such levels have been unambiguously positive, indicating the tendency of markets to run in cycles around their long-term mean. For the 25 worst trailing ten-year real returns, the *minimum* subsequent ten-year real return was 10.5%.
- ◆ Although the risk of investing in equities has been well rewarded over the long term, the risk premium (the expected excess return of equities relative to bonds, or of equities or bonds relative to money market instruments) has been unstable and unpredictable. When investors are comfortable with the perceived risk of owning equities (as they typically are after a period of strong returns), they become willing to pay more for equities than they would if they perceived the risk as greater. This equates with implicit acceptance of a lower excess return versus cash and bonds, which occurred with exuberant investors during the late 1990s.
- ◆ Analysis of the distribution of annual nominal equity returns shows that 65% have fallen in the range of 0% to 32%. This makes market timing an extremely dangerous game: the entire inflation-adjusted cumulative return for the period 1900–2009 was concentrated in 55 of this period's 1,356 months. In other words, the cumulative real return of 1,301 of these 1,356 months was roughly zero, and a poor market timer would have earned nothing despite being in the market 96% of the time. This suggests that investors should not allow their equity exposure to fall below an appropriate minimum, regardless of market valuations, but should also consider varying this equity exposure (within a predetermined range) on the basis of the market's vulnerability to a significant decline.
- ◆ Since the bursting of the tech bubble in 2000, the equity market has embarked on a similar path to other secular bears of the past. After an initial sharp sell-off that saw the FTSE® All-Share Index lose half of its value from September 2000 to March 2003, U.K. equities enjoyed a strong “bear market rally,” more than doubling from

their lows and eclipsing their previous high. Such retesting of the previous market highs occurred during the secular bear markets of the 1930s, 1950s, and 1970s, but subsequent declines were devastating. For instance, FTSE® All-Share prices dropped by 45% between December 1936 and September 1940, by 40% between June 1972 and September 1981, and most recently 44% between October 2007 and February 2009. It may be spurious to draw conclusions from such limited historical examples; however, these data suggest that equity investors should be prepared for either further market declines in *real terms* or at least a period of relatively stagnant performance.

- ◆ While most headlines focus on the swings of stock market prices, what matters most for long-term investors are total returns, or price appreciation plus the reinvestment of dividends. For example, since 1918, U.K. equities have produced a nominal AACR of 10.4%. Over the same period, the price level of the stock market compounded at a 5.2% rate, implying that the income return (calculated as total return minus price appreciation) compounded at a 5.2% rate, accounting for 50.4% of the total return.
- ◆ In nominal terms, equity dividend growth has averaged 6.6% annually since September 1962 and 0.7% in real terms. For the full period since September 1962, the average annual dividend yield of equities is 4.3% and the average annual current yield of long-dated gilts is 8.2%. These simple averages are misleading because they mask a secular shift that occurred around mid-century. Before 2008, there was no year after 1962 when equities provided more current income than gilts. However,

in three out of the past five years, the dividend yield on equities has exceeded that of gilts, as interest rates and bond yields have declined to historic lows. Whether or not this trend marks an anomaly created through dovish central bank policy or some sort of secular shift remains to be seen.

- ◆ Long-term studies confirm the conventional wisdom that equities perform best when inflation is low or falling and that bonds perform best in the later stages of deflation. However, it may be that the direction of inflation is more influential than the price level or that investors respond primarily to the divergence between reported and expected inflation. Moreover, history tells us that markets are complex and subject to many other influences in addition to inflation and interest rates—corporate earnings, for example, are at least as important. ■

We last issued our report on historical U.K. capital market returns in 2010 as global economies began recovering from the worst recession since the 1930s. Much has occurred in the interim, with equity markets rallying to within a few percentage points of their pre-crisis highs, as governments and central banks around the world continue to support economies with asset purchasing programs. Gilts have also posted handsome gains over the same period, pushing yields to their lowest levels in decades. In thinking about where the markets go from here, now seems an appropriate time to review the historical record and see where we stand in relation to the past.

Evaluation of historical asset class returns enables us to learn about conditions in which performance was strong or weak, as well as examine historical risk premiums across asset classes. However, the past alone should not be used to forecast the future. History is more like an atlas than a GPS device, providing a guide to the variety of ways in which the market has behaved, rather than producing one simple route.

The first section of this report puts recent market moves into historical context. The remaining sections discuss the distribution of capital market returns; examine how the distribution of returns differs over holding periods of varying length; highlight evidence of equity mean reversion; and show that, while equities outperform gilts, and gilts outperform cash on average over time, the risk premium is unstable. This report also includes the best and worst periods for equities, gilts, and money market instruments; characteristics of bull and bear markets; a review of equity and gilt income, earnings, and price appreciation; and the effects of the overall economic environment on capital market returns.

From Boom to Bust and Back Again: 2008–12

U.K. equity markets posted gains in 2012, with the FTSE® All-Share Index returning 12.3% (9.3% in inflation-adjusted or “real” terms). After a strong first quarter, equity returns faded as concerns over a Eurozone breakup gained traction. However, Mario Draghi’s pledge in July 2012 to do “whatever it takes” to save the euro helped boost investor confidence and, subsequently, equity returns in the second half of the year.

Before the recent recovery began in second quarter 2009, the market dropped 48.8% from its June 2007 nominal peak to a trough in March 2009. The depth of the bear market decline was the largest since 1974 and was deeper than the average (-33.6%) bear market losses since 1972. The duration of the decline, meanwhile, was similar to that of earlier bear markets, lasting roughly 21 months, slightly below the average since 1972 (22.9 months).

The solid equity performance of 2012 boosted the FTSE® All-Share Index price level to within about 10% of its pre-crisis highs. The trailing nominal ten-year average annual compound return (AACR) for the period ending December 2012 is 8.8%, not far off the mean of 9.5% since 1900 when our data begin. But if we extend this calculation to encompass the dismal returns of the turn of the 21st century (2000, 2001, and 2002), that figure falls to a mere 3.0%. The trailing *real* ten-year AACR of 5.8% is in line with the long-term historical average of 5.2%, but when we extend this calculation back another three years, the figure falls to 0.3%. The poor trailing ten-year AACRs of the past few years were some of the worst on record, with negative values in 2008 and 2009. The only other historical periods

that saw negative trailing ten-year AACRs were during World War I and the mid-1970s to early 1980s as high inflation spoiled equity returns. While returns at the end of 2008 and early 2009 fall into the far left tail of the distribution of equity returns, they are certainly within historical bounds and are by no means unprecedented. The dismal performance of equities over this period, however, implies a much higher probability that future equity returns will be above average. For the 25 worst trailing ten-year real returns, for instance, subsequent ten-year real returns averaged 14.4% annually, with a maximum of 18.5%. The 25 worst trailing ten-year nominal returns, meanwhile, witnessed subsequent ten-year nominal returns averaging 9.3% annually.

Since the lows of early March 2009, equities have roared back to life. The FTSE® All-Share Index returned 16.6% annualized through the end of December 2012. Both the trailing nominal (8.8%) and real (5.8%) ten-year AACRs have moved back to just slightly below their historical averages. The recent equity rally is instructive, as the lion's share of historical equity returns has occurred in similar concentrated bursts. For instance, the entire inflation-adjusted cumulative return since 1900 is concentrated in just 55 of 1,356 monthly returns. Thus, returns going forward could likely be muted thanks to the powerful move in equities over recent months.

Coming off of a stellar performance in 2011, gilts returned 6.0% in 2012, in line with the long-term average since 1900 of 6.2%. For the period encompassing the equity rally (15 quarters ending fourth quarter 2012), gilts returned an annualized 9.5%. Interestingly, gilts have continued to post gains since 2009, with falling yields sending a conflicting signal when compared with the rise in equity

prices. The yield on the ten-year gilt touched a generational low in July 2012 of 1.40%. Since that time, yields have recovered a bit to 1.88% as of December 31, 2012, but remain well below the historical average (7.45% since 1980) despite improving economic activity and record issuance.

The recent performance of government debt has maintained the above average long-term returns seen in recent years. The nominal AACR for the past 20 years is 9.0% and the 20-year real return is 6.2%, compared to the average rolling 20-year nominal and real returns of 6.1% and 1.8%, respectively.

Turning to cash, Treasury bills posted a meager gain of 0.3% in 2012 as the Bank of England (BOE) kept interest rates pinned near zero. Cash has failed to keep up with the rate of inflation, which was 2.7%, below its average annual rate of roughly 4% since 1900. Indeed, cash has generated a paltry AACR of 0.5% since 2009. Although the rate of inflation has yet to spike, this will be an important factor for investors to monitor in the near future as central banks and governments throughout much of the developed world eventually normalize interest rates.

Based on historical precedent, U.K. equities seem likely (although by no means guaranteed) to deliver long-term returns on par with historical norms. Gilts, on the other hand, seem more likely to disappoint. First, government debt has enjoyed an amazing rally since 1975, posting a nominal AACR of 11.9% from January 1975 to December 2012. Extended periods of above average returns tend to be followed by periods of below average returns. Second, equity investors can assume with some degree of confidence that both equity prices and equity dividends will keep up with the rate of inflation better than gilts over the long term (except for

those gilts that are indexed to inflation). With ten-year gilts yielding 1.88% as of December 31, 2012, priced below the long-term average level of inflation, investors are placing much faith in the ability of fiscal and monetary policymakers to keep the inflation genie in the bottle.

Long-Term Total Returns

Viable general conclusions cannot be drawn from return data for periods shorter than several decades and, even then, investors should be mindful that very long-term statistics are beginning- and end-point sensitive and are more variable than commonly assumed. Exhibit 1 shows annual total returns, cumulative wealth, and AACRs through 2012 (in nominal terms) for equities and gilts over the past 113 years.

Over the past 100 years (1913–2012), the AACR for equities has been 9.9%. However, the past 50 years have seen notably higher returns, averaging 12.2%. The latter part of this period has not been as kind, with equities delivering only 7.8% compound returns over the past 20 years. But are these returns below average? The AACR of U.K. equities for the full period (1900–2012) is 8.8%, as the poor returns of the first decade of the twentieth century weigh on the data series. Most historical analyses of U.K. equities begin somewhat conveniently in 1918 or 1920, thereby excluding the long bear market and high inflation triggered by the outbreak of World War I. The average annual return since 1919 (the end of World War I) is 10.3% nominal.

Real equity returns (Exhibit 3) have shown somewhat less variation, ranging between about 5% and 8% over various long-term holding periods, but are still beginning- and end-

point sensitive. For instance, the past 40 years (1973–2012) have seen average real returns of 5.5%. Advance the starting date one decade (1983–2012) and the average return jumps to 7.5%.

Turning to gilts, the variation in inflation has also created wide divergence in long-term gilt returns. The past 100 years have seen average annual gilt returns of 6.3% nominal, while the past 50 years have seen average annual returns of 9.2%. The contrast is equally noticeable in real terms—the 3.1% average return for the past 50 years is over 50% higher than that of the past 100 years (2.0%).

In nominal terms, gilt investors have witnessed an amazing rally since 1975, with a nominal AACR of 11.9% from January 1975 to December 2012, the period when interest rates began their secular march downward as policymakers tamed the beastly inflation of the 1970s. Long-term gilt yields fell from a peak of 17.18% at the end of 1974 to recent secular lows below 3%. In the last 38 years, gilts have recorded double-digit nominal gains 50% of the time, compared to the long-term figure of 25%.

In real terms, however, the story is different, as inflation has gnawed away gilt returns over most of the twentieth century. The highest real returns on gilts were recorded during the deflationary periods of the 1930s. Of the 48 instances of double-digit real rolling monthly ten-year AACRs, all but 13 occurred during the 1930s, with the remaining occurrences taking place in 2000 and 2001. Most remarkable in this series is the extraordinary number of rolling monthly ten-year periods for which real returns on gilts are negative—39% of periods since 1900. In 93% of the rolling monthly ten-year periods from May 1912 until November 1925, returns for gilts were negative in real terms, while in only 31% of rolling monthly ten-year

periods between February 1944 and January 1983 did gilt investors receive a positive real return. It is the overwhelming influence of these dismal periods, of course, that results in the low 1.8% long-term real AACR on gilts and that makes the recent real returns appear so high by comparison. For the most recent 25-year period, the real AACR is 5.6%, in the top quintile of rolling annual periods since 1900. The last time that a rolling quarterly 25-year period for gilts posted a negative real return was the 1960–84 annual period.

For Treasury bills, the story is similar to that of gilts—the past 100 years have seen average returns of 5.1% nominal and 0.8% real, compared to 7.5% nominal and 1.5% real for the past 50 years. The average annual nominal return is less than 5.0% for every rolling monthly ten-year period before May 1958 to April 1968 and only reaches double-digit figures again in the November 1970 to October 1980 period. In every successive rolling monthly ten-year period until the September 1985 to August 1995 period, however, the nominal return on Treasury bills is more than 10.0%, reaching a high of 11.9% in the period ending October 1989. As with gilts, *real* average annual ten-year returns on Treasury bills are very high in the late 1920s and early 1930s (a range of approximately 4.5% to 10.0%), generally low, or more often negative, from the late 1930s through the early 1980s, and then unusually high again in the late 1980s and early 1990s. Since then, real ten-year AACRs have been gradually descending thanks to a combination of low short-term interest rates and moderate inflation. The 0.2% real return for the most recent ten-year period is the lowest since the period ending March 1985.

The lesson of the above is that even with evidence to the contrary, no mistake is more

common among investors than that of basing investment decisions on the extrapolation of capital market returns from recent, relatively short periods. For these reasons, investors should still consider the distribution of long-term returns, rather than assume a long time period will eliminate beginning- and end-point sensitivity.

Distribution of Returns

Exhibits 4–9 show the distribution of capital market returns over various holding periods (summarizing the results of various 50-, 25-, 20-, ten-, five-, three-, and one-year holding periods between 1900 and 2012) and indicate that time increases the probability of earning a significant risk premium in the stock market. Exhibit 5 shows that no rolling monthly 50-, 25-, or 20-year period contains negative returns on equities. In rolling monthly ten-year periods (January 1900 to December 1909, April 1900 to March 1910, etc.), equity returns are negative ten out of 1,237 (0.8%) periods, while in rolling monthly five- and three-year periods, returns are negative 164 out of 1,297 (12.6%) and 245 out of 1,321 (18.5%) times, respectively. These statistics are often cited as indicative of probable future returns from the equity market, but investors should be wary of all such extrapolations because the mathematics of 20-year or even ten-year rolling monthly returns is such that the better years before and after the 1930s are counted more often than those negative years. The reiterative effect of counting rolling periods in a series that contains far more positive than negative observations produces a positive bias in the data, even though the negative observations are of comparable magnitude. The result is that the mean slightly overstates the case for equities.

The apparent solution to this common statistical problem is to rely solely on independent series such as 1900–19, 1920–39, or 1900–09, 1910–19, etc. However, the limited number of such series (five for 20-year periods and 11 for ten-year periods are far fewer than the statistically desirable 30) as well as the complication of beginning- and end-point sensitivity create an overwhelming handicap. Consequently, although both rolling and independent period returns are analyzed in the exhibits, neither measure is entirely satisfactory on its own.

Even when averaged over very long time periods, capital market returns are significantly influenced by beginning and ending dates, which suggests investors should not assume any single number can be regarded as some sort of “normal” or “expected” long-term average annual return. There are 757 rolling monthly 50-year periods since 1900 (and surely most investors would agree that 50 years qualifies as long term); the highest nominal AACR on equities for any one of these 50-year periods is 15.0% (January 1950 to December 1999) and the lowest is 4.3% (February 1900 to January 1950), a spread of 10.7 percentage points (Exhibit 6). A large spread remains even when these returns are adjusted for inflation: the highest 50-year real AACR is 8.3% (January 1950 to December 1999) while the lowest is less than one-quarter of this, at 2.0% (July 1903 to June 1952) (Exhibit 8).

Remarkably, the relative dispersion of long-term AACRs on gilts is almost as broad: the highest nominal return for any 50-year period is 9.4% (January 1961 to December 2011), while the lowest is only 2.9% (April 1907 to June 1952) (Exhibit 7). The extraordinary damage inflicted on fixed income investors is highlighted by adjusting these returns for inflation. Of the 757 rolling monthly 50-year periods since 1900, in

only 327 have investors in gilts earned a real AACR greater than 1.0%. Even the highest 50-year average annual real return is a relatively meager 3.4% for the period June 1962 to May 2012, and in 50 periods the annual average real return has been -0.5% or worse. These figures reflect total returns—that is, they assume constant reinvestment of coupon payments.

Anyone startled by the dispersion of returns among 50-year periods should perhaps avoid the same analysis conducted for all rolling 25-year periods since 1900. Such broad dispersion should effectively dispel the illusionary precision of the “expected” returns for equities that constitute the inputs for asset allocation models. The hard fact is that returns for a given period (even as long as 25 or 50 years) are unlikely to fall anywhere near the “average.” Of the 1,057 rolling monthly 25-year periods from 1900 to 2012, 875 (or 83%) have nominal average annual returns greater than 11.3% or less than 9.3% (i.e., approximately 100 basis points greater or less than the 10.3% AACR on equities over all 25-year periods).

It can hardly be stressed enough that simulation models built on long-term series (e.g., 100+ years) will tend to highlight what appears consistent and ignore what has proved unstable, thus obscuring the important truth that markets can change character as they try to anticipate emerging trends rather than respond to them after they have already become well established. This fact alone limits the knowledge to be gained by simulating future returns based on historical data. Nevertheless, studies of historical data do provide an effective antidote to the persistent habit, widespread even among sophisticated investors, of extracting general conclusions from short episodes of market history.

Exhibits 12 and 14 show the distribution of annual equity and gilt returns. During the 113 years since 1900, 65% of nominal annual equity returns have fallen in the range of 0% to 32%, which only reinforces the futility of any attempt to predict returns for any given year in the future. One would expect the distribution of gilt returns to be considerably narrower, and it is—but by no means narrow enough to form a basis for useful forecasting: 58% of annual returns on gilts fall in the range of -4% to 8% (and 59% in the range of 0% to 16%). Such information provides an additional anecdote to the common expectation that returns will revolve closely around their long-term average. On the contrary, the pattern of returns is irregular and unpredictable, with the “average” composed of individual observations that vary widely from the mean.

Exhibits 13 and 15 also display the distribution of equity and gilt returns. These exhibits, however, include all rolling monthly periods over the last 113 years. Thus, the sample size contains far more data points (1,345 versus 113). While the shape of the respective equity and gilt distributions are comparable, Exhibits 13 and 15 remove any seasonal effects by incorporating all beginning and end dates rather than relying solely on calendar-year returns. For instance, rolling monthly annual equity returns were negative 27.8% of the time compared to 24.8% of the time for calendar-year returns, a significantly higher figure. Returns at the end of 2012 clearly fall within historical bounds and are by no means unprecedented (in fact, they fall into the most common return bucket of 8% to 16%). At the lower end of the spectrum, there are 25 rolling monthly periods during the last 113 years when equities returned -24% or less, with the worst returns occurring in the

inflationary 1970s. The rest are concentrated throughout the latest recession.

Evidence of Equity Mean Reversion

Exhibits 19–24 document the tendency of equity returns to revert to their long-term mean, particularly over longer time horizons. Extended periods of below average returns *tend* to be followed by periods of above average returns. Exhibit 25 charts the progression of the U.K. stock market over the past 113 years around its long-term, cumulative real return trend line. It is particularly noteworthy how tightly the cumulative return line wraps around the trend-line return, thereby pointing to the tendency of the cumulative return to revert. After years of sustained separation during the 1990s, equities dipped toward their trend line briefly in 2008 and 2009 and have since hovered right above it. This could imply that a period of below trend cumulative returns is in store. Any long-term analysis, however, should greatly de-emphasize the impact of short-lived moves in predicting future results.

Such mean reversion analysis is dangerous because it does not account for *secular* shifts in the economy. Mean reversion of equity returns is premised on the notion that the economy (and therefore the market) goes through cycles (e.g., the business cycle), each of which contains the seeds of its subsequent reversal. Very occasionally, however, the economy undergoes a secular shift that completely vitiates analyses based on observation of recent cycles. This is seen in the bottom panel of Exhibit 25, which provides the same analysis, but divides the data into two historical periods, one ranging from 1900 to 1957, and the other from 1958 to the present. This analysis suggests a very

high probability that in 1957, subsequent real returns would regress to the prevailing trend line of 2.6%, thereby implying a high probability that the market would underperform that average annual return over succeeding years. In fact, the real AACR over the next five years (1958–62) was 14.8% and over the next ten years (1958–67), 11.2%. For all sorts of reasons, which the perspective of 50 years now allows us to perceive quite clearly, the economy was shifting into a much higher gear, resulting in a powerful secular shift in the stock market. In fact, the chart reflecting the trend line since 1958 would suggest that a period of above trend cumulative returns lies in store. Although the burden of proof is clearly with those who claim that “it’s different this time,” we should never forget that while they are usually wrong in mistaking a cyclical swing for a secular shift, every once in a blue moon their vision proves correct, while the rest of us remain with our backs to the future, peering myopically at an irrelevant past.

Exhibits 23 and 24 further illustrate the tendency of equity returns to mean revert by showing the relationships between rolling quarterly ten- and 15-year AACRs and their subsequent returns. The data show that on average, low-return periods are followed by periods of high returns, and conversely that high-return periods are followed by lower subsequent returns. This mean-reverting tendency is greater for a 15-year time frame, but appears to hold true for ten-year periods as well.

Ten-year returns are probably more useful in that they are more reliable statistically and could be reflective of some longer institutional investment time horizons. Especially interesting are the rolling quarterly ten-year periods of nominal and real returns on common equities

from 1900 through 2012, which clearly reveal the tendency of markets to accentuate the very positive or the very negative for extended periods of time. For instance, the worst ten-year periods in stock market history occurred before and during World War I, throughout the Depression, among the declines in the 1970s, in the post-tech bubble rout, and in the recent Great Recession. Inflation appears to have been the primary cause of the first and third of these, while deflation underlay the second. In each of the previous cases, an extended debacle was followed by a period of extraordinary returns, although it remains to be seen if the current rally will extend into the latter half of this decade. Ten-year periods of unusually low returns have typically been followed by periods of exceptionally high returns. However, periods of exceptionally high returns have not necessarily been followed by periods of exceptionally low returns—although there is statistically valid evidence that, on average, equity returns do tend to regress to the mean even over periods of this length.

Given the dramatic developments of 2008 and 2009, it remains important for investors to remember that equities were not in uncharted territory. As shown in Exhibit 20, the dismal real average annual ten-year return ending in March 2009 of -2.9%, while uncommon, is not unprecedented even for the postwar period. Many of the worst rolling monthly ten-year real annual returns were periods ending during 1910–20 and 1970–80, as high inflation spoiled equity returns. Importantly, subsequent ten-year returns from such levels have been unambiguously positive (Exhibit 21), indicating the tendency of markets to run in cycles around their long-term mean. For the 25 worst trailing ten-year real returns, subsequent ten-year real

returns have averaged 14.4% annually, with a *minimum* real return of 10.5%.

Also important for investors is the mean-reverting relationship between asset classes. Exhibit 26 shows the year-over-year ratio between the cumulative wealth of returns on equities compared to that of gilts since 1900. Equities have noticeably outperformed gilts in the postwar era, but recent equity underperformance has dropped the ratio below the differential return trend line of 3.3%. From such levels, history shows that a period of above average relative returns for equities should take place. However, this ratio might be skewed by government and central bank intervention in the wake of the financial crisis.

Risk Premiums

This brings us to a discussion of longer-term relative performance trends. Over the long run, equities have been by far the best investment—£100 invested in equities in 1900 grew to £1,364,232 by the end of 2012, while the same amount invested in gilts grew to £52,683, and in Treasury bills to £20,831 (Exhibit 1). Exhibit 28 shows that equities have outperformed gilts 64% of the time based on rolling one-year periods, while the odds grow in an investor's favor the longer the time horizon; equities beat gilts 95% of the time over 25-year holding periods.

Financial theory postulates that due to the inherently greater risk of equities relative to government gilts (where interest and principal payments are backed by the full faith and credit of the government), investors must demand an “equity risk premium” as compensation for holding shares. It is the collecting of such premiums over time that generates the long-

term outperformance of equities over gilts and money market securities.

Exhibit 30 shows that the equity risk premium has averaged approximately 3.5% over most rolling three- to 20-year periods. However, the range around this average is quite wide; even for 20-year periods, the equity risk premium has been as high as 12.3% and as low as -2.2%. While it is tempting to argue that equities “should” offer a return of 3.5% over the prevailing risk free rate, this is rarely the case.

Numerous studies have attempted to determine some predictable risk premium, but none has succeeded—perhaps because the *ex ante* equity risk premium, which is determined by investor expectations at the start of the period, is most influenced by the *ex post* premium received in the most recent historical period. When investors are comfortable with the perceived risk of owning equities (as they typically are after a period of strong returns), it follows that they would be willing to pay more for equities than they would if they perceived the risk as greater. Paying more for equities nearly guarantees a lower excess return versus cash and bonds (unless bond investors are equally confident in their expectations). Exuberant investors did exactly that during the late 1990s, driving equity valuations to record levels, thereby setting the stage for the dismal returns of equities relative to those of gilts and cash over the past decade.

For gilts, only during the periods 1921–34 and 1982–2009 have investors been persistently rewarded for holding long-dated fixed income securities over cash; over the past 100 years, gilts have only outperformed cash by 1.3% annualized (by 1.1% annualized since 1950). As a result, any long-term asset allocation model based on historical precedent would indicate that investors should ignore gilts entirely and

allocate assets solely between equities and Treasury bills. However, this illustrates the danger of retrospective investing—the fact that long-dated fixed income securities have generated poor returns in the past does not prove they will always produce poor returns. Over the past 20 years, gilts have earned a positive risk premium of 1.2% *over* equities (in contrast to the average 3.8% premium in favor of equities) and 4.6% over Treasury bills. Investors must gauge whether shifts in fiscal policy, the economic environment, and the character of the capital markets that have contributed to the outstanding returns on gilts during the past decade are cyclical or secular, and shape asset allocation strategies that reflect reasonable expectations for the future rather than blindly extrapolate the past.

Equity, Gilt, and Money Market Instrument Returns: Best Cases

The best and worst periods for equities relative to gilts are shown in Exhibits 31 and 32. Since 1900, there have been four periods of significant generational equity outperformance: from August 1921 to August 1929, when equities managed an AACR nearly double that of gilts; from April 1942 to November 1968, when equities increased more than 20-fold (an AACR of 12.7% compared to a meager 2.2% on gilts); and from December 1974 to December 1999 (excluding the early 1980s, which saw record returns in gilts). Among the best periods for gilts over equities were the first eight years of the twentieth century, the dismal 1930s, the turbulent period from 1968 to 1974, and from 1999 to the present. Deflationary periods have undoubtedly favored gilts over stocks. During the worldwide Depression, the decline in equity prices and dividends was so severe that an

investor committing \$100 to the stock market at the end of September 1929 would have seen the investment periodically dip below its initial value until the end of 1934. Only by mid-1950 would the return match what would have been achieved had the money originally been put in gilts.

Although both equities and gilts experienced above average returns in the 1980s and 1990s, gilts have outperformed equities of late, with an AACR of 6.3% compared to 4.4% for equities since 1999. Gilt outperformance over such a lengthy period has occurred rather infrequently over the past 113 years. Indeed, gilts have enjoyed better returns than equities in only 21.2% of rolling monthly 15-year periods since 1900, with nearly all prior instances occurring in the 1930s and 1940s when the poor equity returns in the Great Depression had yet to fall out of the calculation period.

While equities have generally outperformed cash by a wide margin over the past 100 years, there have been periods where holding cash was preferable to being in the market (Exhibit 33). Among the best periods for cash are the onset of the Depression over 1929–32, the market rout of 1972–74, and, most recently, the bursting of the tech and credit bubbles (1999–2011). While the current period has matched neither the Depression era nor the early 1970s in terms of outperformance (cash outperformed equities by a cumulative 52.4% during the Depression and 87.2% during the early 1970s), equities underperformed cash by 24.4% between 1999 and 2011.

Bull and Bear Markets

Looking at discrete annual periods, we can characterize “bear markets” as periods when equities and gilts fail to generate returns over the so-called risk-free rate offered by Treasury bills. Conversely, bull markets can be defined as periods when risk shares and gilts generate returns over those of money market instruments. Exhibits 36 and 37 show that since 1900, there have been 66 “bull market” years for equities (or 58% of all years) and 53 such years for gilts (47% of all years).

The best period for equities was 1980–86, which produced a cumulative nominal return of 432.0% (224% real), followed by 1941–48 (176.7% nominal, 147.0% real) and 1975 (158.2% nominal, 106.7% real). For gilts, the best period was 1995–98, which saw nominal returns of 99.0% (76.7% real), followed by an 89.2% return just a few years earlier (1991–93). The worst period for equities was 1973–74, when shares returned -64.4%, underperforming Treasury bills by 87.2%. The 2000–02 bear market was the second-worst such period, with equities returning -36.9% (underperforming Treasury bills by 52.7%). Gilt investors were hit with a -24.9% return during 1972–74 (underperforming Treasury bills by 54.6%), while in real terms the worst period for gilts was between 1915 and 1917, during which government gilts lost nearly 50% of their real value, underperforming Treasury bills by 14.4% (21.4% nominally).

One of the interesting uses of such data (apart from documenting the historical odds that favor a long as opposed to a short capital market position) is to calculate the degree to which a successful market-timing strategy could have added to returns during particular periods. Indeed, the entire inflation-adjusted cumulative

return for the period 1900–2012 was concentrated in 55 of this period’s 1,356 months. In other words, excluding the best 55 months from the data set results in a cumulative real return of roughly -\$15 for the remaining 1,301 quarters. Therefore, a poor market timer would have lost money despite being in the market 96% of the time (Exhibit 38). On the other hand, excluding the worst 55 months would see the cumulative wealth of £100 invested grow to £12,148,563 in real terms, compared to only £19,695 for the full 1,356 months.

Although it is true that successful market timing could have improved returns during the postwar period, this observation begs the question of whether investors can be consistently proficient at timing the market, even if a theoretical opportunity exists. Given that the evidence is inconclusive that investors can consistently time market ups and downs, investors should only build extreme cash positions if they anticipate a major market calamity such as those of 1929–31, 1973–74, 2000–02, and 2008, and if they can develop a thoughtful game plan *and* have a strong will to execute this plan. For those choosing to raise cash, they must do the following: (1) develop ironclad decision rules for market exit and re-entry (i.e., rules that trigger selling and re-entry at preset levels); and (2) stick with these rules *no matter what* (i.e., accept the potentially significant opportunity costs of staying out of the market while it is rising, and be able to stomach further losses after buying back into the market should it continue lower).¹

Exhibit 40, which defines equity market cycles in a more conventional manner (with a bull market defined as a continuous period of market gains without a decline of 20%

¹ For further discussion, please see our May 2007 Market Commentary *Why Not Hold Cash?*

or more), shows retracement ratios of equity prices following bull market peaks. In the postwar period, bear markets have averaged peak-to-trough declines of 32.2%, compared to an average decline of 49.2% between 1921 and 1940. Since 1900, the average and median bear market declines were 34.8% and 32.6%, respectively. Despite the wide variance in their duration, bear markets have been relatively similar in severity, partly because they eventually wipe out most of the gains earned in the previous run-up. Since 1900, bull markets have seen an average gain of 110.4% (median of 99.7%) and an average retracement ratio of 83.5% (median of 70.9%), although retracements of over 100% are not at all uncommon, as evidenced by the bursting of the tech bubble. Investors seeking to avoid the sharp falls that accompany the typical bear market, however, run the risk of missing the explosive rallies that often follow market downturns, as evidenced in the run-up of stock prices since March 2009.

With the gift of hindsight, we can clearly see 1929, 1969, and 2000 were appropriate times to reduce equity exposure, as the preceding *secular* rallies had driven equity markets to new highs and to dangerous levels of overvaluation. The resulting *secular* bear markets that followed can be characterized as periods of prolonged equity weakness (although punctuated by sharp, violent cyclical rallies) during which market valuations unwind from one extreme to another. While determining the beginnings and ends of secular markets is certainly of a subjective nature (and open to debate), U.K. equities underwent a secular decline in the early twentieth century amid World War I, during the worldwide Depression of the 1930s, in the inflationary eras of the early 1950s and 1970s,

and, most recently, in the aftermath of the 1990s tech bubble.²

Exhibit 41 shows the cumulative real performance of several secular bear markets. While there are few historical examples to draw from, secular bears can be characterized by an initial steep sell-off, followed by a series of bear market rallies, then a choppy general decline (amid other short “rallies”). Since the bursting of the tech bubble in 2000, the equity market has embarked on a similar path to that of other secular bear markets since the Depression. After an initial sharp sell-off that saw the FTSE® All-Share Index lose half of its value from September 2000 to March 2003, U.K. equities enjoyed a strong “bear market rally,” more than doubling from their lows and eclipsing their previous high. Such retesting of the previous market highs occurred during the secular bears markets of the 1930s, 1950s, and 1970s, but subsequent declines were devastating, including the plunge of 2008 and 2009. For instance, prices dropped by 42% in real terms between June 2007 and March 2009, and by 63% between June 1972 and September 1981. It may be spurious to draw conclusions from such limited historical examples; however, these data suggest that equity investors should be prepared for either further market declines *in real terms* or at least periods of relatively stagnant performance following a bear market rally.

² The actual beginnings, ends, and cumulative performance of secular markets are certainly of a subjective nature and dependent on the quality and frequency of data used (e.g., daily data versus quarterly); therefore, our descriptions should be viewed as approximate. For further discussion of secular U.K. equity cycles, please see our August 2006 Market Commentary *New Bull or Same Old Secular Bear?*

Price, Earnings, and Income Data

While headlines tend to focus on the swings of stock market prices, what matters most for long-term investors are *total* returns, or price appreciation plus the reinvestment of dividends. As Exhibits 43 and 44 show, the compounding of reinvested dividends accounts for the bulk of long-term equity returns. For example, since 1900, U.K. equities have produced a nominal AACR of 8.8%. Over the same period, the price level of the stock market compounded at a 4.0% rate, implying that the income return (calculated as total return minus price appreciation) compounded at a 4.8% rate, accounting for 55% of the total return. Adjusting for inflation produces even starker results. Equities have produced a 4.8% real return since 1900, although price appreciation has only compounded at a 0.2% inflation-adjusted rate over this period. This implies that the income return accounted for 96% of the real total return since 1900.

Stated another way, £100 invested in equities in 1900 would have grown to £19,695, adjusted for inflation. By contrast, £100 invested solely in the price level of the stock market (essentially spending all dividend income) grows to only £121 after inflation. The compounding of dividends over time is massively important (Exhibit 47)—the volatility of price (which is a function of both earnings growth and the valuation placed on said earnings) eats away at returns, while the steady compounding of dividends wins the race.

Exhibit 48 shows the growth in both price and total returns in real terms for rolling quarterly one-, three-, five-, and ten-year periods. Over rolling quarterly ten-year periods from 1900 to 2012, the *price* return was negative 47% of the time compared to a mere 21% of the time for

total returns—a message in staunch contradiction to those that rely on an ever-rising equity market. More than half of these negative ten-year real return periods ended in the early 1900s; however, they have appeared as recently as June 2010.

In the long run, a growing dividend stream will generate more current income than a fixed interest payment; how long “the long run” is obviously depends on the initial spread between the equity and gilt yields, and on the rate of growth of the equity dividends. In 1966, £100 invested in equities generated a dividend of £6.04, and £100 invested in gilts produced £6.87 of income; after only two years, the growth of the dividends meant that the annual cash flow from the equities matched the £6.87 annual gilt interest payment. In 1972, the yield on equities was 3.4%, but that on gilts was 9.6%; therefore, it was 17 years (1989) before the equity dividend payment exceeded the annual interest payment from the gilts. But by the end of 2011 and 2012, the yield spread was negative (equity dividend yield [DY] of 3.6% and gilt yield of 2.6%) as the BOE continues to suppress interest rates.

For the period 1962 to 2012, the average annual DY of equities is 4.3% and the average annual yield of long-dated gilts is 8.2%. These simple averages are misleading, however, because they do not include a secular shift that occurred around mid-century as forward-looking investors began to recognize the secular and systemic character of postwar inflation. Investors began to realize that a growing dividend stream provided greater protection against inflation than did a portfolio of fixed income investments. They also started to understand that the greater risk inherent in equity dividends could be minimized through diversification. Although the trend has reversed

in recent years as gilt yields have plummeted to historic lows, prior to 2008 there was no year in which equities yielded more than gilts. For the 34 years from 1968 to 2001 (with the exception of 1974), the yield of gilts was approximately *double* that of equities for each year.

Historically, DYs on equities higher than government gilt yields have only occurred amid periods of deflation, or very, very low inflation, as investors became negative on the growth prospects for equities. In the current market environment, this yield gap still exists thanks to ultra-low bond yields and the desire of investors to earn income. Given central banks are holding rates down, investor attitudes may be changing. Corporations could seek to attract capital by raising dividends if this preference for income continues.

Equity investors can assume with some degree of confidence that both equity prices and equity dividends will keep up with the rate of inflation over the long term—even if there are protracted shorter periods when both lag by a wide margin. The opposite applies to fixed income investments (except for those that are indexed to inflation). The only bulwark against the corrosive power of inflation is a prospective yield high enough not only to compensate for today's rate of inflation, but also to protect investors against the loss of purchasing power of their principal during the life of the security. To the extent that the current yield on long-dated gilts implicitly overestimates future inflation, investors will realize handsome returns (as they have during most of the 1980s and 1990s); to the extent that gilt yields fail to adequately discount future inflation, investors in such securities will be disappointed (as they have been for most of the past century). As a result of voracious demand for long-duration assets by liability-matching investors (such as

pension funds and insurers), as well as government and central bank intervention in the face of a lackluster global economic recovery, yields on long-dated gilts have fallen to historically low levels.

Economic Environment

At the most fundamental level, stock market prices are driven by corporate earnings, which in turn are a function of underlying economic growth. Since 1962, nominal GDP and nominal earnings per share have compounded at an average annual rate of 8.3% and 7.5%, respectively, while equity prices have compounded at a 7.4% rate (reflecting an upward shift in valuations over the period). Therefore, many investors equate strong economic growth with strong stock market performance and vice versa. However, the relationship is much more nuanced than this—the stock market is a discounting mechanism that moves in anticipation of (although not always ahead of) changes in earnings and economic growth and is subject to the whims of investor sentiment and psychology (i.e., the vacillations between greed and fear, hope and despair). While every recession has been accompanied by a sharp sell-off in equities, not every bear market takes place amid a recession. Furthermore, equities do not always turn down once earnings growth slows, nor is every downturn in earnings the result of an economic recession.

The truth is that investors never really know in real time whether the economy has entered a recession. It is this uncertainty that causes the markets to be so volatile heading into a growth slowdown, as every new piece of information is digested and weighed. Since 1972, equities have peaked an average of 12 months prior to the start of a recession, falling an average of

28% until the beginning of the downturn, then dropping an additional 10%, on average, before bottoming. Equities then undergo a “relief rally” during the latter stages of the recession, as the market anticipates the eventual economic recovery. Thus, equities posting positive returns amid periods of economic contraction produce the seemingly counterintuitive results seen in Exhibit 49, as most of the pain is front loaded. Also, it should not be surprising that while stocks beat gilts by a considerable margin during economic expansion, fixed income products have posted solid returns during economic contractions. The lesson here is that often the best time to buy equities is when economic data are at their most negative and the outlook the darkest.

Exhibit 50 reviews historical returns in relation to inflation. A careful study of long-term returns indicates that equities have performed the worst in periods of relatively high inflation, reasonably well in periods of moderate inflation, best in periods of very low inflation, and poorly in periods of severe deflation. Most notable are the very poor real returns of all asset classes during the extremely high inflation periods of 1914–20 and 1973–81. In stark contrast to these periods is the relatively high performance of all asset classes (gilts especially) during the most recent disinflationary period beginning in the early 1980s. In short, price stability is key for equities, with markets suffering amid the fat tails of rampant inflation or deflation. Gilts, of course, do best amid deflation but suffer mightily amid high inflation, while cash tends to outperform both equities and gilts amid high inflation (i.e., cash loses less of its value).

Perhaps of greater importance is the direction of inflation rather than its current level. High and falling inflation, coupled with falling gilt

yields, has been very bullish for equities and gilts, while a shift from deflation to low inflation has been bullish for equities as it reflects a resumption of economic growth. Furthermore, equities and gilts could perform poorly in anticipation of high inflation, well before it shows up in officially reported statistics. For now, it appears as though inflation remains contained. However, it remains to be seen how policymakers will navigate the normalization of interest rates and the unwinding of massive balance sheet positions.

Overall, investors should be wary of extrapolating too much from economic data. History tells us that markets are complex and subject to many other influences in addition to the underlying economy. Indeed, markets are often driven more by expectations of changes in fundamentals, rather than the fundamentals themselves. For even if economic growth is strong, if growth fails to meet investors’ expectations asset prices can fall. Similarly, if strong growth does not translate into strong profits, then equities can still disappoint. Often, the most prudent time to sell equities in favor of gilts is when the economic prospects are the “best” and the most profitable time to do the opposite is when the outlook is the most desperate. ■

Share Index Data

The total return series in this report have been extended back to 1900 to encompass over a full century of returns.

Data from 1900 to June 1962 are based on the historical total return index of U.K. 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®.

Price data for what is now called the FTSE® All-Share Index are available back to 1964, but official total returns data are not available until 1993. While historical total return proxies for the FTSE® All-Share are available, to make the return data in this report comparable with the valuation analysis conducted in our related *U.K. Historical Capital Markets Valuations* report, we have chosen to focus on the returns of the Non-Financial Index from 1962 to 1992, for which we have reliable earnings data.

The FT-500 (Non-Financial) Index was the longest-running series identified that contained price-earnings valuation information. It was a market cap-weighted index and covered a broad section of the market with the exclusion of financials. In December 1993, the FT-500 was replaced by the FTSE® Total Non-Financial Index. The constituents of the index subsequently changed from the top 500 stocks by market capitalization (excluding financials) to the full constituents of the FTSE® All-Share Index (excluding financials). In our analysis of the FTSE® Total Non-Financial

Index we examined various valuation and performance metrics as compared to the FTSE® All-Share to ensure a smooth transition from one index to the other. Specifically, we compared monthly data for the price level and total return for both indices over the period from February 1993 to December 2012. Both the price level and total return series of the two indices had correlations of 0.97.

Fixed Interest Index Data

The long-dated gilt total return series consists of returns on 2.5% consols from 1900 to 1954 provided by Global Financial Data, Inc.; a total return bond index constructed from changes in 20-year government bond yields from 1933 to 1979 calculated by Cambridge Associates with yield data from Global Financial Data, Inc.; and from 1980 to 2012 the returns from the Datastream 20-Year U.K. Benchmark Government Index.

To track trends on the short end of the fixed interest market, we have used the three-month Treasury bill returns and yields provided by Global Financial Data, Inc. from 1900 to January 1985 and Thomson Reuters Datastream from February 1985 to present.

Inflation Data and Inflation-Adjusted Series

Our historical inflation series is based on the Retail Price Index (RPI) from 1900 to November 2003, and the harmonized U.K. Consumer Price Index (CPI) from December 2003 to December 2012. In December 2003, the Bank of England switched its official inflation target for U.K. monetary policy from the RPI to the CPI series, a shift our data series mimics. Historical RPI data are supplied by Global Financial Data, Inc., while CPI data are provided by Thomson Reuters Datastream.

Data Sources

Report data are provided by FTSE International Limited, Global Financial Data, Inc., and Thomson Reuters Datastream. To the extent permissible by law, FTSE accepts no liability for errors or omissions in the data. ■



Exhibits



Exhibit 1
Equity and Gilt Nominal Returns
 1900–2012

Year	Annual Total Return (%)		Cumulative Wealth		Average Annual Compound Return (%) Through 2012	
	Equities	Gilts	Equities	Gilts	Equities	Gilts
1899	---	---	100.0	100.0	---	---
1900	4.1	1.9	104.1	101.9	8.8	5.7
1901	1.5	-0.7	105.7	101.2	8.8	5.7
1902	1.6	1.6	107.3	102.8	8.9	5.8
1903	-0.6	-2.3	106.7	100.5	9.0	5.8
1904	-1.2	4.0	105.4	104.5	9.1	5.9
1905	0.0	3.8	105.4	108.5	9.2	5.9
1906	0.4	-1.0	105.9	107.4	9.3	6.0
1907	0.5	0.0	106.4	107.4	9.3	6.0
1908	-0.8	3.6	105.5	111.3	9.4	6.1
1909	0.6	1.6	106.1	113.1	9.5	6.1
1910	1.6	-0.9	107.8	112.1	9.6	6.1
1911	2.1	0.3	110.0	112.4	9.7	6.2
1912	0.9	0.5	111.0	112.9	9.8	6.3
1913	0.5	-0.9	111.7	112.0	9.9	6.3
1914	6.4	-1.5	118.8	110.3	10.0	6.4
1915	0.4	-11.7	119.3	97.5	10.0	6.5
1916	-8.9	-1.8	108.7	95.7	10.1	6.7
1917	6.6	4.6	115.9	100.1	10.3	6.8
1918	16.3	13.8	134.8	113.9	10.4	6.8
1919	-8.9	-10.9	122.8	101.5	10.3	6.7
1920	-9.3	-8.2	111.4	93.2	10.5	7.0
1921	19.6	18.3	133.2	110.2	10.8	7.1
1922	30.5	18.1	173.7	130.1	10.7	7.0
1923	6.2	3.7	184.5	135.0	10.5	6.9
1924	14.6	7.6	211.5	145.2	10.5	6.9
1925	9.1	1.0	230.8	146.6	10.5	6.9
1926	7.4	2.5	247.8	150.3	10.5	7.0
1927	13.0	7.7	280.1	161.9	10.5	7.1
1928	12.6	5.5	315.5	170.9	10.5	7.0
1929	-3.4	-1.1	304.6	169.0	10.5	7.1
1930	-15.4	14.3	257.6	193.1	10.7	7.2
1931	-19.2	0.3	208.2	193.6	11.0	7.1
1932	10.8	38.8	230.8	268.7	11.5	7.2
1933	31.8	7.0	304.2	287.6	11.5	6.8
1934	11.7	5.9	339.9	304.7	11.2	6.8
1935	12.0	3.9	380.7	316.6	11.2	6.8
1936	18.1	-1.5	449.5	311.9	11.2	6.9
1937	-15.7	3.2	378.9	321.8	11.1	7.0

Exhibit 1 (continued)
Equity and Gilt Nominal Returns
 1900–2012

Year	Annual Total Return (%)		Cumulative Wealth		Average Annual Compound Return (%) Through 2012	
	Equities	Gilts	Equities	Gilts	Equities	Gilts
1938	-9.2	0.6	344.0	323.7	11.5	7.0
1939	7.0	3.5	368.2	335.1	11.8	7.1
1940	-6.8	10.1	343.2	369.0	11.9	7.2
1941	29.9	6.4	445.8	392.4	12.2	7.1
1942	24.6	4.1	555.3	408.4	12.0	7.1
1943	12.9	0.5	626.8	410.5	11.8	7.2
1944	15.5	5.7	723.8	434.0	11.8	7.3
1945	3.7	5.0	750.6	455.6	11.7	7.3
1946	23.3	9.5	925.7	498.9	11.9	7.3
1947	1.8	-5.0	942.5	473.8	11.7	7.3
1948	0.8	6.8	949.6	506.0	11.8	7.5
1949	-9.1	-4.5	863.1	483.2	12.0	7.5
1950	12.3	0.7	969.5	486.7	12.4	7.7
1951	8.0	-8.5	1,047.4	445.3	12.4	7.8
1952	1.3	3.9	1,060.5	462.5	12.5	8.1
1953	23.2	9.2	1,306.8	505.2	12.7	8.2
1954	41.9	7.7	1,854.8	544.2	12.5	8.2
1955	7.2	-12.0	1,989.0	479.0	12.1	8.2
1956	-3.1	1.9	1,926.5	488.3	12.1	8.6
1957	2.9	-2.8	1,981.8	474.8	12.4	8.7
1958	41.7	11.9	2,808.9	531.3	12.6	8.9
1959	50.5	4.1	4,226.5	552.9	12.1	8.9
1960	-0.2	-2.9	4,216.7	536.8	11.5	9.0
1961	2.6	3.2	4,325.6	554.1	11.8	9.2
1962	1.6	19.2	4,395.5	660.4	11.9	9.3
1963	25.7	3.0	5,523.3	680.3	12.2	9.2
1964	-5.6	-1.8	5,215.8	668.3	11.9	9.3
1965	10.9	2.5	5,781.7	684.9	12.3	9.5
1966	-4.3	4.8	5,535.0	717.5	12.3	9.7
1967	35.9	1.2	7,520.2	725.8	12.7	9.8
1968	48.1	-3.4	11,136.3	701.1	12.3	10.0
1969	-11.1	2.7	9,899.1	720.4	11.5	10.3
1970	-5.8	3.9	9,329.5	748.7	12.1	10.5
1971	44.1	29.1	13,448.0	966.2	12.6	10.7
1972	14.2	-8.0	15,354.9	888.4	11.9	10.2
1973	-27.9	-13.6	11,063.3	767.4	11.9	10.7
1974	-50.6	-5.4	5,467.7	725.9	13.1	11.5

Exhibit 1 (continued)
Equity and Gilt Nominal Returns
 1900–2012

Year	Annual Total Return (%)		Cumulative Wealth		Average Annual Compound Return (%) Through 2012	
	Equities	Gilts	Equities	Gilts	Equities	Gilts
1975	158.2	32.5	14,116.1	961.7	15.6	11.9
1976	5.3	10.3	14,867.2	1,060.7	13.1	11.4
1977	49.4	44.5	22,215.2	1,532.8	13.4	11.5
1978	9.8	-6.4	24,384.5	1,434.4	12.5	10.6
1979	8.7	10.0	26,494.3	1,578.2	12.6	11.2
1980	33.1	19.1	35,267.8	1,879.2	12.7	11.2
1981	14.5	9.3	40,390.8	2,054.4	12.1	11.0
1982	34.6	54.8	54,375.5	3,179.7	12.0	11.0
1983	24.9	17.9	67,915.8	3,747.8	11.3	9.8
1984	35.2	7.5	91,831.4	4,028.3	10.9	9.5
1985	20.6	10.8	110,754.4	4,464.2	10.1	9.6
1986	27.3	8.7	140,945.2	4,854.1	9.7	9.6
1987	8.4	15.6	152,729.3	5,613.4	9.1	9.6
1988	10.3	9.9	168,444.0	6,170.5	9.2	9.4
1989	35.9	5.7	228,849.0	6,524.9	9.1	9.3
1990	-8.7	3.8	208,964.2	6,770.6	8.1	9.5
1991	22.9	19.1	256,915.9	8,065.4	8.9	9.8
1992	19.1	16.9	306,016.1	9,426.4	8.3	9.3
1993	28.4	35.9	392,903.3	12,807.3	7.8	9.0
1994	-5.8	-12.1	369,921.4	11,259.8	6.8	7.7
1995	23.9	17.3	458,155.1	13,211.1	7.5	9.0
1996	16.7	8.6	534,674.4	14,349.6	6.6	8.5
1997	23.6	22.4	660,627.6	17,557.6	6.0	8.5
1998	13.8	27.6	751,600.0	22,407.1	5.0	7.6
1999	24.2	0.7	933,505.2	22,562.4	4.4	6.3
2000	-5.9	8.0	878,416.2	24,363.3	3.0	6.7
2001	-13.3	0.0	761,661.8	24,357.2	3.7	6.6
2002	-22.7	10.0	588,894.3	26,804.5	5.4	7.3
2003	20.9	1.6	711,738.4	27,228.9	8.8	7.0
2004	12.8	7.8	803,120.9	29,354.7	7.5	7.6
2005	22.0	11.0	980,148.2	32,583.3	6.8	7.6
2006	16.8	-1.3	1,144,335.0	32,161.6	4.8	7.1
2007	5.3	3.3	1,205,167.9	33,228.3	3.0	8.6
2008	-29.9	11.1	844,475.9	36,918.0	2.5	9.7
2009	30.1	-1.3	1,098,815.1	36,421.8	12.7	9.3
2010	14.5	9.4	1,258,307.6	39,846.6	7.5	13.1
2011	-3.5	24.7	1,214,761.5	49,695.4	4.1	15.0
2012	12.3	6.0	1,364,232.0	52,683.2	12.3	6.0

Exhibit 2
Money Market Instrument Returns and Inflation
 1900–2012

<u>Year</u>	<u>Annual Total Return (%) Money Market Instruments</u>	<u>Annual Inflation Rate (%)</u>	<u>Cumulative Wealth Money Market Instruments</u>	<u>Cumulative Inflation Index</u>	<u>AACR (%) Through 2012 Money Market Instruments</u>	<u>Average Annual Inflation Rate (%) Through 2012</u>
1899	---	---	100.0	100.0	---	---
1900	4.1	-1.7	104.1	98.3	4.8	3.8
1901	3.5	-1.1	107.8	97.2	4.8	3.9
1902	3.0	0.0	111.0	97.2	4.9	3.9
1903	3.5	1.1	114.9	98.3	4.9	4.0
1904	2.9	1.1	118.3	99.4	4.9	4.0
1905	2.2	0.0	120.9	99.4	4.9	4.0
1906	3.0	1.1	124.6	100.4	4.9	4.0
1907	3.8	2.2	129.3	102.6	4.9	4.1
1908	2.3	-2.1	132.3	100.5	5.0	4.1
1909	2.2	1.1	135.1	101.6	5.0	4.2
1910	3.1	2.1	139.3	103.8	5.0	4.2
1911	2.9	1.0	143.3	104.8	5.0	4.2
1912	3.1	3.1	147.7	108.1	5.1	4.2
1913	3.5	2.0	153.0	110.3	5.1	4.2
1914	3.2	8.1	157.9	119.2	5.1	4.3
1915	3.8	22.1	163.8	145.6	5.1	4.2
1916	5.3	22.2	172.5	177.9	5.1	4.1
1917	5.1	12.1	181.3	199.5	5.1	3.9
1918	3.7	18.9	188.0	237.2	5.1	3.8
1919	4.0	2.3	195.4	242.6	5.1	3.7
1920	6.5	17.8	208.2	285.7	5.1	3.7
1921	5.3	-27.5	219.3	207.0	5.1	3.5
1922	2.6	-7.3	225.1	191.9	5.1	3.9
1923	2.7	-0.6	231.1	190.8	5.2	4.1
1924	3.4	1.7	239.0	194.1	5.2	4.1
1925	4.2	-2.8	249.0	188.7	5.2	4.1
1926	4.6	0.0	260.5	188.7	5.2	4.2
1927	4.3	-4.0	271.8	181.1	5.2	4.3
1928	4.2	-0.6	283.3	180.1	5.2	4.4
1929	5.4	-0.6	298.5	179.0	5.2	4.4
1930	2.6	-7.8	306.2	165.0	5.2	4.5
1931	3.5	-3.9	317.0	158.5	5.3	4.7
1932	1.7	-3.4	322.3	153.1	5.3	4.8
1933	0.6	0.0	324.2	153.1	5.3	4.9
1934	0.7	0.7	326.5	154.2	5.4	4.9
1935	0.5	2.8	328.3	158.4	5.5	5.0
1936	0.6	2.8	330.2	162.9	5.5	5.0
1937	0.6	5.3	332.0	171.5	5.6	5.1

Exhibit 2 (continued)
Money Market Instrument Returns and Inflation
 1900–2012

<u>Year</u>	<u>Annual Total Return (%) Money Market Instruments</u>	<u>Annual Inflation Rate (%)</u>	<u>Cumulative Wealth Money Market Instruments</u>	<u>Cumulative Inflation Index</u>	<u>AACR (%) Through 2012 Money Market Instruments</u>	<u>Average Annual Inflation Rate (%) Through 2012</u>
1938	0.6	-2.6	334.0	167.1	5.7	5.1
1939	1.2	12.3	338.2	187.6	5.7	5.2
1940	1.0	12.6	341.6	211.3	5.8	5.1
1941	1.0	2.1	345.1	215.7	5.9	5.0
1942	1.0	-0.8	348.6	214.0	5.9	5.0
1943	1.0	0.0	352.1	214.0	6.0	5.1
1944	1.0	1.7	355.6	217.5	6.1	5.2
1945	0.9	0.8	358.8	219.2	6.2	5.2
1946	0.5	0.0	360.7	219.2	6.2	5.3
1947	0.5	4.0	362.5	227.9	6.3	5.4
1948	0.5	3.8	364.4	236.7	6.4	5.4
1949	0.5	3.7	366.3	245.5	6.5	5.4
1950	0.5	2.7	368.1	252.0	6.6	5.4
1951	0.6	11.1	370.3	280.1	6.7	5.5
1952	2.2	6.7	378.3	298.8	6.8	5.4
1953	2.3	1.6	387.1	303.4	6.9	5.4
1954	1.8	3.8	394.1	315.1	7.0	5.4
1955	3.8	5.3	409.0	331.7	7.1	5.5
1956	5.0	3.4	429.6	342.9	7.1	5.5
1957	4.9	4.6	450.7	358.8	7.2	5.5
1958	4.7	1.8	471.7	365.3	7.2	5.5
1959	3.4	0.0	487.8	365.3	7.3	5.6
1960	5.1	1.9	512.5	372.1	7.3	5.7
1961	5.4	4.4	540.0	388.3	7.4	5.8
1962	4.2	2.7	562.7	398.6	7.4	5.8
1963	3.7	1.8	583.8	406.0	7.5	5.9
1964	4.7	4.8	611.3	425.4	7.6	6.0
1965	6.1	4.5	648.4	444.6	7.6	6.0
1966	6.3	3.6	689.1	460.8	7.7	6.0
1967	6.0	2.5	730.3	472.3	7.7	6.1
1968	7.3	5.9	783.4	500.3	7.7	6.1
1969	7.9	4.7	845.3	523.6	7.7	6.2
1970	7.2	7.9	906.6	564.9	7.7	6.2
1971	5.7	9.0	958.5	615.9	7.7	6.1
1972	5.6	7.7	1,012.6	663.0	7.8	6.1
1973	9.7	10.6	1,110.8	733.2	7.9	6.0
1974	12.0	19.1	1,243.9	873.5	7.8	5.9
1975	10.7	24.9	1,376.4	1,091.1	7.7	5.6
1976	11.7	15.1	1,537.5	1,255.6	7.6	5.1

Exhibit 2 (continued)
Money Market Instrument Returns and Inflation
 1900–2012

<u>Year</u>	<u>Annual Total Return (%) Money Market Instruments</u>	<u>Annual Inflation Rate (%)</u>	<u>Cumulative Wealth Money Market Instruments</u>	<u>Cumulative Inflation Index</u>	<u>AACR (%) Through 2012 Money Market Instruments</u>	<u>Average Annual Inflation Rate (%) Through 2012</u>
1977	8.0	12.1	1,659.9	1,408.0	7.5	4.9
1978	8.8	8.4	1,806.6	1,526.0	7.5	4.7
1979	13.8	17.2	2,055.5	1,788.9	7.5	4.5
1980	16.2	15.1	2,388.4	2,059.6	7.3	4.2
1981	13.8	12.1	2,717.8	2,307.8	7.0	3.9
1982	12.0	5.4	3,044.7	2,432.5	6.8	3.6
1983	10.0	5.3	3,350.3	2,561.7	6.6	3.5
1984	9.7	4.6	3,675.5	2,679.0	6.5	3.5
1985	12.2	5.7	4,124.3	2,831.7	6.4	3.5
1986	10.9	3.7	4,573.6	2,937.0	6.2	3.4
1987	9.7	3.7	5,017.9	3,045.5	6.0	3.4
1988	10.2	6.8	5,531.9	3,251.8	5.9	3.3
1989	14.1	7.7	6,313.1	3,502.4	5.7	3.2
1990	15.3	9.3	7,278.4	3,829.7	5.3	3.0
1991	11.5	4.5	8,115.3	4,000.7	4.9	2.7
1992	9.4	2.6	8,879.1	4,103.8	4.6	2.6
1993	5.4	1.9	9,359.4	4,183.4	4.4	2.7
1994	5.3	2.9	9,857.6	4,304.3	4.3	2.7
1995	6.6	3.2	10,509.9	4,442.9	4.2	2.7
1996	6.1	2.5	11,149.8	4,552.0	4.1	2.6
1997	6.8	3.6	11,907.3	4,717.1	4.0	2.7
1998	7.2	2.7	12,765.2	4,846.8	3.8	2.6
1999	5.2	1.8	13,434.3	4,932.3	3.6	2.6
2000	6.0	2.9	14,245.8	5,076.7	3.4	2.6
2001	5.0	0.7	14,956.2	5,112.1	3.2	2.6
2002	4.0	2.9	15,550.5	5,262.5	3.1	2.8
2003	3.7	2.7	16,118.6	5,402.9	3.0	2.8
2004	4.6	1.6	16,857.3	5,491.6	2.9	2.8
2005	4.7	1.9	17,650.2	5,596.9	2.7	2.9
2006	4.8	3.0	18,495.6	5,763.1	2.4	3.1
2007	5.8	2.1	19,566.2	5,885.0	2.0	3.1
2008	4.5	3.1	20,449.8	6,067.9	1.3	3.3
2009	0.6	2.8	20,562.7	6,239.7	0.5	3.4
2010	0.5	3.7	20,665.1	6,472.4	0.4	3.5
2011	0.5	4.2	20,766.0	6,744.0	0.4	3.5
2012	0.3	2.7	20,831.3	6,926.8	0.3	2.7

Exhibit 3
Equity and Gilt Real Returns
 1900–2012

Year	Annual Total Return (%)		Cumulative Wealth		Average Annual Compound Return (%) Through 2012	
	Equities	Gilts	Equities	Gilts	Equities	Gilts
1899	---	---	100.0	100.0	---	---
1900	6.0	3.7	106.0	103.7	4.8	1.8
1901	2.6	0.4	108.7	104.1	4.8	1.8
1902	1.6	1.6	110.5	105.8	4.8	1.8
1903	-1.7	-3.3	108.6	102.3	4.8	1.8
1904	-2.3	2.8	106.1	105.2	4.9	1.9
1905	0.0	3.8	106.1	109.2	5.0	1.8
1906	-0.7	-2.1	105.4	106.9	5.0	1.8
1907	-1.6	-2.2	103.7	104.6	5.1	1.9
1908	1.3	5.8	105.0	110.7	5.1	1.9
1909	-0.5	0.6	104.5	111.4	5.2	1.9
1910	-0.5	-3.0	103.9	108.0	5.2	1.9
1911	1.0	-0.8	105.0	107.2	5.3	1.9
1912	-2.1	-2.6	102.7	104.5	5.3	2.0
1913	-1.4	-2.8	101.2	101.5	5.4	2.0
1914	-1.6	-8.9	99.6	92.5	5.5	2.1
1915	-17.7	-27.6	82.0	67.0	5.5	2.2
1916	-25.5	-19.7	61.1	53.8	5.8	2.5
1917	-4.9	-6.7	58.1	50.2	6.2	2.8
1918	-2.2	-4.3	56.8	48.0	6.3	2.9
1919	-10.9	-12.9	50.6	41.8	6.4	3.0
1920	-23.0	-22.1	39.0	32.6	6.6	3.2
1921	65.0	63.2	64.3	53.2	7.0	3.5
1922	40.7	27.4	90.5	67.8	6.5	3.0
1923	6.8	4.3	96.7	70.7	6.2	2.7
1924	12.7	5.8	109.0	74.8	6.2	2.7
1925	12.2	3.8	122.3	77.7	6.1	2.7
1926	7.4	2.5	131.3	79.7	6.0	2.7
1927	17.7	12.2	154.6	89.4	6.0	2.7
1928	13.3	6.2	175.2	94.9	5.9	2.6
1929	-2.9	-0.5	170.2	94.4	5.8	2.5
1930	-8.3	24.0	156.2	117.0	5.9	2.5
1931	-15.9	4.4	131.4	122.2	6.1	2.3
1932	14.7	43.6	150.7	175.5	6.4	2.3
1933	31.8	7.0	198.7	187.8	6.3	1.9
1934	11.0	5.2	220.4	197.6	6.0	1.8
1935	9.0	1.1	240.3	199.8	5.9	1.7
1936	14.9	-4.2	276.0	191.5	5.9	1.8
1937	-20.0	-2.0	220.9	187.6	5.8	1.8

Exhibit 3 (continued)
Equity and Gilt Real Returns
 1900–2012

Year	Annual Total Return (%)		Cumulative Wealth		Average Annual Compound Return (%) Through 2012	
	Equities	Gilts	Equities	Gilts	Equities	Gilts
1938	-6.8	3.3	205.9	193.7	6.2	1.9
1939	-4.7	-7.8	196.2	178.6	6.4	1.9
1940	-17.2	-2.2	162.4	174.6	6.5	2.0
1941	27.2	4.2	206.6	181.9	6.9	2.1
1942	25.6	4.9	259.5	190.9	6.6	2.0
1943	12.9	0.5	292.9	191.8	6.4	2.0
1944	13.6	4.0	332.8	199.5	6.3	2.0
1945	2.9	4.2	342.5	207.9	6.2	2.0
1946	23.3	9.5	422.3	227.6	6.2	2.0
1947	-2.1	-8.7	413.5	207.8	6.0	1.8
1948	-3.0	2.9	401.2	213.8	6.1	2.0
1949	-12.4	-7.9	351.6	196.8	6.3	2.0
1950	9.4	-1.9	384.6	193.1	6.6	2.2
1951	-2.8	-17.7	373.9	159.0	6.6	2.2
1952	-5.1	-2.6	355.0	154.8	6.7	2.6
1953	21.3	7.6	430.7	166.5	6.9	2.7
1954	36.7	3.7	588.6	172.7	6.7	2.6
1955	1.9	-16.4	599.7	144.4	6.2	2.6
1956	-6.3	-1.4	561.9	142.4	6.3	3.0
1957	-1.7	-7.1	552.4	132.3	6.6	3.0
1958	39.2	9.9	769.0	145.4	6.7	3.2
1959	50.5	4.1	1,157.1	151.4	6.2	3.1
1960	-2.0	-4.7	1,133.3	144.3	5.5	3.1
1961	-1.7	-1.1	1,114.1	142.7	5.6	3.2
1962	-1.0	16.1	1,102.8	165.7	5.8	3.3
1963	23.4	1.1	1,360.5	167.6	5.9	3.1
1964	-9.9	-6.3	1,226.0	157.1	5.6	3.1
1965	6.1	-1.9	1,300.5	154.1	6.0	3.3
1966	-7.6	1.1	1,201.2	155.7	6.0	3.5
1967	32.6	-1.3	1,592.3	153.7	6.3	3.5
1968	39.8	-8.8	2,225.9	140.1	5.7	3.6
1969	-15.1	-1.8	1,890.6	137.6	5.1	3.9
1970	-12.6	-3.7	1,651.6	132.5	5.6	4.1
1971	32.2	18.4	2,183.6	156.9	6.1	4.2
1972	6.1	-14.6	2,315.8	134.0	5.5	3.9
1973	-34.8	-21.9	1,508.9	104.7	5.5	4.4
1974	-58.5	-20.6	625.9	83.1	6.8	5.2
1975	106.7	6.1	1,293.7	88.1	9.5	6.0
1976	-8.5	-4.2	1,184.0	84.5	7.6	6.0

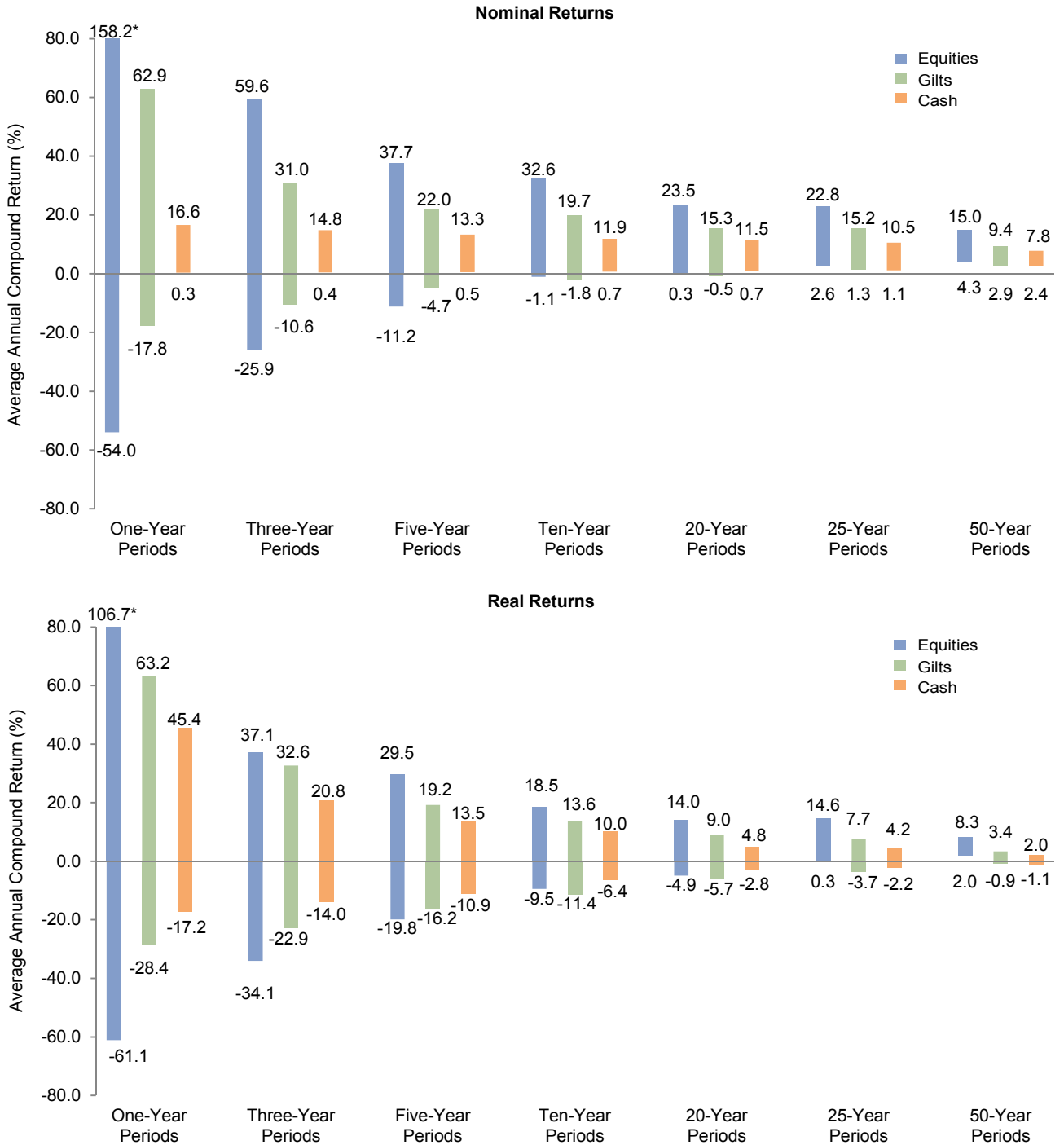
Exhibit 3 (continued)
Equity and Gilt Real Returns
 1900–2012

Year	Annual Total Return (%)		Cumulative Wealth		Average Annual Compound Return (%) Through 2012	
	Equities	Gilts	Equities	Gilts	Equities	Gilts
1977	33.2	28.9	1,577.7	108.9	8.1	6.3
1978	1.3	-13.7	1,598.0	94.0	7.5	5.7
1979	-7.3	-6.1	1,481.0	88.2	7.7	6.3
1980	15.6	3.4	1,712.4	91.2	8.2	6.7
1981	2.2	-2.4	1,750.2	89.0	7.9	6.9
1982	27.7	46.8	2,235.3	130.7	8.1	7.2
1983	18.6	11.9	2,651.2	146.3	7.5	6.0
1984	29.3	2.8	3,427.8	150.4	7.2	5.8
1985	14.1	4.8	3,911.2	157.7	6.4	6.0
1986	22.7	4.8	4,799.0	165.3	6.2	6.0
1987	4.5	11.5	5,015.0	184.3	5.6	6.0
1988	3.3	2.9	5,180.0	189.8	5.6	5.8
1989	26.1	-1.8	6,534.0	186.3	5.7	6.0
1990	-16.5	-5.1	5,456.5	176.8	4.9	6.3
1991	17.7	14.0	6,421.8	201.6	6.0	6.9
1992	16.1	13.9	7,456.8	229.7	5.5	6.5
1993	26.0	33.3	9,391.9	306.1	5.0	6.2
1994	-8.5	-14.6	8,594.2	261.6	4.0	4.9
1995	20.0	13.7	10,312.1	297.4	4.7	6.1
1996	13.9	6.0	11,746.0	315.2	3.9	5.7
1997	19.2	18.1	14,005.1	372.2	3.3	5.7
1998	10.7	24.2	15,507.2	462.3	2.3	4.9
1999	22.0	-1.1	18,926.4	457.4	1.7	3.6
2000	-8.6	4.9	17,302.8	479.9	0.3	4.0
2001	-13.9	-0.7	14,899.1	476.5	1.1	3.9
2002	-24.9	6.9	11,190.4	509.4	2.6	4.3
2003	17.7	-1.1	13,173.2	504.0	5.8	4.1
2004	11.0	6.1	14,624.6	534.5	4.6	4.7
2005	19.7	8.9	17,512.4	582.2	3.8	4.5
2006	13.4	-4.1	19,856.2	558.1	1.7	3.9
2007	3.1	1.2	20,478.5	564.6	-0.1	5.3
2008	-32.0	7.8	13,917.1	608.4	-0.8	6.1
2009	26.5	-4.1	17,610.1	583.7	9.1	5.7
2010	10.4	5.5	19,441.1	615.6	3.8	9.2
2011	-7.3	19.7	18,012.6	736.9	0.7	11.1
2012	9.3	3.2	19,694.9	760.6	9.3	3.2

Exhibit 4
Equity, Gilt, and Money Market Instrument Average Annual Compound Returns
 1913–2012 • Percent (%)

	<u>100-Year 1913–2012</u>	<u>90-Year 1923–2012</u>	<u>80-Year 1933–2012</u>	<u>70-Year 1943–2012</u>	<u>60-Year 1953–2012</u>	<u>50-Year 1963–2012</u>	<u>40-Year 1973–2012</u>	<u>30-Year 1983–2012</u>	<u>20-Year 1993–2012</u>	<u>Ten-Year 2003–12</u>
<u>Nominal</u>										
Equities	9.9	10.5	11.5	11.8	12.7	12.2	11.9	11.3	7.8	8.8
Gilts	6.3	6.9	6.8	7.2	8.2	9.2	10.7	9.8	9.0	7.0
Money Market Instruments	5.1	5.2	5.3	6.0	6.9	7.5	7.9	6.6	4.4	3.0
Equities Less Gilts	3.5	3.6	4.6	4.6	4.5	3.0	1.1	1.5	-1.2	1.8
Equities Less Money Market Instruments	4.8	5.3	6.1	5.8	5.8	4.7	4.0	4.7	3.4	5.8
Bonds Less Money Market Instruments	1.3	1.7	1.5	1.2	1.3	1.7	2.9	3.2	4.6	4.0
Inflation	4.2	4.1	4.9	5.1	5.4	5.9	6.0	3.5	2.7	2.8
<u>Real</u>										
Equities	5.4	6.2	6.3	6.4	6.9	5.9	5.5	7.5	5.0	5.8
Gilts	2.0	2.7	1.9	2.0	2.7	3.1	4.4	6.0	6.2	4.1
Money Market Instruments	0.8	1.1	0.4	0.9	1.5	1.5	1.7	3.0	1.7	0.2

Exhibit 5
Range of Equity, Gilt, and Cash Returns for Various Rolling Monthly Time Horizons
 1900–2012



* Graph capped for scale purposes.

Exhibit 6
Equities: Nominal Compound Returns Summary
 1900–2012

<u>Periods</u>	<u>Number of Periods</u>	<u>High (%)</u>	<u>Low (%)</u>	<u>Mean (%)</u>	<u>Standard Deviation (%)</u>	<u>Number Negative</u>	<u>Percent Negative</u>	<u>Number Below Mean</u>	<u>Percent Below Mean</u>
Rolling 50-Year (1900–49, 1901–50, etc.)	757	15.0	4.3	10.4	3.0	0	0.0	374	49.4
Rolling 25-Year (1900–24, 1901–25, etc.)	1,057	22.8	2.6	10.3	4.4	0	0.0	489	46.3
Rolling 20-Year (1900–19, 1901–20, etc.)	1,117	23.5	0.3	10.1	4.8	0	0.0	562	50.3
Rolling Ten-Year (1900–09, 1901–10, etc.)	1,237	32.6	-1.1	9.5	6.3	10	0.8	689	55.7
Independent Ten-Year (1900–09, 1910–19, etc.)	11	24.1	0.6	9.1	7.5	0	0.0	6	54.5
Rolling Five-Year (1900–04, 1901–05, etc.)	1,297	37.7	-11.2	9.3	8.3	164	12.6	650	50.1
Independent Five-Year (1900–04, 1905–09, etc.)	22	37.1	-11.2	9.3	11.1	2	9.1	12	54.5
Rolling Three-Year (1900–02, 1901–03, etc.)	1,321	59.6	-25.9	9.4	10.8	245	18.5	661	50.0
Independent Three-Year (1900–02, 1903–05, etc.)	37	59.6	-25.9	9.7	13.8	6	16.2	20	54.1

Note: Exhibit shows monthly average annual compound returns.

Exhibit 7
Gilts: Nominal Compound Returns Summary
 1900–2012

<u>Periods</u>	<u>Number of Periods</u>	<u>High (%)</u>	<u>Low (%)</u>	<u>Mean (%)</u>	<u>Standard Deviation (%)</u>	<u>Number Negative</u>	<u>Percent Negative</u>	<u>Number Below Mean</u>	<u>Percent Below Mean</u>
Rolling 50-Year (1900–49, 1901–50, etc.)	757	9.4	2.9	5.4	2.1	0	0.0	434	57.3
Rolling 25-Year (1900–24, 1901–25, etc.)	1,057	15.2	1.3	6.1	3.7	0	0.0	659	62.3
Rolling 20-Year (1900–19, 1901–20, etc.)	1,117	15.3	-0.5	6.1	4.1	13	1.2	679	60.8
Rolling Ten-Year (1900–09, 1901–10, etc.)	1,237	19.7	-1.8	5.9	4.8	92	7.4	710	57.4
Independent Ten-Year (1900–09, 1910–19, etc.)	11	15.3	-1.1	5.6	5.0	1	9.1	7	63.6
Rolling Five-Year (1900–04, 1901–05, etc.)	1,297	22.0	-4.7	5.8	5.5	133	10.3	811	62.5
Independent Five-Year (1900–04, 1905–09, etc.)	22	20.6	-1.7	5.7	6.1	2	9.1	15	68.2
Rolling Three-Year (1900–02, 1901–03, etc.)	1,321	31.0	-10.6	5.9	6.6	202	15.3	811	61.4
Independent Three-Year (1900–02, 1903–05, etc.)	37	28.3	-9.1	5.8	7.7	5	13.5	22	59.5

Note: Exhibit shows monthly average annual compound returns.

Exhibit 8
Equities: Real Compound Returns Summary
 1900–2012

<u>Periods</u>	<u>Number of Periods</u>	<u>High (%)</u>	<u>Low (%)</u>	<u>Mean (%)</u>	<u>Standard Deviation (%)</u>	<u>Number Negative</u>	<u>Percent Negative</u>	<u>Number Below Mean</u>	<u>Percent Below Mean</u>
Rolling 50-Year (1900–49, 1901–50, etc.)	757	8.3	2.0	5.8	1.5	0	0.0	365	48.2
Rolling 25-Year (1900–24, 1901–25, etc.)	1,057	14.6	0.3	5.8	2.5	0	0.0	502	47.5
Rolling 20-Year (1900–19, 1901–20, etc.)	1,117	14.0	-4.9	5.6	3.3	59	5.3	574	51.4
Rolling Ten-Year (1900–09, 1901–10, etc.)	1,237	18.5	-9.5	5.2	5.6	261	21.1	615	49.7
Independent Ten-Year (1900–09, 1910–19, etc.)	11	16.0	-7.0	5.1	7.4	3	27.3	6	54.5
Rolling Five-Year (1900–04, 1901–05, etc.)	1,297	29.5	-19.8	5.2	8.4	372	28.7	619	47.7
Independent Five-Year (1900–04, 1905–09, etc.)	22	18.8	-19.8	5.3	10.0	6	27.3	10	45.5
Rolling Three-Year (1900–02, 1901–03, etc.)	1,321	37.1	-34.1	5.4	11.2	431	32.6	682	51.6
Independent Three-Year (1900–02, 1903–05, etc.)	37	36.1	-34.1	5.7	13.4	15	40.5	21	56.8

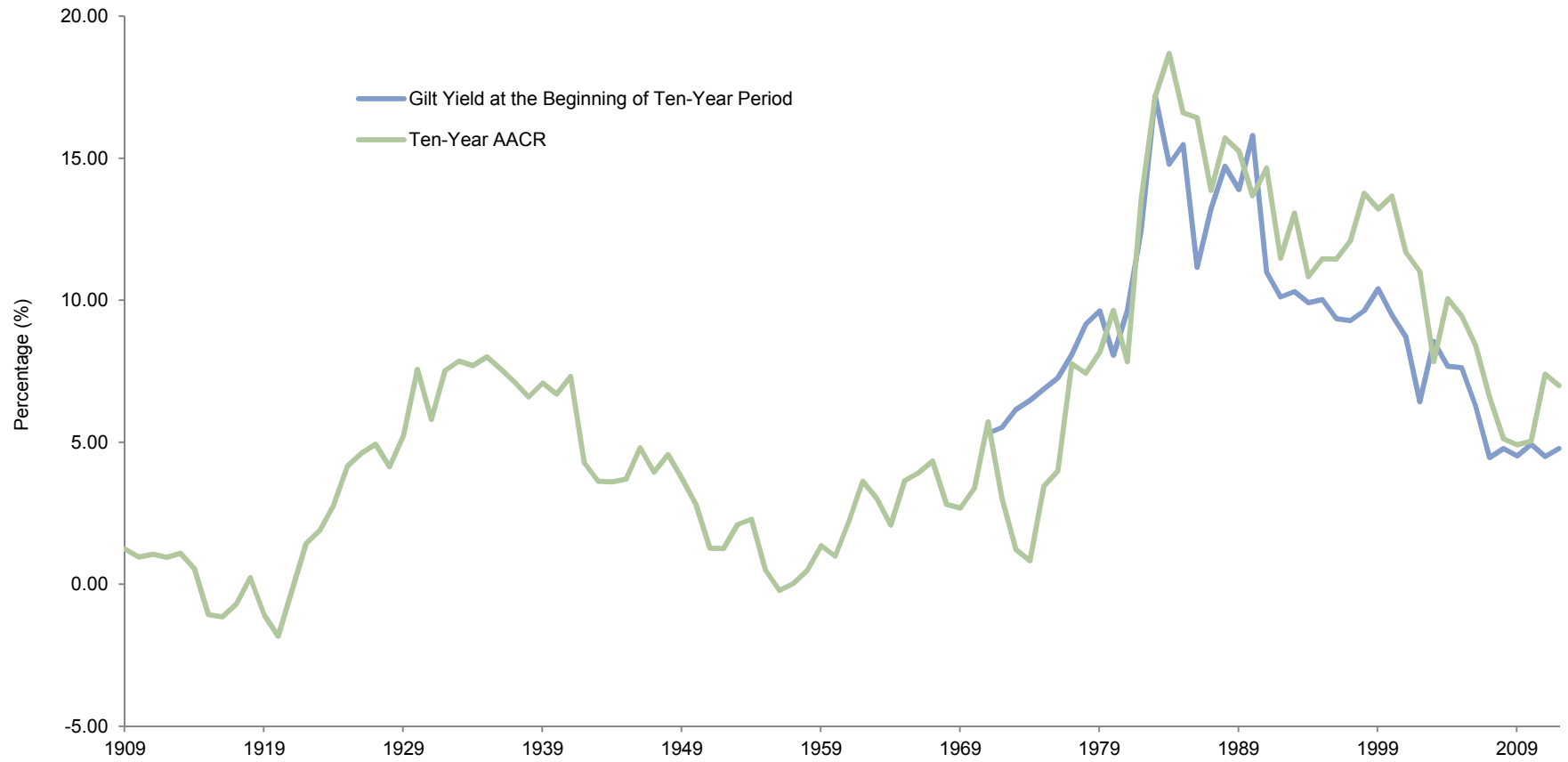
Note: Exhibit shows monthly average annual compound returns.

Exhibit 9
Gilts: Real Compound Returns Summary
 1900–2012

<u>Periods</u>	<u>Number of Periods</u>	<u>High (%)</u>	<u>Low (%)</u>	<u>Mean (%)</u>	<u>Standard Deviation (%)</u>	<u>Number Negative</u>	<u>Percent Negative</u>	<u>Number Below Mean</u>	<u>Percent Below Mean</u>
Rolling 50-Year (1900–49, 1901–50, etc.)	757	3.4	-0.9	1.1	1.1	129	17.0	444	58.7
Rolling 25-Year (1900–24, 1901–25, etc.)	1,057	7.7	-3.7	1.8	3.1	393	37.2	549	51.9
Rolling 20-Year (1900–19, 1901–20, etc.)	1,117	9.0	-5.7	1.8	3.7	526	47.1	637	57.0
Rolling Ten-Year (1900–09, 1901–10, etc.)	1,237	13.6	-11.4	1.8	5.2	477	38.6	685	55.4
Independent Ten-Year (1900–09, 1910–19, etc.)	11	9.4	-9.3	1.8	5.9	4	36.4	6	54.5
Rolling Five-Year (1900–04, 1901–05, etc.)	1,297	19.2	-16.2	1.9	6.6	447	34.5	694	53.5
Independent Five-Year (1900–04, 1905–09, etc.)	22	15.9	-14.7	1.9	7.1	8	36.4	13	59.1
Rolling Three-Year (1900–02, 1901–03, etc.)	1,321	32.6	-22.9	2.0	8.1	505	38.2	688	52.1
Independent Three-Year (1900–02, 1903–05, etc.)	37	29.4	-19.1	2.1	9.4	13	35.1	20	54.1

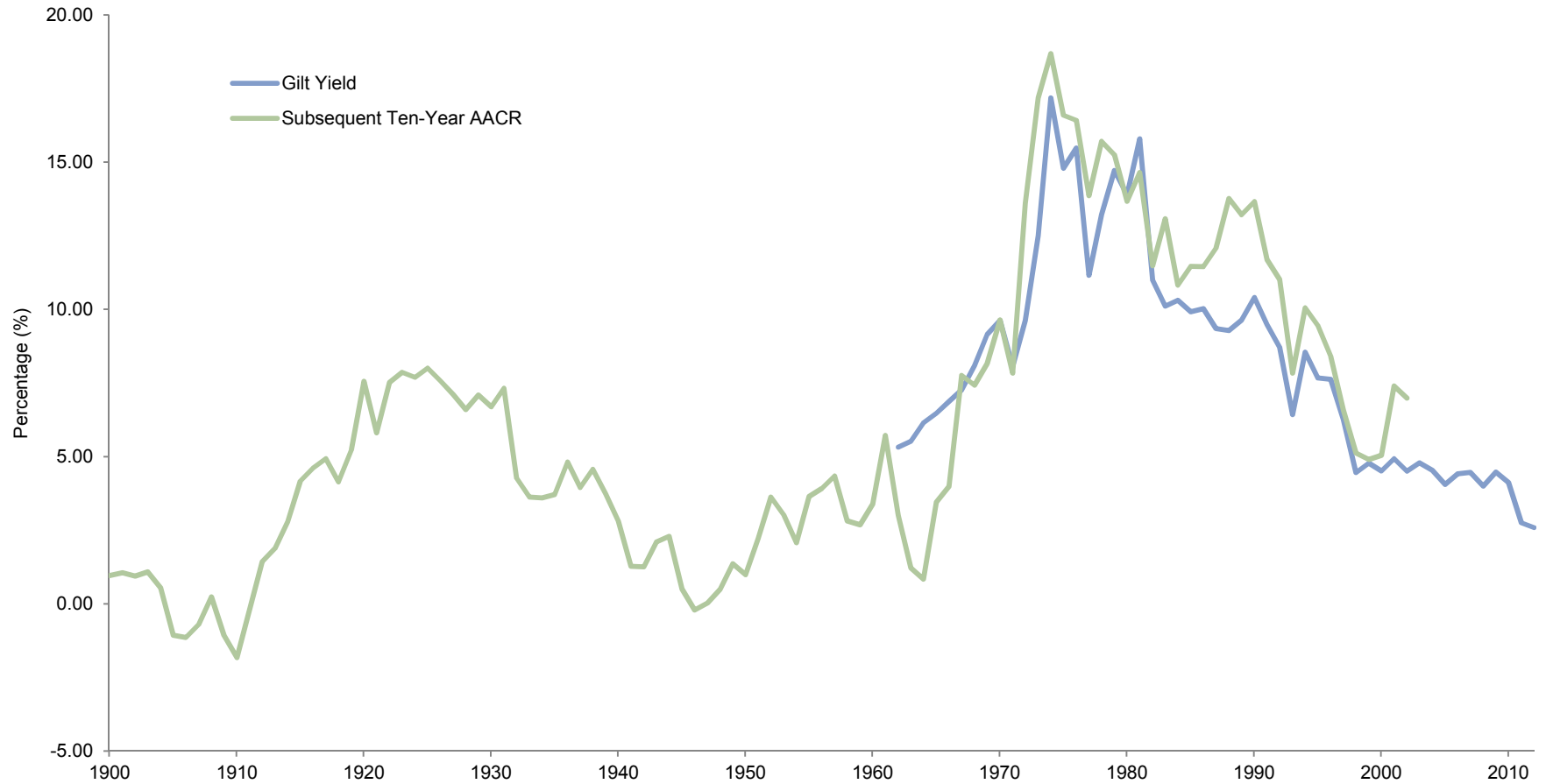
Note: Exhibit shows monthly average annual compound returns.

Exhibit 10
Gilts: Ten-Year AACRs and Initial Bond Yields
 1900–2012



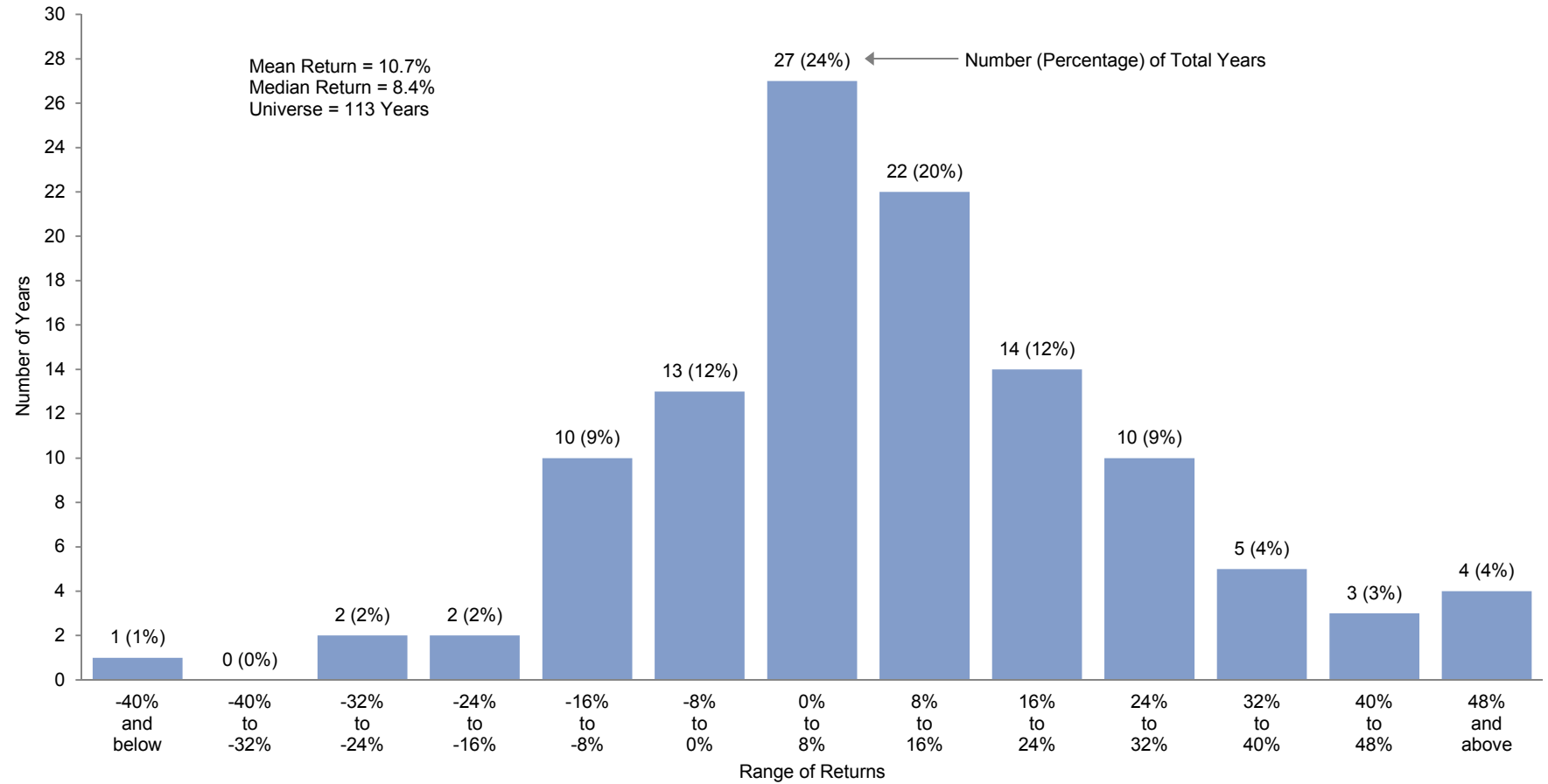
Notes: Based on annual data. Yields are based on the beginning of the ten-year period. For example, the yield shown in 1971 was the yield in 1962. The last full ten-year period was from 2003 to 2012.

Exhibit 11
Gilt Yields and Subsequent Ten-Year AACRs
 1900–2012



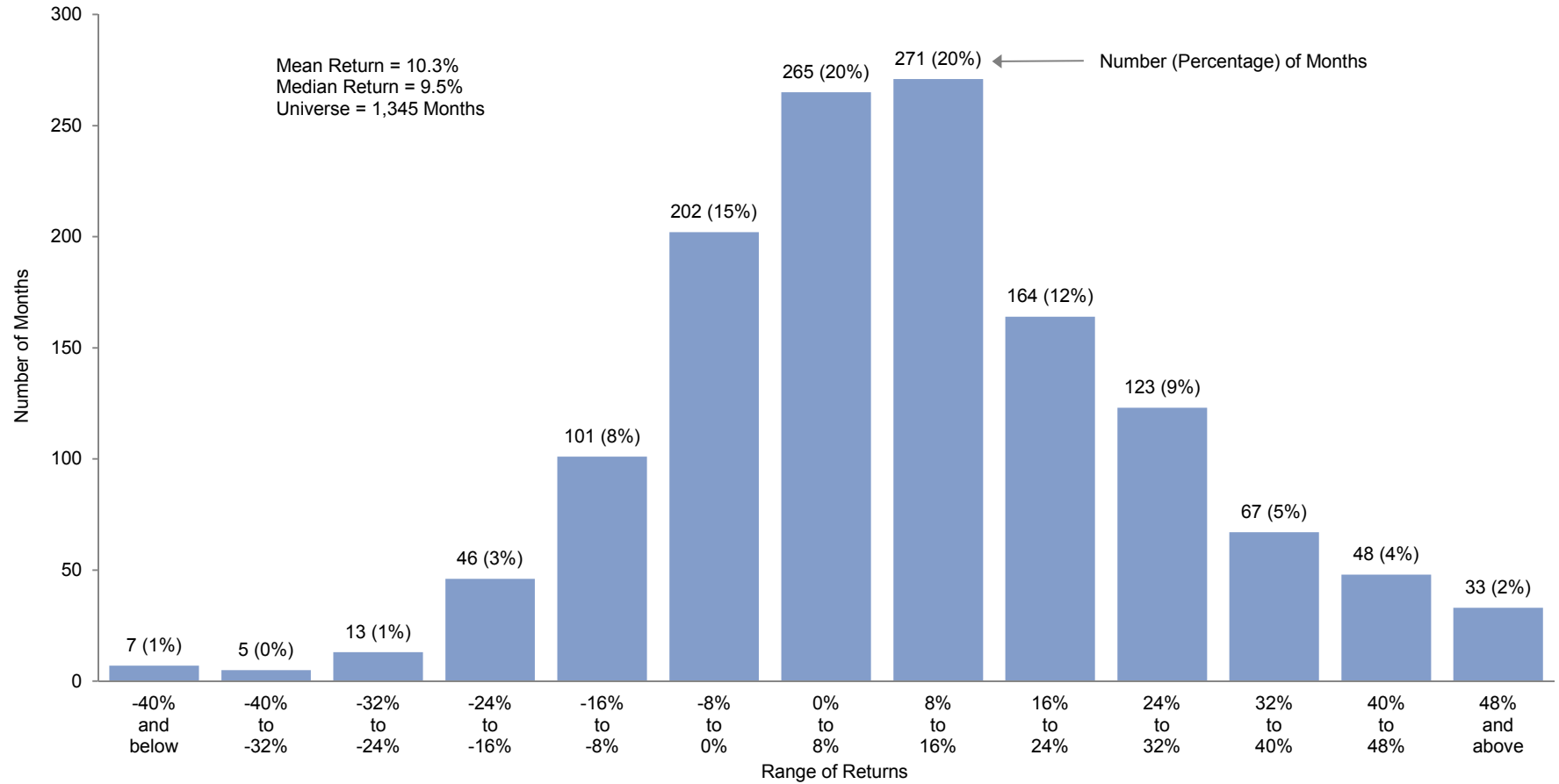
Notes: Based on annual data. The last full ten-year period was from 2003 to 2012.

Exhibit 12
Distribution of Annual Equity Returns
 1900–2012



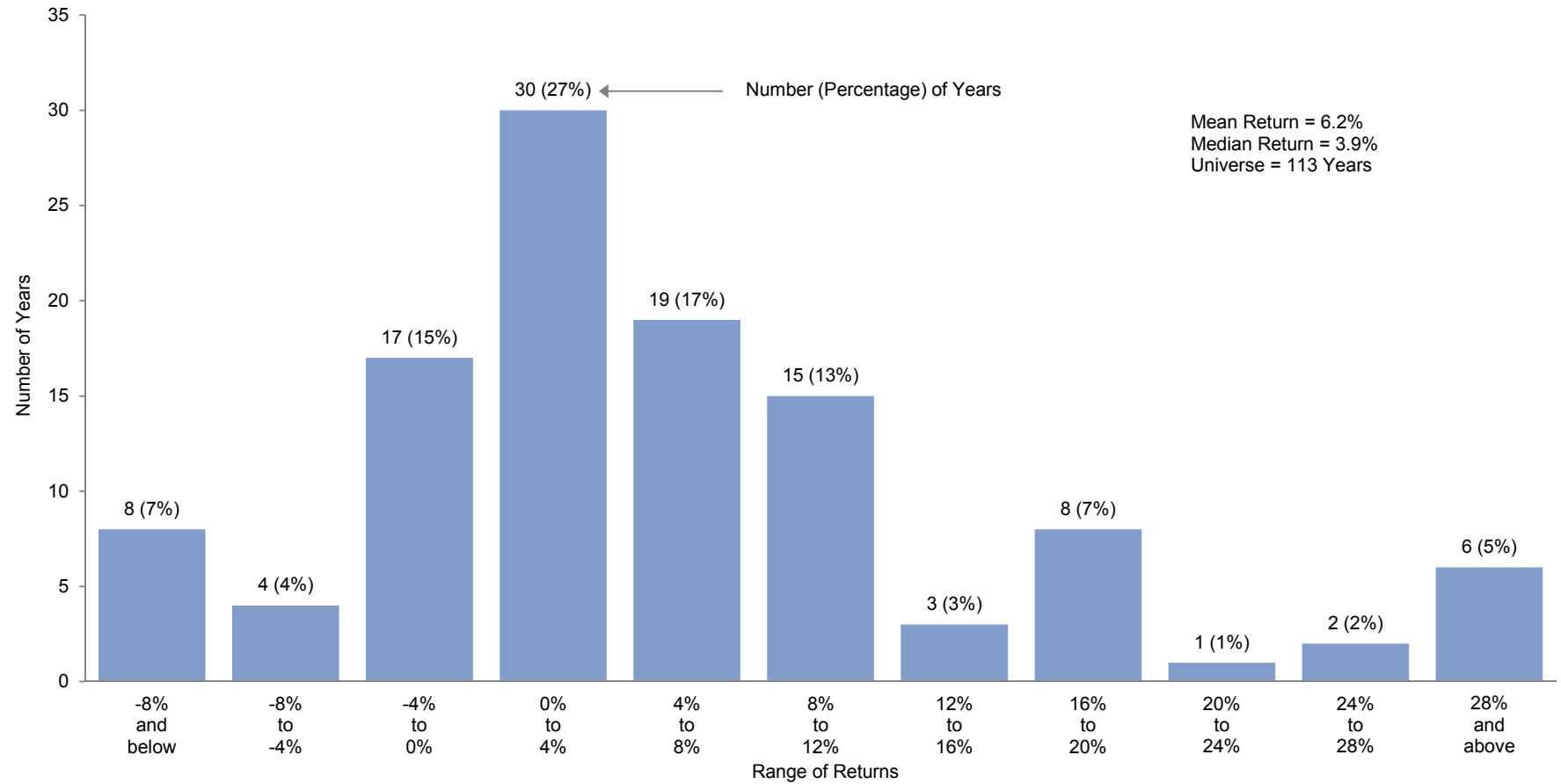
Note: Percentages may not total 100% due to rounding.

Exhibit 13
Distribution of Rolling 12-Month Equity Returns
 1900–2012



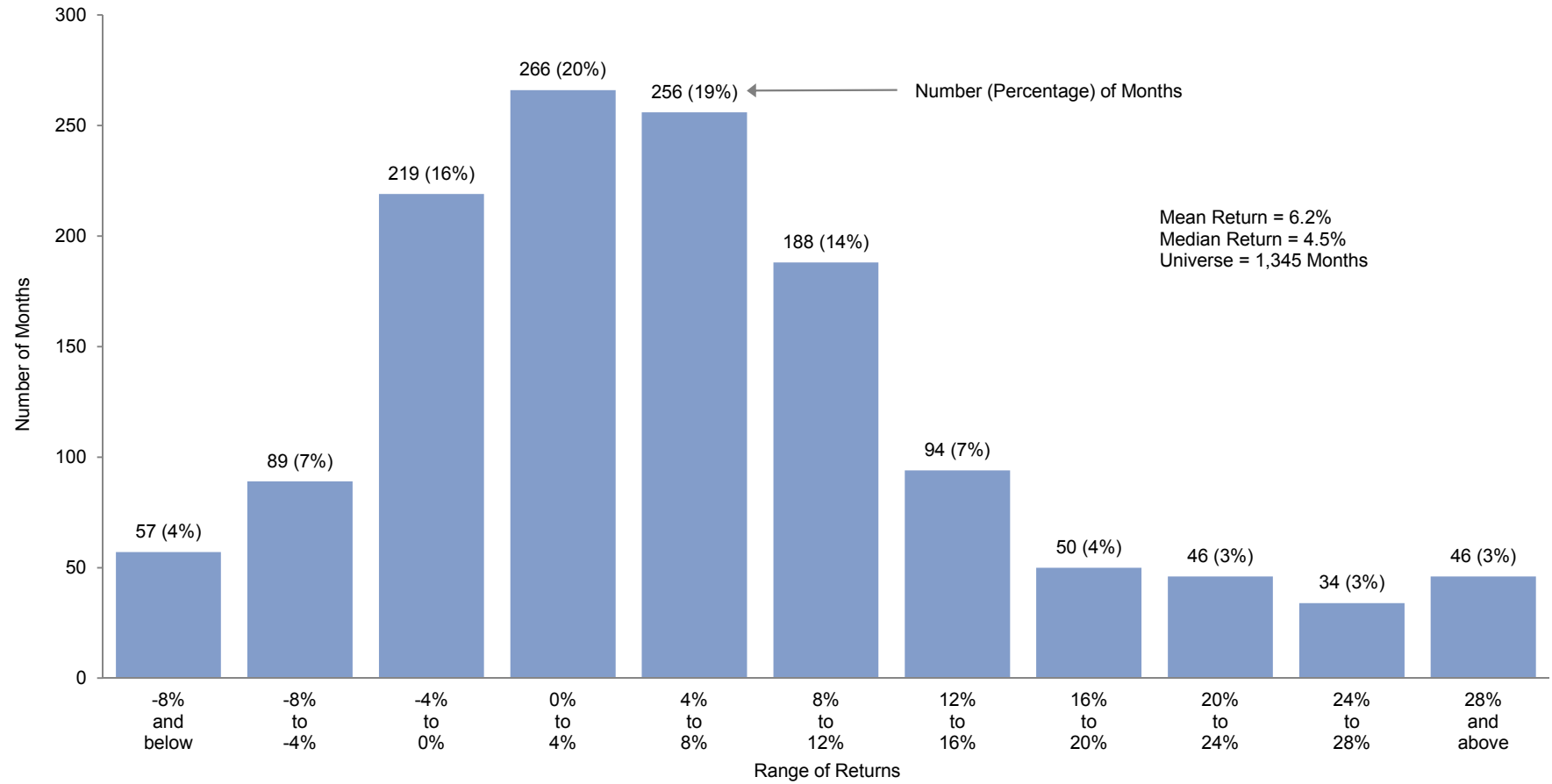
Note: Percentages may not total 100% due to rounding.

Exhibit 14
Distribution of Annual Gilt Returns
 1900–2012



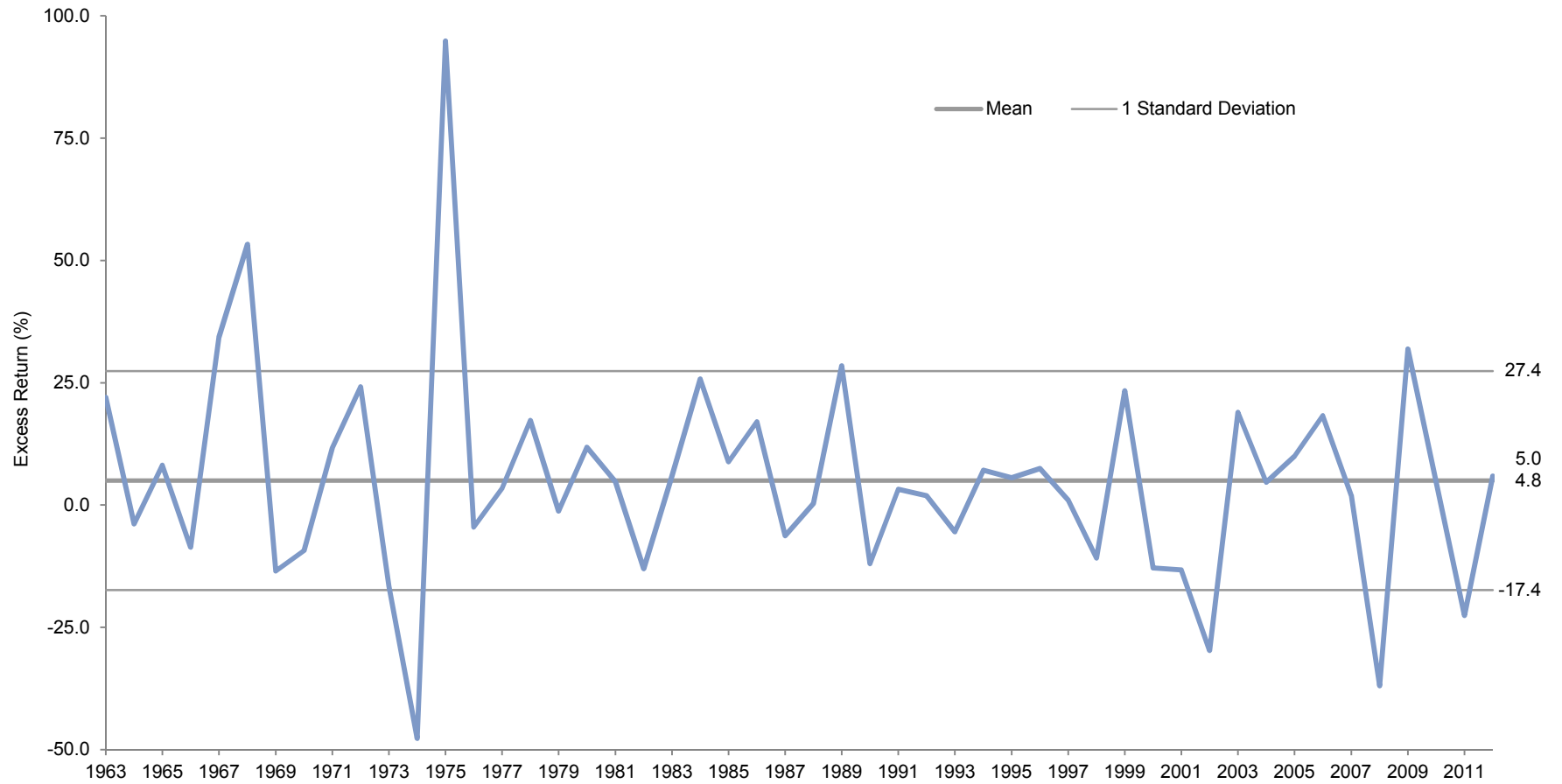
Note: Percentages may not total 100% due to rounding.

Exhibit 15
Distribution of Rolling Monthly Annual Gilt Returns
 1900–2012



Note: Percentages may not total 100% due to rounding.

Exhibit 16
Realized Annual Excess Returns of Equities Over Gilts
 1963–2012



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

Exhibit 17
Maximum Drawdown of Equities and Gilts
 1900–2012

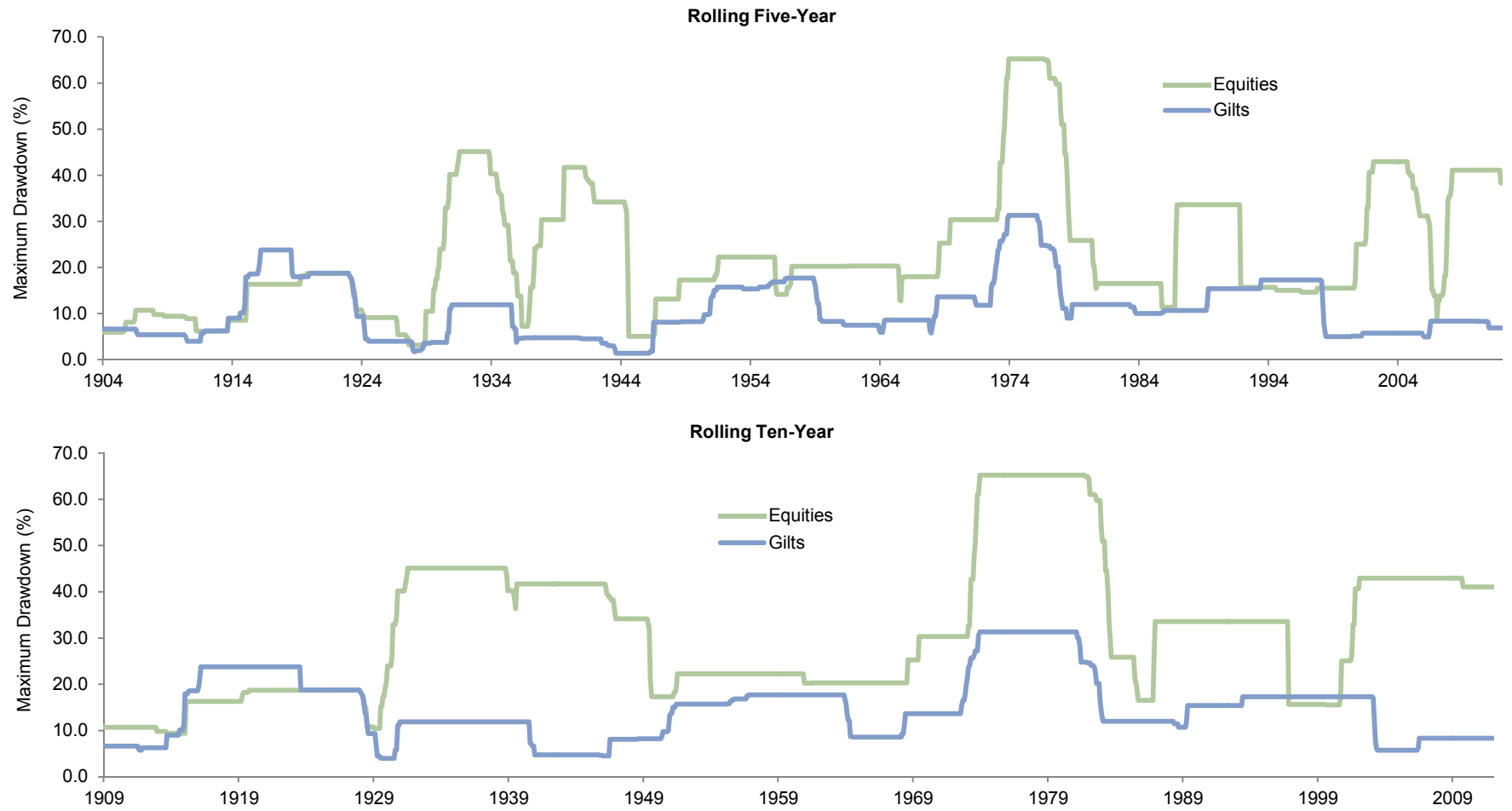
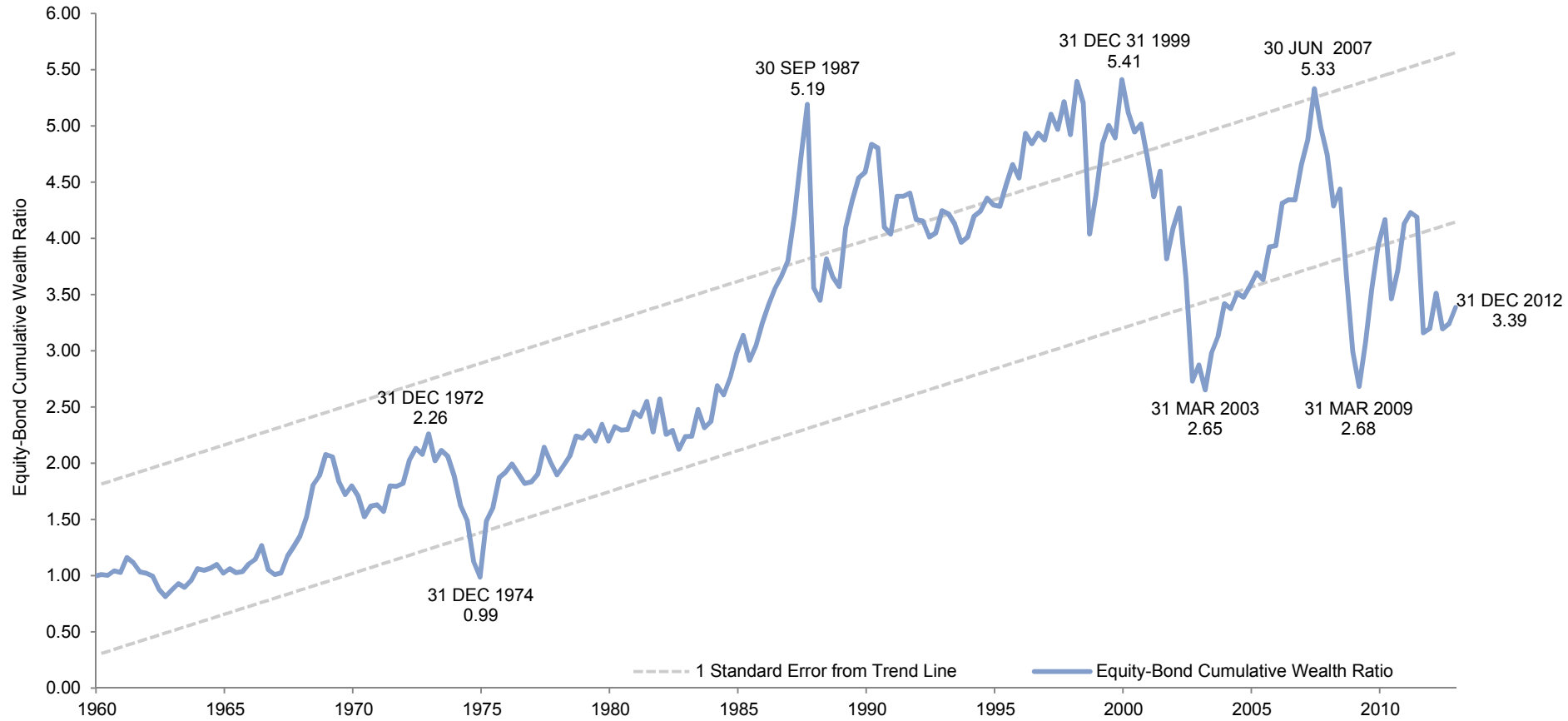
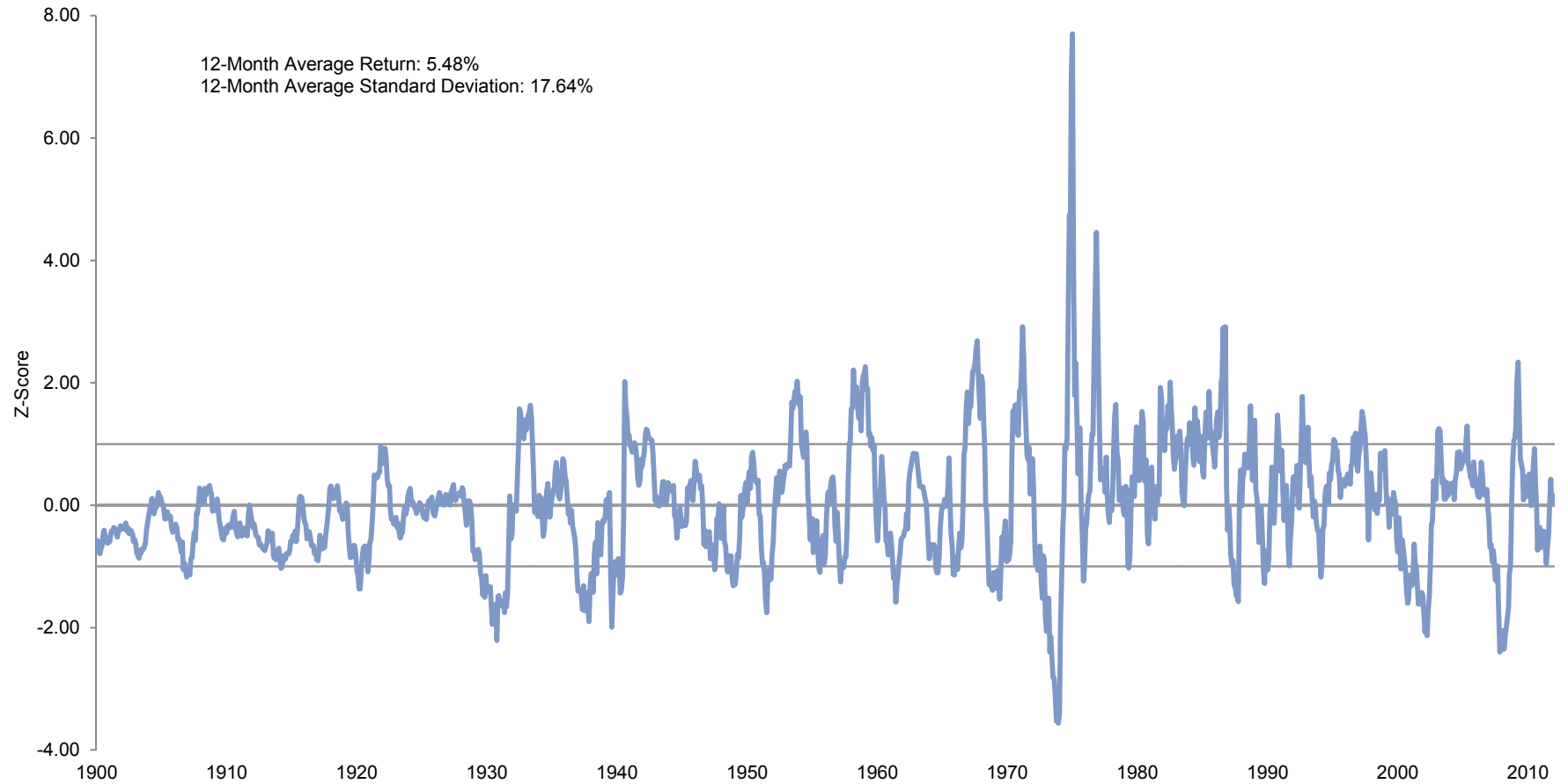


Exhibit 18
Ratio of Equity Returns to Gilt Returns
 1960–2012



Notes: The ratio is calculated by dividing the cumulative wealth of the FTSE equity return by the cumulative wealth of the U.K. gilt index return. The upper and lower bounds are formed by adding and subtracting 1 standard error from the regression of the equity and bond ratio. All data are quarterly.

Exhibit 19
Equity Nominal Annual Price Returns Deviation from Trend
 1900–2012



Note: Z-score represents the number of standard deviations above or below the historical average valuation.

Exhibit 20
Equity Rolling Monthly Total Return Ten-Year AACR
 1900–2012

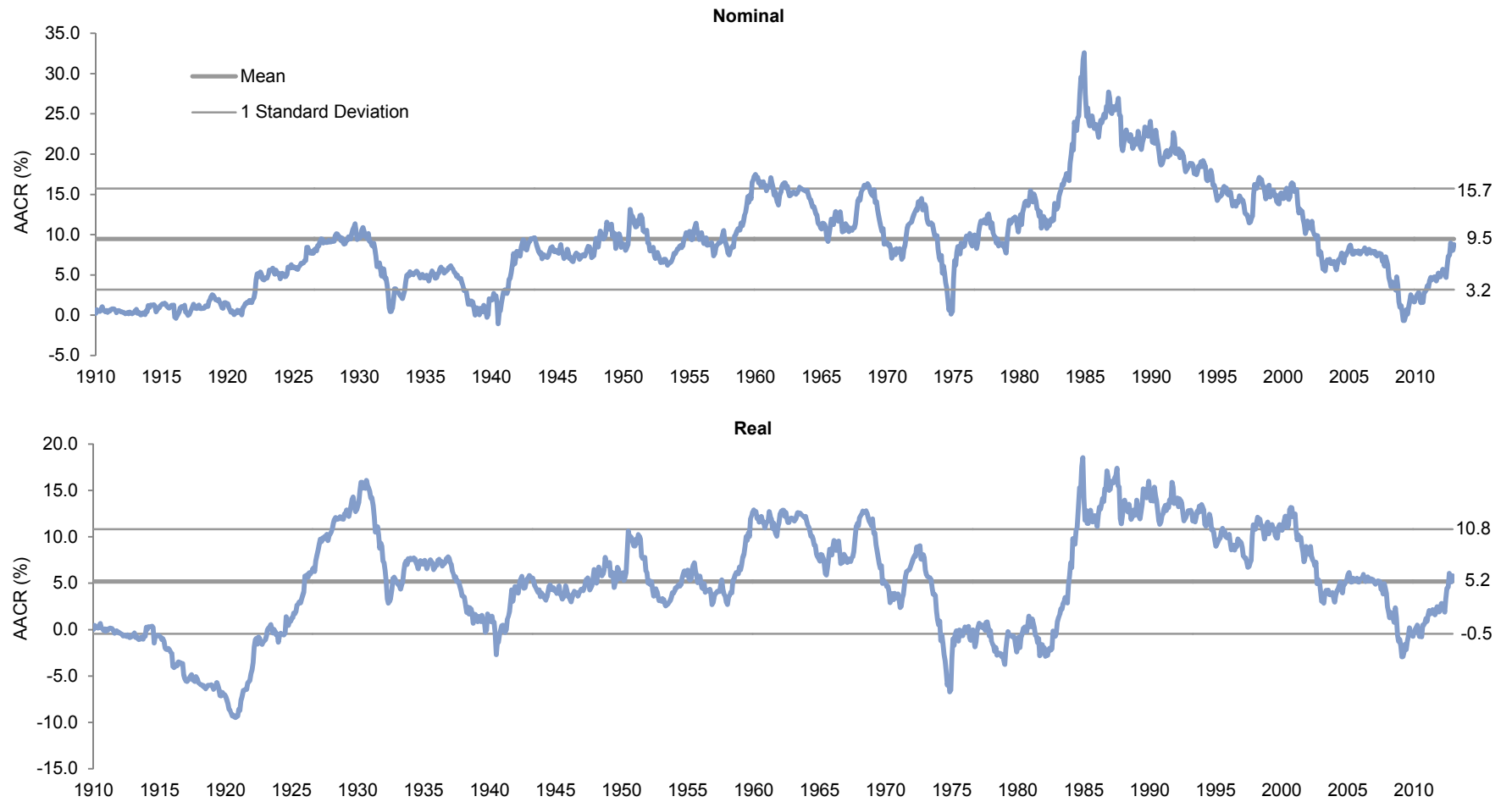


Exhibit 21**25 Worst Equity Nominal and Real Ten-Year Periods and Subsequent Returns**

1900–2012 • Percent (%)

<u>Ten-Year Period Ending</u>	<u>Worst Trailing Nominal Ten-Year AACR</u>	<u>Subsequent Nominal Ten-Year AACR</u>	<u>Ten-Year Period Ending</u>	<u>Worst Trailing Real Ten-Year AACR</u>	<u>Subsequent Real Ten-Year AACR</u>
31/07/1940	-1.1	13.1	31/10/1920	-9.5	15.5
28/02/2009	-0.7	---	30/09/1920	-9.4	16.1
31/03/2009	-0.7	---	31/12/1920	-9.3	14.9
29/02/1916	-0.4	8.4	30/11/1920	-9.3	15.3
30/09/1939	-0.3	10.1	31/07/1920	-9.3	15.4
31/01/1916	-0.2	8.4	31/08/1920	-9.2	15.2
30/04/2009	-0.2	---	30/06/1920	-9.0	15.3
31/03/1916	-0.1	8.1	31/05/1920	-8.7	15.9
31/01/1917	0.0	9.1	28/02/1921	-8.7	14.2
31/10/1938	0.0	11.5	31/01/1921	-8.6	14.2
28/02/1921	0.0	8.9	30/04/1920	-8.6	15.9
30/06/1913	0.0	5.8	31/03/1920	-8.0	15.0
31/10/1939	0.0	9.6	31/03/1921	-7.7	13.4
28/02/1939	0.0	11.3	29/02/1920	-7.6	13.8
31/07/1920	0.1	9.9	30/04/1921	-7.3	12.1
28/02/1917	0.1	9.5	31/01/1920	-7.2	13.4
31/07/1913	0.1	5.4	30/09/1919	-7.2	14.3
31/10/1913	0.1	5.3	31/08/1919	-7.1	14.0
30/04/1916	0.1	7.7	31/12/1919	-7.0	12.9
30/11/1974	0.1	31.7	30/11/1919	-6.9	12.7
30/06/2009	0.1	---	31/10/1919	-6.8	13.5
31/10/1912	0.2	4.4	30/11/1974	-6.7	17.6
30/09/1913	0.2	5.6	31/05/1921	-6.6	10.5
30/04/1912	0.2	5.1	30/06/1921	-6.5	10.6
31/07/1912	0.2	5.4	31/12/1974	-6.5	18.5
	Average	9.3		Average	14.4
	Max	31.7		Max	18.5
	Min	4.4		Min	10.5
	% Positive	100.0		% Positive	100.0

Note: Average annual compound returns (AACRs) based on monthly total returns.

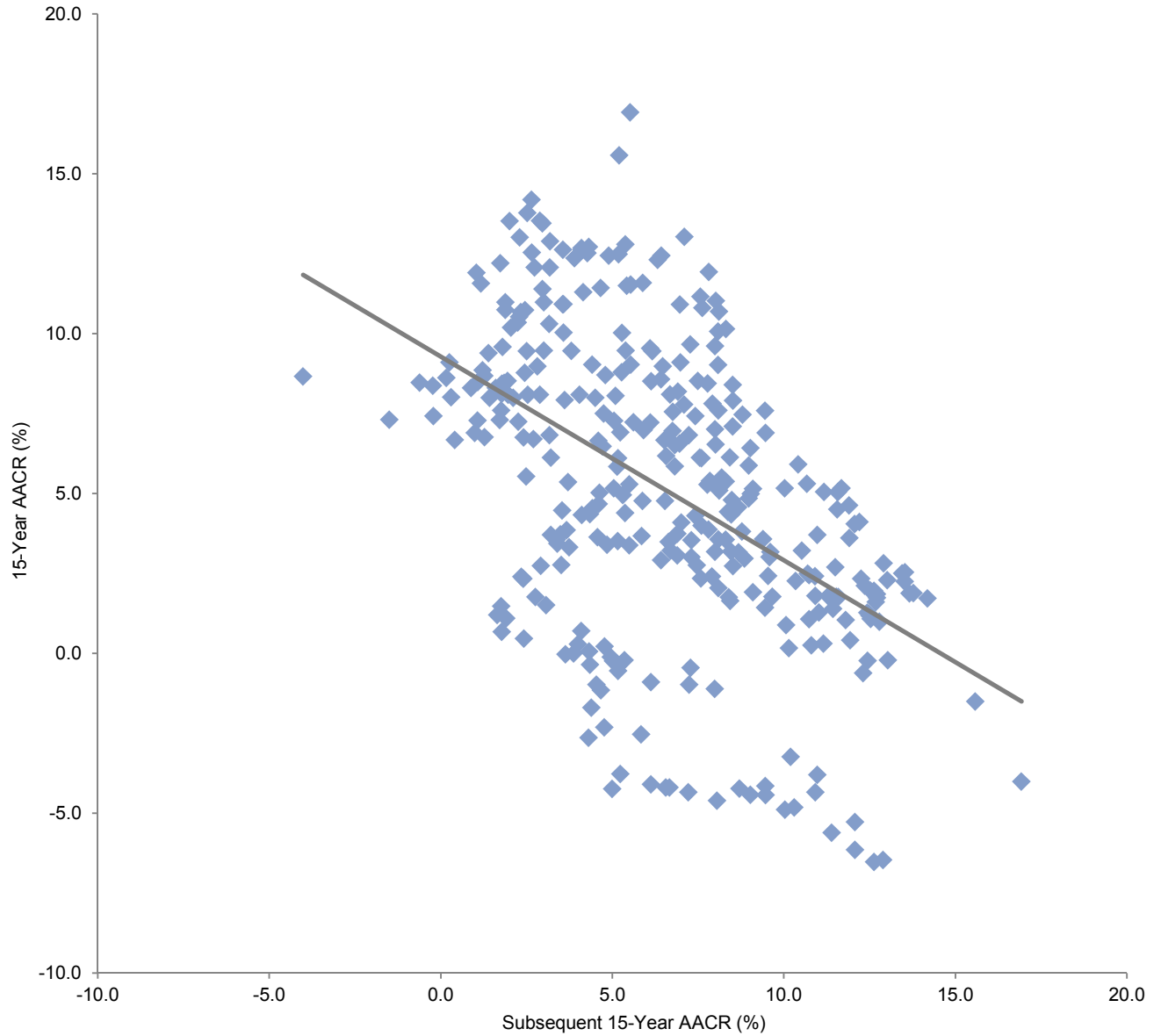
Exhibit 22**25 Best Equity Nominal and Real Ten-Year Periods and Subsequent Returns**

1900–2012 • Percent (%)

<u>Ten-Year Period Ending</u>	<u>Best Trailing Nominal Ten-Year AACR</u>	<u>Subsequent Nominal Ten-Year AACR</u>	<u>Ten-Year Period Ending</u>	<u>Best Trailing Real Ten-Year AACR</u>	<u>Subsequent Real Ten-Year AACR</u>
31/12/1984	32.6	15.0	31/12/1984	18.5	9.6
30/11/1984	31.7	15.7	30/11/1984	17.6	10.4
30/09/1984	29.5	16.2	31/07/1987	17.4	6.8
31/10/1984	29.2	16.2	31/10/1986	17.1	9.4
31/10/1986	27.7	14.4	30/06/1987	16.6	6.7
31/01/1985	27.5	14.3	30/11/1986	16.5	9.5
31/08/1984	27.5	17.4	31/05/1987	16.4	7.3
31/07/1987	26.9	11.6	30/09/1930	16.1	-1.4
30/11/1986	26.9	14.4	31/12/1989	16.0	11.2
30/06/1987	26.1	11.5	28/02/1987	16.0	7.9
31/05/1987	26.0	12.0	31/05/1930	15.9	0.8
28/02/1987	25.9	12.7	30/04/1930	15.9	0.8
31/08/1986	25.9	14.0	30/09/1991	15.9	7.3
30/09/1986	25.9	14.8	31/03/1987	15.9	7.7
31/03/1985	25.7	14.7	30/04/1987	15.8	7.7
31/03/1987	25.7	12.5	31/10/1930	15.5	-0.6
30/04/1987	25.5	12.5	31/08/1987	15.5	7.2
31/12/1986	25.2	14.3	30/09/1987	15.4	7.5
31/01/1987	25.1	13.7	31/07/1930	15.4	-2.7
30/06/1986	24.9	13.5	31/05/1990	15.4	11.2
31/08/1987	24.9	12.0	31/10/1991	15.3	7.9
31/07/1985	24.7	16.0	30/09/1984	15.3	10.8
30/09/1987	24.7	12.3	30/11/1930	15.3	-0.1
31/07/1984	24.7	18.0	30/06/1930	15.3	-0.5
28/02/1985	24.7	14.5	30/09/1986	15.3	9.8
	Average	14.2		Average	6.1
	Max	18.0		Max	11.2
	Min	11.5		Min	-2.7
	% Positive	100.0		% Positive	80.0

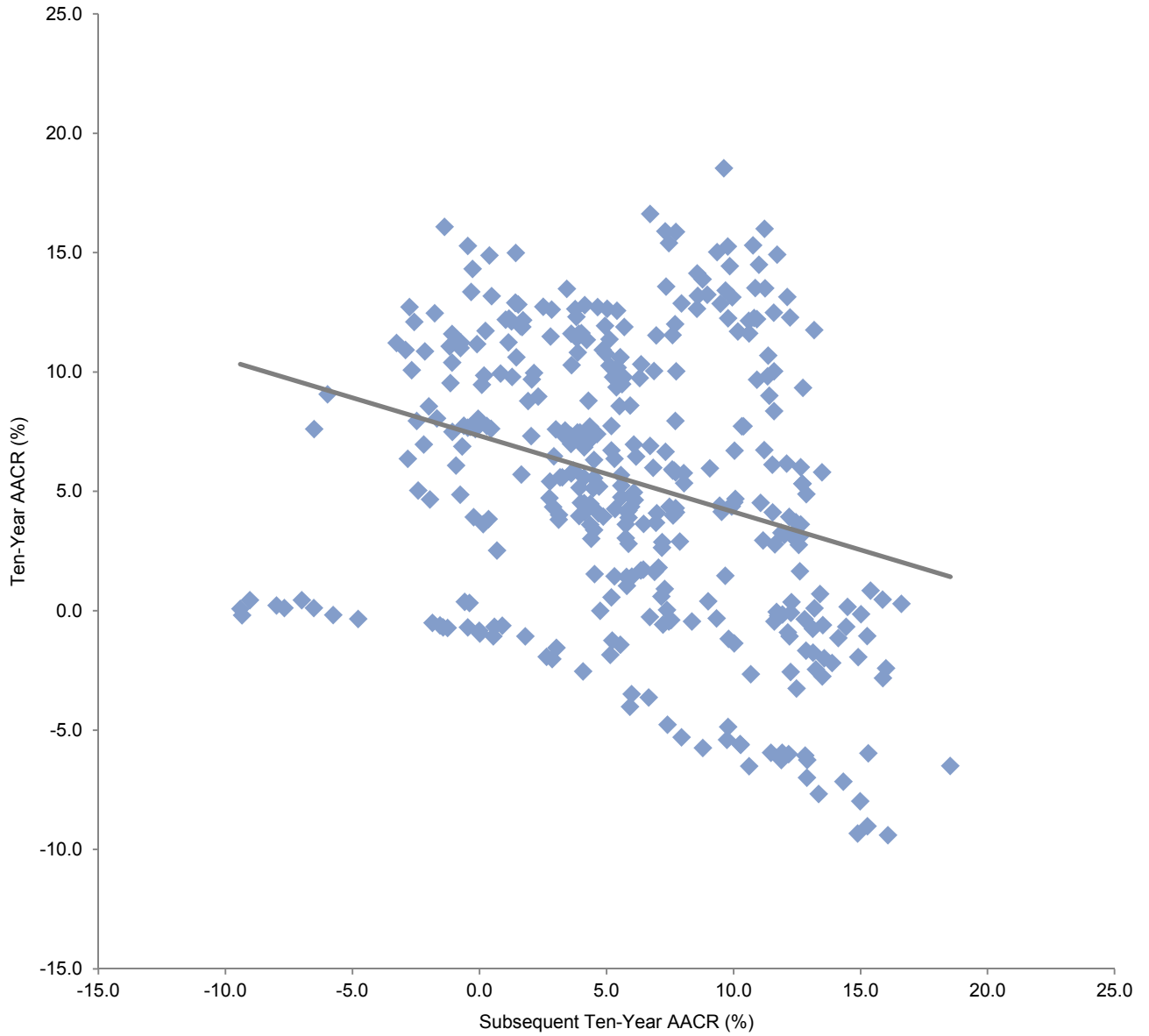
Note: Average annual compound returns (AACRs) based on monthly total returns.

Exhibit 23
Relationship Between Rolling Quarterly 15-Year Equity Real AACR
and Subsequent 15-Year Equity Real AACR
 1900–2012



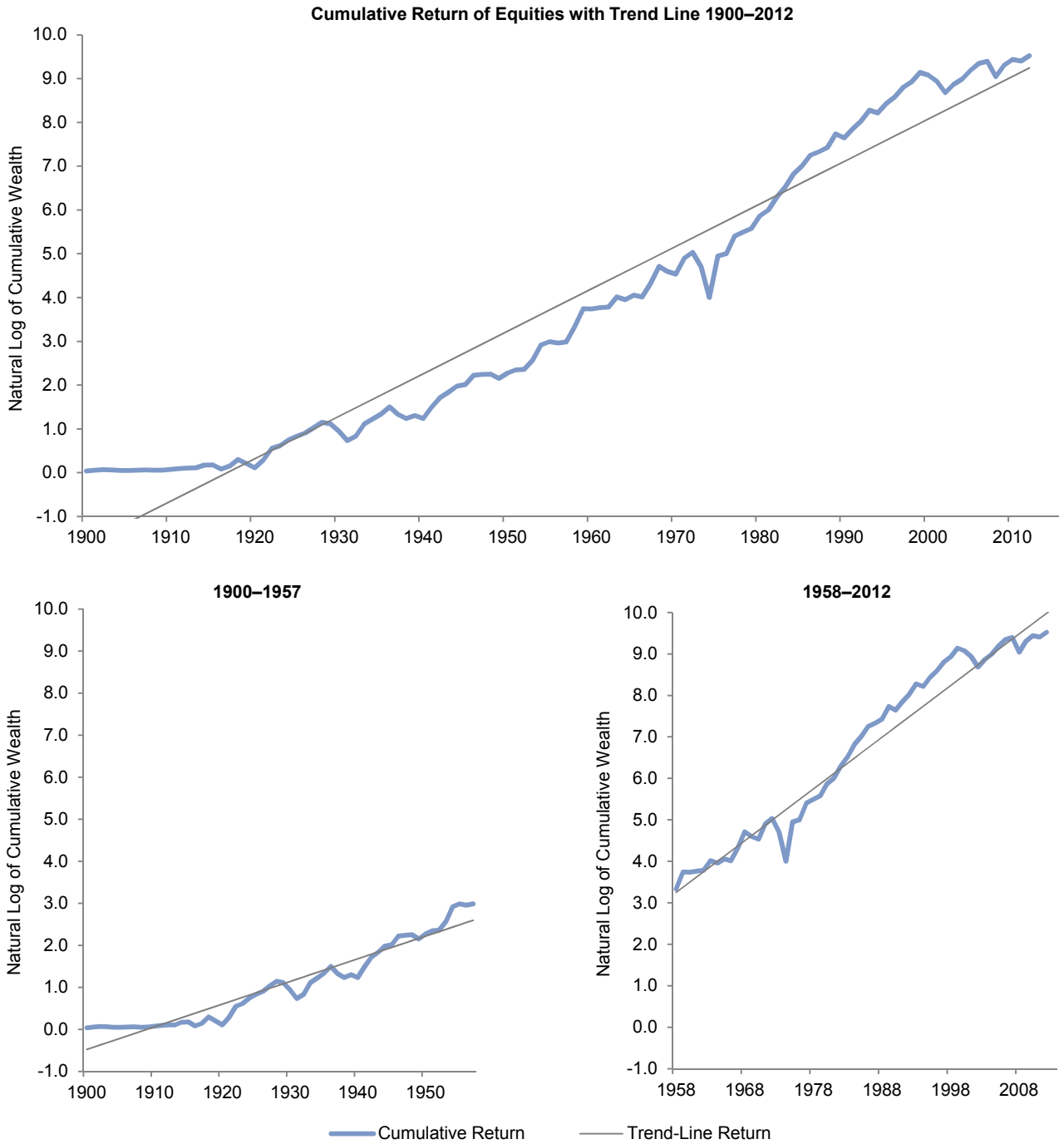
AACR Quartiles	Beginning Period 15-Year AACR (%)				Subsequent 15-Year AACR (%)			
	Mean	High	Low	Std Dev	Mean	High	Low	Std Dev
First	-0.87	1.91	-6.52	2.53	8.67	16.93	1.64	3.78
Second	3.50	5.04	1.95	0.88	7.98	13.53	2.35	3.06
Third	6.90	8.46	5.05	1.04	5.46	11.68	-1.50	3.14
Fourth	10.88	16.93	8.47	1.80	4.09	8.32	-4.01	2.41

Exhibit 24
Relationship Between Rolling Quarterly Ten-Year Equity Real AACR
and Subsequent Ten-Year Equity Real AACR
 1900–2012



AACR Quartiles	Beginning Period Ten-Year AACR (%)				Subsequent Ten-Year AACR (%)			
	Mean	High	Low	Std Dev	Mean	High	Low	Std Dev
First	-2.39	0.37	-9.41	2.65	8.12	18.54	-9.41	6.80
Second	3.51	5.68	0.39	1.48	6.49	15.87	-9.03	4.39
Third	7.80	10.27	5.71	1.38	4.35	13.48	-6.50	4.36
Fourth	12.68	18.54	10.28	1.63	5.02	13.18	-3.26	4.48

Exhibit 25
Long-Term Nominal Trend Analysis



Notes: Cumulative return is the natural log of the cumulative wealth index. Predicted return is a regression line fitted to the historical data, which serves as a long-term trend line.

Exhibit 26
Cumulative Differential Between Equity and Gilt Returns
 1900–2012

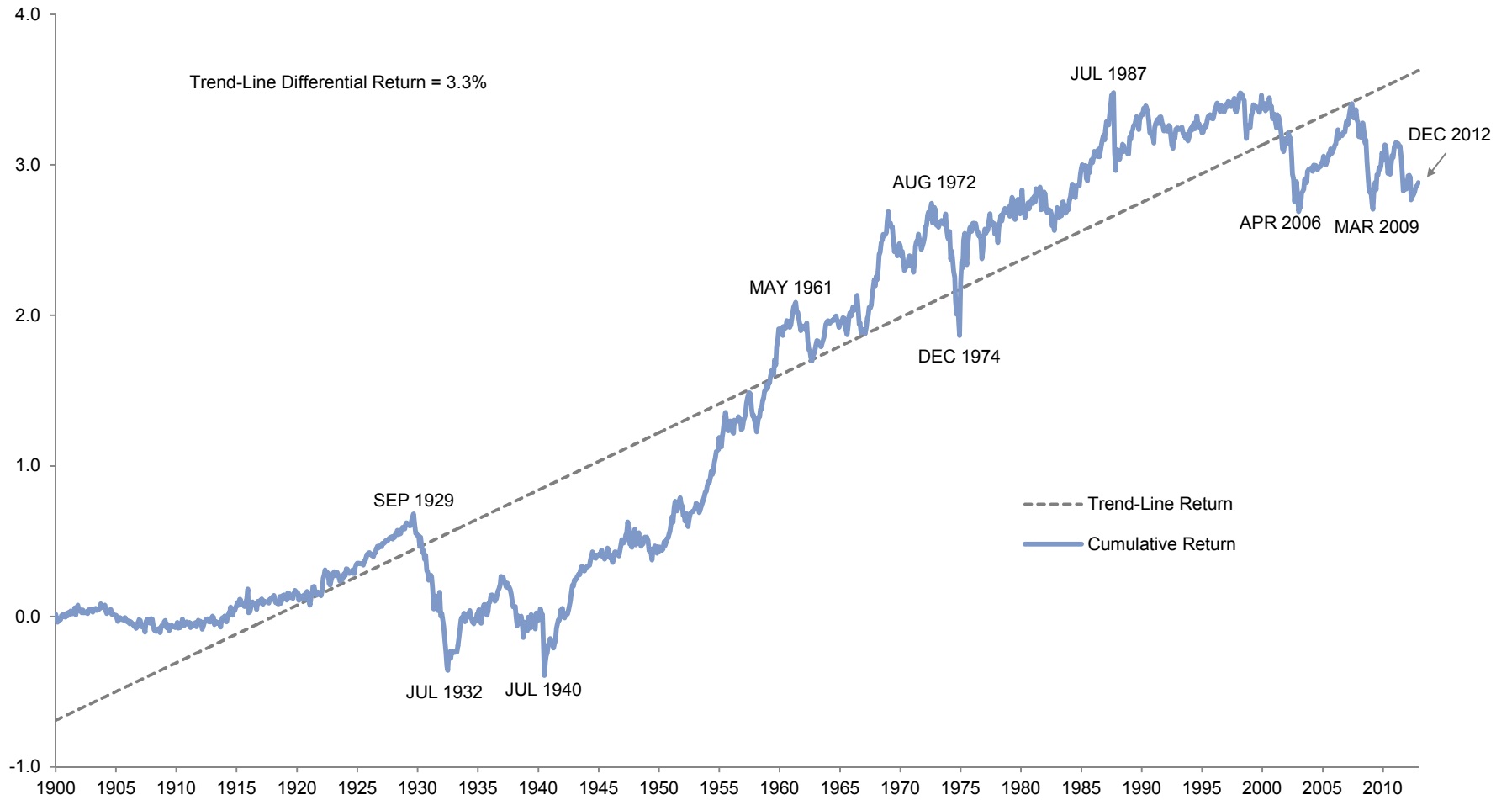


Exhibit 27
Cumulative Differential Between Equity and Cash Returns
 1900–2012

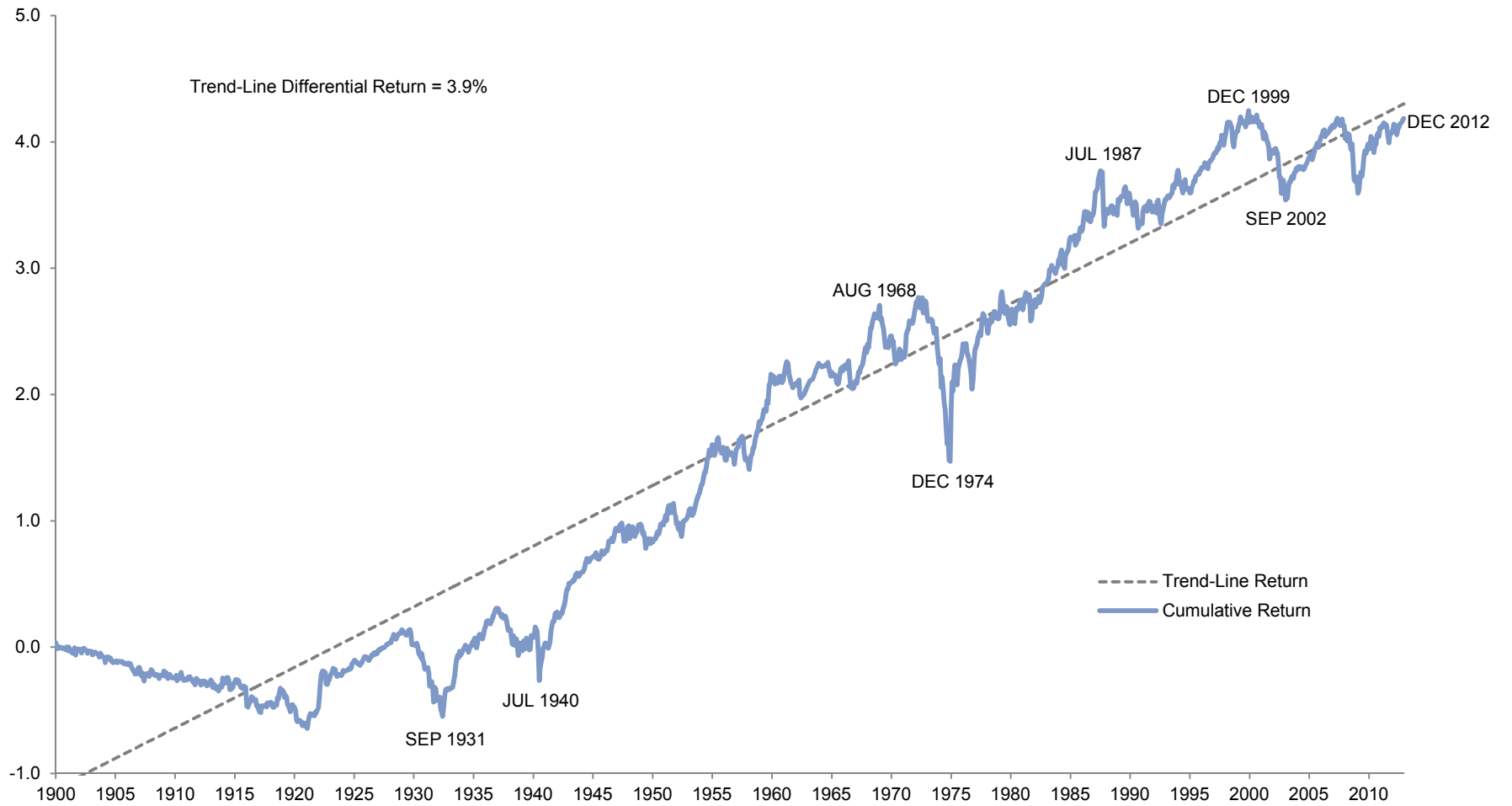


Exhibit 28
Excess Returns of Equities Over Gilts
 1900–2012 • Rolling Monthly Periods

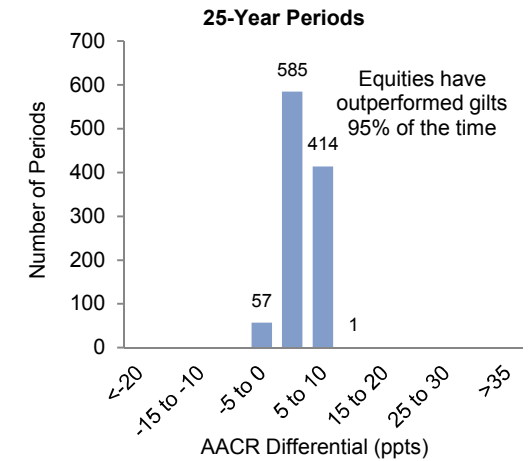
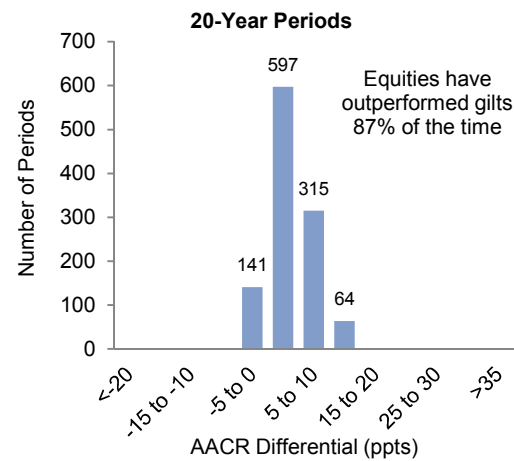
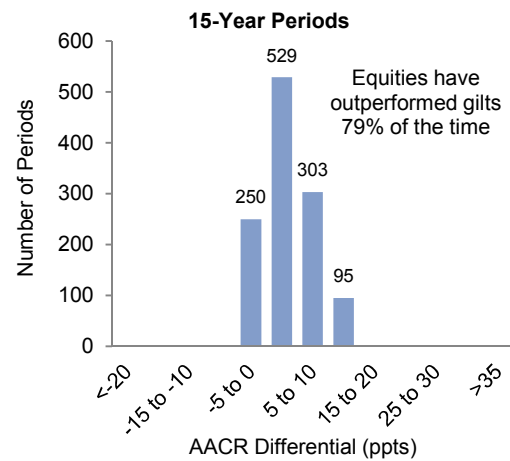
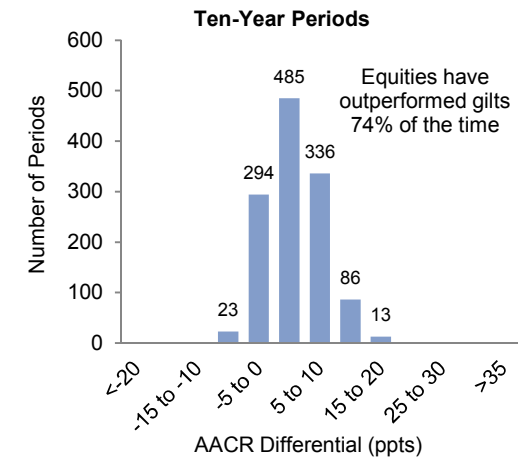
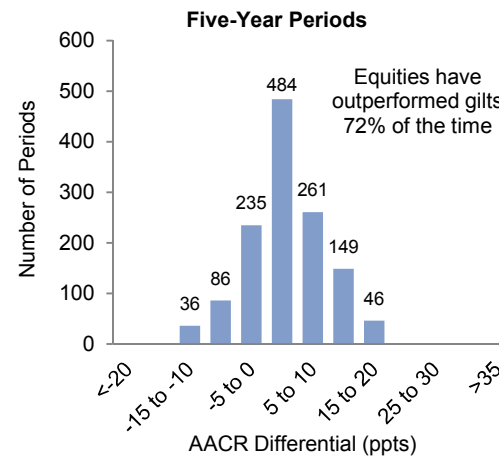
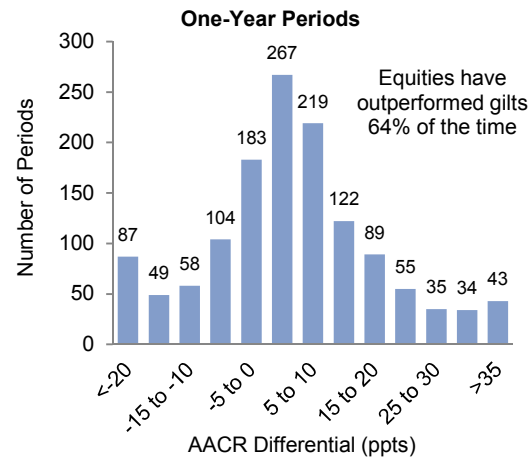


Exhibit 29
Excess Returns of Equities Over Cash
 1900–2012 • Rolling Monthly Periods

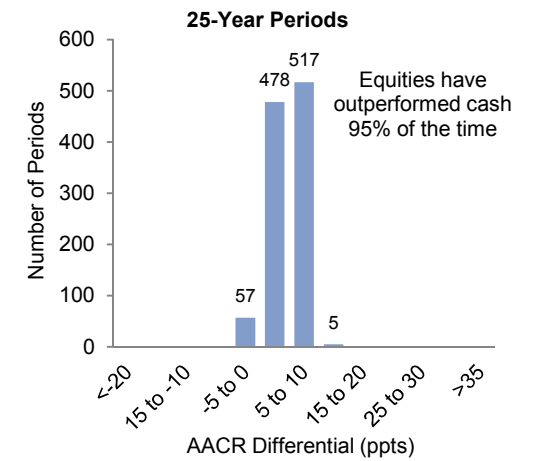
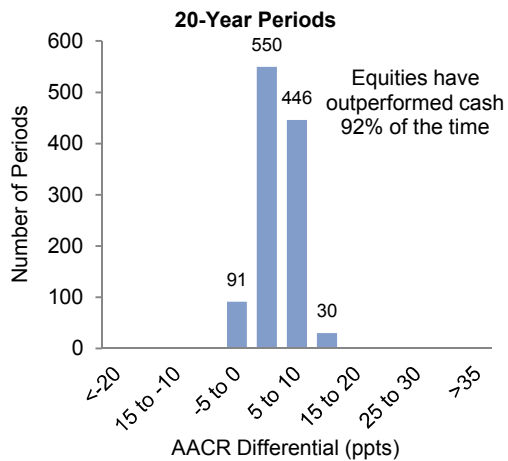
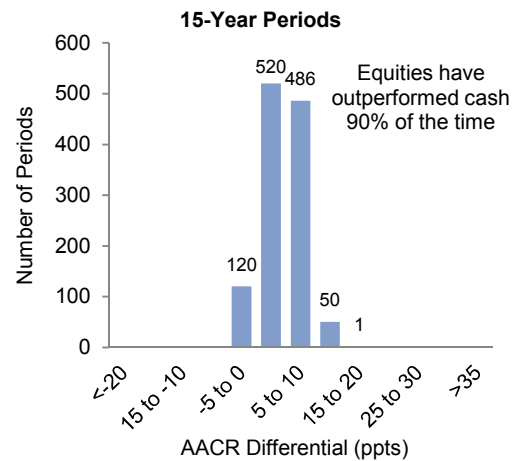
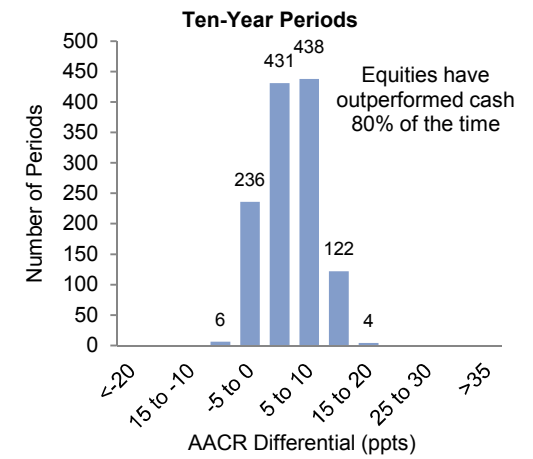
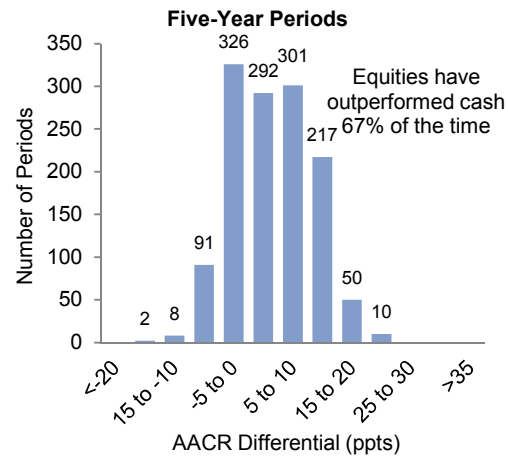
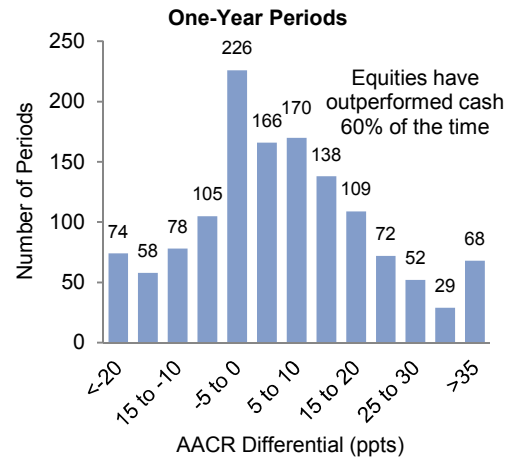


Exhibit 30
Average Annual Compound Returns for Different Periods
 1900–2012

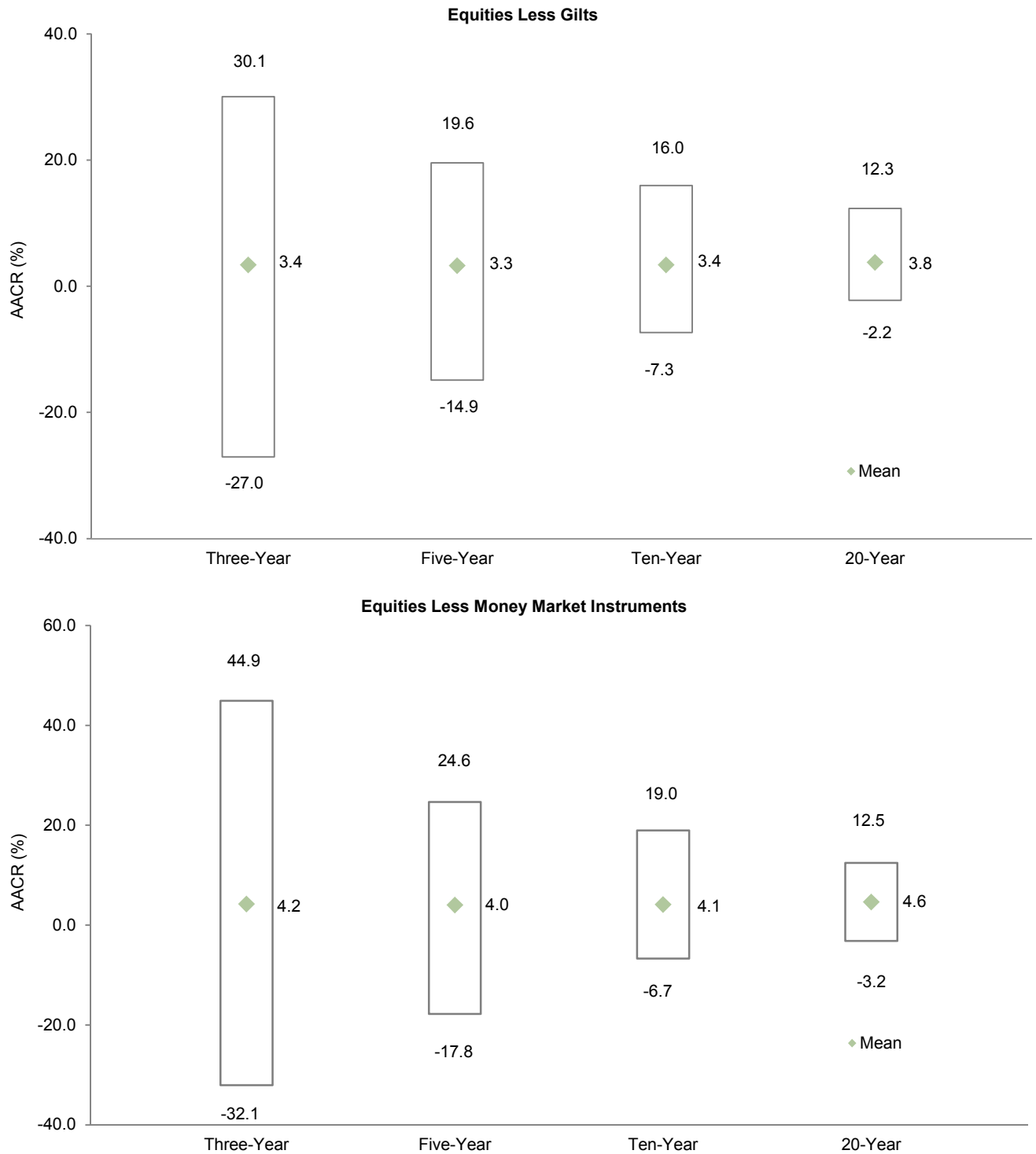


Exhibit 31
Cumulative Wealth of Best Periods for Equities Relative to Gilts

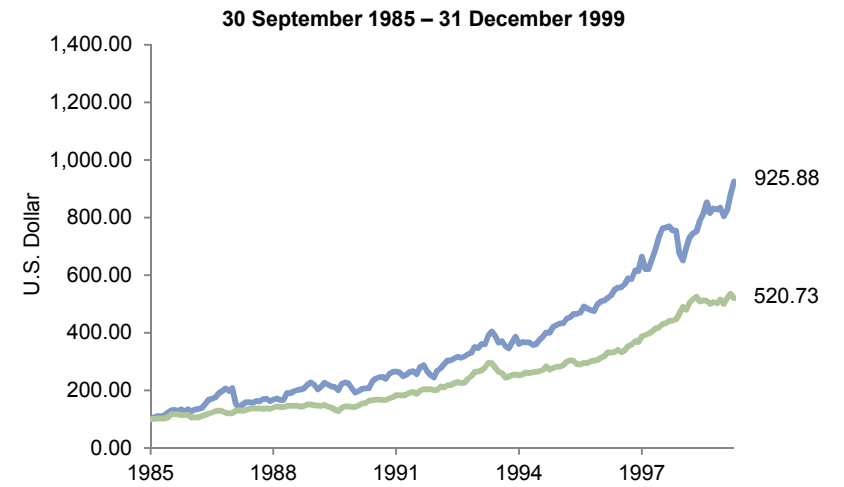
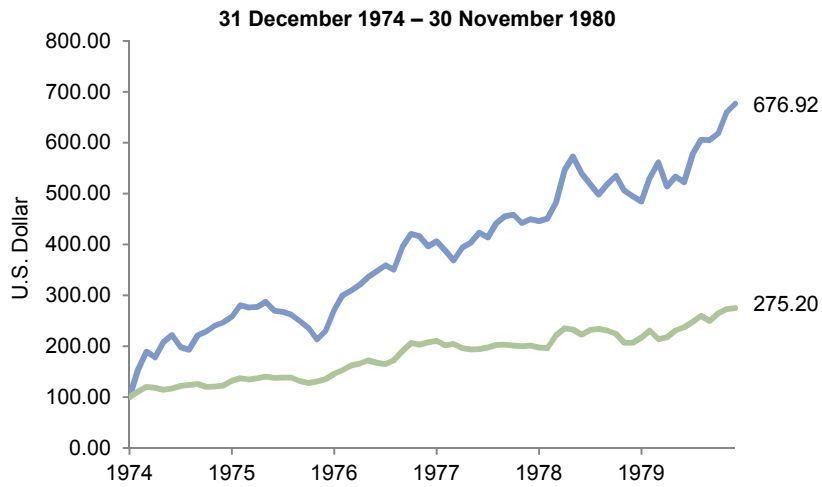
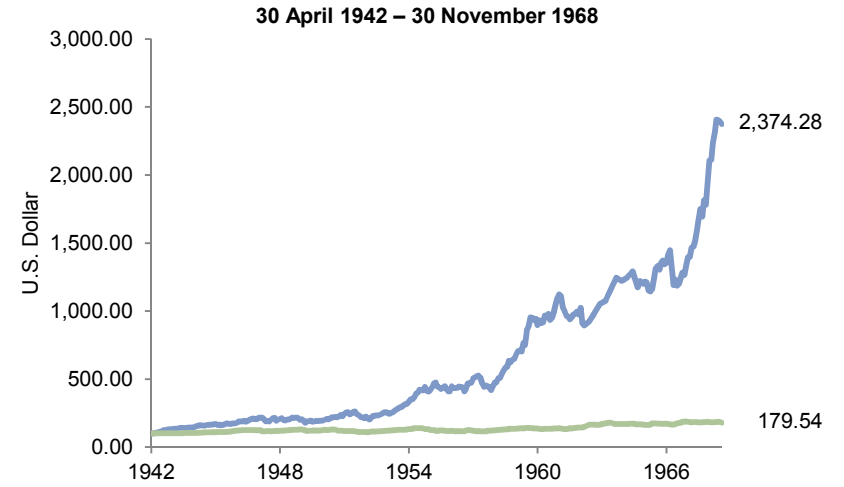
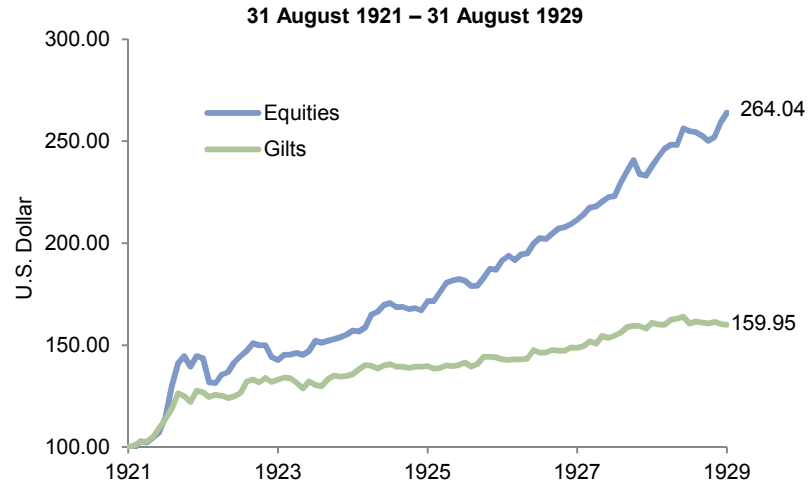


Exhibit 32
Cumulative Wealth of Best Periods for Gilts Relative to Equities

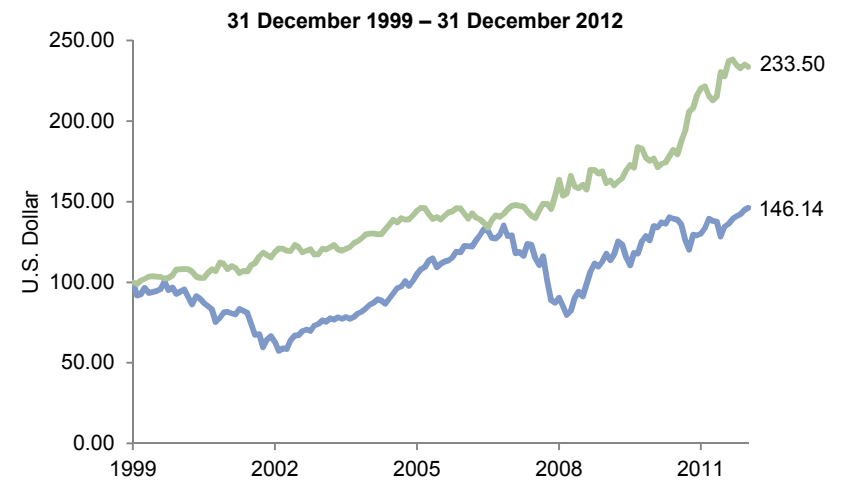
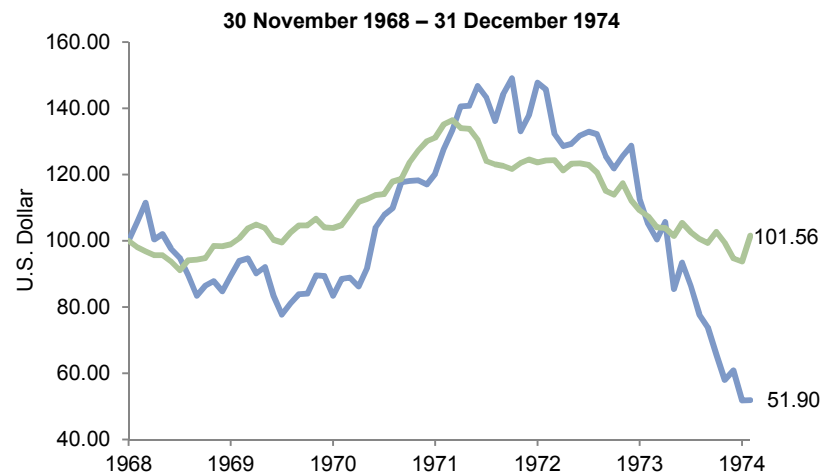
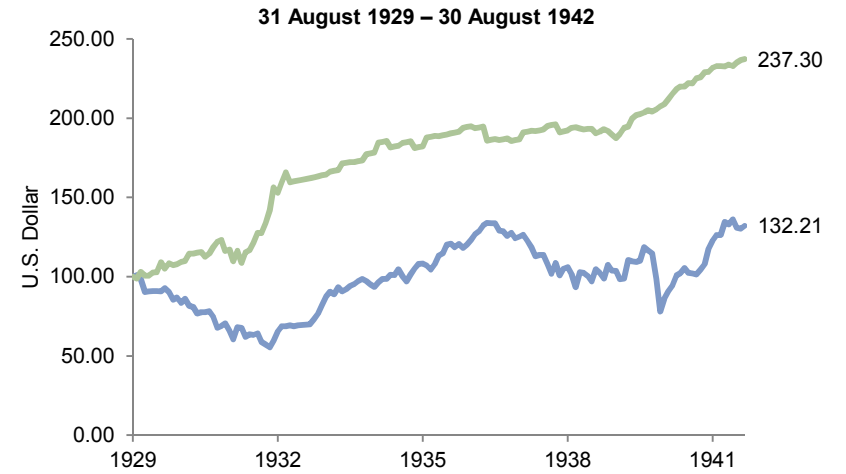
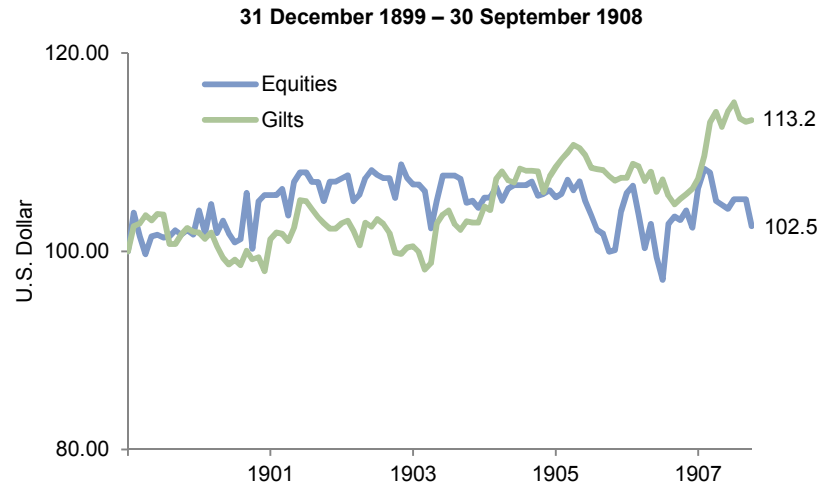


Exhibit 33
Cumulative Wealth of Best Periods for Money Market Instruments Relative to Equities

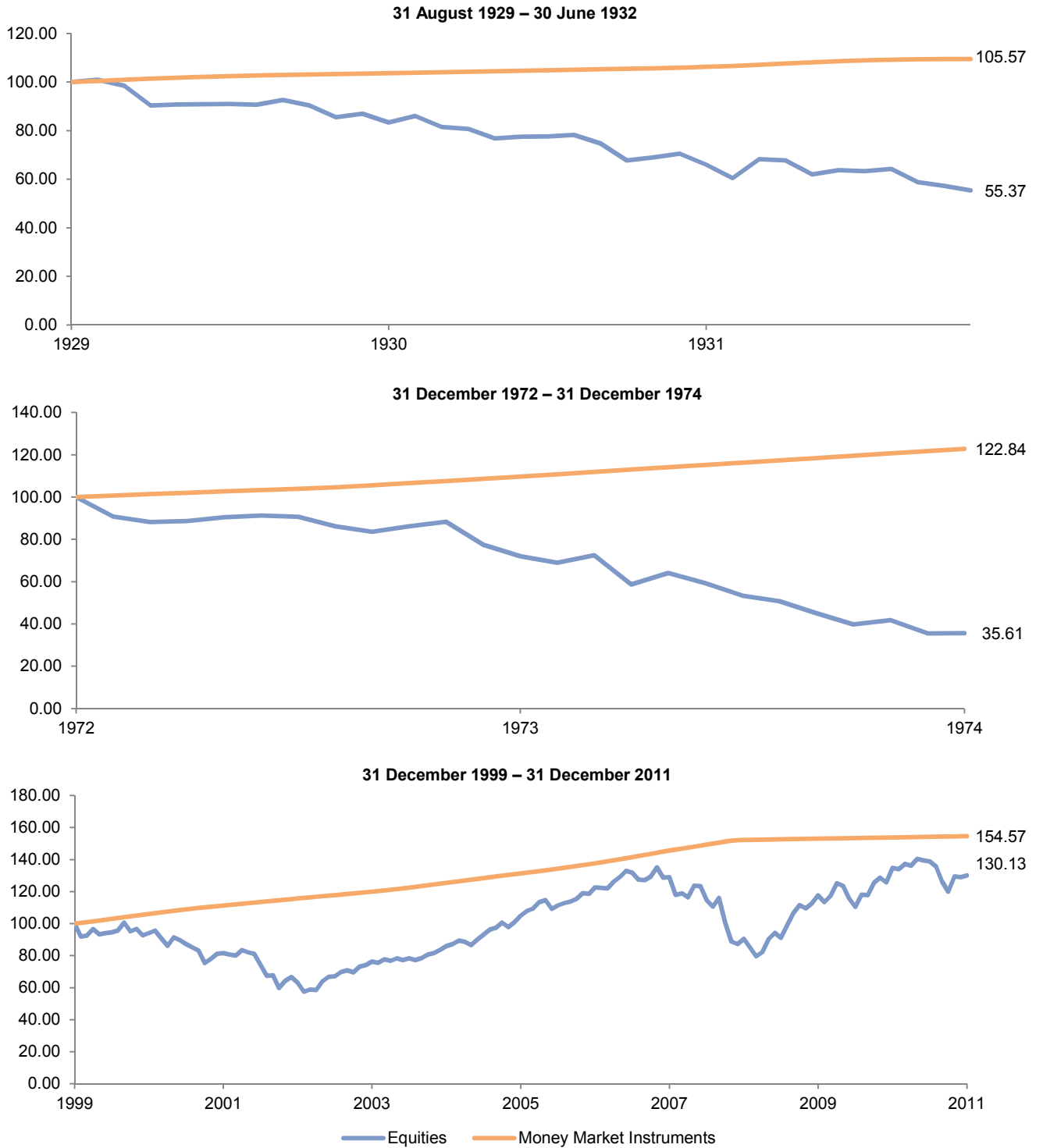


Exhibit 34
Relationship Between Deviation from Trend Line and Subsequent Equity Real Price Return: One- and Five-Year Returns
 1900–2012

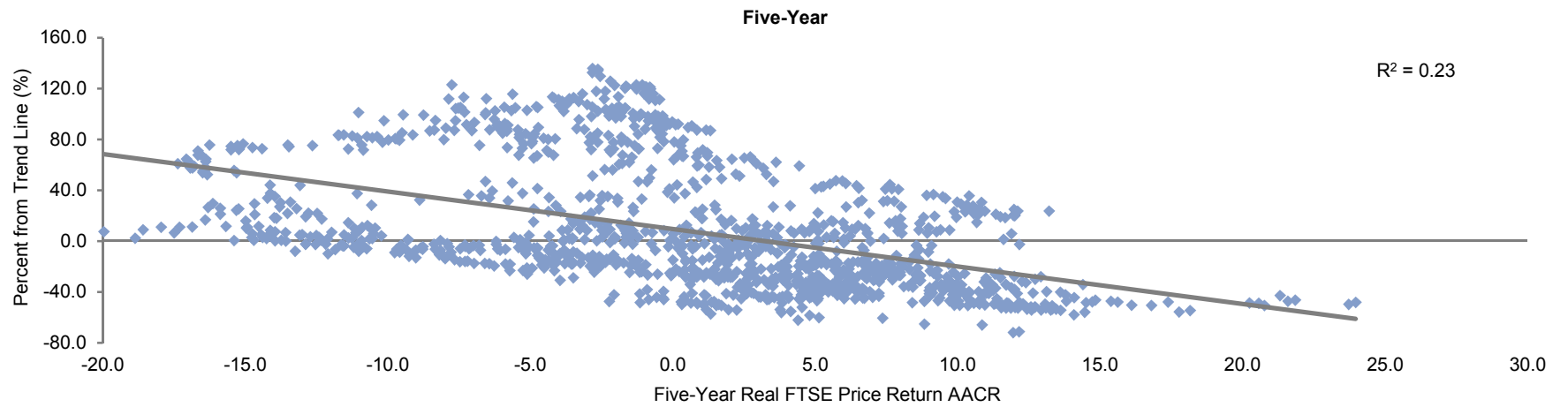
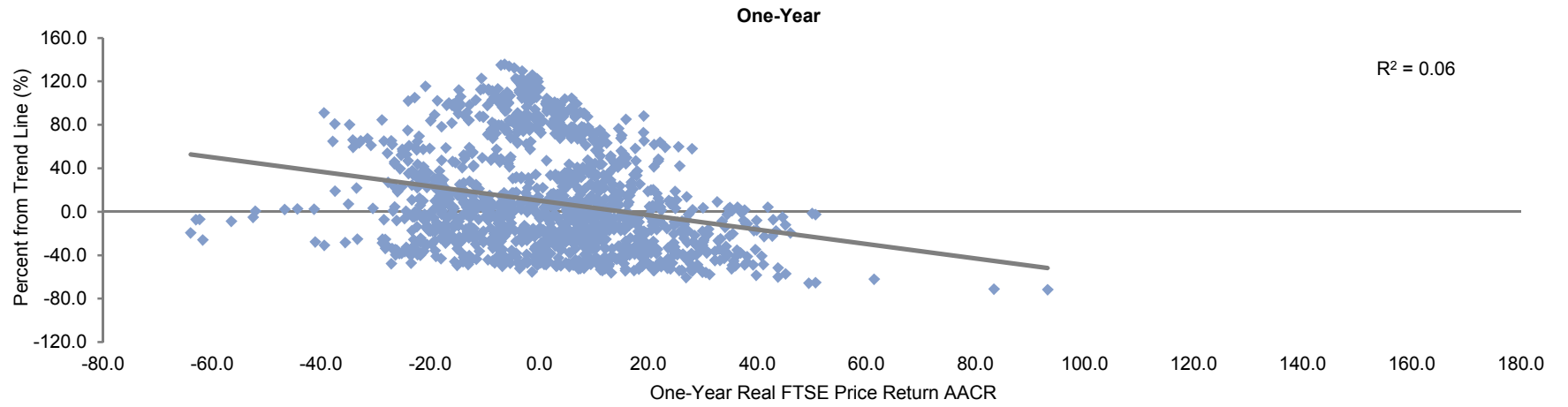


Exhibit 35
Relationship Between Deviation from Trend Line and
Subsequent Equity Real Price Return: Ten-Year Returns
1900–2012

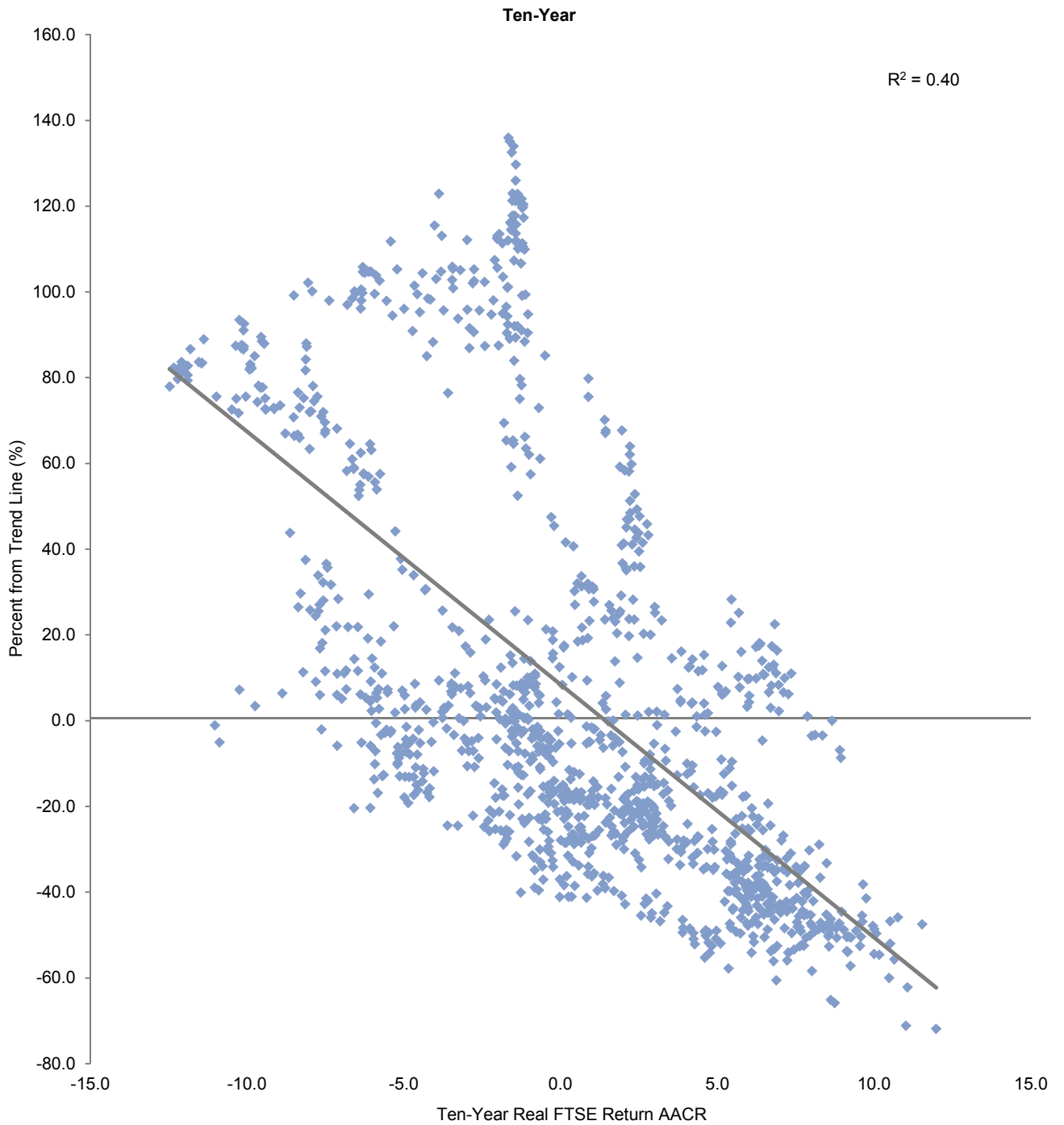


Exhibit 36
Bull and Bear Equity Markets
 1900–2012

<u>Period</u>	<u>Market</u>	<u>(%)</u>	<u>Period</u>	<u>Market</u>	<u>(%)</u>
1900	Bull	4.1	1971–72	Bull	64.6
1901–13	Bear	7.2	1973–74	Bear	-64.4
1914	Bull	6.4	1975	Bull	158.2
1915–16	Bear	-8.5	1976	Bear	5.3
1917–18	Bull	24.0	1977–78	Bull	64.0
1919–20	Bear	-17.3	1979	Bear	8.7
1921–28	Bull	183.2	1980–86	Bull	432.0
1929–31	Bear	-34.0	1987	Bear	8.4
1932–36	Bull	115.9	1988–89	Bull	49.8
1937–38	Bear	-23.5	1990	Bear	-8.7
1939	Bull	7.0	1991–93	Bull	88.0
1940	Bear	-6.8	1994	Bear	-5.8
1941–48	Bull	176.7	1995–99	Bull	152.4
1949	Bear	-9.1	2000–02	Bear	-36.9
1950–51	Bull	21.4	2003–06	Bull	94.3
1952	Bear	1.3	2007–08	Bear	-26.2
1953–55	Bull	87.6	2009–10	Bull	49.0
1956–57	Bear	-0.4	2011	Bear	-3.5
1958–59	Bull	113.3	2012	Bull	12.3
1960–62	Bear	4.0			
1963	Bull	25.7			
1964	Bear	-5.6			
1965	Bull	10.9			
1966	Bear	-4.3			
1967–68	Bull	101.2			
1969–70	Bear	-16.2			
High Bull Return (%)	1980–86	432.0	High Bear Return (%)	1979	8.7
Low Bull Return (%)	1900	4.1	Low Bear Return (%)	1973–74	-64.4
Mean Bull-Year Return (%)		22.3	Mean Bear-Year Return (%)		-5.5
Standard Deviation (%)		20.9	Standard Deviation (%)		10.8
Number of Bull Market Years		66	Number of Bear Market Years		47
Percentage of Total Years (%)		58	Percentage of Total Years (%)		42

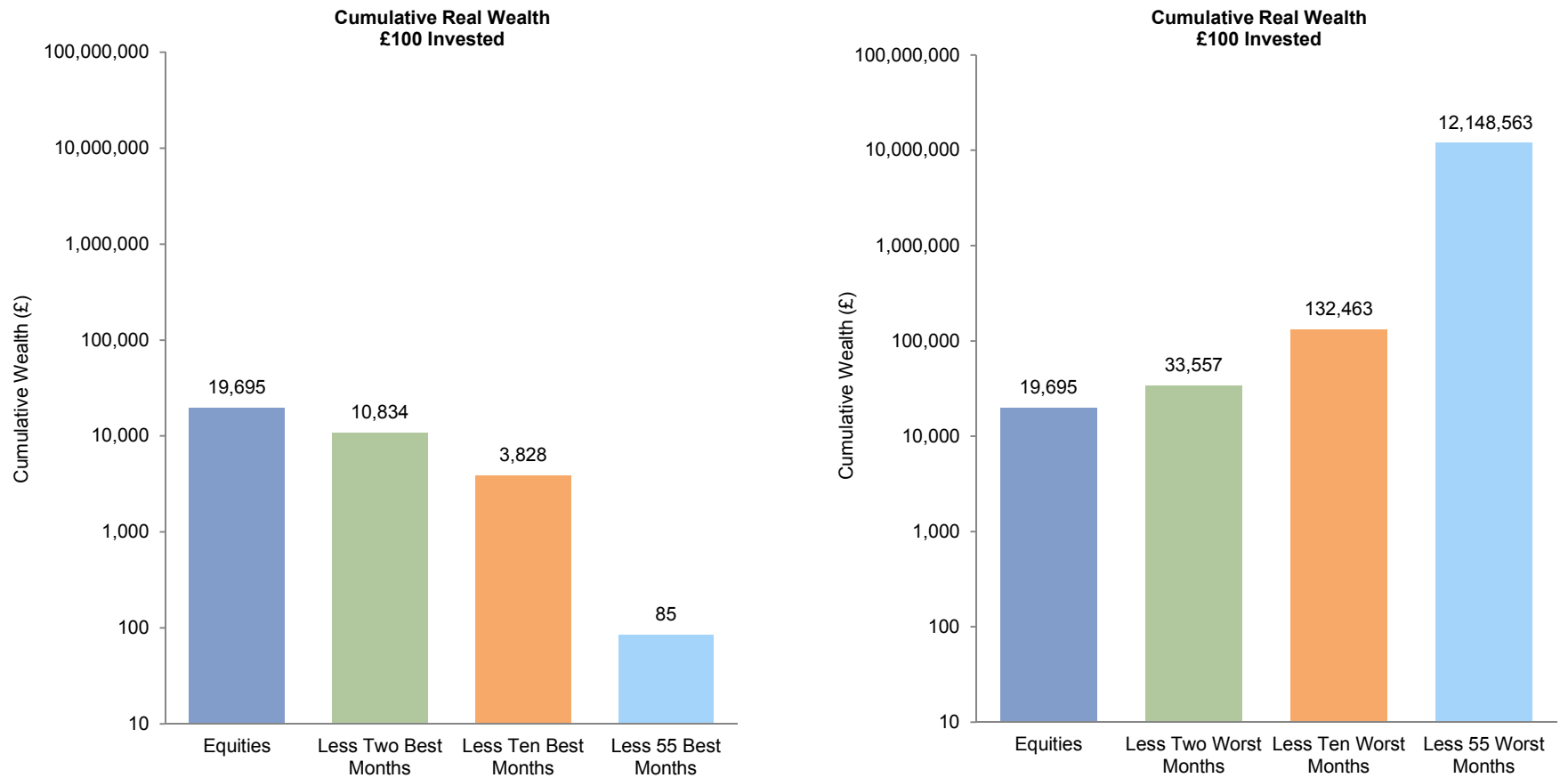
Note: Bull markets are characterized by annual equity market returns greater than those available from money market instruments; bear markets are the converse.

Exhibit 37
Bull and Bear Gilt Markets
 1900–2012

<u>Period</u>	<u>Market</u>	<u>(%)</u>	<u>Period</u>	<u>Market</u>	<u>(%)</u>
1900–03	Bear	0.5	1960–61	Bull	0.2
1904–05	Bull	8.0	1962	Bear	19.2
1906–07	Bear	-1.1	1963–70	Bull	13.4
1908	Bull	3.6	1971	Bear	29.1
1909–17	Bear	-10.0	1972–74	Bull	-24.9
1918	Bull	13.8	1975	Bear	32.5
1919–20	Bear	-18.2	1976	Bull	10.3
1921–24	Bull	55.9	1977	Bear	44.5
1925–26	Bear	3.5	1978–79	Bull	3.0
1927–28	Bull	13.7	1980	Bear	19.1
1929	Bear	-1.1	1981	Bull	9.3
1930	Bull	14.3	1982–83	Bear	82.4
1931	Bear	0.3	1984–86	Bull	29.5
1932–35	Bull	63.5	1987	Bear	15.6
1936	Bear	-1.5	1988–90	Bull	20.6
1937	Bull	3.2	1991–93	Bear	89.2
1938	Bear	0.6	1994	Bull	-12.1
1939–42	Bull	26.2	1995–98	Bear	99.0
1943	Bear	0.5	1999	Bull	0.7
1944–46	Bull	21.5	2000	Bear	8.0
1947	Bear	-5.0	2001	Bull	0.0
1948	Bull	6.8	2002	Bear	10.0
1949	Bear	-4.5	2003	Bull	1.6
1950	Bull	0.7	2004–05	Bear	19.7
1951	Bull	-8.5	2006–07	Bull	2.0
1952–54	Bear	22.2	2008	Bear	11.1
1955–57	Bull	-12.8	2009	Bull	-1.3
1958–59	Bear	16.4	2010–12	Bear	44.6
High Bull Return (%)	1995–98	99.0	High Bear Return (%)	1984–86	29.5
Low Bull Return (%)	1950	0.7	Low Bear Return (%)	1972–74	-24.9
Mean Bull-Year Return (%)		13.5	Mean Bear-Year Return (%)		-0.2
Standard Deviation (%)		11.5	Standard Deviation (%)		5.7
Number of Bull Market Years		53	Number of Bear Market Years		60
Percentage of Total Years (%)		47	Percentage of Total Years (%)		53

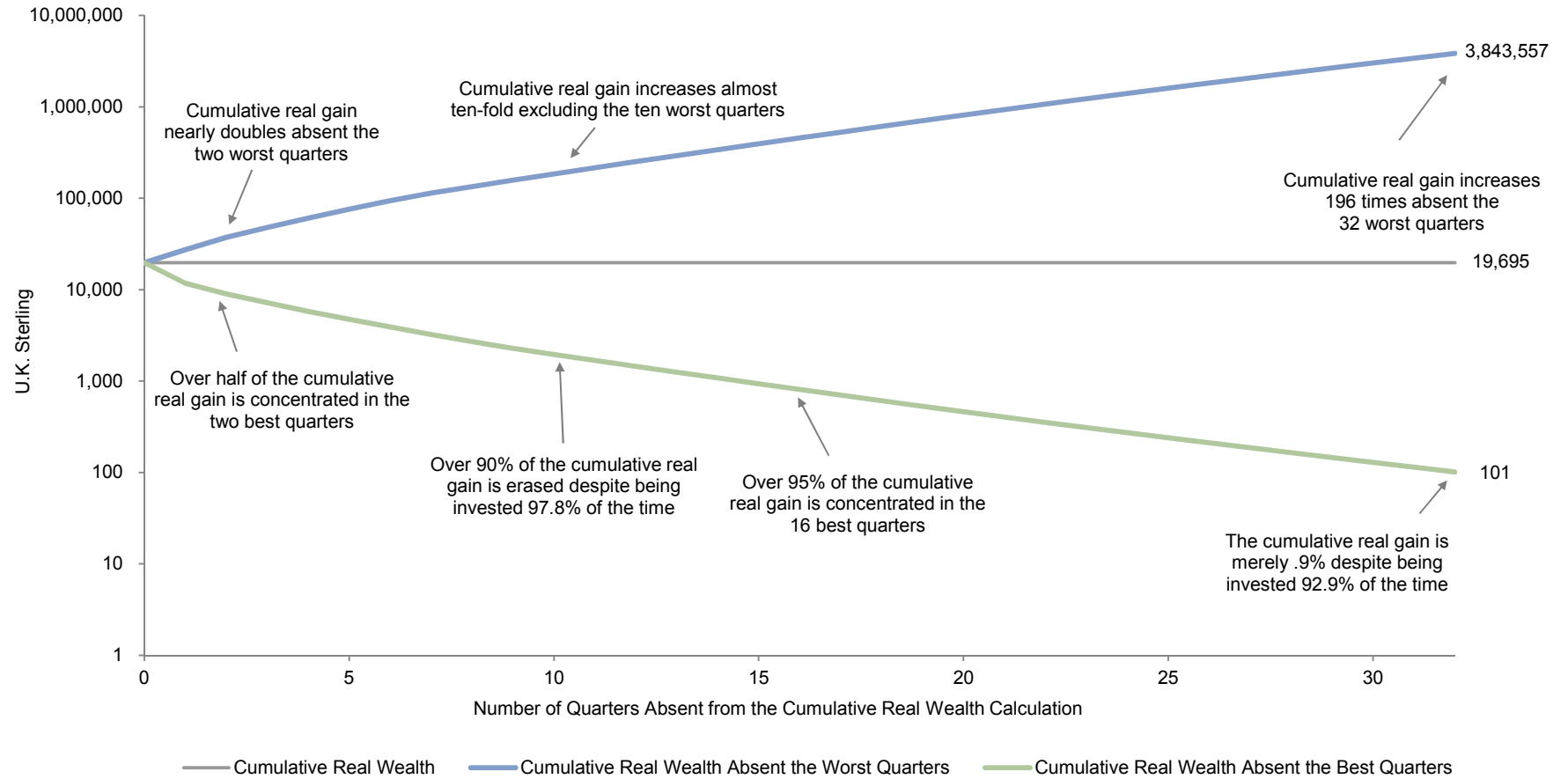
Note: Bull markets are characterized by annual gilt market returns greater than those available from money market instruments; bear markets are the converse.

Exhibit 38
Cumulative Real Wealth Absent the Best and Worst Months for Equities
 1900–2012



Notes: Equity Index rebased to 100 as of 1 January 1900. Cumulative real wealth is shown on a logarithmic scale.

Exhibit 39
Cumulative Real Wealth Absent the Best and Worst Quarters for Equities
 1900–2012



Notes: Index rebased to 100 as of 1 January 1900. Cumulative real wealth is shown on a logarithmic scale.

Exhibit 40
Retracement Ratios Following Bull Market Peaks

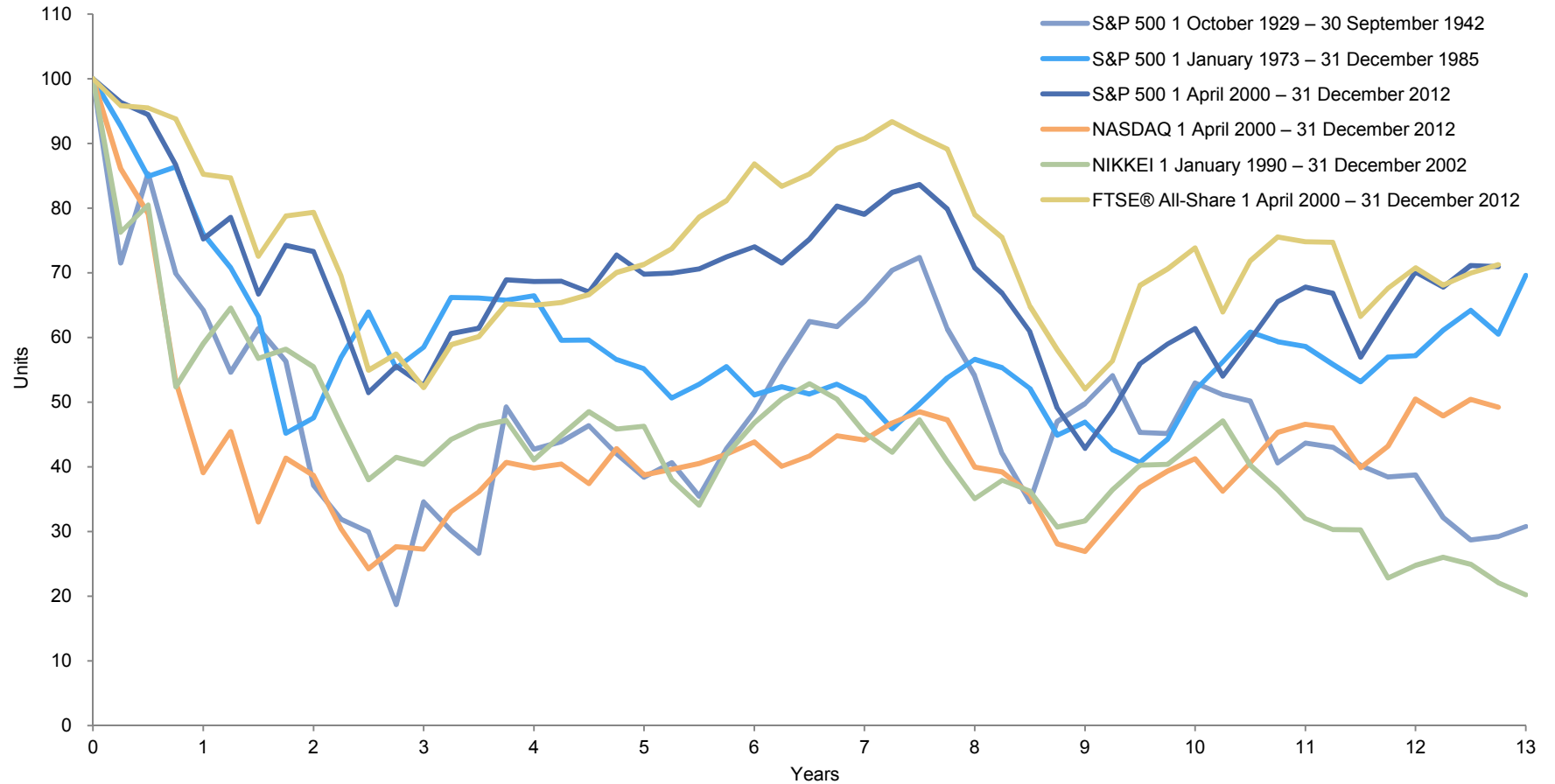
<u>Date of Trough</u>	<u>Date of Peak</u>	<u>Trough to Peak Percent Rise (%)</u>	<u>Number of Months</u>	<u>Date of Subsequent Trough</u>	<u>Peak to Subsq Trough Percent Decline (%)</u>	<u>Number of Months</u>	<u>Retracement Ratio (%)</u>
30-Nov-1887	28-Feb-1900	91.0	147.0	31-Oct-1921	-42.9	260.1	90.1
31-Oct-1921	30-Sep-1929	73.2	95.0	30-Jun-1932	-52.3	33.0	123.7
30-Jun-1932	31-Dec-1936	105.3	54.0	31-Jul-1940	-52.3	43.0	102.0
31-Jul-1940	30-Jun-1947	165.6	83.0	30-Jun-1949	-25.1	24.0	40.2
30-Jun-1949	31-May-1951	27.6	23.0	30-Jun-1952	-25.5	13.0	118.1
30-Jun-1952	31-Jul-1955	96.9	37.0	28-Feb-1958	-24.9	31.0	50.7
28-Feb-1958	30-Apr-1961	128.0	38.0	31-Jul-1962	-26.7	15.0	47.5
31-Jul-1962	31-Jan-1969	108.3	78.1	27-May-1970	-36.9	15.8	70.9
27-May-1970	01-May-1972	99.7	23.2	13-Dec-1974	-72.9	31.4	146.0
13-Dec-1974	06-Jun-1975	148.9	5.7	08-Aug-1975	-20.7	2.1	34.5
08-Aug-1975	30-Jan-1976	41.2	5.7	27-Oct-1976	-32.6	8.9	111.8
27-Oct-1976	04-May-1979	144.1	30.2	15-Nov-1979	-22.5	6.4	38.2
15-Nov-1979	17-Aug-1981	54.0	21.1	28-Sep-1981	-21.5	1.4	61.3
28-Sep-1981	16-Jul-1987	365.9	69.6	10-Nov-1987	-36.6	3.8	46.6
10-Nov-1987	03-Jan-1990	56.3	25.8	24-Sep-1990	-21.6	8.7	59.9
24-Sep-1990	20-Jul-1998	199.9	93.8	05-Oct-1998	-24.9	2.5	37.4
05-Oct-1998	04-Sep-2000	50.8	23.0	21-Sep-2001	-34.8	12.6	103.4
21-Sep-2001	06-Dec-2001	22.0	2.5	12-Mar-2003	-38.6	15.1	214.3
12-Mar-2003	15-Jun-2007	118.3	51.1	03-Mar-2009	-48.8	20.6	90.0
	Average	110.4	47.7		-34.8	28.9	83.5
	Median	99.7	37.0		-32.6	15.0	70.9
03-Mar-2009	03-May-2011*	77.4	26.0				

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

Notes: The retracement ratio is the cumulative amount lost, peak to trough, divided by the amount previously gained, trough to peak. It represents the percentage of the prior market rise eliminated by the subsequent period decline. A bull market is defined as a continuous period without a price decline of approximately 20% or more. In the event that a bear market includes several steep 20%+ falls and equally powerful short counter-rallies, we have taken the total peak-to-trough decline, rather than the individual sell-offs. Periods calculated using monthly data from Global Financial Data, Inc. from November 1887 through December 1968 and with daily data from Thomson Reuters Datastream beginning 1 January 1969.

* As of 31 December 2012, the current peak occurred on 3 May 2011. This does not imply that the market has reached a final peak.

Exhibit 41
Cumulative Wealth for Various Bear Markets for the S&P 500, Nasdaq, Nikkei, and FTSE® All-Share Indices
 In Real Terms • Base Value = 100



Notes: Cumulative wealth is based on quarterly price levels. All units are in local currency unless otherwise noted.

Exhibit 42
Equity Real Price Level Deviation from Trend
 1900–2012

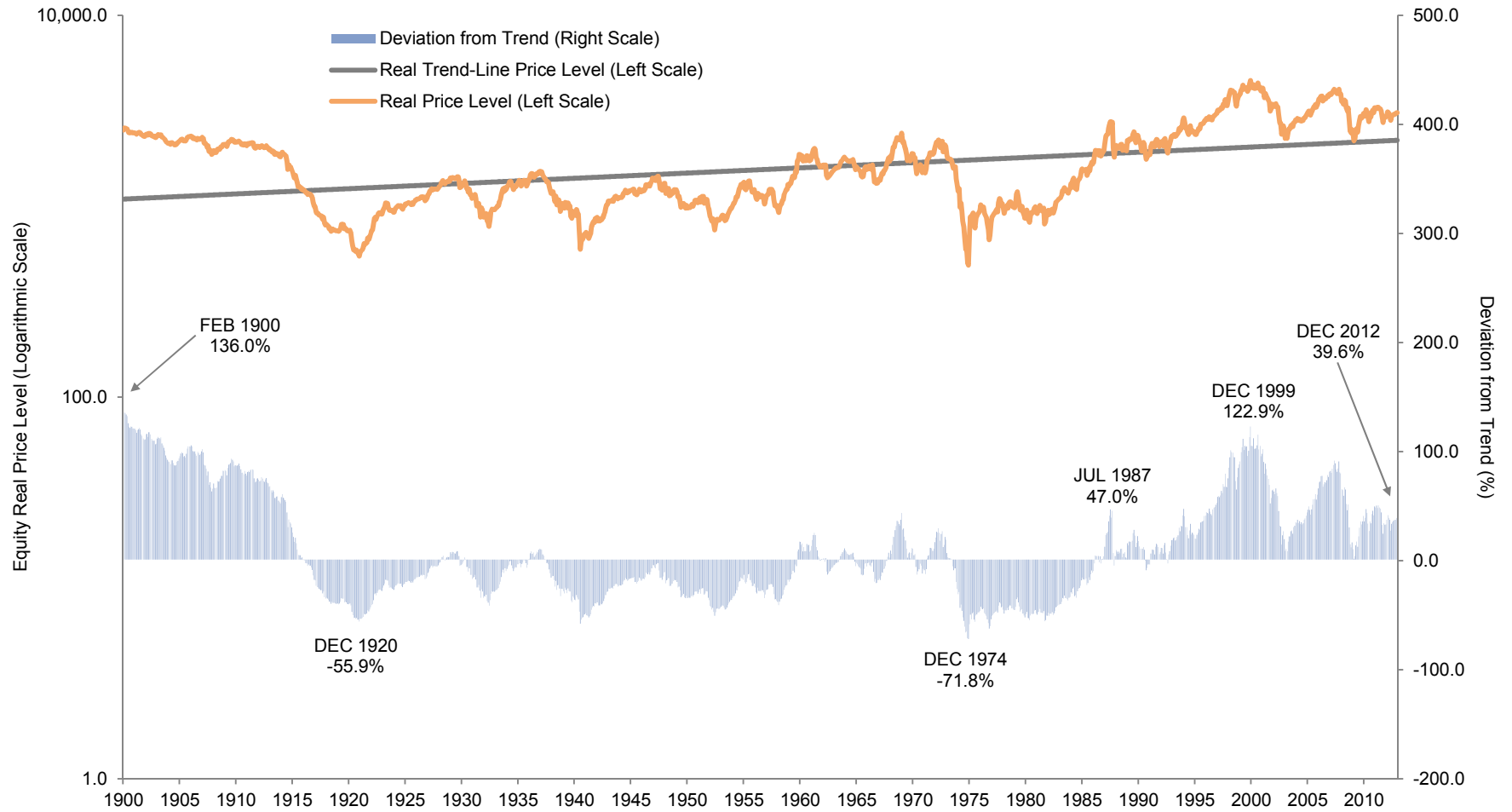


Exhibit 43
Dividend Income as a Percentage of Equity Total Return
 1900–2012

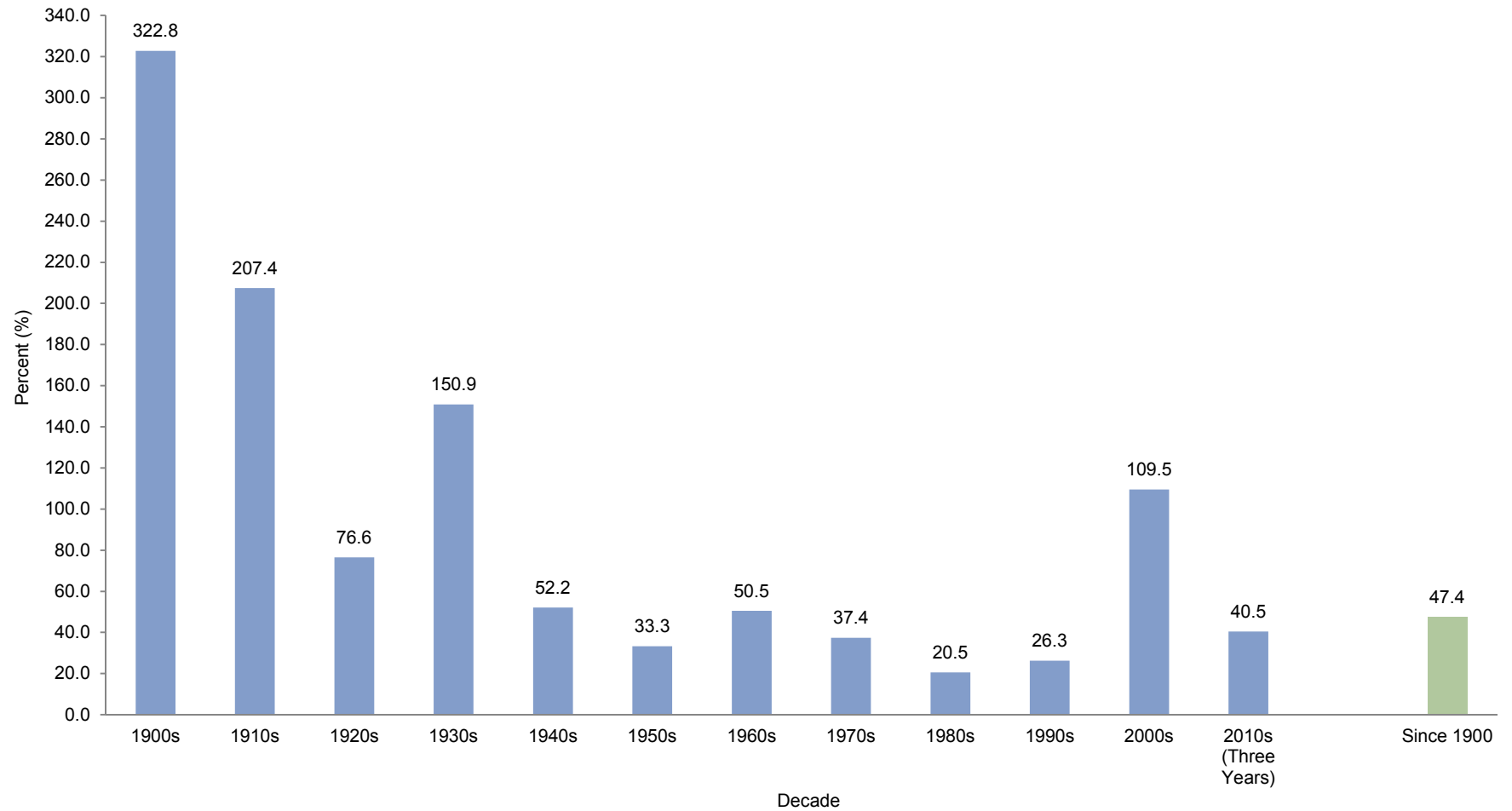
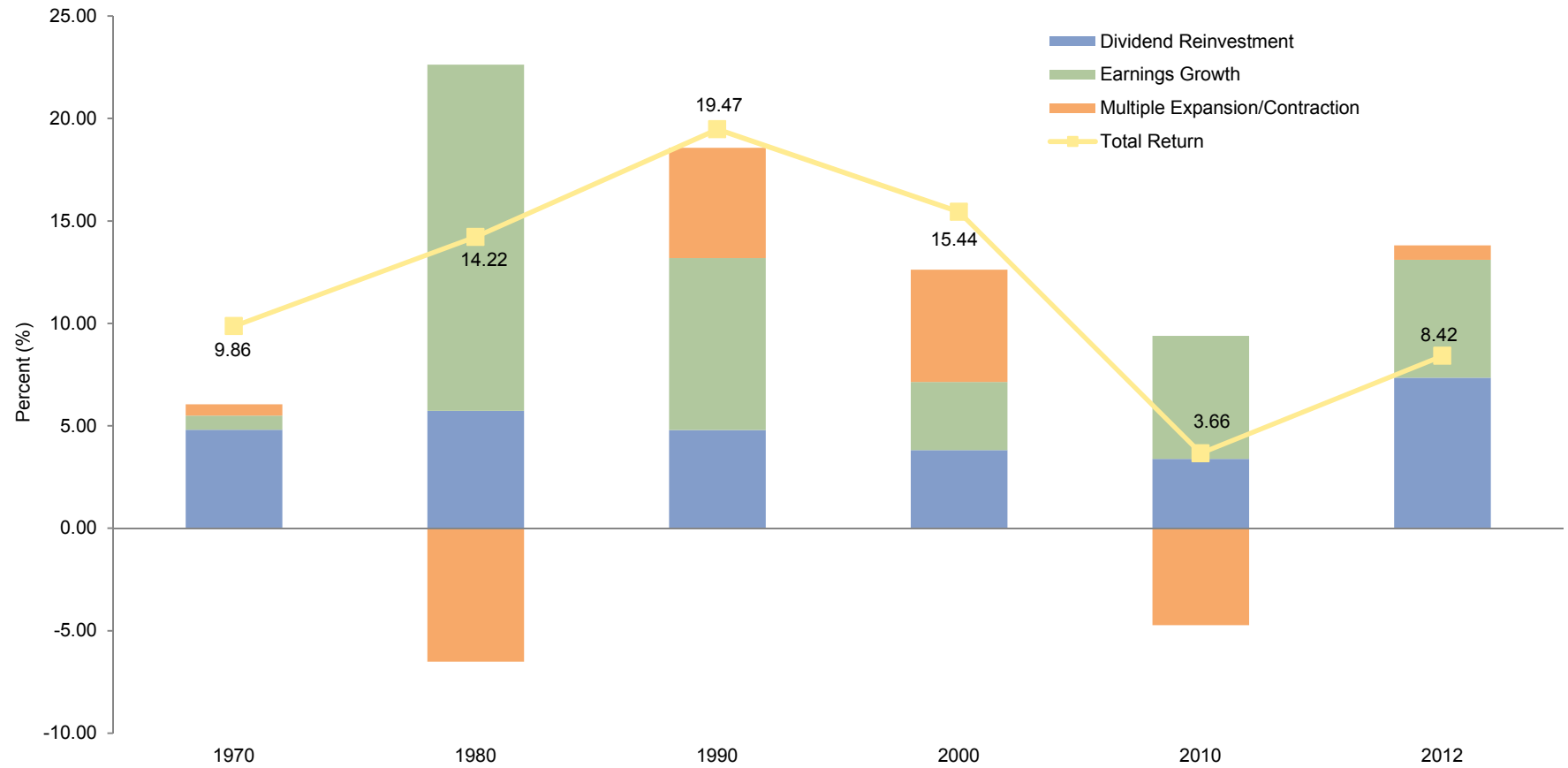


Exhibit 44
Breakdown of Total Return Over Time
 1963–2012



Notes: Data for 1970 represents eight years ending in 1970. Data for 2012 represents two years ending in 2012. Figures will not sum exactly to total return calculation due to the effect of combining cross terms.

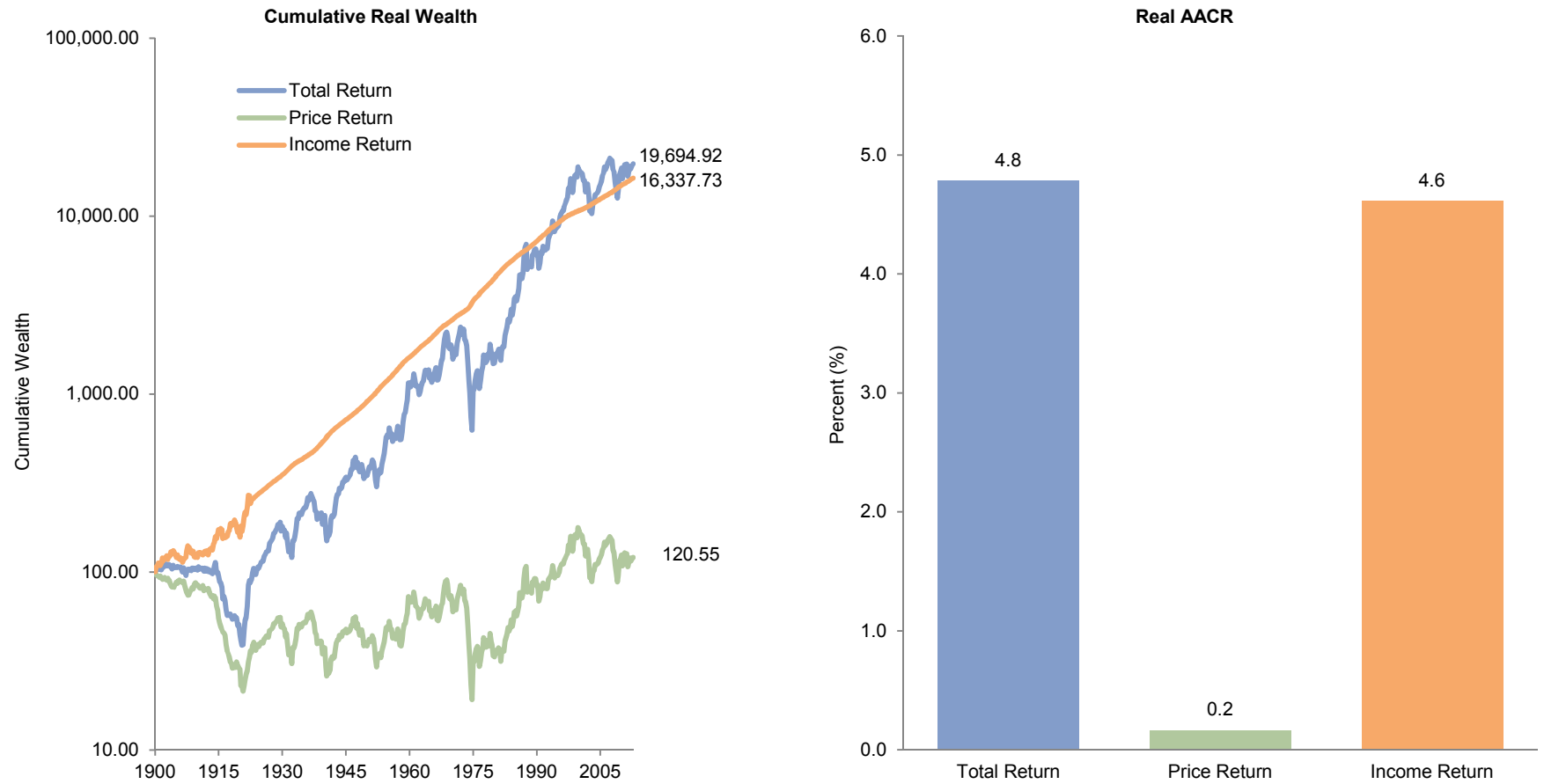
Exhibit 45
Equity and Gilt Annual Yields
 1962–2012 • Percent

<u>Year</u>	<u>Equities (Dividend)</u>	<u>Gilts</u>	<u>Year</u>	<u>Equities (Dividend)</u>	<u>Gilts</u>
1962	4.7	5.3	2002	3.6	4.5
1963	4.2	5.5	2003	3.1	4.8
1964	5.3	6.2	2004	3.1	4.5
1965	5.4	6.5	2005	3.0	4.1
1966	6.0	6.9	2006	2.9	4.4
1967	4.5	7.3	2007	3.0	4.5
1968	3.2	8.1	2008	4.5	4.0
1969	3.9	9.2	2009	3.2	4.5
1970	4.6	9.6	2010	2.9	4.1
1971	3.4	8.1	2011	3.5	2.7
1972	3.4	9.6	2012	3.6	2.6
1973	5.1	12.5			
1974	12.2	17.2			
1975	5.6	14.8	Mean	4.3	8.2
1976	6.4	15.5	Median	4.2	8.1
1977	5.3	11.2	High	12.2	17.2
1978	5.7	13.2	Low	2.1	2.6
1979	7.1	14.7			
1980	6.3	13.9			
1981	5.8	15.8			
1982	5.0	11.0			
1983	4.5	10.1			
1984	4.3	10.3			
1985	4.3	9.9			
1986	4.0	10.0			
1987	4.2	9.4			
1988	4.7	9.3			
1989	4.2	9.6			
1990	5.3	10.4			
1991	4.9	9.5			
1992	4.3	8.7			
1993	3.5	6.4			
1994	4.0	8.5			
1995	3.8	7.7			
1996	3.8	7.6			
1997	3.2	6.3			
1998	2.5	4.5			
1999	2.1	4.8			
2000	2.2	4.5			
2001	2.6	4.9			

Exhibit 46
Average Equity and Gilt Annual Yields for 20-Year Periods
1962–2012 • Percent (%)

<u>Period</u>	<u>Equities (Dividend)</u>	<u>Gilts</u>
1962–81	5.4	10.5
1963–82	5.4	10.8
1964–83	5.4	11.1
1965–84	5.4	11.3
1966–85	5.3	11.4
1967–86	5.2	11.6
1968–87	5.2	11.7
1969–88	5.3	11.8
1970–89	5.3	11.8
1971–90	5.3	11.8
1972–91	5.4	11.9
1973–92	5.5	11.8
1974–93	5.4	11.5
1975–94	5.0	11.1
1976–95	4.9	10.8
1977–96	4.7	10.4
1978–97	4.6	10.1
1979–98	4.5	9.7
1980–99	4.2	9.2
1981–00	4.0	8.7
1982–01	3.9	8.2
1983–02	3.8	7.8
1984–03	3.7	7.6
1985–04	3.7	7.3
1986–05	3.6	7.0
1987–06	3.5	6.7
1988–07	3.5	6.5
1989–08	3.5	6.2
1990–09	3.4	6.0
1991–10	3.3	5.6
1992–11	3.2	5.3
1993–12	3.2	5.0

Exhibit 47
Cumulative Real Total, Price, and Income Returns and Real Average Annual Compound Returns of Equities
 1900–2012



Note: Cumulative total, price, and income returns are shown on a logarithmic scale.

Exhibit 48
The Effect of Compounding on Rolling Real Returns
 1900–2012

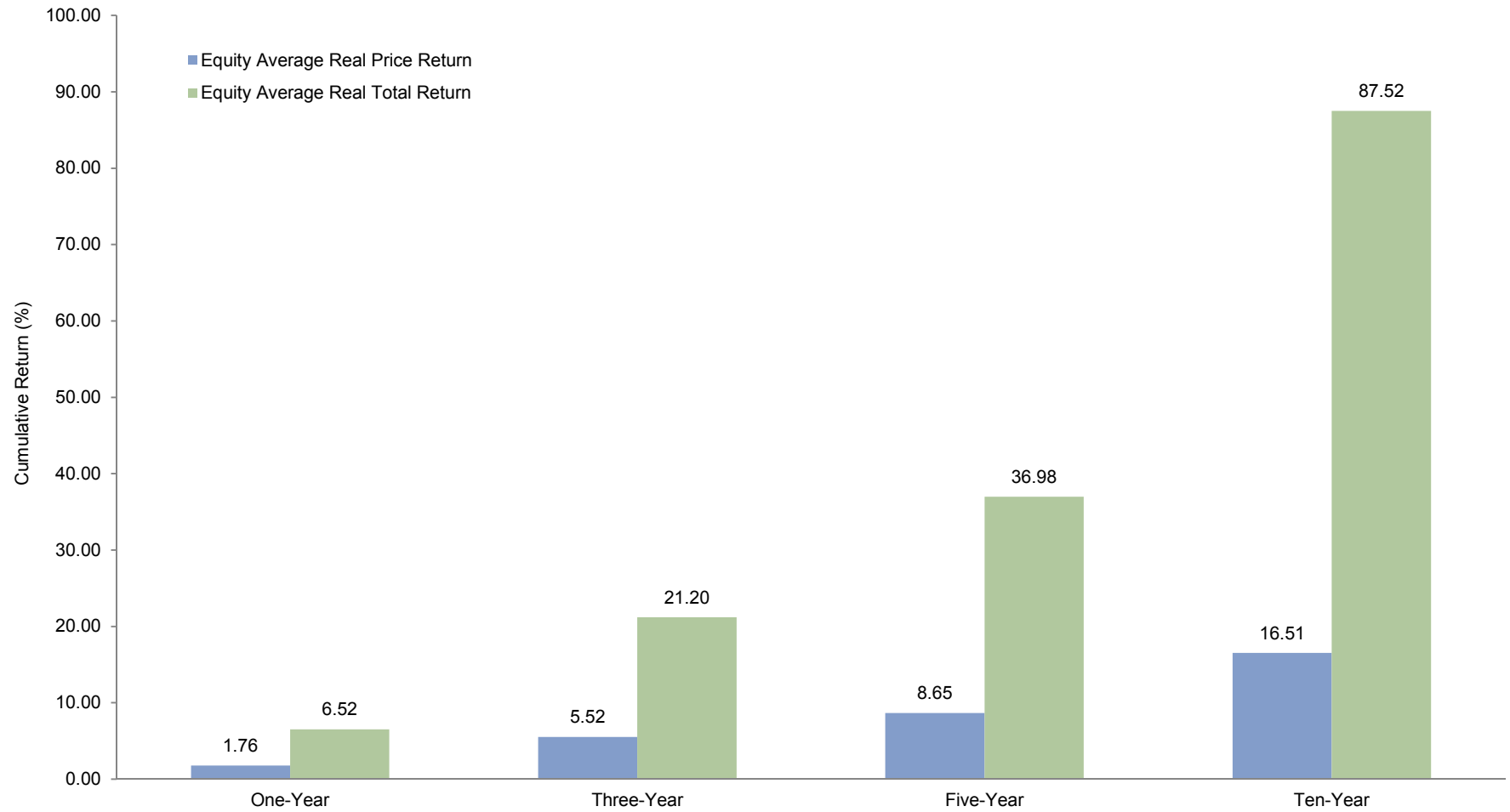
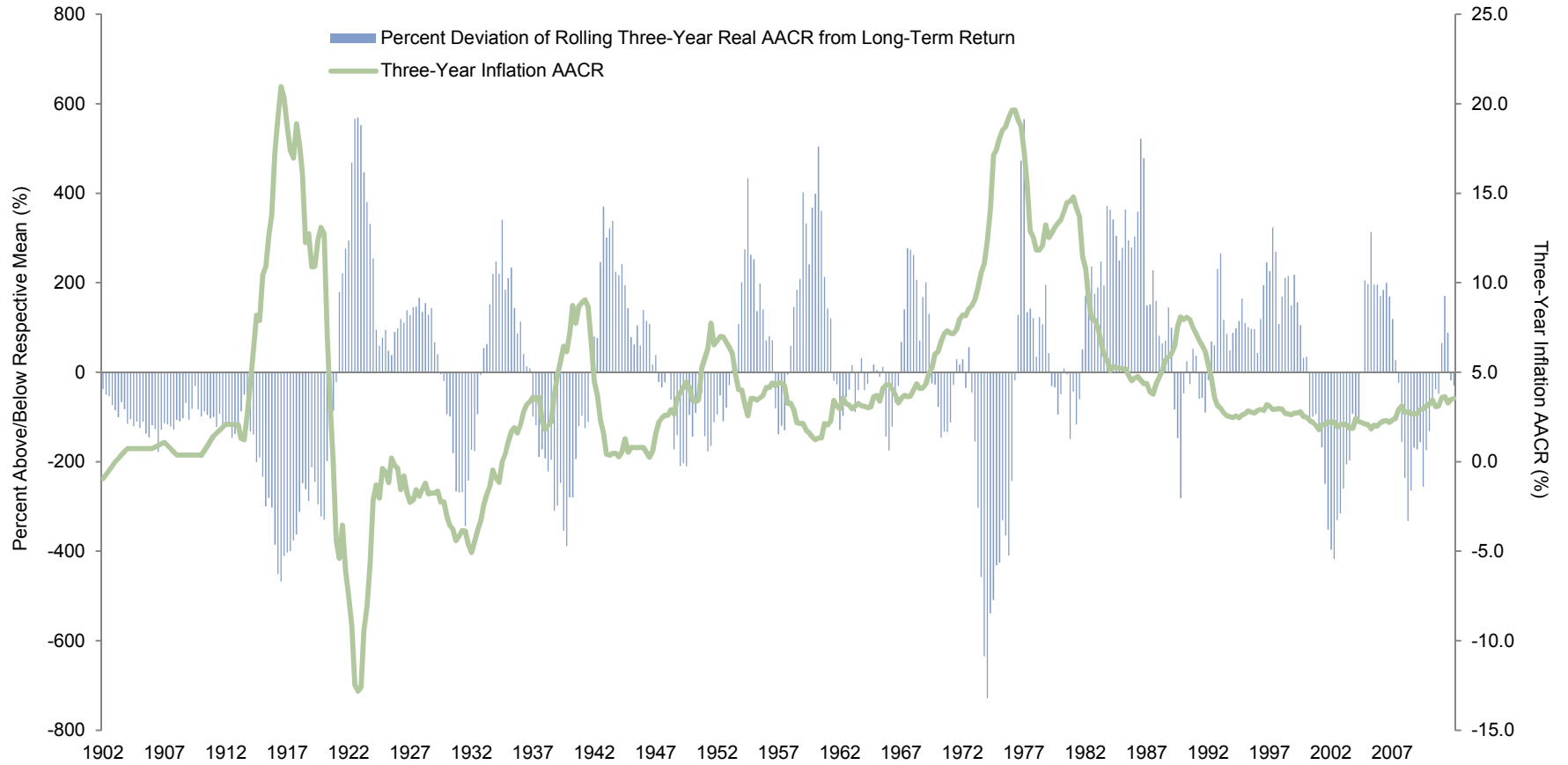


Exhibit 49
U.K. Business Cycle Expansions and Contractions
 September 1952 – December 2012

<u>Periods of Expansion</u>	<u>Quarters</u>	<u>Nominal Average Annual Return (%)</u>			
		<u>Equities</u>	<u>Bonds</u>	<u>Cash</u>	<u>Inflation</u>
September 1952 – September 1974	88	8.5	2.0	5.5	4.8
September 1975 – June 1979	15	24.3	19.1	10.0	12.7
June 1981 – June 1990	36	21.6	13.4	11.6	6.0
March 1992 – June 2008	65	9.1	8.7	5.6	2.5
December 2009 – September 2010	3	9.0	18.1	0.5	2.7
Mean	41	15.9	12.3	6.6	5.7
Median	36	9.1	13.4	5.6	4.8
 <u>Periods of Contraction</u>					
September 1974 – September 1975	4	105.1	23.2	10.6	26.5
June 1979 – June 1981	8	18.0	9.5	15.0	16.1
June 1990 – March 1992	7	6.9	16.2	12.3	4.4
June 2008 – December 2009	6	1.7	10.0	1.6	2.2
Mean	6	32.9	14.7	9.9	12.3
Median	7	12.5	13.1	11.5	10.2

Source: Economic Cycle Research Institute.

Exhibit 50
Level and Direction of Inflation Versus Rolling Three-Year Equity Real Returns
 1900–2012 • Shown as a Percentage of the Long-Term Average of 5.4%



Notes: Graph shows percent above/below mean for returns. Line shows trailing three-year average annual compound returns (AACRs) for inflation. Bars are based on quarterly data and show rolling three-year real AACRs as a percentage of the long-term average three-year real return of 5.4% since 1900.