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Credit Suisse Global Investment Returns Yearbook 2016

Introduction

16 December 2015 marked the reversal of the trend that had dominated financial markets for almost a decade: the Federal Reserve finally increased rates. And yet, although the rate hike was widely anticipated in magnitude and timing, markets, which had previously proven surprisingly resilient, saw a period of sharp declines and volatility in subsequent weeks. Given the fact that market participants have not dealt with rising rates in the USA and the UK for a considerable amount of time, the level of investor uncertainty is hardly surprising, and we believe that the wealth of long-term asset prices provided by the Credit Suisse Global Investment Returns Yearbook can be particularly helpful in this context. The 2016 Yearbook contains data going back to 1900 across 21 countries. The companion publication, the Credit Suisse Global Investment Returns Sourcebook 2016, extends the scale of this resource further with detailed tables, graphs, listings, sources and references.

In the first chapter of the Yearbook, Elroy Dimson, Paul Marsh and Mike Staunton from the London Business School analyze whether the market's fixation on interest rate hikes is historically warranted by their impact on equity and bond returns. From that perspective, the market reaction was what we should have expected, based on the evidence from interest rates in the USA for over 100 years and in the UK since 1930. While the announcement day impacts are typically small, particularly for well-signaled policy moves, rate rises are on average bad news for stocks and bonds.

In their second chapter, the authors compare the asset performance of trading strategies over interest-rate hiking and easing cycles. Across a broad set of asset classes – including equities, bonds, currencies, real estate, precious metals and collectibles – the findings point to substantial differences between returns during hiking and easing cycles. Nevertheless, the analysis also suggests that, tactically, no asset class is likely to offer contracyclical returns in relation to interest-rate changes. This reinforces the case for long-term diversification as long as the costs of diversifying are not disproportionate. As we continue to live in a low-return world, bond returns are likely to be much lower and there is no reason to believe that the equity risk premium is unusually elevated. Consequently, the real returns on bonds, equities and risk assets in general seem likely to be relatively low.

In the third chapter, Jonathan Wilmot revisits the similarities and differences between the three great crises of capitalism in the1890s, 1930s and since 2008–09. The history of recoveries from these major deflationary shocks reminds us that rapid monetary policy normalization cannot be taken for granted. It also suggests that real bond returns will be close to zero over the next decade, with real equity returns around their longer run average of 4%–6% per annum. This world of low market returns will likely drive major changes in the fund management industry, as previously successful investment approaches struggle to meet investor needs.

The Yearbook is one of a series of publications from the Credit Suisse Research Institute that link the internal resources of our extensive research teams with world class external research.

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To contact the authors or to order printed copies of the Yearbook or of the accompanying Sourcebook, see page 68.

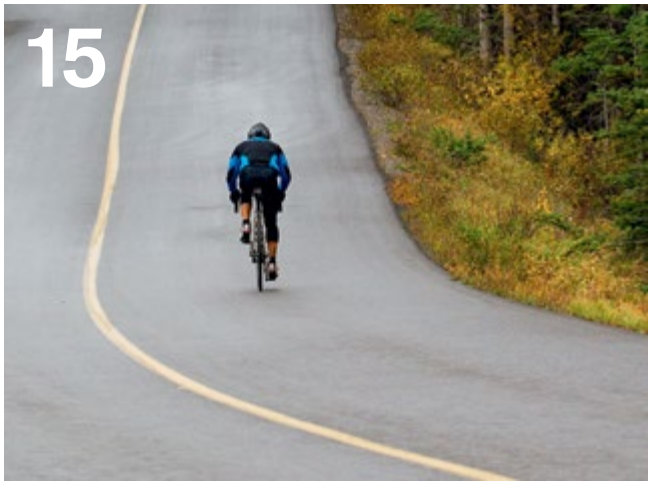

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PHOTO: PHOTO_CONCEPTS / ISTOCKPHOTO.COM

Does hiking damage your wealth?

This chapter analyzes whether the market's preoccupation with interest rate rises by central banks is justified by the impact they have on financial market prices and returns. We use over a century of daily returns for the USA together with 85 years of UK data to examine the immediate effect of rate increases (and decreases) on stock and bond markets. We also look globally at the impact of interest rate changes on equity and bond returns using annual data for 21 Yearbook countries spanning the period from 1900 to 2015.

Elroy Dimson, Paul Marsh and Mike Staunton, London Business School

Until late last year, no American or British investment professionals in their 20s (and only a few in their early 30s) had experienced a rise in their domestic interest rate during their working lives. This changed in December 2015 when the Federal Reserve raised rates for the first time in almost a decade, thus ending the longest run of unchanged rates (which were also the lowest on record) since the Fed was established in 1913. Meanwhile, in the UK, the Bank of England's official bank rate has remained at 0.5% since early 2009, also the lowest on record. The last UK rate rise was in October 2007; the next could happen sometime in 2016.

In 2015, the news was dominated by speculation about when and whether the Fed would raise rates. Commentators attributed a high proportion of the moves in asset prices, globally as well as in the USA, to changing perceptions about Fed policy and timing. Yet when rates were finally increased by 0.25% on 16 December—a move that had been widely anticipated in timing and magnitude—the market's initial reaction was a strong rally. However, by the next day, that had come to an abrupt halt. US Treasury yields retreated across the curve, and the dollar rose on a trade-weighted basis by 1.4%.

Were markets wrong to be so obsessed by the rate change? Was the market's volatile response to be expected, when the Fed had so carefully managed expectations? In this chapter, we analyze official interest rate changes in both the USA and the UK over a long period to assess the typical impact of rate changes on equities, bonds, and currencies. We draw on previous research to distinguish between the impact of expected and unexpected rate changes. Finally, we look globally at the impact of interest rate changes on equity and bond returns using 116 years of data for 21 Yearbook countries.

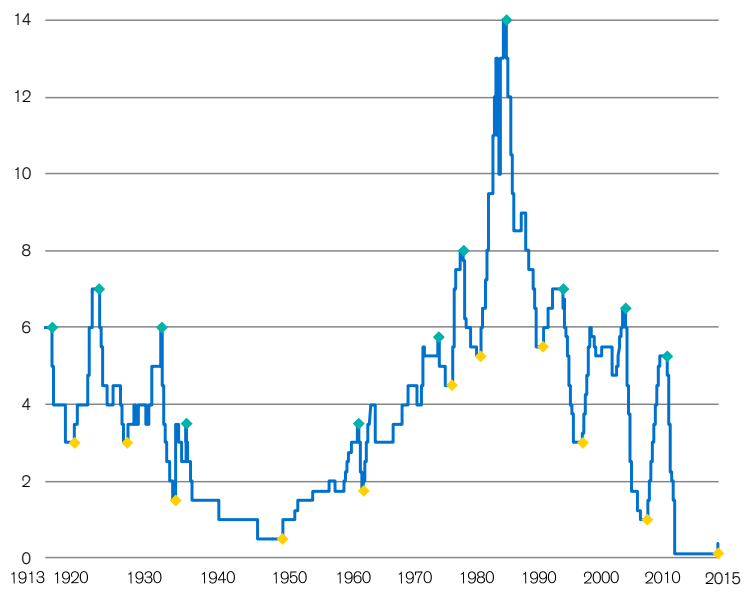
Long-run interest rate histories

In the United States, the Federal Reserve System oversees the interest rate at which banks and other depositary institutions lend money to each other. The Federal Open Market Committee (FOMC) sets a target rate in meetings that normally take place on eight occasions per year. In the United Kingdom, the Monetary Policy Committee (the MPC), which meets on twelve occasions a year, determines the official interest rate at which the central bank lends to banks.

The Federal funds target rate and the Bank of England official bank rate are the key interest rates used by the American and British governments to enact monetary policy. These official rates act as the benchmark rates for all other short-term interest rates in the economy.

Figure 1

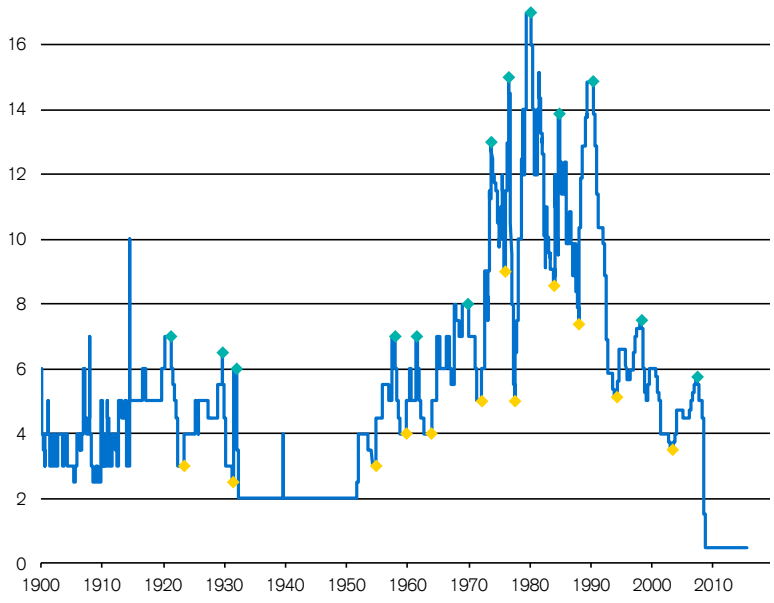
US: Federal Reserve official interest rates (%), 1913–2015



Source: Elroy Dimson, Paul Marsh and Mike Staunton, Federal Reserve, Global Financial Data

Figure 2

UK: Bank of England official interest rates (%), 1900–2015



Source: Elroy Dimson, Paul Marsh and Mike Staunton, Bank of England

Figure 1 shows the path of official US interest rates since the Federal Reserve System was created at the end of 1913. It shows The Fed's target rate since 1990 and, before that, the Federal Reserve discount rate. Figure 2 shows the corresponding data for the UK's official bank rate (and its predecessors) since 1900.

Official interest rates have varied greatly over time, ranging from near zero in both countries to a high of 14% in the USA and 17% in the UK. The broad pattern over time is similar since the two countries have experienced many of the same crises, as well as parallel bouts of inflation. Rates were at their lowest during the Great Depression, World War II and following the recent financial crisis. Rates peaked during the high inflation of the late 1970s and early 1980s, with the UK more affected.

From these charts, we can readily identify periods when interest rates rose, known as "hiking cycles" or "tightening cycles." Similarly, there are periods of falling rates – "easing cycles" or "loosening cycles." The small yellow diamonds show the start of hiking cycles, while the small turquoise diamonds show the start of easing cycles. Sometimes, there is a plateau following a hiking cycle, or a floor following an easing cycle, but with only a few exceptions (the recent period from 2008–15 being one of them), these interludes are brief. More typically, hiking cycles have been rapidly followed by easing cycles and vice versa.

Hiking or easing cycles can be quite jagged. The large spike in Figure 1 shows that US rates rose from 5.25% in 1977 to 14% in 1981. However, rates fell from 13% to 10% during the first half of 1980 before climbing again to their 14% peak. With hindsight, this looks like a single hiking cycle, but it could also be viewed as a tightening cycle, then an easing cycle, followed by a further tightening cycle. We return to this issue in the following chapter when we examine returns over interest rate cycles.

How should markets react to rate hikes?

Interest rate changes are a major instrument of monetary policy and a key tool in controlling inflation. The direct channel of transmission is via bank borrowing costs. Banks pass on rate rises to customers through higher interest rates on credit cards, variable rate mortgages and other loans, and corporate borrowing. This lowers the amount that consumers can spend, restricts the money supply, and helps dampen inflationary pressures.

Financial markets are another important transmission mechanism. Markets rapidly incorporate news, so official rate changes have their first and most immediate impact on stock and bond prices. This alters the value of investors' portfolios, generating a "wealth effect," with lower wealth asso-

ciated with less future spending and vice versa. Bond price changes reflect changes in the costs of longer-term loans for individuals and corporations. This also impacts real economic activity.

The conventional wisdom is that rate hikes lead to falls in both bond and stock prices. Central banks in market economies set only the short-term policy rate. They can seek to influence, but do not control, longer-term rates. However increases in the policy rate often signal (or are accompanied by guidance on) the expected path of future short-term rates. A rise in the policy rate thus has knock-on effects on longer-term rates. An increase in longer-term rates will trigger a fall in the prices of government bonds, corporate bonds, and fixed rate mortgages and loans.

In principle, stock prices are the discounted value of companies' expected future cash flows. If a rate rise reduces consumer spending, this will lower corporate revenues, profits and cash flows, and hence stock prices. But an increase in the denominator of the discounting formula, i.e. the discount rate, will also lower stock prices. A higher short-term interest rate will increase the discount rate on near-term cash flows, but any knock-on effect on longer-term interest rates will have a much larger effect by lowering the present value of medium- and longer-term cash flows. The discount rate might also rise because of an increase in the risk premium.

Numerous studies confirm the conventional wisdom. US evidence that rate rises on average lead to stock price falls (and vice versa) is provided by Waud (1970), Jensen and Johnson (1995), Bernanke and Kuttner (2005) and others. Bredin, Hyde, Niztsche and O'Reilly (2007) provide UK evidence, while Bohl, Siklos and Sondermann (2008) document the impact of European Central Bank rate changes on Eurozone stocks. For the USA, Kuttner (2001) shows that rate changes lead to higher yields (and thus lower prices) for instruments ranging from 3-month treasury bills up to 30-year bonds.

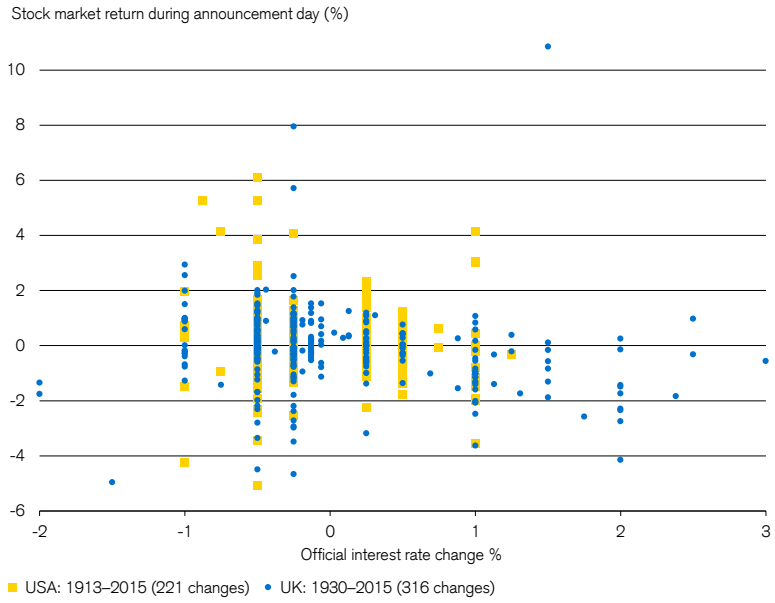
Market participants, however, are sophisticated: they do not simply view all rate rises as bad news. They also look at any implications or signals that a rate change conveys. For example, central banks tend to raise rates only when they believe the economy is strong enough. Rate rises can thus be viewed as a positive signal about the economy. Conversely, a rate cut might be seen as bad news, especially in a crisis. Similarly, there is much evidence that high inflation is bad for stocks and bonds (see Dimson, Marsh and Staunton, 2012). So when inflation is high, rate rises may be welcomed as evidence of a resolve to drive inflation down.

More generally, markets will react only to the surprise element of a rate change. Central banks go to great lengths to provide guidance on their criteria, thinking and intentions. The minutes of their meetings are carefully scrutinized for clues and textual subtleties (see Rosa, 2011). Furthermore, their decisions are data dependent, and there is a constant flow of relevant economic data on employment, GDP and so on that helps guide markets on the central bank's likely next move.

Rate changes, or indeed, their failure to happen at a particular meeting, are thus seldom likely to be major surprises. Thus when we estimate the impact of rate-change announcements, the signal-to-noise ratio will be low. Many other factors impact market prices, and there is also uncertainty about how to interpret signals about timing and importance when these vary over time. This explains why Bernanke and Kuttner (2005) found that, even on days when rates changed or when there was a no-change FOMC meeting, only 17% of the variance in equity prices was associated with surprises about monetary policy.

Figure 3

US and UK rate changes and stock market returns (%), 1913–2015



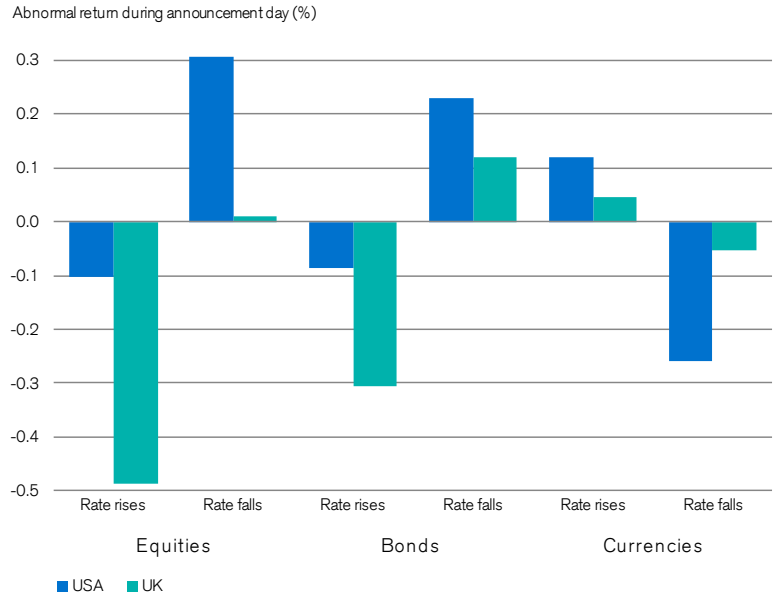
Source: Elroy Dimson, Paul Marsh and Mike Staunton; Dimson-Marsh-Staunton (DMS) database; Bank of England, Federal Reserve, Global Financial Data, Thomson-Reuters Datastream.

The distribution of rate changes

The scatter diagram in Figure 3 shows the relationship between both US and UK rate changes and stock market returns on the corresponding announcement days. The rate changes plotted are those shown in Figures 1 and 2. Rate changes mostly occur in "round" amounts, so there is clustering around ±¼%, ±½% and ±1%. Figure 3 displays 221 US rate changes and 316 UK changes, an average of 2.1 changes per year for the US and 3.7 for the UK. In the USA, rate

Figure 4

Market reaction to rate changes on the announcement day



Source: Elroy Dimson, Paul Marsh and Mike Staunton; Dimson-Marsh-Staunton (DMS) database; Bank of England, Federal Reserve, Global Financial Data, Thomson-Reuters Datastream.

changes ranged from −1% to +1¼%; in the UK, the dispersion was wider, from −2% to +3%.

At least by eye, there appears to be little relationship between interest rate changes and stock market returns. For both countries, however, there is a statistically significant relationship. The coefficients on a regression of stock returns on rate changes are −0.43 (t-value −2.3) for the USA and −0.36 (t-value −3.4) for the UK. This implies that stock prices tend to fall by 0.43% in the USA and 0.36% in the UK for every 1% rise in the official interest rate. The adjusted R-squareds are 0.02 and 0.03, respectively.

The effects, while quite modest, are in the predicted direction. But, as anticipated, the noise-to-signal ratio is high. We are looking here, however, simply at the impact of the raw rate change, with no attempt to extract the surprise element. Furthermore, Figure 3 shows just the announcement-date impact. It is also of interest to investigate what happens not only on the announcement day, but also before and afterwards.

Event study of interest rate changes

To look at the market's behavior around the time of the announcement, we carry out an event study. We focus on three windows. First, we examine investment returns over the announcement day (from the market close prior to announcement to the market close following the announcement). Next, we estimate the performance of each asset class from 20 trading days before the announcement to the pre-announcement market close. Last, we measure performance from the post-announcement market close to 20 days later.

We average returns in "event time" across all rate-change announcements. We include only dates on which rates changed, ignoring all potential announcement days on which there was no rate change. The latter can, of course, also impact market prices, depending on prior expectations.

We analyze equities, bonds and currency. Our analysis obviously needs daily returns data. Daily equity data is available for the full period covered by Figures 1–3 from the Dimson-Marsh-Staunton (DMS) US and UK equity series. For bonds, the DMS series has daily data starting in 1962 for the USA and 1967 for the UK, so these are the starting dates for the bond event study. For currencies, we look only at the post-Bretton Woods period. For the USA, we use the Federal Reserve trade-weighted index of the dollar against other currencies starting in 1973. For the UK, we use the sterling-dollar exchange rate from 1972.

Our cumulative event time returns are converted to abnormal returns using a simple autoregressive model to de-mean them and adjust for the very small degree of serial correlation. This ensures that the returns we observe over the entire 41-day event window (from 20 days before to 20 days after the announcement day) are not impacted by the tendency of stocks and bonds to rise over time. By construction, the mean daily abnormal return outside of the event window is zero.

The impact of converting to abnormal returns is modest when it comes to the full 41 days, and over a 1-day window it makes a particularly small difference. However, for consistency, performance measures employ the same procedure even when we are estimating returns over the announcement day.

Market reactions around rate changes

Figure 4 reports the 1-day performance of the three asset categories over the course of the announcement day. In this and the following charts, we present results for both the USA and the UK, looking separately at the impact of rate rises and rate falls.

The first four bars of this chart report announcement-day returns on the equity markets. On rate rises, equities fell by an average of 10 basis points (bp) in the USA and by 49 bp in the UK. On rate falls, equities rose by 31 bp in the USA and by 1 bp in the UK.

The middle four bars report performance in the bond markets. On the day in which a rate rise was announced, bonds fell by an average 8 bp in the USA and by 31 bp in the UK. On announcement of rate falls, bonds rose by 23 bp in the USA and by 12 bp in the UK.

The last four bars report the reaction of the currency markets on the day of the announcement. On interest rate rises, the home currency rose by 12 bp (US dollars) or 5 bp (UK pounds). On interest rate falls, the home currency fell by 26 bp (US dollars) or 5 bp (UK pounds). The announcement-day returns were as one would predict from a change in the cost of funds. For each of the three asset categories, given the interest rate announcement, market behavior was similar in direction in the USA and the UK.

A rate change could be triggered by pre-announcement market conditions, so the behavior of the market over the preceding 20-day period depends on a variety of factors. It seems unlikely that declining equity markets would trigger a rate hike (as we see mainly in the UK), so it is more likely that equity and bond markets anticipated the policy tightening – e.g. through central bank communication or some data events – which caused the losses in the run-up to tightening. In an efficient market, we would expect the implications of the rate change to be fully impounded in asset prices by the end of the announcement day. This would imply cumulative abnormal returns that were close to zero (i.e. flat-lining) in the subsequent 20-day period. We turn next to examining the pre- and post-announcement performance of equities and bonds.

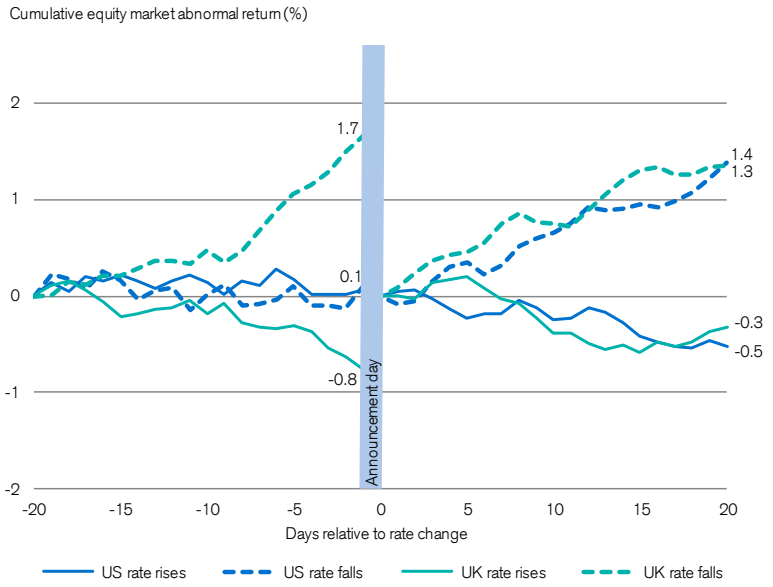
Pre- and post-announcement equity returns

The next two graphs (Figures 5 and 6) display the cumulative abnormal return on equities and on bonds. The left half of each chart shows performance in event time from 20 days before the rate change up to the market close immediately before the announcement. The right half of each chart shows performance in event time from the market close after the announcement till 20 days after the announcement. The solid lines show asset performance before and after rate rises, while the dashed lines relate to rate falls. As before, blue denotes the USA and turquoise denotes the UK.

The blue lines on the left of Figure 5 show that, in the USA, equities barely moved over the 20 days before rate changes. The turquoise lines show greater pre-announcement divergences for UK equities. For rate rises, equities fell by 0.8% in the 20 days before the announcement, while for rate falls they rose by 1.7%. Perhaps surprisingly, in the UK (but not in the USA), rate rises were on average announced after a period of stock market weakness, while falls were announced after a period of stock market strength. The focus of investors is likely to be on what has tended to happen after a rate change is announced. On the right side of Figure 5, we see that rate rises have been followed in the next 20 days by stock market underperformance averaging

Figure 5

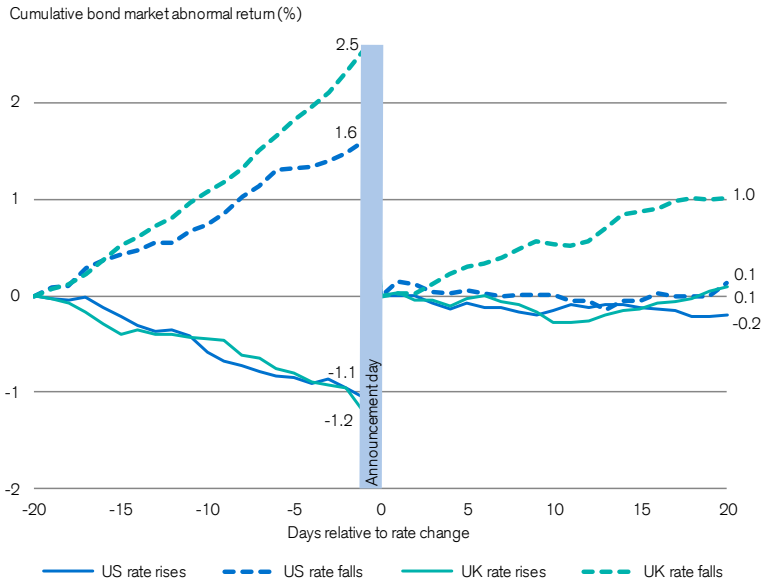
Equity market performance before and after rate changes



Source: Elroy Dimson, Paul Marsh and Mike Staunton; Dimson-Marsh-Staunton (DMS) database; Bank of England, Federal Reserve, Global Financial Data, Thomson-Reuters Datastream.

Figure 6

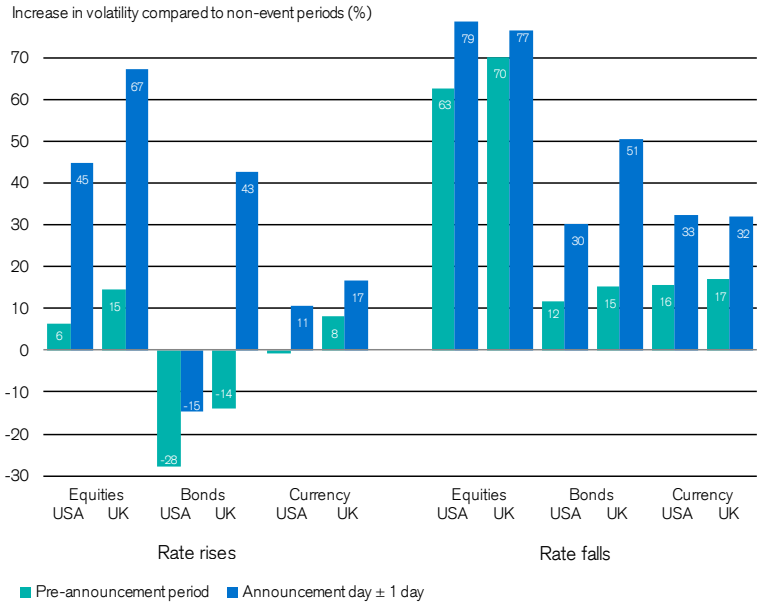
Bond market performance before and after rate changes



Source: Elroy Dimson, Paul Marsh and Mike Staunton; Dimson-Marsh-Staunton (DMS) database; Bank of England, Federal Reserve, Global Financial Data, Thomson-Reuters Datastream.

Figure 7

Market volatility before and around the time of rate changes



Source: Elroy Dimson, Paul Marsh and Mike Staunton; Dimson-Marsh-Staunton (DMS) database; Bank of England, Federal Reserve, Global Financial Data, Thomson-Reuters Datastream.

–0.4%. Rate falls have been followed in the next 20 days by outperformance averaging 1.3%. Adding in the announcement-day returns in the previous chart, stock market performance from the pre-announcement market close to 20 days after was as follows: for a rate rise –0.6% (USA) and –0.8% (UK), and for a rate fall 1.7% (USA) and 1.4% (UK). Interest rate rises proved to be somewhat painful for equity investors, whereas rate cuts were beneficial.

Bond and currency returns

The lines on the left of Figure 6 show that, in both the USA and the UK, bonds moved more substantially than equities over the 20 days before rate changes. The solid lines show that for rate rises, bonds fell by an average –1.1%, while for rate falls, the dashed lines show that bonds rose by an average 2.0% in the 20 days before the announcement. Either rate changes were a response to recent changes in bond yields, or bond markets were anticipating the interest rate change that was going to be announced.

Turning to what happened post-announcement, the right side of Figure 6 shows that rate rises have been followed in the next 20 days by bond market returns that were close to neutral, while falls have been followed in the next 20 days by bond market outperformance averaging 0.5% (with a marginally positive return after US rate rises, and a larger 1.0% return in the UK).

Adding in the announcement-day returns from Figure 4, bond market performance from the market close before a rise to 20 days after was –0.3% (US) and –0.2% (UK). Bond market performance from the market close before a fall to 20 days after was 0.4% (US) and 1.1% (UK). Interest rate rises had a neutral impact for bond investors, while rate cuts were neutral for US investors, but, in retrospect, were beneficial for UK bond investors.

The reaction of the currency markets is more nuanced. Other things equal, we would expect rate rises to lead to a stronger domestic currency and vice versa, and the evidence is broadly consistent with this. After the announcement-day currency returns shown in Figure 4, subsequent movements were small. Having risen by 12 bp on announcement of a rate rise, the dollar declined by 9 bp over the next 20 days, and having risen by 5 bp on rate rises, the pound weakened by 27 bp afterwards. Similarly, having declined by 26 bp on rate cuts, the dollar recovered by 22 bp afterwards. In slight contrast, having declined by 5 bp on rate cuts, the pound fell afterwards by 66 bp, but there was also some weakening over the period following rate rises (we do not graph the currencies in event time to conserve space).

In summary, all the announcement-day effects in the USA and the UK for all three asset classes, and for rate falls as well as rises, were in the direction predicted, but their magnitude was quite small. For US and UK bonds and for UK (but not US) equities, however, returns over the 20 days before the announcement were also in the predicted direction and much larger in size. This is consistent with central banks preferring to avoid surprising the markets and with markets correctly anticipating the direction, magnitude and timing of rate changes. Markets will have been assisted by guidance from the central bank and the release of relevant economic data in the run-up to the rate change.

Do markets influence central banks?

Clearly, rate changes impact asset prices, but the relationship also works in reverse. In deciding when and by how much to change rates, central banks will be influenced by recent market movements. Rigobon and Sach (2003) analyzed US stocks over 1985–99 and concluded that rising stock prices tended to drive short-term interest rates in the same direction. This is in part because central banks are concerned about the wealth effect, which is positive in a bull market and negative when markets fall sharply, and is one reason why central banks lowered rates and loosened policy in reaction to the 1987 crash and the more recent financial crisis.

Volatility can play a similar role. When contemplating rate rises, central banks may choose to delay if markets seem too volatile. We compute

volatilities over the pre-announcement period by taking the standard deviation of all daily returns during the 20-day pre-announcement period, first across all rate rises, and then across all rate falls. We compute the announcement-day volatility in the same way, using data for the 3-day period from the pre-announcement day to the post-announcement day.

Figure 7 provides some support for the view that central banks' interventions may be influenced by market volatility. The left-hand side of the chart relates to rate increases. It shows the extent to which volatility is heightened relative to normal (i.e. non-event periods) during the 20 days before the announcement (turquoise bars) and over the announcement period (the blue bars show average volatility over the 3-day period centered on the announcement day). The first set of four bars is for equities, the next for bonds and the third for currency.

The first bar on the left thus shows that, for US equities, volatility prior to rate rises was 6% higher than normal during the pre-announcement period and 45% higher over the announcement itself. As one would expect, volatility is mostly appreciably higher than normal over the announcement period, the only exception being US bond volatility. Furthermore, the blue bars are always higher than the turquoise bars, indicating that volatility is always higher over the announcement period than beforehand.

The surprising feature of Figure 7 is that, prior to rate rises, volatility is fairly subdued in the pre-announcement period. In the USA, for example, it is 6% higher than normal for equities, 28% lower for bonds and the same as normal for currency. The right-hand side of Figure 7 shows the corresponding data for rate falls. Before rate falls, volatility is noticeably higher in all cases than before rate rises. This is consistent with the notion that when volatility is high, central banks tend to defer rate rises. In the case of rate cuts, it is consistent with central banks tending to loosen policy following crises.

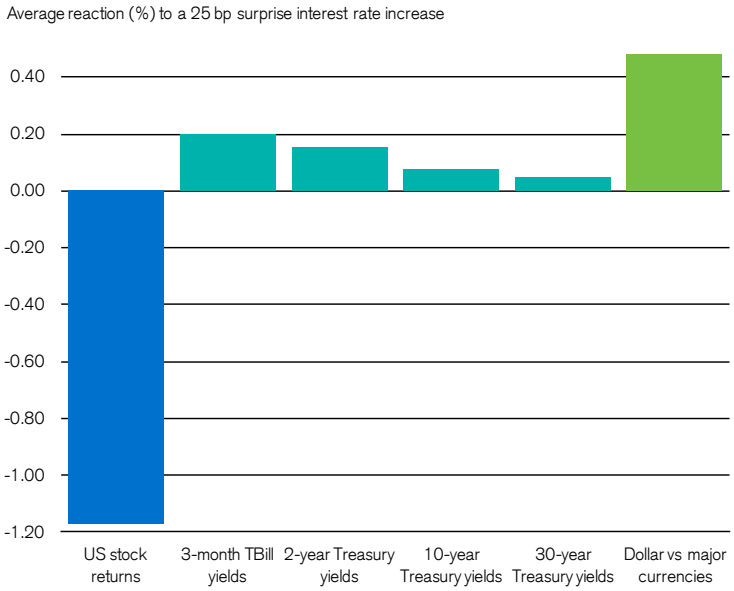
The market reaction to rate surprises

We noted above that markets react only to the surprise element of a rate change. Our event studies focused just on the raw rate change, and did not seek to isolate the surprise element. They are useful in providing guidance on what to expect from a rate change. For example, the muted reaction over the actual announcement period of the important US rate change in December 2015 was entirely consistent with the typically small reactions we have observed historically.

Rate changes are widely anticipated, however, not least by the Fed funds futures market. A number of researchers, including Kuttner (2001) and Bernanke and Kuttner (2005) have isolated the surprise element of announcements by defining the surprise as the actual rate change minus the rate change inferred from Fed funds futures prices. Using this definition, even "no change" meeting days become important, as the lack of a change can itself be a surprise. Others, such as Cieslak and Pavol (2014) use survey evidence to extract the surprise part in a rate change. These studies demonstrate persuasively that the market response to the surprise component is significantly stronger than the response to the raw change.

Figure 8

Reaction to US rate change surprises



Source: Bernanke and Kuttner (2005), Kuttner (2001), Rosa (2010)

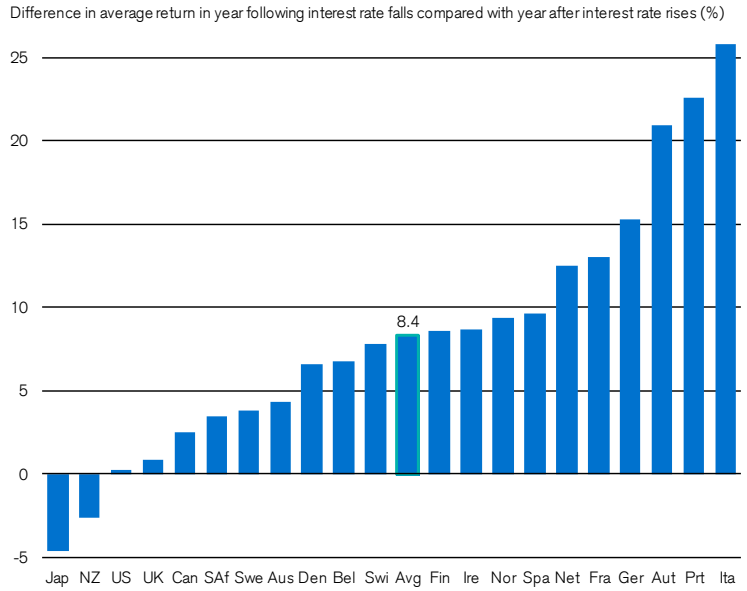
Figure 8 summarizes the US evidence on the impact of a 25 bp surprise interest rate rise. The impact on equities (the blue bar) is taken from the Bernanke and Kuttner (2005) study which covered the period from 1989 to 2001. They found that equities typically fell by almost 1.2% for every 25 bp of "surprise" rate increase.

The impact on fixed income securities (the turquoise bars) is from Kuttner (2001) who analyzed the period from 1989 to 2000, expressing his results as the impact on yield, rather than returns. A 25 bp surprise rate increase leads to a 20 bp increase in 3- month Treasury bill rates, a 15 bp increase in 2-year Treasuries, an 8 bp rise in 10-year bonds, and a 5 bp rise in 30-year Treasury bond yields.

Finally, the impact of surprise rate rises on the dollar (the green bar) is taken from a study by Rosa (2010) spanning 1999–2007, which investigated the impact of rate changes on currencies using an event study with intraday data for five

Figure 9

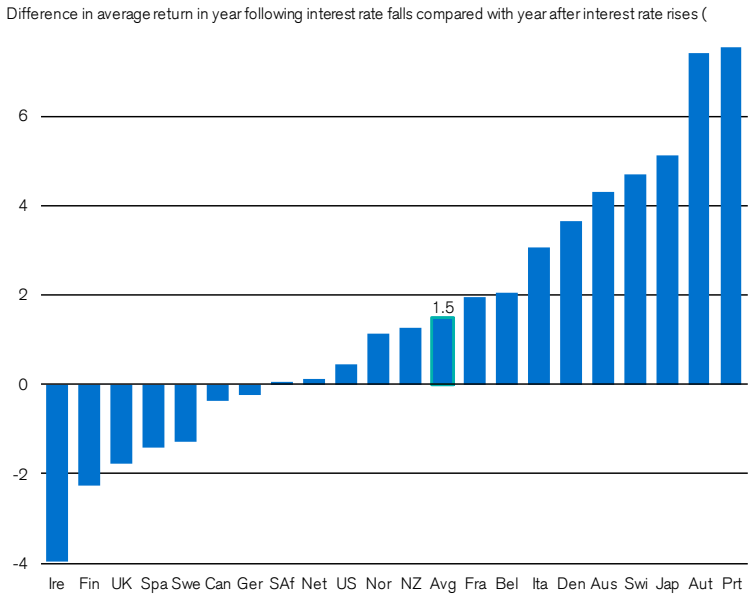
Impact of rate changes on real equity returns, 1901–2015



Source: Elroy Dimson, Paul Marsh and Mike Staunton; Dimson-Marsh-Staunton (DMS) database

Figure 10

Impact of rate changes on real bond returns, 1901–2015



Source: Elroy Dimson, Paul Marsh and Mike Staunton; Dimson-Marsh-Staunton (DMS) database

exchange rates (the US dollar versus the euro, the Canadian dollar, the British pound, the Swiss franc, and the Japanese yen). Rosa found that a 25 bp surprise rate rise led, on average, to a 48 bp appreciation of the dollar against the other major currencies.

Long-run global evidence

We have seen that, historically in the USA and the UK, rate rises have on average been viewed as bad news for stocks and bonds, while rate falls have been greeted favorably. The extensive Yearbook database enables us to investigate whether this has also held true for other countries over even longer periods, and to study predictive patterns in contrast to contemporaneous ones. The database now covers asset returns in 23 countries since 1900.

Our focus up to this point on the USA and the UK partly reflects the importance of these two countries' financial markets, but it is also driven by data availability. For these two countries, we have a long sample of daily returns data, as well as a record of all their official interest rate changes and when they happened. We do not have the equivalent data on rate changes for other countries, and the Yearbook database provides only annual data. Our global analysis of the impact of interest rate changes on stock and bond returns is therefore, of necessity, much coarser.

For each of the 21 countries for which we have a continuous returns history since 1900, we identify "rate fall" and "rate rise" years. A year is deemed to be a rate fall year if the Treasury bill return is at least 25 bp lower than in the previous year. It is categorized as a rate rise year if the bill return is at least 25 bp higher than the year before. Years in which there is only a very small or no change from the year before are ignored. We then compute the average returns in the year following (1) rate fall years and (2) rate rise years and report the difference between the two.

Figure 9 presents the results of this predictive analysis for equity returns. It shows that, for every country other than Japan and New Zealand, real stock returns were on average higher in the year following rate fall years than in the year after rate rise years. The average of the 21 countries is given by the bar in the center of the chart with a green border. This shows that, for the average country, real returns were 8.4% higher in years following rate falls compared with years following rate rises. As well as looking at return differences over a 1-year subsequent period, we also computed the differences over a 5-year period, and the results were very similar.

Of the 19 countries for which there was a positive difference in returns, Figure 9 shows that the magnitude was smallest for the USA and the UK.

This observation – that the USA and the UK experienced no effective impact on real equity returns from interest rate changes – may be important as a message for the future, now that other markets are more mature. On the other hand, we saw above that when we utilize higher frequency data and the actual dates of official rate rises, both the USA and the UK experienced large positive effects. This suggests that the results in Figure 9, which are based on a much less granular analysis, may understate the extent to which real stock returns were higher during periods of easing rather than tightening.

Many of the countries plotted in Figure 9 had a troubled history during the first half of the 20th century, largely due to the world wars and the episodes of high inflation that often followed in their wake. We have therefore rerun the analysis for the period from 1950 onward. The results were very similar, but slightly stronger. In 20 of the 21 countries, real stock returns were on average higher following rate fall years than rate rise years (the exception was New Zealand). The average difference over the period from 1950 on was 8.9%.

Figure 10 shows the identical analysis for bond returns. For two-thirds of the countries, real bond returns were on average higher in the year following rate fall years than in the year after rate rise years. The average of the 21 countries is given by the bar in the center of the chart with a green border. This shows that, for the average country, real bond returns were 1.5% higher in years following rate falls compared with years following rate rises.

From 1950 onward, the results were very similar, with all but five countries showing a positive effect, and the average difference again being 1.5%. If we look out over five years rather than just one, then all but one country (South Africa) showed a positive difference and the average annualized difference was 1.6%.

Conclusion

Markets took the December 2015 rate rise in their stride, despite this being the first US rate hike for almost a decade. This is precisely what we should have expected as it was widely anticipated. Markets react only to the surprise element of rate rises.

We have examined all changes in the official interest rate in the USA for over 100 years and in the UK since 1930. The announcement-day impacts are small, but in the predicted direction. Rate rises are on average bad news for stocks and bonds, while rate falls are greeted favorably.

When we look over the 40-day period around rate changes, the relationship is more obvious, and the effects are much larger. This is consistent with markets correctly anticipating the direction, timing and magnitude of rate changes. They are helped in this task by central bank guidance and macroeconomic data announcements. Researchers who have controlled for the surprise element of rate changes, typically using futures market rates, also find that the announcement effects are much larger. Rate changes matter, even though the reaction on the day itself often seems muted.

The relatively small announcement-day reaction is a tribute to the fact that markets are effective in anticipating rate changes and their likely impact. Public knowledge, such as current central bank policies and pronouncements, is already impounded in stock and bond prices. It is surprises in central bank policy and actions that impact asset prices. So investors with a superior understanding of central bank policy, or who are better able to forecast the macroeconomic variables that condition central bank decisions, should have an edge.

Besides rate changes impacting asset prices, asset prices and volatility themselves influence rate changes. There is a tendency for rising stock prices to drive short-term interest rates in the same direction, while sharply falling prices can provoke monetary easing. This effect may partly be driven by policymakers' concern with wealth effects. There is also evidence that, when volatility is high, central banks tend to defer rate hikes.

Our detailed analysis of the market's reaction to interest rate change announcements was limited to the USA and the UK since these are the only two countries for which we have long-run historical daily returns data, as well as a comprehensive record of all official rate changes. However, when we conducted a coarser analysis based on annual data, but extended now to 21 countries over the period from 1900 to date, our findings were consistent with our finer-grained event-study analysis. Real equity and bond returns both tended to be higher in the year following rate falls than in the year after rate rises. This relationship also held for subsequent periods longer than a year.

This raises an obvious question; namely, how do different asset classes perform over entire hiking and easing cycles? In the following chapter, we shift our focus away from the immediate impact of rate changes, and instead compare asset performance over entire interest rate hiking and easing cycles. We find substantial differences between the two.

PHOTO: GIBSONPICTURES / ISTOCKPHOTO.COM

Cycling for the good of your wealth

This chapter compares asset performance over entire interest rate hiking and easing cycles, using a trading strategy that could, in principle, have been implemented in real time. First, we look at the performance of equities, bonds, bills and currencies and at the corresponding equity and maturity premia. We then examine performance within the equity market, analyzing factor returns, including industries, as well as the returns from size, value and momentum. Finally, we examine the returns on real assets (including precious metals such as gold and silver), collectibles (including art, stamps and wine), and real estate (including housing and farmland). In all cases, we find substantial differences between returns during hiking and easing cycles.

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When the Fed raised rates in December 2015, its intention was that this would be the first of a series of such hikes. The last hiking cycle, which began in June 2004, also started with a 25 basis-point rise, taking rates from the floor at that time of 1% to 1.25%. It was followed by a further 16 rate rises, and a hiking cycle that lasted over three years. While no one today expects 16 further rises, no one expected such a prolonged cycle back in June 2004 either.

At the other extreme, the December rate rise could turn out to be a one-off. 2016 has not started well, and a fresh crisis could cause the Fed to reverse policy. Indeed, there have been seven instances of a single-rate-rise US hiking "cycle" over the last 100 years. On average, hiking cycles have lasted just under two years (1.9) and involved 4.3 rate rises. Easing cycles have lasted slightly longer (2.2 years) with an average of 4.7 rate cuts.

Since the financial crisis, US monetary policy has been very loose with ultra-low interest rates plus quantitative easing. Over the seven years since the start of 2009, US stocks have performed strongly with a real return of 12.6% per annum, while long bonds have enjoyed an annualized real return of 2.4%. Does the start of a new hiking cycle and the move to a somewhat tighter policy herald the end of good returns?

In the previous chapter, our focus was on the immediate impact of rate changes. In this chapter, our focus is on examining asset performance over entire hiking and easing cycles.

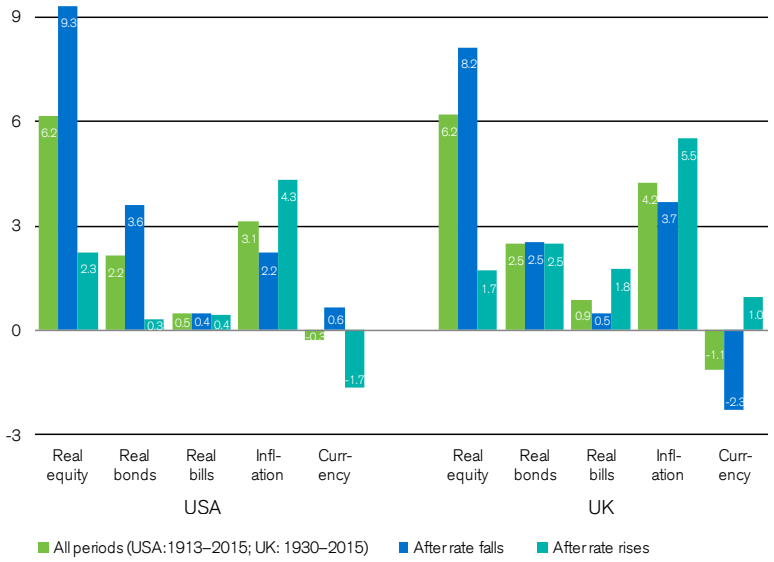
Defining hiking and easing cycles

A simple approach to measuring performance over interest rate cycles in the USA and the UK would be to utilize the cycle start and end dates depicted in Figures 1 and 2 of the previous chapter. Investment over hiking cycles involves buying assets on the date corresponding to each of the small yellow diamonds, which denote the start of the up-cycle, and selling on the date of the next turquoise diamond, which marks the reversal point and the start of the down-cycle. Similarly, investment over easing cycles involves investing at each turquoise diamond date and selling at the next yellow diamond.

We follow this procedure for the USA and the UK – the two countries for which suitable data is available – measuring returns in real terms since our main concern is with the impact of rate changes on the purchasing power of investment assets. The use of real returns is also important when making comparisons here, as the average inflation rate is likely to have differed between periods of tightening and easing.

Figure 1

Performance of assets after rate rises and rate falls



Source: Elroy Dimson, Paul Marsh and Mike Staunton; Dimson-Marsh-Staunton (DMS) database; Bank of England, Federal Reserve, Global Financial Data, Thomson-Reuters Datastream.

We find large differences in real asset returns between tightening and loosening cycles. During all tightening cycle periods, US stocks achieved an annualized real return of 4.9%, while during easing cycles they enjoyed a much higher return of 8.8%. Similarly, the annualized real return on US bonds over all tightening cycles was –0.2%, while the corresponding return over easing cycles was 5.0%. For the UK, the differences were in the same direction, but even larger.

This strategy could not, however, have been followed in real time as hindsight was used to define the cycles. The turning points in Figures 1 and 2 of the previous chapter were identified visually and we ignored any temporary jaggedness in the pattern of rates over time. Thus if the chart shows that rates rose from a low to a subsequent high, we define this as a hiking cycle, even though within this there may have been temporary rate cuts that were soon reversed.

In real time, however, an investor would observe only the rate cut, not that it was destined to be temporary and be reversed, and that rates would then resume their climb to the high. To have divined the latter would have required clairvoyance.

Asset returns after rate rises and falls

To circumvent this problem, we adopt a simple trading rule that could be followed in real time. It entails investing (1) after unbroken runs of rate rises, and (2) after unbroken runs of rate falls. Investing after rate rises involves buying assets on the announcement of an initial rate hike (e.g. the December 2015 US rate rise), staying invested as long as rates continue to rise or stay the same, then selling on the announcement of the first rate cut. Investing after rate falls involves purchasing after an initial rate cut then holding until the next rate rise. Essentially, this is a mechanical way of defining hiking and easing cycles.

By defining cycles in this way, there are no "left-over" periods. All points in time are designated either as falling within a hiking cycle or an easing cycle. Our US data starts in 1913, and from 1913 to 2015, US markets were in a rising interest rate mode 44% of the time, and in a falling rates mode 56% of the time. The UK data starts in 1930, and UK markets spent less time in hiking mode (30%) and more time in periods of easier money (70%).

Figure 1 (this page) shows the results of following this strategy. The left side of the chart refers to the USA and the right-hand side to the UK. Each group of three bars relates to a different asset class, with the green bar in each grouping showing the returns over the entire period, the blue bar showing returns after rate falls (easing cycles) and the turquoise bar showing returns after rate rises (hiking cycles).

Looking first at the USA, there are large differences between the returns following rate rises and those after rate falls, especially for stocks and bonds. Equities gave an annualized real return of 6.2% over the entire period, but just 2.3% during rate-rise periods, compared with 9.3% during rate falls. US bonds gave an annualized real return of 2.2% over the full period, but just 0.3% in the rate-rise regime, compared with 3.6% while rates fell. In contrast, real bill returns (the short-term risk-free real interest rate), were virtually the same under both regimes. The differences in returns between rate-rise and rate-fall periods were statistically significant at the 1% level for both equities and bonds, but insignificant for bills.

The annualized US inflation rate was also higher at 4.3% during hiking cycles compared with 2.2% during periods of easing. This difference was significant at the 0.01% level. Hiking cycles are often triggered by inflation fears and are targeted at bringing it down. To achieve this typically requires multiple rate rises and there are also time lags. So it is unsurprising that inflation tends to be higher during tightening cycles.

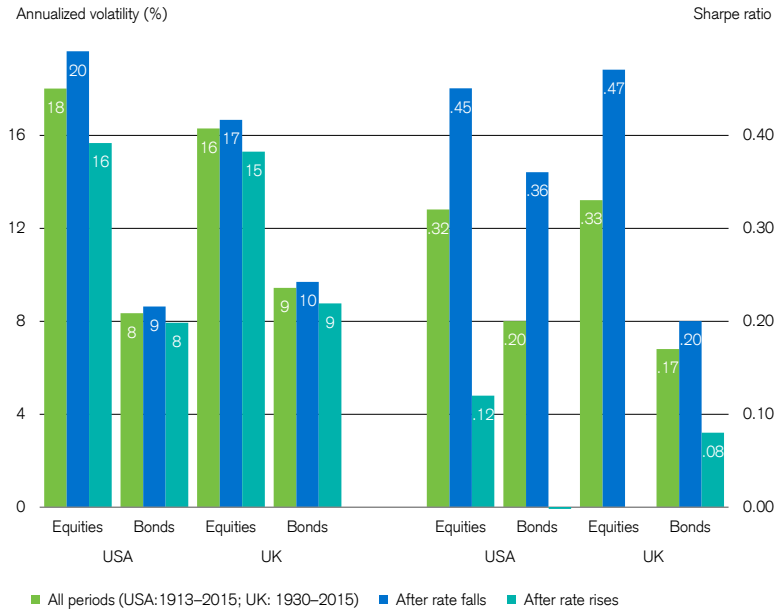
Finally, the performance of the dollar is a somewhat counter-intuitive result. We might expect the

dollar to be strong during periods of rate rises, but in fact it has been weaker. Over the entire period covered by our analysis, the annualized depreciation of the dollar against other major currencies was 0.3%. During hiking cycles, it depreciated at an annualized rate of 1.7%, while during easing cycles, it appreciated by 0.6% per annum. This may reflect the higher inflation rate during tightening cycles or perhaps the stronger US economy that tends to prevail during easing cycles.

The right-hand side of Figure 1 on page 16 shows similar findings for the UK. UK stocks gave an annualized real return of 6.2% over the entire period, but just 1.7% during periods of rising rates, versus 8.2% during easing cycles. This difference is statistically significant at the 3% level. In contrast to the USA, UK bonds gave very similar returns during hiking and easing cycles, while the UK real rate of interest (real bill return) was 1.3% per annum higher during tightening than easing cycles. As in the USA, the annualized inflation rate during UK tightening cycles was much higher (5.5%) than during easing cycles (3.7%), and this was statistically significant at the 1% level. Finally, the pound strengthened against the dollar by 1% per year during tightening cycles, but weakened by 2.3% per year during easing periods. This contrasts with the findings above for the USA.

Figure 2

Volatility and Sharpe ratios after rate rises and rate falls



Source: Elroy Dimson, Paul Marsh and Mike Staunton; Dimson-Marsh-Staunton (DMS) database; Bank of England, Federal Reserve, Global Financial Data, Thomson-Reuters Datastream.

Volatility after rate rises and falls

An obvious question is whether the higher returns during easing cycles could be due to risk. To investigate this, we computed the annualized volatilities of real returns over both easing and hiking cycles. As the left-hand side of Figure 2 shows, the volatility of equities and bonds in both countries was indeed greater during easing cycles. Equity volatility was 25% higher in the USA and 6% larger in the UK. Bond volatility during easing periods exceeded volatility during hiking cycles by 9% in the USA and 11% in the UK.

The right-hand side of Figure 2 shows the corresponding Sharpe ratios, which measure the reward per unit of volatility. The Sharpe ratio is defined as the real annualized asset return less the real Treasury bill rate, all divided by the standard deviation of the real asset returns. Despite the higher volatility during easing cycles, the Sharpe ratios are still well above the corresponding ratios during hiking cycles. During easing cycles, US equities had a Sharpe ratio of 0.45 compared with 0.12 during periods of rising rates. The figures for the UK, 0.47 and 0.00, are similar. US bonds had a Sharpe ratio of 0.36 during easing cycles compared with –0.01 during hiking cycles. In the UK, the margin of outperformance for bonds was more slender, with a ratio of 0.20 during easing cycles and 0.08 during periods of rising rates.

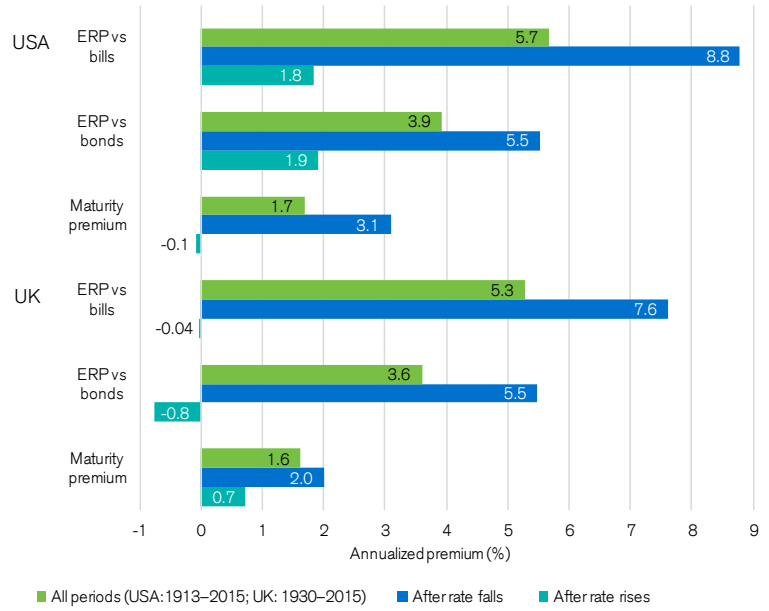
Risk premia after rate rises and falls

Figure 3 shows annualized risk premia over tightening and easing cycles. The top half of the chart relates to the USA and the bottom half to the UK. For each country, three premia are shown: the equity risk premium (ERP) relative to bills, ERP relative to bonds, and the maturity premium (the long-term bond return expressed as a premium over the three-month Treasury bill return). The green bars refer to the entire period, the turquoise bars to tightening cycles and the blue bars to easing cycles.

Figure 3 shows that, during US easing cycles, the ERP relative to bills was 8.8% per year, far higher than the 1.8% during tightening cycles. But, even in tightening cycles, investors would have been better off remaining in equities, as the ERP relative to bills and bonds stayed positive. During these periods, they would have been marginally better off in cash than bonds, as the annualized maturity premium was –0.1%. Note that the entire maturity premium from long-term bond returns relative to bills was earned during easing cycles. The differences in both the ERP relative to bills and the maturity premium between tightening and easing cycles were statistically significant at the 1% level.

Figure 3

Performance of premia after rate rises and rate falls



Source: Elroy Dimson, Paul Marsh and Mike Staunton; Dimson-Marsh-Staunton (DMS) database; Bank of England, Federal Reserve, Global Financial Data, Thomson Reuters Datastream.

The UK results are broadly similar, but Figure 3 shows that, in the UK, the entire long-run ERP was earned during easing cycles. The difference in the ERP relative to bills during easing and tightening cycles was significant at the 1% level. During tightening cycles, cash performed slightly better than stocks, while bonds outperformed by 0.8% per year. Before transaction costs, investors would have been better off and would have experienced lower risk by selling out of equities during tightening cycles. As in the USA, the maturity premium was appreciably lower during tightening cycles, although it remained positive in the UK.

Cyclical and non-cyclical industries

Investment assets are often classified as cyclical or non-cyclical (sometimes labeled defensive), or as sensitive or insensitive to interest rates. Cyclical investments are more exposed to the state of the economy. For example, they may be manufacturers or distributors of discretionary items that consumers demand when they feel wealthier and cut back on in recessionary times, or they may be producers of durable goods such as raw materials and heavy equipment. Cyclical businesses include cars, airlines, hotels, fine dining, furniture, luxury goods, technology, machinery and tooling.

Non-cyclical businesses may provide necessities that are in demand even during a downturn or they may even be contracyclical, moving in the opposite direction from the overall economy. Non-cyclical companies include household non-durables, pharmaceuticals, tobacco, insurance or public utilities. True contracyclical sectors are rare, but might be illustrated by outplacement specialists, whose services in finding alternative employment for redundant workers may be in particular demand in times of recession.

A common investment doctrine is to seek market-beating performance from non-cyclicals during bad economic times, and to harvest an upswing from cyclicals when the economy enters a recovery. However, there is little hard evidence to indicate that such strategies can be successfully implemented in practice (see Stangl, Jacobsen and Visaltanachoti, 2009), not least because the right times for investing and switching may be apparent only with hindsight. It is hard to predict economic booms and recessions, and, given the state of the economy, it is uncertain how sensitive company earnings are to economic conditions.

An illustration is when Caterpillar Inc. researchers once found a leading indicator that predicted the state of the US economy by several months, and shared their findings with the firm's CFO: "We've got good news and bad news," they explained. "The good news is we found an indicator that predicts shifts in US GDP with a lead time of six to nine months. The bad news is it's our own sales to users" (reported in Colvin, 2011). Using that criterion, Caterpillar anticipated the US recession coming in the third quarter of 2007 and, when publicized, their prediction triggered a one-day fall in the S&P 500 of 2.6%.

As the Caterpillar anecdote illustrates, the timing and magnitude of economic growth can be hard to judge. We do, however, have information on the interest rate cycle, and can identify unambiguously the date (and size) of interest rate rises (hiking cycles) and rate falls (easing cycles). In earlier studies, James, Kim, and Cheh (2014) found that over the period 1949–2012, the US monthly prime loan rate could underpin a profitable sector-rotation strategy, and Conover, Jensen, Johnson, and Mercer (2008) found that, over the period 1973–2005, a sector-rotation strategy generated an annualized outperformance of 3.4% compared to a buy-and-hold benchmark. A limitation of the Conover et al study is that it covered only seven rate rise and seven rate fall episodes.

Industry factors after rate rises and falls

Motivated by this literature, we examine the impact of rising and falling rates using a larger sample spanning the 90-year period since 1926. We identify periods after a US rate rise or fall and

measure the performance of each industry index. We estimate industry factor returns, where the latter are the annualized returns on each industry index measured relative to the contemporaneous return on the overall equity market index.

The US results are summarized in Figure 4. The vertical axis shows the industry factor return following an interest rate rise (blue bars) and following an interest rate fall (turquoise bars). The horizontal axis shows the industries, which are described below. The underlying data are from Ken French's 12 Industry Portfolio daily series, which currently run from July 1926 to July 2015.

The industries are ranked loosely from defensive to cyclical. On the left are utilities and telecoms. They are followed by engineering, healthcare and drugs, business equipment (including software), financials, and chemicals. Towards the right are consumer non-durables, manufacturing, other industries (those not covered by the other 11 groups, such as business services, construction, hotels, entertainment, mining, and transport), retail and wholesale, and consumer durables. The ranking is based on the average responsiveness of these industry groups over the very long term to changes in interest rates in the USA and (using the same industry groupings) in the UK.

Interestingly, cutting-edge publications on investment provide little evidence on whether stock market returns are robustly related to industry cyclicality. As we wrote a year ago in the Global Investment Returns Yearbook (Dimson, Marsh and Staunton, 2015), "In research terms… industries are the Cinderella of factor investing."

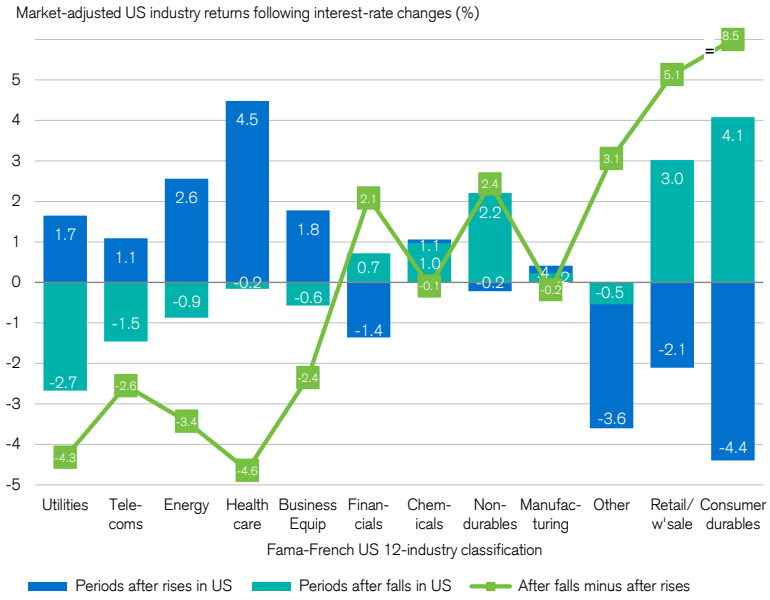
Yet as we noted then, industry factors are a key organizing concept in investment, and there is an enduring emphasis in portfolio management on getting industry exposures right. Industry membership is the most common method for grouping stocks for portfolio risk management, relative valuation and peer-group valuation. Much of that is founded on a belief that industries respond to the economic environment in a consistent way.

Figure 4 confirms what practitioners knew all along. Not only do US investment returns correlate with broad perceptions about industry cyclicality, but there is a systematic relationship between performance in tightening and easing cycles. Industry factor returns during declining interest rates are systematically in the opposite direction to industry factor returns during rising interest rates.

There are three small exceptions to this feature of Figure 4, namely chemicals, manufacturing, and the "other" category. For these three groups, industry factor returns tend slightly to be in the same—rather than the opposite—direction during tightening and easing cycles. Why might this be? In part, the industries in Figure 4 are aggregate groupings and the "other" category contains a somewhat unconnected selection of leftover fields of business. We gain additional insight by analyzing the "other" group in more detail in the next section of this chapter.

Figure 4

Impact of rate changes on US industry returns, 1926–2015



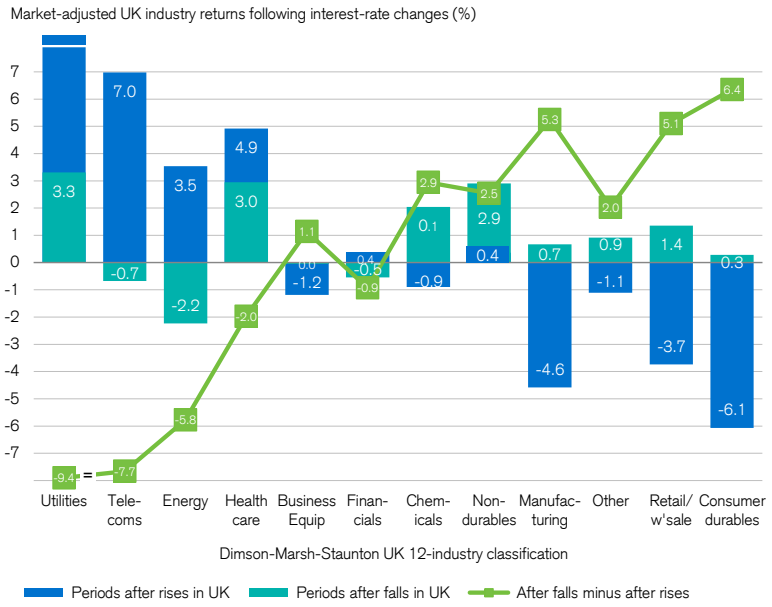
Source: Elroy Dimson, Paul Marsh and Mike Staunton; Dimson-Marsh-Staunton (DMS) database; Bank of England, Federal Reserve, Global Financial Data, Ken French's website.

For each industry our performance indicator is the difference between the industry factor return during hiking cycles and easing cycles. We portray the difference in the green line plot in Figure 4. This exposure to monetary conditions varies markedly across industries. Although the pattern shown in Figure 4 as a whole is persuasive, the difference in returns for individual industries between hiking and easing cycles is statistically significant only for consumer durables, retail and wholesale and healthcare.

Remember that the timing rule depicted in Figure 4 could have been followed in real time, and does not rely on hindsight. Our research design thereby avoids look-ahead bias. In addition, we have taken steps to reduce the likelihood that our findings are valid in-sample but not out-of-sample. We have done this by evaluating an executable trading rule that is simple, intuitive and not ad hoc. The periods in which we are exposed to specific industries are spread out over time and do not reflect just one episode in history. And crucially, we have analyzed and reported just one trading rule, and not selected a particular scheme that worked well, while ignoring others that proved less successful.

Figure 5

Impact of rate changes on industry returns, UK 1955–2015



Source: Elroy Dimson, Paul Marsh and Mike Staunton; Dimson-Marsh-Staunton (DMS) database; Bank of England, Federal Reserve. First bar truncated because of limited number of observations.

Industry factor robustness

Another way to evaluate the robustness of the US evidence reported above is to investigate the UK. We therefore use the London Share Price Database (LSPD) to construct industry indices over the period 1955–2015, based as closely as possible on the definitions used by Ken French for the 12 Industry Portfolios used for the USA above. Because of earlier nationalization, two of the 12 industries, telecoms and utilities, were not represented within the UK stock market in 1955. The UK telecoms index started life in 1981, when the first telecom company was privatized, while the utilities index began in 1989, when the UK government sold off the first batch of utilities.

Our findings are reported in Figure 5, which has the same format as Figure 4. The industries are also presented in the same sequence so as to facilitate comparisons with the USA. Figure 5 reveals the same general pattern for the UK as we saw in the USA. Factor returns in different interest rate regimes correlate with perceptions about industry cyclicality, and there is an inverse relationship between stock market performance in tightening and easing cycles. Industry factor returns during periods of declining interest rates are systematically in the opposite direction to industry factor returns during rising interest rates.

Apart from utilities, for which there are very few observations, and where we have truncated the post-interest rate-rise factor return, the only exceptions in Figure 5 are healthcare, for which the industry factor return was similar during tightening and easing cycles, and consumer nondurables, for which the post-rate-rise industry factor return was close to zero.

Analyzing these UK industry indexes provides a complementary body of evidence on the response of industry stock market indexes to interest rate changes. Since these successive, non-overlapping episodes are not a product of hindsight or look-ahead selection bias, there is some reliability in the relationships we have uncovered, though naturally the magnitudes of the responses vary considerably. When we focus on individual UK industries, the differences we observe between returns in hiking and easing cycles were statistically significant for consumer durables, retail and wholesale (as in the USA), and manufacturing.

One should not conclude that there is a clear cause-and-effect relationship between changes in short-term interest rates, on the one hand, and ensuing longer-term industry returns on the other hand. The relationship between interest rate changes and stock market performance is difficult to disentangle – the more so since monetary policy is predicated on forecast economic conditions. To dig deeper into stock market responses to rate hikes and cuts, we look next at some of the other underlying factors that drive equity returns.

Before moving on from focusing on industry groupings, we should look inside the "other" category for the US and UK markets. For the leisure subgroup (which Ken French labels as "Fun") the difference between the industry factor return during hiking cycles and easing cycles averages 7.4% (a statistically significant 10.9% in the USA, versus 3.8% in the UK), so that "other" contains a very cyclical consumer subsector.

"Other" also contains a construction subsector, which bears comparison with the property subsector of financials. Property and construction, taken together, have an average industry factor return difference between hiking and easing cycles of 3.4% in the USA and of 7.5% in the UK, the latter being statistically significant. Listed companies exposed to the real estate market tend to be beneficiaries when interest rates are cut and tend to be hurt when interest rates rise.

From industries to factors

Portfolio returns are impacted by industry exposure. But, as we note in Chapter 3 of the Global Investment Returns Sourcebook 2016, investment

performance is also influenced by whether a portfolio favors large or small companies, value or growth stocks, higher- or lower-yielding securities, or momentum or reversal strategies. These factors—size, style, income, and momentum—are the longest established and best-documented regularities in the stock market, sometimes referred to as smart beta factors. We refer readers to the Sourcebook for our review of over a century of financial market history, and what it reveals about the long-term risks and returns from factor-tilted portfolios.

It is well known that stock market risk exposures can be associated with both superior and inferior performance. There has been a resurgence of interest in these contributors to stock market returns since publication of the five-factor model of Fama and French (2015abcd, 2016). Our emphasis in this chapter is on factors that, in addition to the overall market, have a particular influence on stock returns in both the USA and the UK and can be estimated for both markets.

We examine the value premium (value stocks relative to growth stocks), the income premium (high yield stocks relative to low (but non-zero) yielders), the size premium (small-caps relative to large-caps), and momentum premium (past winners relative to past losers). The US value premium is based on Fama and French's division of stocks into the top 30% of "value" stocks and bottom 30% of "growth" stocks according to their ratio of book value to market value of equity. The UK value premium is based on an update to the study by Dimson, Nagel and Quigley (2003), in which value is based on the top and bottom 40% of stocks ranked according to their ratio of book value to market value of equity.

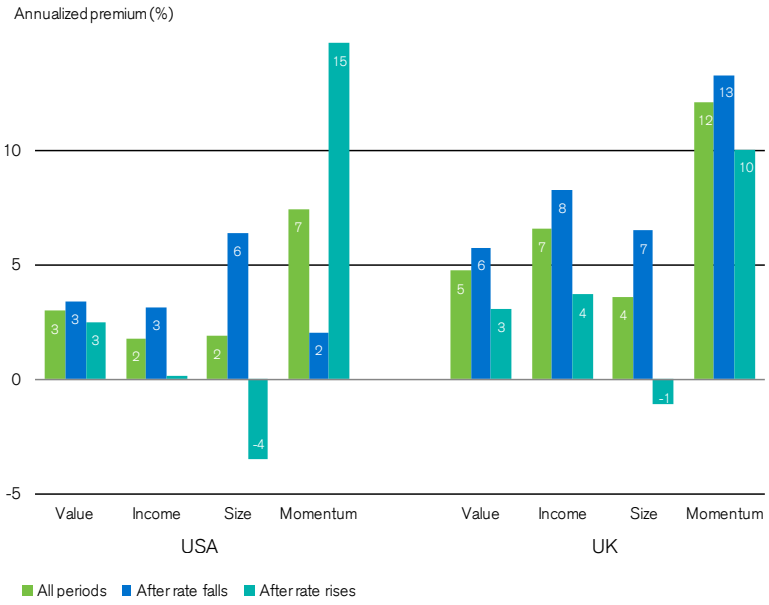
The US income premium is based on the "Univariate sorts on D/P" data from Ken French's website, and is the premium provided by the 30% of stocks with the highest yield relative to the 30% with the lowest yield. Zero dividend stocks are excluded from this premium. The UK income premium is calculated in the same way from LSPD data, using the same definitions.

The US size premium is based on the returns from small-cap stocks (the smallest 30% in the market) and large-cap stocks (the largest 30%) taken from "Portfolios based on size" on Ken French's website. The UK size premium is based on an update of the Dimson, Nagel and Quigley (2003) study. Large-caps are defined as the 30% of stocks with the largest capitalizations, while small-caps are taken to be the remaining 70%.

The momentum premium is based on Griffin, Ji, and Martin's (2003) 6/1/6 strategy in which stocks are ranked by their 6-month performance and, after 1 month, the top quintile ("winners") is bought and the bottom quintile ("losers") is sold short. The portfolio is held for six months and then rebalanced. We have updated their US study to 2015, and replicated this strategy in the UK using data from LSPD. We report the performance of the winner-minus-loser portfolio, which measures the results from running a notional long-short fund. Further details are provided in Chapter 3 of the Global Investment Returns Sourcebook 2016.

Figure 6

Impact of rate changes on factor returns



Source: Elroy Dimson, Paul Marsh and Mike Staunton; Dimson-Marsh-Staunton (DMS) database; Bank of England, Federal Reserve, Global Financial Data, Ken French's website.

Factor premia after rate rises and falls

Our US factor data runs from 1926 (1927 for income) to late 2015, while our UK data starts in 1955 (1956 for income) and runs to late 2015. In Figure 6, the green bars portray these four premia over the entire sample period. Value, income and size all generated annualized premia of several percentage points, while momentum generated a substantially larger premium (albeit at the expense of high turnover and costs). More details on these premia are provided in the Sourcebook.

The remaining bars on the chart show how the premia behave after rises or falls in interest rates. The blue bars show the magnitude of the premia during periods after interest rate falls, while the turquoise bars show what happened during periods of rising interest rates. Falling interest rates underpinned an expansion of the value, income and size premia in the USA and the UK. The momentum premium was

elevated in the UK during periods in which interest rates fell, but that was not the case in the USA. The transatlantic difference in momentum premia during hiking and easing cycles is a reminder of the volatile nature of the momentum premium, which is highly sensitive to reversals in the stock market.

The value and income premia stayed positive even during periods of rising interest rates, although they got smaller, and in the case of income in the USA, almost disappeared. The size premium, however, not only disappeared during periods of rising rates, but turned negative. Indeed, the size premium was the only factor where the difference in returns between hiking and easing cycles was statistically significant in both the USA and the UK.

We can speculate about the reasons for this. First, small-caps in both the USA and the UK tend to have a higher proportion of their assets, sales and profits in their home country. Since we are looking at the impact of domestic interest rate rises, and since central banks use rate rises to dampen domestic inflationary pressures, small-caps are likely to be affected more than their larger, more international large-cap counterparts.

Second, smaller companies are generally in a weaker position during hiking cycles in terms of funding. They have less easy access to bond markets, tend to be reluctant to raise equity when markets are weaker, and are more dependent on domestic bank lending. Many large-caps are multinationals that can shop around globally for finance. Third, the sector profile of small caps may also be part of the explanation. They have greater exposure to domestic, consumer facing businesses and to more cyclical industries.

The Fama-French five-factor model adds two quality factors to the size and value effects they had popularized in their early work. They are a profitability factor (stocks with a high operating profitability perform better) and an investment factor (companies with high growth in assets have inferior returns). In their empirical research, Fama and French find that these two factors largely explain the traditional value factor (based on the market-to-book ratio). We investigate the two quality factors using data from Ken French's website, and find that the premia associated with quality are elevated during expansionary periods.

Fama and French (2015abcd, 2016) omit from their new model two other factors that make a documented contribution to stock market performance. They are momentum, which we have addressed above, and the low-volatility anomaly (portfolios of low-vol stocks have produced higher risk-adjusted returns than portfolios comprising high-vol stocks). Using US and UK data, we therefore examine the low-volatility premium in the same way as the other factors represented in Figure 6. We confirm that stocks with low betas, low specific risk and low variance achieved higher returns than their higher-risk brethren. Consistent with our other results, we find that falling interest rates underpinned an expansion of the low-volatility premia in both countries.

Real asset returns and interest rate changes

We use the term "real assets" to refer to durable stores of wealth such as farmland, artworks, and precious metals, while excluding financial securities such as public or private equity. Capgemini/RBC (2015) and Barclays (2012) report that, in aggregate, real assets represent a larger proportion of household and high-net-worth individual wealth than fixed income or public equity.

Real assets can in principle be divided into two groups. There are those that provide a financial cash flow to owners, and those that provide an intangible income. The former may be illustrated by real estate, while the latter are sometimes referred to as "treasure assets." The distinction is not black and white, and many assets share both attributes. For example, housing offers an imputed rental value, but it can also provide the owner with non-financial personal utility; art may provide a warm feeling to collectors, though it is sometimes perceived as a store of value and as a form of protection against high inflation. Housing is often regarded as an investment, whereas art collecting is typically viewed as a hobby – yet the distinction is moot.

Real assets therefore offer the prospect of long-term price appreciation (or depreciation) plus non-financial utility that is difficult to estimate. We researched the long-term price performance of real estate and gold in Dimson, Marsh and Staunton (2012). Our current focus, however, is not on long-term returns, but on the shorter-term responses of real asset values to changes in the interest rate. Income is rarely available for these investments, but omission of income fortunately has a limited impact on measuring sensitivity to financial market conditions. To illustrate this in a different context, it is well known that omission of dividends has little impact on estimates of equity betas or volatilities.

In contrast to listed securities, real assets are traded infrequently and in illiquid markets. Consequently, real asset indices are often annual, and only occasionally quarterly or monthly. Furthermore, intra-year index values generally suffer from smoothing bias, and are notorious for giving the misleading impression of having low risk and low correlation with financial assets. By investigating assets with annual observations, we benefit from enlarging the number of series we can study, lengthening the period of observation to over a century, mitigating the concern that our findings might be specific to particular episodes, and re-

ducing the impact of smoothing bias from appraisal-based indices. We examine three sets of real assets for which long-term returns have been estimated: collectibles, precious metals and real estate.

The collectibles comprise artworks, investment-quality postage stamps, first growth Bordeaux wine, and musical instruments (violins), all of which were analyzed in Dimson and Spaenjers (2014). The art price series is estimated by Goetzmann, Renneboog and Spaenjers (2011), and extended by linking it to the Artprice (2015) index. The stamp price series is for British postage stamps from Dimson and Spaenjers (2011), linked to the Stanley Gibbons GB250 Index. The wine price index is for premier cru Bordeaux from Dimson, Rousseau, and Spaenjers (2015). The violin price index is derived from the studies by Graddy and Margolis (2011, 2013).

The precious metals data comprises series for gold and silver; we studied gold in Dimson, Marsh and Staunton (2012) and silver prices are inferred from the silver-to-gold price ratios in Officer and Williamson (2015). We also study the diamond price series provided by Spaenjers (2016). The data on real estate is for the USA and the UK. The annual US house price index is from Shiller (2015a, 2015b) and the farmland index is from the US Department of Agriculture (1973, 2015). The UK house price index is from Monnery (2011) and Nationwide (2015), and the farmland index is from Savills (2015).

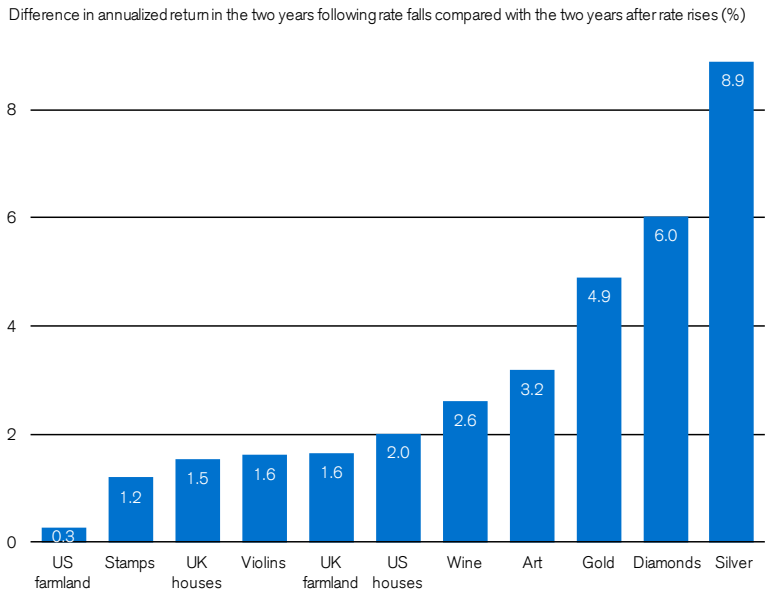
All series begin in 1900 except US farmland, which starts in 1910. Where the source data was in nominal terms, it is inflation-adjusted using inflation rates from Dimson, Marsh and Staunton (2016). For consistency with our earlier work, we focus on returns denominated in US dollars and British pounds. We converted returns to both inflation-adjusted USD and inflation-adjusted GBP using real exchange rates from Dimson, Marsh and Staunton (2016). The underlying data uses materials compiled by Spaenjers (2016), to whom we express our thanks. The index series do not necessarily run from end-year to end-year, and so it is important to examine the change in asset value in the years following a change in the interest rate. In our reported results, we focus on an interval of two years following the change in interest rates. This allows for the possibility that asset values are slow to respond to tightening or loosening monetary conditions.

Monetary conditions and real assets

We have found that financial asset returns and risk premia have been lower during periods of rising interest rates than during periods of declining rates. We can now examine whether that

Figure 7

Impact of rate changes on real asset returns



Source: Elroy Dimson, Paul Marsh and Mike Staunton; Dimson-Marsh-Staunton (DMS) database; Dimson and Spaenjers (2014). For full sources, see text and reference list.

carries over to real asset returns. For each of the real asset return series, we identify US and UK rate fall and rate rise years.

As before, when we examined equities and bonds around the world in the previous chapter, a year is deemed to be a rate-fall year if the Treasury bill return is at least 25 bp lower than in the previous year. It is categorized as a rate-rise year if the Treasury bill return is at least 25 bp higher than the year before. Years in which there is only a very small or no change from the year before are ignored. We then compute the average inflation-adjusted annualized asset return in the two years after rate-fall years and in the two years after rate-rise years.

In investigating the impact of interest rate changes, we need to decide which country's interest rate is likely to be more relevant to the asset in question. In the case of real assets that are permanently physically located in a particular country, we measure the impact of that country's interest rate. So we examine the sensitivity of US housing and farmland returns (in real USD terms) to US interest rates, while UK housing and farmland returns (in real GBP terms) are analyzed relative to UK interest rates.

The other "treasure assets" are portable, not restricted to a particular country, and are of interest to global buyers and investors worldwide. In our analysis, we measure the returns on these assets in both GBP and USD terms, and analyze them against both UK and US interest rate changes. However, the results that we report below treat these assets as global assets, measuring their returns in real USD, and analyzing their sensitivity relative to US interest rate changes.

Figure 7 presents our results. The bars show the difference in the average annualized 2-year return after interest rate falls, compared with interest rate rises. Thus, for example, diamonds have on average given a real USD return that is 6% per year higher over the two years following an interest rate fall than after an interest rate rise. Quite clearly, all of the real assets perform better following interest rate falls than interest rate rises. This is as we would expect, and consistent with all of our analysis above on publicly traded assets.

Conclusion

We have looked at asset returns over hiking and easing cycles. Based on a simple strategy that investors could follow, we have found marked and statistically significant differences in stock and bond returns between periods following interest rate rises and periods after rate cuts. In the USA, annualized real equity returns were just 2.5% during tightening cycles and 10.3% during loosening periods. Real bond returns were 0.2% in hiking cycles and 3.7% during periods of easing. Our findings were similar for the UK.

Our results are a record of what has happened over a long period of capital market history. They do not address the risks of pursuing particular strategies. For example, asset returns are generally higher if investors buy securities after a cut in interest rates; yet these economic conditions may coincide with the very times at which investors are reluctant to invest and are hence more risk-averse. In an efficient market, the elevated rewards from buying during rate cuts may simply be the compensation required to draw as many buyers as sellers into the market at those times.

Stock and bond returns have been lower during periods of rising interest rates. But these have also been periods of higher inflation. Inflation has historically been associated with lower returns from stocks and bonds. It thus remains an open question whether the poorer asset returns during rate hiking cycles are due to the "illness" (inflation) or the "cure" (rate hikes).

Now that the USA appears to be entering an episode of rising interest rates, does this imply that prospective stock returns are likely to be low? Should we be similarly pessimistic about asset returns in the UK, where tightening might start later in 2016? Meanwhile, should we be optimistic about Eurozone and Japanese returns, where central banks are continuing to loosen, or returns in China where the People's Bank of China is cutting rates? Will what has been dubbed the "Great Divergence" between central bank policies around the world translate into sharply differing asset returns?

First, asset returns around the world tend to be quite highly correlated, and we would expect this to continue. Second, while history can undoubtedly provide clues to the future, we should be cautious about any forecasts. The results we have presented are based on long-term averages spanning many different economic conditions. The averages conceal considerable differences between cycles. Indeed, during 40% of US hiking cycles, equities actually performed better than during the easing cycles that preceded them. Markets are very effective at humbling us and confounding our beliefs, especially if they are consensus positions.

The expected return from financial assets is low, and we have been unable to find any evidence that returns are on average elevated as a consequence of actual or anticipated interest rate rises. So is this the right time to seek exposure to other sources of reward in the financial markets? In other words, can other asset categories offer us contracyclical returns in relation to interest rate changes?

History tells us that the broad answer is no. While some sectors and asset classes are less sensitive than others to tightening cycles, interest rate rises are accompanied by lower risk premia, inferior industry returns, smaller rewards from many factor-investing strategies, and reduced price appreciation for a wide variety of real assets. It is hard to identify assets that perform well in absolute terms during hiking cycles, although we do detect relative outperformance at such times from defensive versus cyclical stocks and from large-cap versus small-cap stocks.

The case for diversification remains important because different assets generate returns that are imperfectly correlated. Whenever assets do not move in lockstep with each other, there is scope to benefit from risk reduction. Provided the costs of diversifying are not disproportionate, portfolios can enhance their expected reward-to-risk ratios by adopting a multi-asset, multi-national, multi-strategy approach to investment. Diversifying for the long-term makes sense. Tactical switches in anticipation of interest rate changes are less likely to contribute to long-term portfolio returns.

Furthermore, markets anticipate and public knowledge, such as current central bank policies, will surely already be impounded in stock and bond prices. It is future surprises in policy that will drive asset prices. So investors with a superior understanding of central bank policy, or who are better able to forecast the macroeconomic variables that condition central bank decisions, should have a potential edge.

Finally, any concerns about lower prospective US and UK returns should be extended globally. We continue to live in a low-return world. Long-term bond yields remain extremely low throughout the developed world, so that future bond returns are likely to be much lower than over the last few decades. Future real equity returns will depend on the expected real risk-free interest rate plus the expected equity premium. Real interest rates remain low everywhere, and there is no reason to believe that the equity risk premium is unusually elevated. Prospectively, therefore, the real returns on bills, bonds, equities, and indeed all risky assets, seem likely to be relatively low.

PHOTO: ALEXSAVA / ISTOCKPHOTO.COM

When bonds aren't bonds anymore

Bond yields in the major developed countries have only been as low as they are now on two occasions, both times in the aftermath of major financial crises. Now that the Federal Reserve has started raising policy rates, it is worth revisiting the parallels and contrasts between the three great crises of capitalism. History highlights the risks of tightening policy too early and suggests that real bond returns will be close to zero for a decade or more, with real equity returns around 4%–6% per annum. In this low market return world, efficient diversification and passive investment approaches will struggle to meet savers' needs, posing a structural challenge to the fund management industry.

Jonathan Wilmot, Head of Macroeconomic Research, Credit Suisse Asset Management

Strangely familiar

How similar are the conditions that have produced today's record low level of short- and long-term interest rates to the 1890s and 1930s?

The three great crises of capitalism

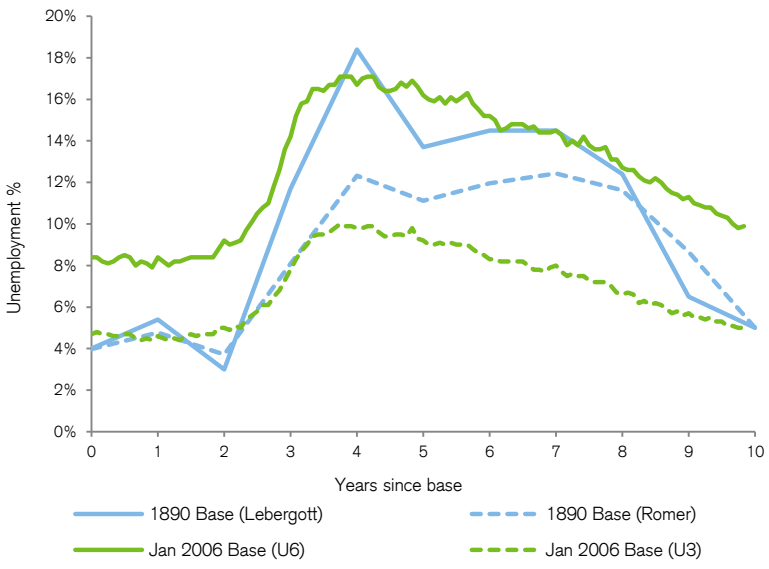
(1) 1890s – Latin America debt crisis, global banking panic and recession
(2) 1930s – The Great Depression
(3) 2008 onward – Lehman shock, Great Recession and European Sovereign Debt Crisis

Many would argue that today's economy bears little resemblance to the economy of the late 19th century or the 1930s because the service sector is now much larger than manufacturing, the role of government is much more extensive, there is no gold standard and – partly for that reason – fiscal and monetary policy have far more room to respond to economic shocks. Taken together, all these factors should lead to an economy that is far more stable and shock resistant than it was 50–100 years ago.

In terms of the "headlines" of economic performance this story is essentially correct: the volatility of both GDP and inflation has declined massively since World War II, and the financial crises of the 1890s and1930s led to larger declines in real Gross Domestic Product (GDP) and the price level than occurred during the "Great Recession" of 2008–09. But there are other metrics in which the similarities are more apparent than the differences. Unemployment, industrial production, corporate profits and credit issuance show rather similar patterns across the three episodes (Figures 1–5).

Figure 1

US unemployment rate 1890s vs. 2000s (U6 and other measures)



U3=official unemployment rate. U6 adds discouraged and part-time workers for economic reasons.
Source: Thomson Reuters Datastream; Lebergott, S. 1964; Romer, C. D. 1986; Credit Suisse

Figure 2

US unemployment (starting in 1928) vs. peripheral Europe unemployment (starting in January 2007)

Source: Thomson Reuters Datastream; Lebergott, S. 1964; Credit Suisse

One might add that today's public hostility to bankers, regulatory agenda and the rise of populism in politics would be very familiar to historians looking at the response to the economic failures of the 1890s and 1930s.

One darned recession after another

The Great Depression of the 1930s was far more severe than the other two episodes. Does it make sense to group them all together?

US real GDP fell 25% from peak to trough in the Great Depression and nominal GDP by nearly 45%. Germany and France suffered roughly similar declines in output and price levels, but the UK fared much less badly after leaving the Gold Standard in September 1931. Looking at the USA alone, the peak to trough decline in industrial production during the 1930s was 40% – double the decline in the 1890s and 2000s.

Thus we find it helpful to label the 1890s and 2008–09 episodes as Great Recessions and use the term Great Depression for the 1930s. The distinction is one of magnitude rather than origin and type of event, however. All three episodes were preceded by unusually rapid increases in credit and by speculative valuations in at least one important asset class; all three involved acute stress in the banking and credit system, which made the following economic contraction more severe; and all three episodes had an international contagion dimension via trade and credit linkages.

As argued in a series of classic papers by Ben Bernanke et al[1], the 1930s episode was most severe for those who stayed on the Gold Standard to the bitter end, and those who suffered the most severe banking panics and credit dislocations. In fact, the US experience in the 1930s looks like two large recessions separated by a brief period of recovery. The build-up to the second downturn in growth starts with the first major round of US bank failures in November 1930, then moves on through the failure of Creditanstalt bank in Austria (May 1931), a second round of US bank failures and a banking crisis in Germany (June/July 1931), followed by Britain leaving the gold standard (September 1931). Shortly after that, the US Federal Reserve (Fed) raised interest rates to stem an outflow of gold, precipitating a further cascade of bank failures and aborting the recovery.

Having plunged nearly 20% from its 1929 peak, US production rose about 7% from January through August 1931, but then fell some 30% over the following 19 months. In short, the Great Depression was indeed very much larger than the 1890s and 2000s episodes, but is most simply

[1] See "The Macroeconomics of the Great Depression" by Ben Bernanke (1995).

seen as two back-to-back Great Recessions experienced by those countries that did not leave the Gold Standard early enough, or protect their bank and credit systems from catastrophic failure.

Regime change and policy mistakes

Can different policy regimes and responses explain different economic outcomes across time and geography?

Though academic debate still rages, we take the view that the scale and speed of money and credit contraction – via the interaction of bank failures and the gold standard rules – can account for most of the difference in outcomes across countries in the 1930s. It also provides a coherent framework for understanding why the 1931 recovery aborted in the USA, leading to the back-to-back Great Recessions shown in Figure 3. More generally, an abrupt and system-wide fall in money and credit availability relative to demand can be thought of as the common feature in our three crises, and policy responses and regimes should be judged on how well they coped with this non-linear shock.

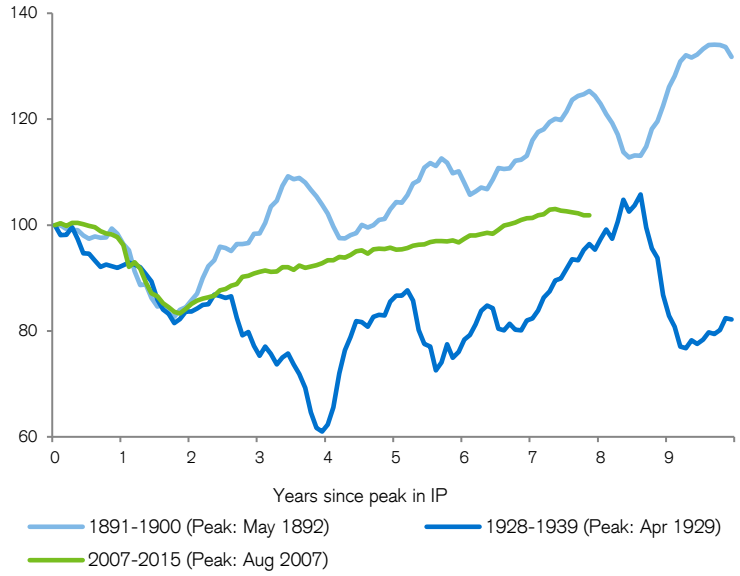
In this regard, it is clear that lessons from the 1930s helped guide the worldwide policy response to the Lehman shock in 2008–09: fiscal policy was eased nearly everywhere and monetary policy focused urgently on preventing bank and financial system failure cascading into a severe monetary contraction. Indeed, this time around, the task of preventing systemic collapse was led by a leading scholar of the Great Depression, who just happened to be Fed Chairman at the time! Other central banks played their part – albeit generally a smaller part – in limiting the impact of the Lehman crisis. Most major governments also used fiscal policy as a stabilizer, but the Chinese credit and fiscal easing program in early 2009 was both very large and implemented very swiftly. Arguably, therefore, it was the US Fed and the Chinese government that really led the global policy response, and contributed most to the recovery in growth and markets after March 2009.

Perversely, this unprecedented global policy response confirms just how systemic and severe the crisis was, how abruptly the demand for cash and safety soared, and how severely the availability of credit and funding liquidity contracted. It is very striking that the resulting falls in US industrial production, corporate earnings and share prices were as large, or larger, than they had been in the 1890s, or in the first half of the Great Depression.

It is also worth noting that, although bank failures were contained and the headline money stock itself did not contract, there was a very large contraction in the "shadow money" stock during

Figure 3

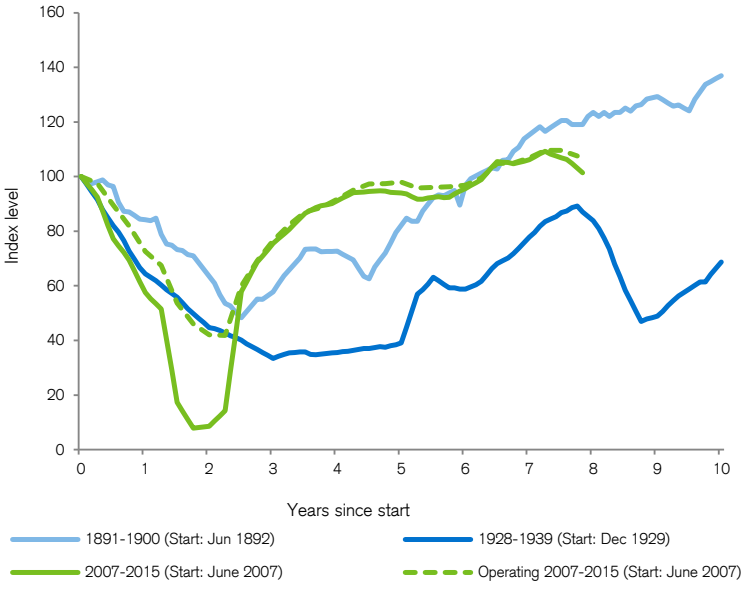
US industrial production since peak in each crisis



Source: Thomson Reuters Datastream; Miron, J. A. and Romer, C. D. 1990; Credit Suisse

Figure 4

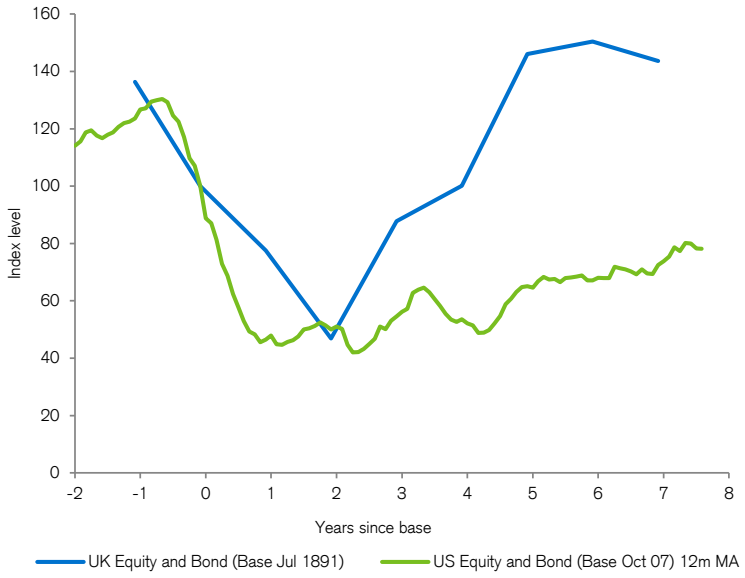
US real corporate earnings (measured from peak in industrial production)



Source: Thomson Reuters Datastream; Shiller, R. J. 2000; S&P Index Analysis; Credit Suisse

Figure 5

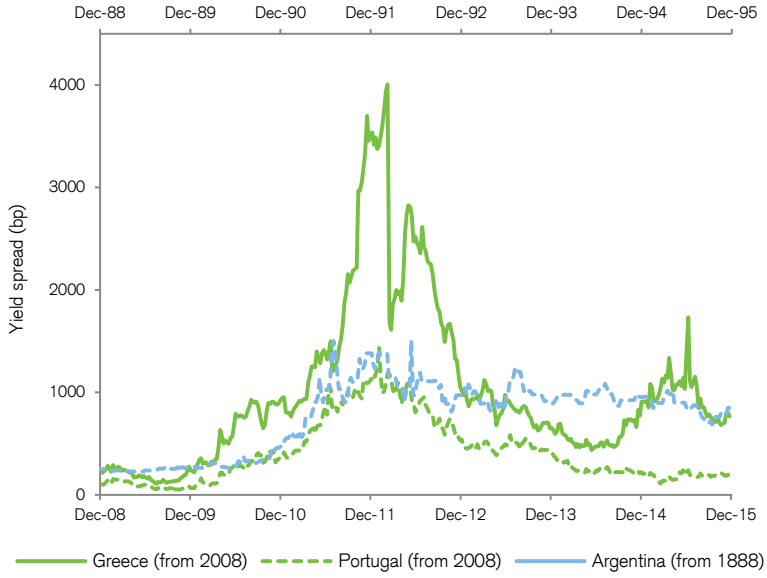
Capital market issuance 1890s vs. US 2007



Source: Thomson Reuters Datastream; Hoffman, C. 1970; Credit Suisse

Figure 6

Latin American and European periphery yield spreads during the 1890s and 2000s*



*Argentina in 1890s: yields above British Consuls. Europe 2008-2015: 10 year yields above German 10 year Bunds.
Source: Mitchener, K. and Claremont, M. 2006; Thomson Reuters Datastream; Credit Suisse

the crisis, as well as in the availability of capital market funding.[2] Based on our estimates, the effective money supply – combining conventional and shadow money – fell by around USD 2 trillion in the crisis (approximately 10%). Figure 5 indicates that US bond and equity market issuance fell nearly as far and fast in 2008–09 as it did in the UK during the 1890s, when Argentina defaulted and Barings Bank had to be bailed out. It also suggests that capital market issuance was slower to recover in the current episode.

Overall, it seems fair to conclude that the initial focus on financial sector stability after Lehman failed helped to prevent an even larger economic downturn. However, as early as late 2009, central bankers began to worry about their exit strategies. And the combination of financial regulation and fiscal policy quickly became contractionary, as fears about private debt unsustainability were replaced by worries over the longer-term solvency of highly indebted governments. So priorities shifted as soon as recovery took visible hold.

At the time, this desire to restore fiscal orthodoxy and build a safer financial system seemed both necessary and urgent. In the event, however, it proved impossible to re-regulate, tighten fiscal policy and normalize interest rates all at the same time. On the contrary, it became necessary to greatly extend the scope of unconventional monetary policy to offset the effect of fiscal and regulatory drag. And the problem of fragile animal spirits in the private sector became even greater when the European Sovereign Debt Crisis escalated sharply in summer 2011.

At this point, peripheral countries in Europe found themselves in much the same situation as if they had been on the Gold Standard, only with even less prospect of exiting! Interestingly, the contagious spread widening in the highly indebted periphery was quite similar to the process in Latin America in the 1890s. The net result was a (very large) pro-cyclical tightening of fiscal policy, just at the moment when capital was flowing out, banks were losing deposits and credit availability was collapsing. In the case of Greece, real GDP fell by 25%, roughly the same amount as it did in the USA or Germany in the 1930s and unemployment soared to Great Depression levels. Other peripheral countries fared less badly than Greece, but still suffered very high unemployment and much larger declines in GDP than the post-World War II norm for recessions.

The main difference with the classical Gold Standard is that the European Central Bank could act as lender of last resort to the whole Eurozone banking system, and did in the end enact quantitative easing in response to accumulating defla-

[2] See "Long Shadows: Collateral Money, Asset Bubbles and Inflation" by Jonathan Wilmot and James Sweeney (2009).

tionary pressure. This has helped narrow sovereign bond spreads and allowed most peripheral yields to fall below nominal GDP growth, improving debt dynamics and partially restoring credit availability.

Fiscal transfers between member states also reduced the speed and scale of the fiscal adjustment that might have been needed otherwise – though possibly not compared to a system in which devaluation and formal default were possible. And in the absence of intra-Eurozone currency adjustment, we have seen a major depreciation of the euro bloc versus the dollar. These changes have seen the Eurozone economic recovery broaden over the past year or so, but did not prevent major financial, economic and political crises occurring in the periphery. Apart from the first oil shock there is little to compare that experience with – except the 1890s or the 1930s. And Greece still defaulted, just as it had done in the aftermath of the 1890s and 1930s shocks.

In summary, policy response and policy regimes do matter. We would argue that allowing large-scale bank failures in the 1930s had intense and cascading effects on output, confidence and credit availability. For the most part, that mistake was not repeated in the current crisis. We would also argue that the Gold Standard rules and the European single currency are ill suited to dealing with large deflationary shocks. Once such a shock occurs, policy makers will be faced with tough choices – get away from the rigid rules and focus on reflation (expand the money stock, devalue, go slowly with fiscal consolidation and regulatory reform) or stick to the rules and deflate.

Rigidity in these circumstances is not a virtue. The Classical Gold Standard did not ultimately survive the Great Depression. And many would argue that the euro will not ultimately survive the current crisis either. Or at least will not survive with all its current members. This line of thought leads to a more general idea of how policy "mistakes" happen – bearing in mind that not all of them need be quite as momentous as the Fed's 1931 decision to raise interest rates and maintain the dollar's parity.

In our view, history suggests that the road to a bad outcome is almost always paved with good intentions and miscalculation, specifically a tendency to underestimate the power of the deflationary dynamic unleashed by a large debt build-up and subsequent systemic shock. Given that there is nothing in living memory to compare with, it is all too easy to underestimate the spike in bank and private sector demand for cash, the size of non-linear credit effects and the many dimensions of international contagion when a shock first hits. And even after recovery begins, it is natural to underplay the residual fragility of private sector animal spirits, and easy to overestimate the prospect of inflation reviving quickly.

Even in the current crisis, this underlying dynamic has been visible – at times exacerbated by political populism – but the impact on the economy and financial markets has so far been mitigated by the ability of the major central banks to respond to each new weakening of growth or increase in financial market volatility with a further round of innovative policy. Will that flexibility persist as the US economy reaches full employment and the Fed moves to gradually normalize policy rates?

Fighting the wrong war?

What about 1937–38? Did the Fed cause the recession when industrial production fell by over 25% and equities fell by 50%?

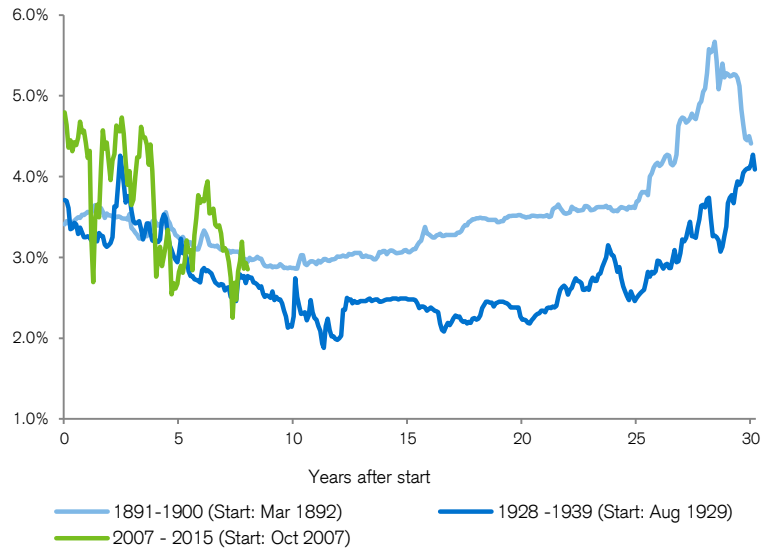
Controversy still rages over the cause(s) of the 1937–38 recession in the USA. The facts are as follows: industrial output troughed after the second Great Recession in March 1933, but then rebounded very strongly in two phases, regaining its 1929 peak around the late summer of 1937. The monetary base had regained its pre-crisis peak by late 1936, and bank excess reserves were well above their pre-crisis levels. Real wages were also rising again – in part due to legislation.

As 1936 wore on, unemployment was falling and the price level growing, but neither unemployment nor prices had returned to anywhere near their pre-crisis levels. Even so, at all levels of government, concern was growing about a return of inflation, an overheated stock market and the effects of so much "excess liquidity" in the system. As a result, policy priorities shifted: the Fed raised bank reserve requirements in three stages beginning in August 1936, the Treasury decided to start sterilizing gold inflows in December 1936, and fiscal policy was tightened somewhat. The monetary base grew almost 60% in the three years to July 1936, stagnated for six months and declined somewhat in 1937. The Treasury reversed its sterilization policy in April 1938.

But by then output had already plunged and the stock market had fallen 50% in just 12 months. Whether it was gold policy and the monetary base, or reserve requirements and the Fed, fiscal policy, the devaluations of the French and Swiss francs in 1936, rising real wages or some combination of all these things may never be clear. Output had risen very rapidly in 1936–37, and it seems likely that excess inventories had built up in the system, making the economy more vulnerable to an accumulation of small shocks to expectations and confidence. Given how fresh the traumas of 1929–33 were at the time, credit availability, investor risk appetite and corporate animal spirits were perhaps more sensitive to the shift in policy tone than could easily have been foreseen.

Figure 7

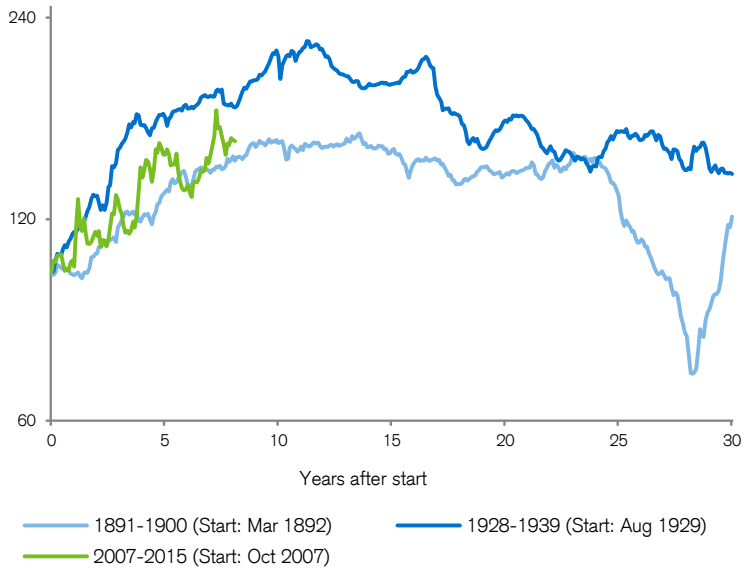
US nominal bond yields – longer recovery (from peak in equity returns)



Source: Thomson Reuters Datastream; Credit Suisse

Figure 8

US real bond returns – longer recovery (log scale, from peak in equity returns)



Source: Thomson Reuters Datastream, Credit Suisse

One should not over-stress the analogies with today, in part because the economy is more diversified and less cyclical than it used to be. And yet there are certainly a few parallels worth noting. Perhaps the most obvious one is that inflation has undershot the Fed's target for some years now; it hardly seems urgent to take precautions against it rising modestly over the next year or two. Others include the fact that the monetary base grew by 50% from November 2012 to July 2014, but has since gone sideways to downward slightly; that excess inventories in manufacturing clearly built up in the 2013–14 period, and that the dollar has appreciated sharply over the past 18 months.

Not to mention that recent equity market volatility, oil sector disruption, events in the high yield market and concerns over China are hardly signaling to corporate leaders that all is right with the world. One could add that the next stage of bank regulation – the shift to the Net Stable Funding Ratio will be implemented over the next two years. But there are also important differences, including the fact that fiscal policy will be easing rather than tightening this year, that inventories are already coming down in some sectors, and that lower oil prices are still a net benefit to the economy.

We draw three simple conclusions. First, history warns us not to take recovery for granted in the aftermath of major financial shocks. We should also not take it for granted that the Fed will succeed in normalizing rates in a straight line. Second, US monetary conditions measured more broadly have tightened considerably over the past two years. It is in the early stages of attempting to raise rates after a long period at zero that one might expect the greatest risk of unintended, potentially non-linear effects on growth, financial markets and inflation expectations. This may be why the futures markets stubbornly refuse to price in rate hikes that match the median Fed interest rate dots. Given the historical precedents, it will make sense to price in faster rate hikes only if (global) growth and financial stability hold up in response to the first hike or two.

Third, the current composition of the Federal Open Market Committee suggests that the actual path of rate hikes will indeed be data dependent – and probably not insensitive to what is happening in global markets. That reduces the risk of persisting in tightening policy should growth and inflation disappoint, or financial instability escalate. It also suggests that the markets themselves will quite quickly price in faster rate hikes if two conditions are met: oil prices stabilize and (global) output growth re-accelerates.

Bond and equity returns

How similar is the pattern of bond and equity returns across our three crises?

For the USA, the broad path of both bond and equity returns has been surprisingly similar, once allowance is made for the "double" Great Recession of the 1930s. For example, US nominal bond yields in this cycle have quite closely mirrored the earlier cycles, though in a much more volatile fashion. And real bond returns lie somewhere in between – see Figures 7 and 8. Looking only at the periods of recovery, the historical echoes are in some ways even more impressive.

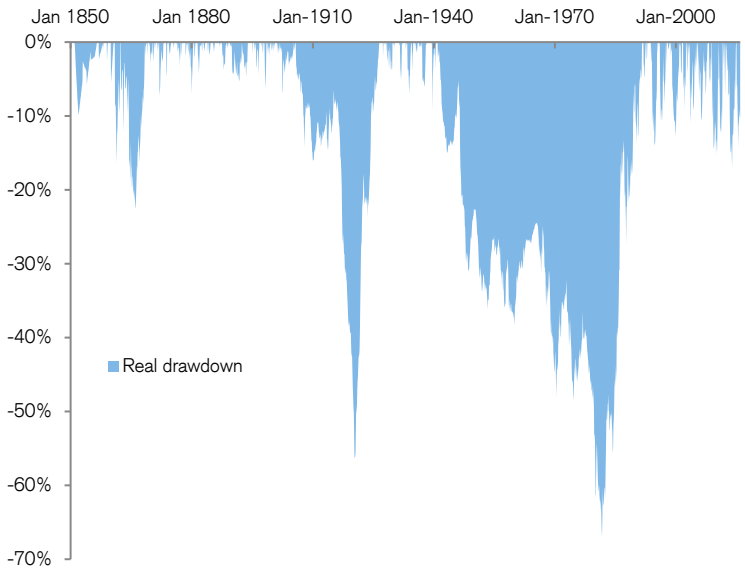
Nominal GDP growth averaged 3.6% per annum over the first 6½ years of this recovery, versus 4.2% per annum in the corresponding period of the 1890s cycle. Meanwhile, inflation was essentially zero in the earlier period: so real growth and real yields were roughly twice as high in the 1890s recovery as in the current one. And just like the current episode, nominal yields were on average 1% below nominal GDP growth (Table 1). It is also striking that nominal bond yields trended downward for some ten years after the 1890s crisis, and for nearly 12 years after the 1929 equity market peak. In other words, nominal yields fell on trend for a long time – and for several years after economic recovery began. This is another way of saying that large deflationary shocks reduce equilibrium real interest rates significantly, and that the effect seems to last a long time.

Meanwhile, the UK experience was quite similar following the 1890s crisis, and slightly less so in the 1930s. Nominal yields were around 4.60% in 1928, and still only 3.4% a decade later, having been as low as 2.9% in 1935–36. The big difference in the two countries, however, was that UK yields fell sharply following the 1931 devaluation and the resumption of gold inflows to the UK. US yields, by contrast, declined most after the policy "mistakes" of 1937 helped tip the economy into recession, and the Treasury ended its policy of sterilization. That is also the point at which the biggest divergences arose between the post-1890s crisis experience in the USA and the 1930s. Taken literally, we are just now at a fork in the road, when either yields start to flatten out (1890s scenario) or the economy goes straight back into recession. In that case, far from raising rates 3–4 times in 2016, the Fed might find itself doing another round of quantitative easing, and contemplating the introduction of negative policy rates.

The other key message from Figures 7 and 8 is the length of time the secular bear market took once yields finally bottomed out. US yields started to trend (gently) higher in the early 1900s, and kept trending higher for about 20 years, with the climax coming just after World War I. That was broadly true in the UK too. After the Great Depression, World War II meant that bond yields were kept artificially low for several years, and it was not until 1945–47 that yields started trending higher again. In this case, it took some 35 years before yields peaked!

Figure 9

US inflation-adjusted long-bond drawdown from peak



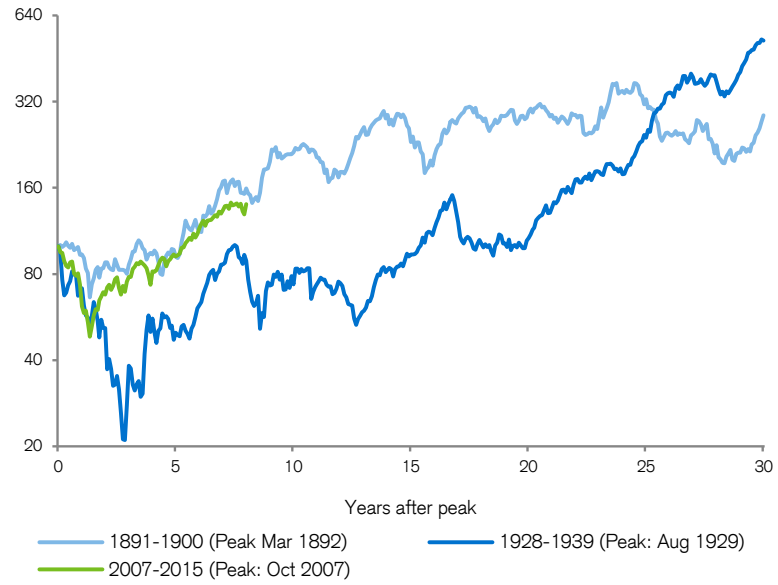
Source: Thomson Reuters Datastream, Credit Suisse

The cumulative loss of wealth from investing in US government bonds was very large indeed. In real terms, US investors suffered a "drawdown" of some 50% over 20 years (1900–20) and of some 65% over 40 years (1941–81). The corresponding figures for the UK are even higher, and contrast strongly with the real returns of over 6% per annum that bond investors have enjoyed over the last 35 years. When it comes to equity returns, there is obviously a major difference between the 1930s and the 1890s – real equity returns fell much further and troughed much later in the 1930s crisis. Equally, output, profits and equity returns bounced back far more strongly in the 1930s than in the other two episodes: until 1937 that is.

By contrast, the match between equity performance in the current cycle and the 1890s episode is uncannily close. At the end of 2015, over eight years from the 2007 peak, real equity returns were less than 5% below the corresponding point in the 1890s cycle (Figure 10). In terms of US equities relative to bonds, the current position is almost an exact match with the 1890s episode (Figure 12). By definition, the same uncanny symmetry would apply to a balanced portfolio.

Figure 10

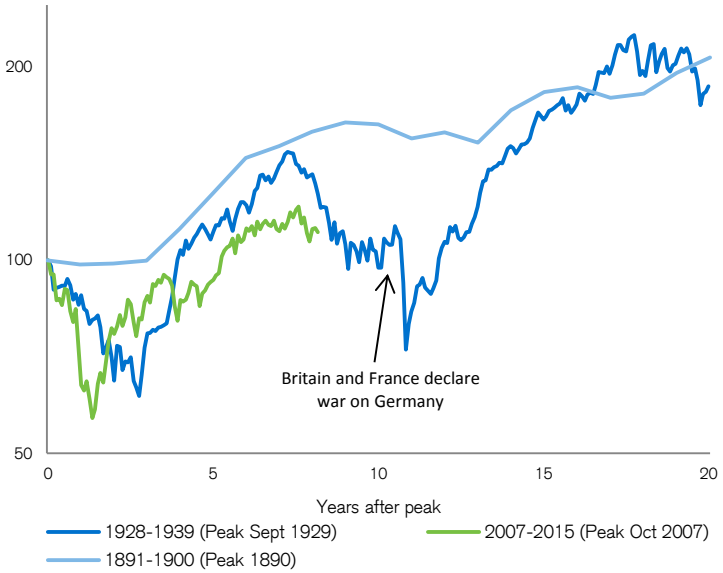
US real equity returns – long recovery (log scale)



Source: Thomson Reuters Datastream, Credit Suisse

Figure 11

UK real equity returns – long recovery (log scale)



Source: Dimson-Marsh-Staunton (DMS) database; Grossman, R. 2002; Thomson Reuters Datastream; Credit Suisse

Of course that might be about to change. Should the 1890s parallel hold up, 2016 would see strong returns for (global) equities after a couple more months of sideways volatility (it is worth noting here that the Credit Suisse Global Investor Risk Appetite Index is quite deep in the panic zone at the time of writing). A 1937-style policy mistake would take us down a very different path. Even so, it flags the possibility that equities could fall 20%–30% in the first half of the year before rallying even more strongly in the second – if and when Fed policy reverses course.

A detailed crisis comparison for the UK is more difficult since there is no credible monthly series for equity returns before 1900. Still, the annual returns data compiled by Grossman suggest that the early 1890s bear market was shallow (perhaps because the Bank of England did not allow Barings to fail) and the subsequent recovery was a strong one as loanable funds financed a domestic investment boom (rather than speculative investments abroad, as had been the case in the 1880s). And, unlike the USA, the UK pattern of returns over the current crisis is quite similar to the 1930s – slightly weaker in fact. On the one hand, this reflects the decision to leave the gold standard in 1931, which greatly reduced the impact of the Great Depression on the economy and profits, and on the other hand, it probably reflects the high exposure to banks and commodity producers within the contemporary UK equity market.

When bonds aren't bonds anymore

Figure 12 and Table 1 illustrate what we think is the main lesson to be drawn from comparing crises, which is that great financial shocks in the end beget, not secular stagnation, but secular reflation. By secular reflation, we mean at least a decade in which short- and long-term interest rates stay habitually below nominal GDP growth and high grade bonds are not really bonds anymore: delivering trend returns that are close to zero or even negative.

Reflation is essentially a structural subsidy from savers to borrowers, and normally favors equities over bonds. After both previous major crises – when private and public debt levels were relatively high – slower debt growth, selective debt restructuring and a long period of reflation have been the solution. Given current demographics, one can probably add to that various types of soft default as governments gradually renege on some of their healthcare and retirement promises.

From Table 1, it seems that the first 7–8 years of recovery after a major crisis tend to deliver above-average returns for both bonds and stocks. This is a logical outcome when equities start at very cheap valuations, and equilibrium (real) bond yields are trending down. Investment in these circumstances needs to be little more than

Table 1

Recovery periods: US yields, growth, inflation and asset prices

	1893–1900	1900–1910	1910–1930		1932–1939	1939–1949	1949–1969		2009–2015
Nominal yields	3.2%	3.1%	3.9%		2.8%	2.3%	3.8%		2.6%*
Nominal GDP	4.2%	5.0%	5.2%		6.7%	11.3%	6.8%		3.6%**
Yield gap	-1.0%	-1.8%	-1.3%		-3.8%	-9.0%	-3.0%		-0.9%**
Real bond returns (CAGR)	6.1%	-0.8%	2.1%		5.5%	-2.4%	-1.1%		4.6%*
Real equity returns (CAGR)	11.9%	5.7%	7.0%		19.1%	3.2%	12.1%		16.7%*
Real GDP	4.1%	2.4%	2.6%		5.7%	5.6%	4.4%		2.1%**
Inflation	0.1%	2.5%	2.5%		0.8%	5.4%	2.4%		1.5%**

* End February 2009 to end December 2015
** End February 2009 to end September 2015
CAGR=Compound Annual Growth Rate.
Source: Thomson Reuters Datastream, Credit Suisse

efficient diversification. Over the following decade, however, the tendency is for bond and stock returns to be much lower. From 1900 to 1910, that meant minus 1% p.a. for real bond returns and 6% p.a. for real equity returns. From 1939 to 1949 (including the impact of World War II), real returns were around minus 2% p.a. for bonds and plus 3% p.a. for equities. Looking forward, we think zero real returns for bonds and 4%–6% for equities would be a good working assumption, with trend returns on a typical mixed portfolio of bonds and stocks down to only 1%–3% p.a. from around 10% p.a. over the past seven years.

This is not to rule out another equity bubble, as robots become the new reserve army of labor and technology companies increasingly disrupt banking, autos, energy, retailing and parts of healthcare. But the more sober assumption is that real equity returns will about match their long-term average, or do slightly worse over the next decade or two. This is not an attractive prospect for savers, or fund managers. Efficient diversification will not be enough to earn good returns; even very well established track records will provide a less reliable guide to future performance; and bond managers will probably have to stray far from their comfort zone to deliver even modestly positive real returns.

For savers, particularly retiring baby boomers, ultra-low yields are little short of disastrous, especially given that a 100% allocation to bonds or annuities is the default option for retirees. More generally, the prospect of a decade or more of zero real returns on "safe" bonds poses a huge structural challenge to the fund management industry. Up until now, the investor response has been to move up the risk spectrum within fixed income, by increasing exposure to riskier credit and more illiquid investments, but this approach may be nearing its limits.

More exposure to equities with some form of drawdown or downside volatility control is likely to be one growing trend. In a world of diminished beta, necessity will likely drive a renewed search for alpha. This could, for example, take the form of thoughtful approaches to more active management of equity, credit and duration risk, the incorporation of factor investing and alternative risk premia into multi-asset portfolios, or the greater use of (big-data-driven) quantitative approaches to security selection and portfolio construction.

Paradoxically, as the fashion for passive investing sweeps the world, the potential benefits of high quality active investment are about to increase enormously.

Figure 12

US long-term equity-to-bond return ratio – recovery since crisis

Source: Thomson Reuters Datastream, Credit Suisse

PHOTO: GIBSONPICTURES / ISTOCKPHOTO.COM

All markets

Country profiles

The coverage of the Credit Suisse Global Investment Returns Yearbook comprises 23 countries and three regions, all with index series that start in 1900. Three countries were added in 2013 (Austria, now with a 116-year record, plus Russia and China, which have a gap in their financial market histories from the start of their communist régimes until securities trading recommenced) and one more in 2014 (Portugal, with a 116-year record). There is a 23-country world region, a 22-country world ex-US region, and a 16-country European region. For each region, there are stock and bond indices measured in USD and weighted by equity market capitalization and gross domestic product (GDP), respectively.

Figure 1 shows the relative market capitalizations of world equity markets at our base date of end-1899. Figure 2 shows how they had changed by end-2014. Markets that are not included in the Yearbook dataset are colored yellow. As these pie charts show, the Yearbook covered 98% of the world equity market in 1900 and 92% at end-2015.

In the country pages that follow, there are three charts for each country or region with an unbroken history. The upper chart reports the cumulative real value of an initial investment in equities, long-term government bonds and Treasury bills, with income reinvested for the last 116 years. The middle chart reports the annualized real returns on equities, bonds and bills over this century, the last 50 years, and since 1900. The bottom chart reports the annualized premia achieved by equities relative to bonds and bills, by bonds relative to bills, and by the real exchange rate relative to the US dollar for the latter two periods.

Countries are listed alphabetically, starting on the next page, and followed by three regional groups. Extensive additional information is available in the Credit Suisse Global Investment Returns Sourcebook 2016. This hard-copy reference book of over 220 pages, which is available through London Business School, also contains bibliographic information on the data sources for each country. The underlying annual returns data are redistributed by Morningstar Inc.

The Yearbook's global coverage

The Yearbook contains annual returns on stocks, bonds, bills, inflation, and currencies for 23 countries from 1900 to 2015. The countries comprise two North American nations (Canada and the USA), ten Eurozone states (Austria, Belgium, Finland, France, Germany, Ireland, Italy, the Netherlands, Portugal, and Spain), six European markets that are outside the euro area (Denmark, Norway, Russia, Sweden, Switzerland and the UK), four Asia-Pacific countries (Australia, China, Japan and New Zealand) and one African market (South Africa). These countries covered 98% of the global stock market in 1900 and 92% of its market capitalization by the start of 2016.

Figure 1

Relative sizes of world stock markets, end-1899

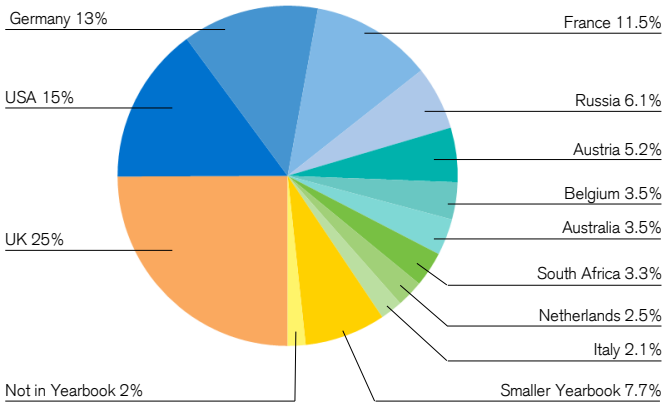
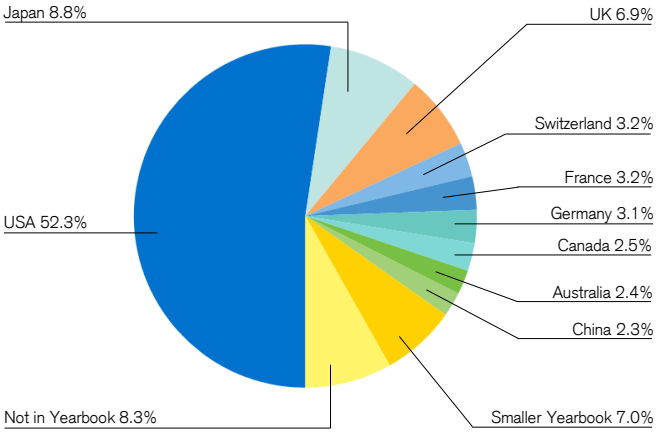


Figure 2

Relative sizes of world stock markets, end-2015



Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2016.

Data sources

1. Dimson, E., P. R. Marsh and M. Staunton, 2002, Triumph of the Optimists, NJ: Princeton University Press
2. Dimson, E., P. R. Marsh and M. Staunton, 2007, The worldwide equity premium: a smaller puzzle, R Mehra (Ed.) The Handbook of the Equity Risk Premium, Amsterdam: Elsevier
3. Dimson, E., P. R. Marsh and M. Staunton, 2016, Credit Suisse Global Investment Returns Sourcebook 2016, Zurich: Credit Suisse Research Institute
4. Dimson, E., P. R. Marsh and M. Staunton, 2016, The Dimson-Marsh-Staunton (DMS) Global Investment Returns Database, Morningstar Inc.

Selected data sources for each country are listed in the country profiles below. Detailed attributions, references, and acknowledgements are in the Sourcebook (reference 3).

Australia

The lucky country

Australia is often described as "The Lucky Country" with reference to its natural resources, weather, and distance from problems elsewhere in the world. But maybe Australians make their own luck.

A large part of the Australian economy is made up of services, which represent three-quarters of GDP. With a strong banking system, the country was relatively untouched by the Global Financial Crisis, and was supported by strong demand for resources from China and other Asian nations. Australia is now confronting the implications of falling global commodity prices.

Whether it is down to economic management, a resource advantage or a generous spirit, Australia has in real terms been the second-best performing equity market over the past 116 years. Since 1900, the Australian stock market has achieved an annualized real return of 6.7% per year.

The Australian Securities Exchange (ASX) has its origins in six separate exchanges, established as early as 1861 in Melbourne and 1871 in Sydney, well before the federation of the Australian colonies formed the Commonwealth of Australia in 1901.

Among all the countries covered by the FTSE World index, Australia has the eighth-largest capitalization. Almost half the FTSE Australia index is represented by banks (36%) and basic materials (10%, mostly mining). The largest stocks at the start of 2016 were Commonwealth Bank of Australia (12% of the index) and Westpac Banking Corporation (9%).They are followed by Australia & New Zealand Banking Group and National Australia Bank (both 7%), plus BHP Billiton, CSL and Wesfarmers (each 4%–5%),

Australia also has a significant government and corporate bond market, and is home to the largest financial futures and options exchange in the Asia-Pacific region.

Capital market returns for Australia

Figure 1 shows that, over the last 116 years, the real value of equities, with income reinvested, grew by a factor of 1948 compared to 6.8 for bonds and 2.2 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 6.7%, bonds 1.7%, and bills 0.7%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 6.0%. For additional explanations of these figures, see page 37.

Figure 1

Cumulative real returns from 1900 to 2015

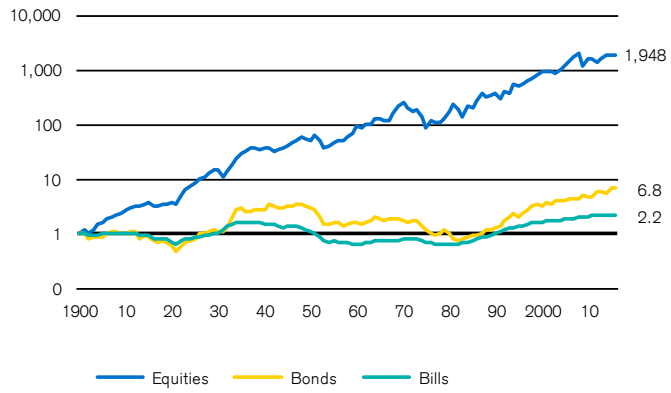


Figure 2

Annualized real returns on major asset classes (%)

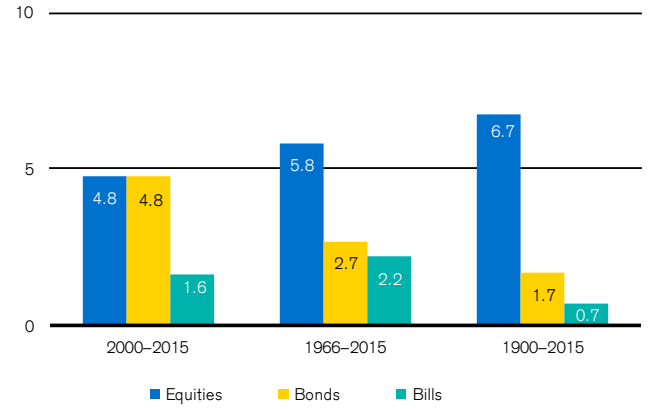
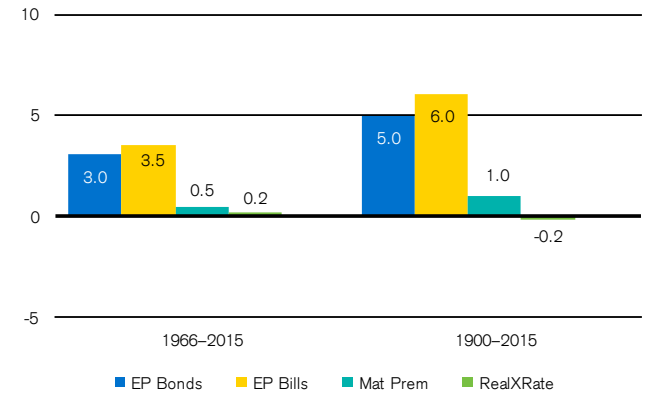


Figure 3

Annualized equity, bond, and currency premia (%)



Note: EP Bonds denotes the equity premium relative to long-term government bonds; EP Bills denotes the equity premium relative to Treasury bills; Mat Prem denotes the maturity premium for government bond returns relative to bill returns; and RealXRate denotes the real (inflation-adjusted) change in the exchange rate against the US dollar.

Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2016

Austria

Best country to be born in

Austria ranks top in the 2015 Family Life Index, an InterNations survey that reports the best places in the world to bring up children. The Economist Intelligence Unit, in a study of 80 countries, reports that Austria is the best country in which to be born today. But what were the origins of the best place to be born?

The Austrian Empire was re-formed in the 19th century into Austria-Hungary, which, by 1900, was the second-largest country in Europe. It comprised modern-day Austria, Bosnia-Herzegovina, Croatia, Czech Republic, Hungary, Slovakia, Slovenia; large parts of Romania and Serbia; and small parts of Italy, Montenegro, Poland, and Ukraine. At the end of World War I and the break-up of the Habsburg Empire, the first Austrian republic was established. Although Austria did not pay reparations after World War I, the country suffered hyperinflation during 1921–22. In 1938, Austria was annexed by Germany and ceased to exist as an independent country until after World War II. In 1955, Austria became a self-governing sovereign state again, and was admitted as a member of the European Union in 1995, and of the Eurozone in 1999. Today, Austria is prosperous, enjoying a high per capita GDP.

Bonds were traded on the Wiener Börse from 1771 and shares from 1818 onward. Trading was interrupted by the world wars and, after the stock exchange reopened in 1948, share trading was sluggish and there was not a single IPO in the 1960s or 1970s. The Exchange's activity expanded from the mid-1980s onward, building on Austria's gateway to Eastern Europe. Still, over the last 116 years, real stock market returns (0.7% per year) have been lower for Austria than for any other country with a record from 1900 to date.

Financials represent half (51%) of the FTSE Austria index. At the start of 2016, the largest Austrian company was Erste Group Bank (39% of the index), followed by OMV, Voestalpine, and Andritz.

Capital market returns for Austria

Figure 1 shows that, over the last 116 years, the real value of equities, with income reinvested, grew by a factor of 2.1 compared to 0.0112 for bonds and 0.0001 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 0.7%, bonds –3.8%, and bills –8.0%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 5.5%. For additional explanations of these figures, see page 37.

Figure 1

Cumulative real returns from 1900 to 2015

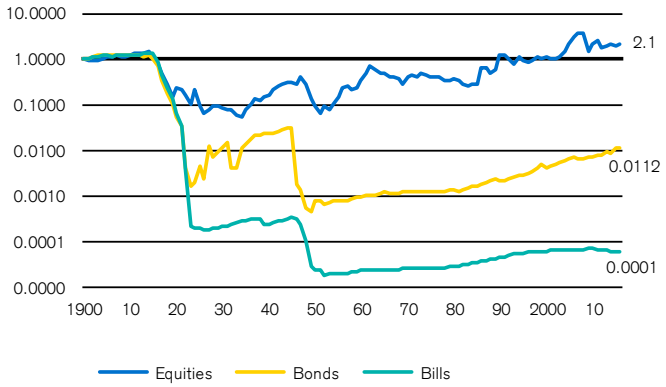


Figure 2

Annualized real returns on major asset classes (%)

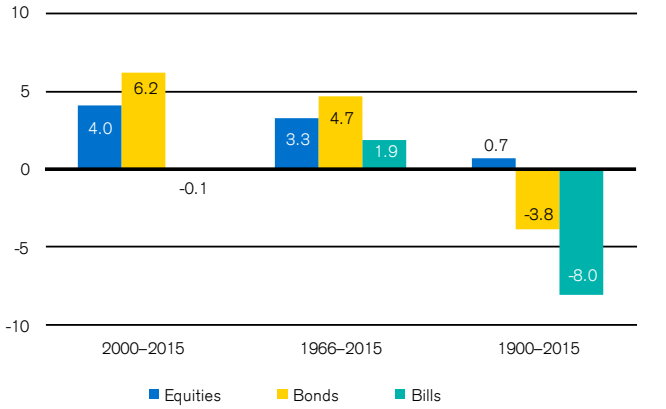
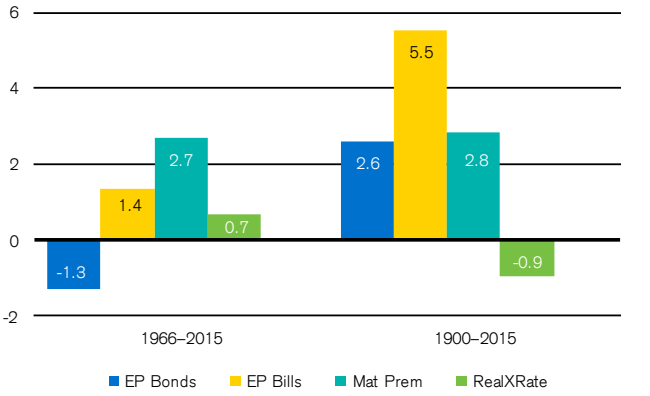


Figure 3

Annualized equity, bond, and currency premia (%)



Note: EP Bonds denotes the equity premium relative to long-term government bonds; EP Bills denotes the equity premium relative to Treasury bills; Mat Prem denotes the maturity premium for government bond returns relative to bill returns; and RealXRate denotes the real (inflation-adjusted) change in the exchange rate against the US dollar.

Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2016

Belgium

At the heart of Europe

Belgium is at the center of Europe. It is home to the diamond capital of the world and is the producer of more beer per capita than any other country. Providing the headquarters of the European Union, Belgium has been ranked the most globalized of the 181 nations in the KOF Globalization Index.

Belgium's strategic location has been a mixed blessing, making it a major battleground in international wars, including the Battle of Waterloo, 200 years ago, and the two world wars of the 20th century. The ravages of war and attendant high inflation rates are an important contributory factor to its poor long-run investment returns – Belgium has been one of the three worst-performing equity markets and the seventh worst-performing bond market out of all those with a complete history. Its equity risk premium over 116 years was the lowest of the Yearbook countries when measured relative to bills, and fifth-lowest measured relative to bonds.

The Brussels Stock Exchange was established in 1801 under French Napoleonic rule. Brussels rapidly grew into a major financial center, specializing in the early 20th century in tramways and urban transport.

Its importance has gradually declined, and what became Euronext Brussels suffered badly during the banking crisis. Three large banks made up a majority of its market capitalization at the start of 2008, but the banking sector now represents less than 10% of the FTSE Belgium index. By the start of 2016, most of the index (56%) was invested in just one company, Anheuser-Busch InBev, the leading global brewer and one of the world's top five consumer products companies.

The Belgian data draws on work by Annaert, Buelens and Deloof (2015), whom we cite in the Credit Suisse Global Investment Returns Sourcebook 2016.

Capital market returns for Belgium

Figure 1 shows that, over the last 116 years, the real value of equities, with income reinvested, grew by a factor of 24 compared to 1.6 for bonds and 0.7 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 2.8%, bonds 0.4%, and bills –0.3%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 3.1%. For additional explanations of these figures, see page 37.

Figure 1

Cumulative real returns from 1900 to 2015

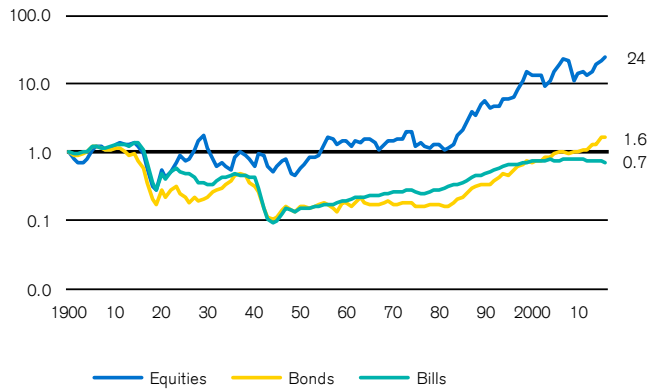


Figure 2

Annualized real returns on major asset classes (%)

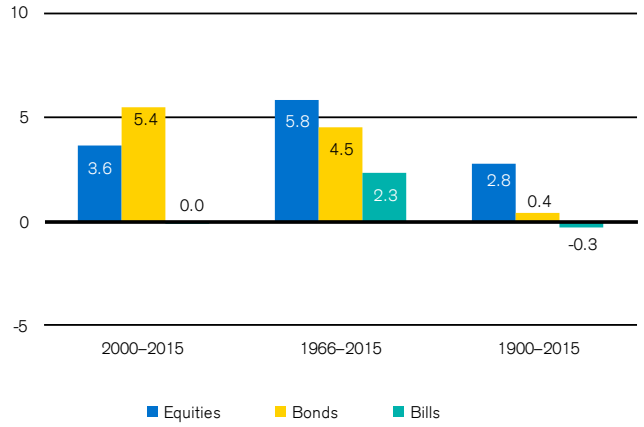
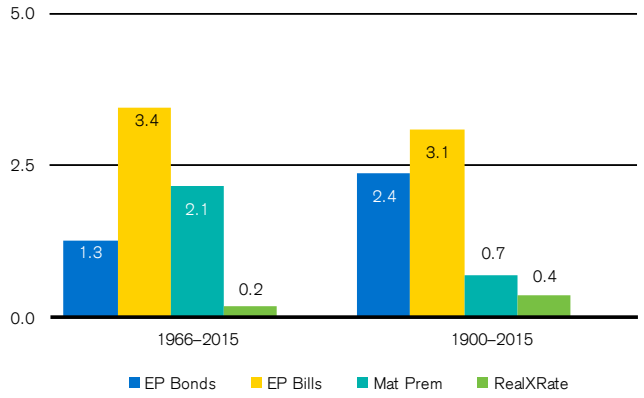


Figure 3

Annualized equity, bond, and currency premia (%)



Note: EP Bonds denotes the equity premium relative to long-term government bonds; EP Bills denotes the equity premium relative to Treasury bills; Mat Prem denotes the maturity premium for government bond returns relative to bill returns; and RealXRate denotes the real (inflation-adjusted) change in the exchange rate against the US dollar.

Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2016

Canada

Resourceful country

Canada is the "most admired" country, according to the 2015 Reputation Institute's survey of 48,000 international respondents. It is regarded as the most reputable nation worldwide, based on a variety of environmental, political, and economic factors.

Canada is the world's second-largest country by land mass (after Russia), and its economy is the tenth-largest. As a brand, it is rated number two out of all the countries monitored in the Country Brand Index. It is blessed with natural resources, having the world's second-largest oil reserves, while its mines are leading producers of nickel, gold, diamonds, uranium and lead. It is also a major exporter of soft commodities, especially grains and wheat, as well as lumber, pulp and paper.

The Canadian equity market dates back to the opening of the Toronto Stock Exchange in 1861 and – as can be seen in the pie chart on the first page of the country profiles section of this report – it is now the world's sixth-largest stock market by capitalization. Canada's bond market also ranks among the world's top ten.

Nearly half (45%) of the market capitalization of the FTSE Canada index is accounted for by financials, predominantly banks (31%). Given Canada's natural resource endowment, it is no surprise that oil and gas has an 18% weighting, with a further 4% in mining stocks. The largest stocks are currently Royal Bank of Canada, Toronto-Dominion Bank, Bank of Nova Scotia, Canadian National Railway, and Suncor Energy.

Canadian equities have performed well over the long run, with a real return of 5.6% per year. The real return on bonds has been 2.3% per year. These figures are close to those we report for the United States.

Capital market returns for Canada

Figure 1 shows that, over the last 116 years, the real value of equities, with income reinvested, grew by a factor of 573 compared to 13.3 for bonds and 5.6 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 5.6%, bonds 2.3%, and bills 1.5%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 4.1%. For additional explanations of these figures, see page 37.

Figure 1

Cumulative real returns from 1900 to 2015

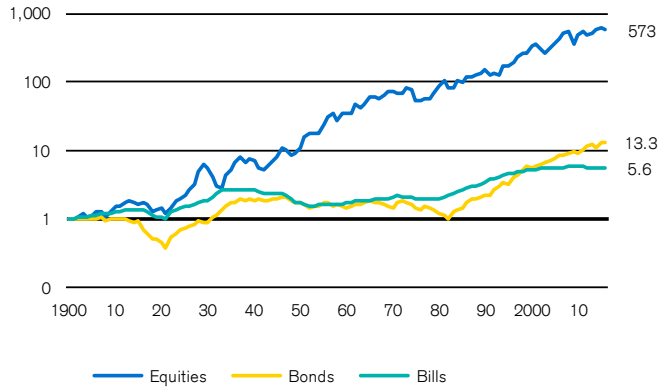


Figure 2

Annualized real returns on major asset classes (%)

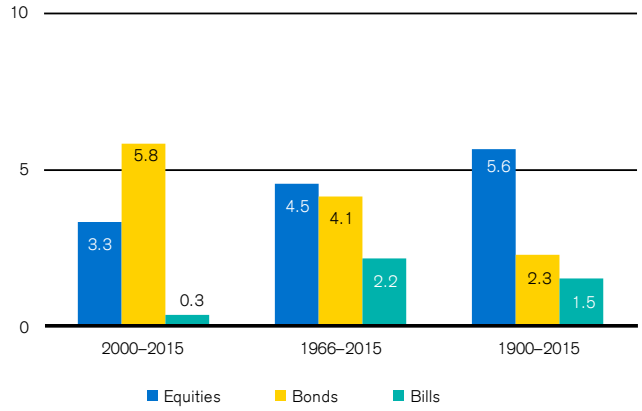
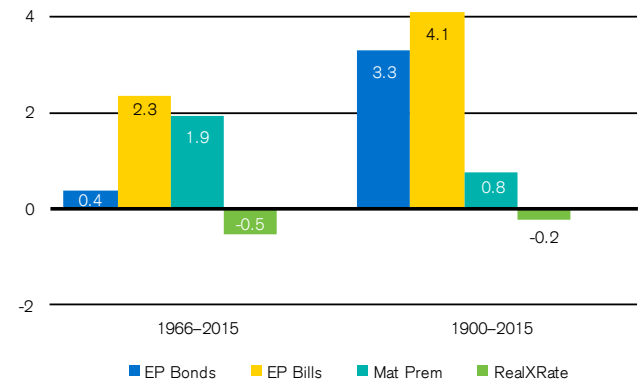


Figure 3

Annualized equity, bond, and currency premia (%)



Note: EP Bonds denotes the equity premium relative to long-term government bonds; EP Bills denotes the equity premium relative to Treasury bills; Mat Prem denotes the maturity premium for government bond returns relative to bill returns; and RealXRate denotes the real (inflation-adjusted) change in the exchange rate against the US dollar.

Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2016

China

The biggest economy

Despite recent wobbles, China's economic expansion has had a big cumulative impact. Measured in international dollars, China now has the world's largest GDP according to the International Monetary Fund, the United Nations, and the CIA World Factbook. BrandFinance now rates the brand value of China as second only to the USA. The world's most populous country, China has over 1.3 billion inhabitants, and more millionaires and billionaires than any country other than the United States.

After the Qing Dynasty, it became the Republic of China (ROC) in 1911. The ROC nationalists lost control of the mainland at the end of the 1946–49 civil war, after which their jurisdiction was limited to Taiwan and a few islands. Following the communist victory in 1949, privately owned assets were expropriated and government debt was repudiated. The People's Republic of China (PRC) has been a single-party state since then. We therefore distinguish between (1) the Qing period and the ROC, (2) the PRC until economic reforms were introduced, and (3) the modern period following the second stage of China's economic reforms of the late 1980s and early 1990s.

The communist takeover generated total losses for local investors, although a minuscule proportion of foreign assets retained some value (some UK bondholders received a tiny settlement in 1987). Chinese returns from 1900 are incorporated into the world and world ex-US indices, including the total losses in the late 1940s.

As discussed in the 2014 Yearbook, China's GDP growth was not accompanied by superior investment returns. Nearly half (42%) of the Chinese market's free-float investible capitalization is represented by financials, mainly banks and insurers. Tencent Holdings is the biggest holding in the FTSE World China index, followed by China Mobile, China Construction Bank, Industrial and Commercial Bank of China.

Capital market returns for China

In addition to the performance from 1900 to the 1940s, Figure 1 shows that, over 1993-2015, the real value of equities, with income reinvested, grew by a factor of 0.5 compared to 1.5 for bonds and 1.1 for bills. Figure 2 displays the annualized real returns from 1993–2015, with equities giving –3.3%, bonds 1.9%, and bills 0.6%. Figure 3 expresses the annualized real returns as premia. Since 1993, the annualized equity risk premium relative to bills has been –3.8%. For additional explanations, see page 37.

Figure 1

Cumulative real returns from 1900 to 2015

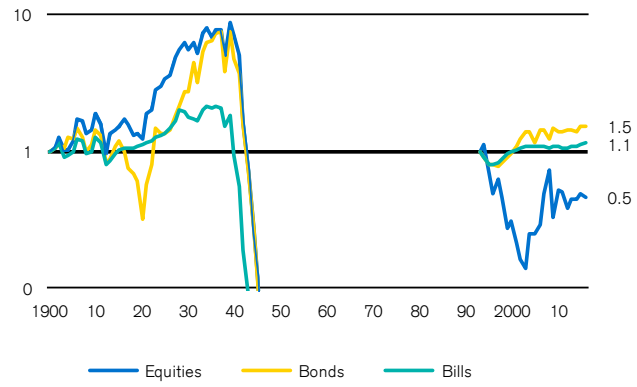


Figure 2

Annualized real returns on major asset classes (%)

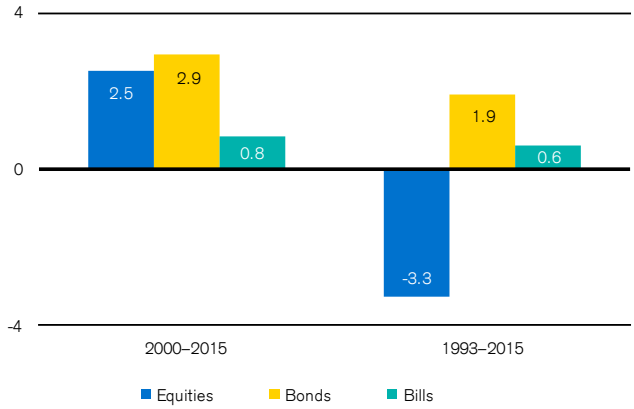
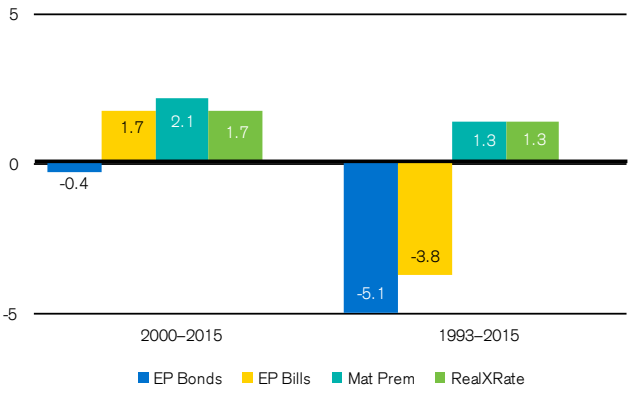


Figure 3

Annualized equity, bond, and currency premia (%)



Note: EP Bonds denotes the equity premium relative to long-term government bonds; EP Bills denotes the equity premium relative to Treasury bills; Mat Prem denotes the maturity premium for government bond returns relative to bill returns; and RealXRate denotes the real (inflation-adjusted) change in the exchange rate against the US dollar.

Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2016

Denmark

Nation of peace

The Global Peace Index 2015 rates Denmark as the most peaceful Yearbook country. According to Transparency International's corruption perceptions index, Denmark is rated as the least corrupt country in the world. There are doubtless cultural and social features of the country that contribute to its quality of life, but it also seems that Danish citizens find their country's social democratic policy to be to their liking.

The unified kingdom of Denmark had emerged in the eighth century, and an absolute monarchy that had begun in 1660 came to an end in 1849 when the country's constitution was signed. In the early 20th century, Denmark adopted a welfare state model. It became a member of the European Union in 1973, but retained its own currency. Whatever the source of Denmark's contentment, it does not appear to spring from outstanding equity returns. Since 1900, Danish equities have given an annualized real return of 5.5%, which is close to the performance of the world index.

In contrast, Danish bonds gave an annualized real return of 3.2%, the highest among the Yearbook countries. This is because our Danish bond returns, unlike those for other Yearbook countries, include an element of credit risk. The returns are taken from a study by Claus Parum (see the reference list in the accompanying Credit Suisse Global Investment Returns Sourcebook 2016), who felt it was more appropriate to use mortgage bonds, rather than more thinly traded government bonds.

The Copenhagen Stock Exchange was formally established in 1808, but traces its roots back to the late 17th century. The Danish equity market is relatively small. The FTSE Denmark index has a high weighting in healthcare (59%) and industrials (12%). Nearly one half (45%) of the Danish equity market is represented by one company, Novo-Nordisk. Other large companies include Danske Bank and AP Møller-Mærsk.

Capital market returns for Denmark

Figure 1 shows that, over the last 116 years, the real value of equities, with income reinvested, grew by a factor of 518 compared to 39.1 for bonds and 10.9 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 5.5%, bonds 3.2%, and bills 2.1%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 3.4%. For additional explanations of these figures, see page 37.

Figure 1

Cumulative real returns from 1900 to 2015

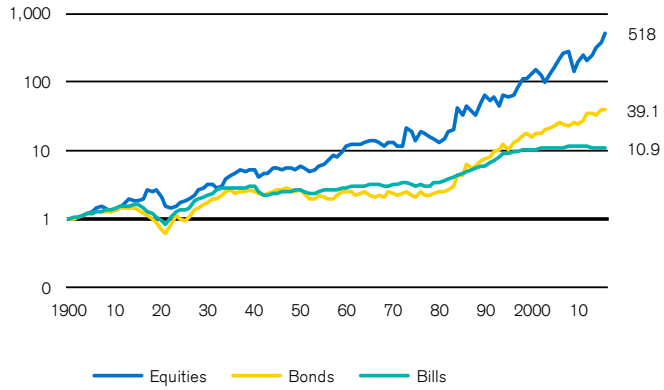


Figure 2

Annualized real returns on major asset classes (%)

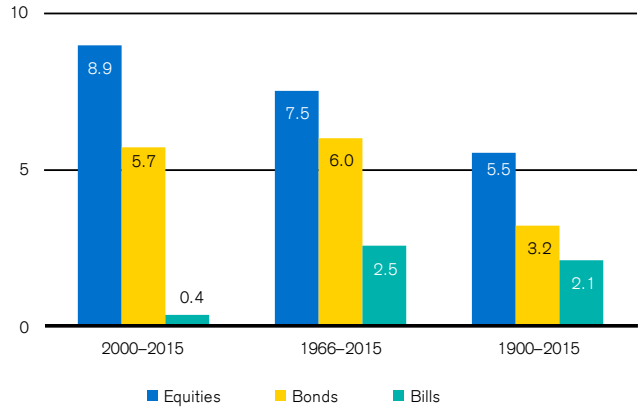
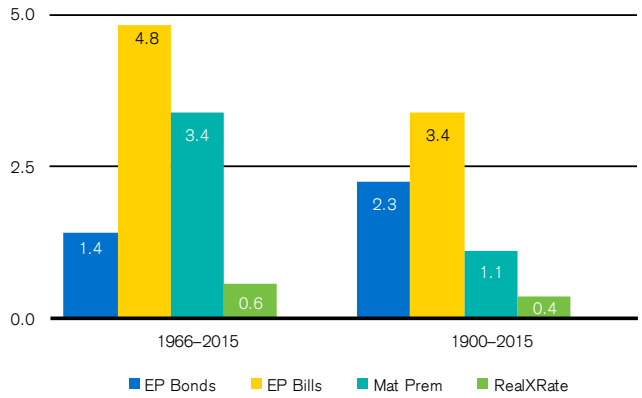


Figure 3

Annualized equity, bond, and currency premia (%)



Note: EP Bonds denotes the equity premium relative to long-term government bonds; EP Bills denotes the equity premium relative to Treasury bills; Mat Prem denotes the maturity premium for government bond returns relative to bill returns; and RealXRate denotes the real (inflation-adjusted) change in the exchange rate against the US dollar.

Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2016

Finland

East meets West

In 2015, the World Press Freedom Index, compiled by Reporters Without Borders, rates Finland as having the greatest freedom of expression and information out of 180 countries. The International Property Rights Index 2015 ranks 129 countries by their physical and intellectual respect for property rights, and Finland comes at the top. The Fund for Peace promotes conflict prevention and sustainable security, and maintains the Fragile States Index. In the Fragile States Index 2015, Finland is ranked the most stable out of all 178 countries.

With its proximity to the Baltics and Russia, Finland is a meeting place for Eastern and Western European cultures. This country of snow, swamps and forests – one of Europe's most sparsely populated nations – was part of the Kingdom of Sweden until sovereignty transferred in 1809 to the Russian Empire. In 1917, Finland became an independent country. A member of the European Union since 1995, Finland is the only Nordic state in the Eurozone. The country has shifted from a farm and forestry community to a more industrial economy. Per capita income is among the highest in Western Europe.

Finnish securities were initially traded over-the-counter or overseas. Trading began at the Helsinki Stock Exchange in 1912. Since 2003, the Helsinki exchange has been part of the OMX family of Nordic markets. At its peak, Nokia represented 72% of the value-weighted HEX All Shares Index, and Finland was a particularly concentrated stock market. Today, the largest Finnish companies are Nokia (22% of the FTSE Finland index), Sampo (20%) and Kone (13%).

We have made enhancements to our Finnish equity series, drawing on work by Nyberg and Vaihekoski (2014), whom we acknowledge in the Credit Suisse Global Investment Returns Sourcebook 2016.

Capital market returns for Finland

Figure 1 shows that, over the last 116 years, the real value of equities, with income reinvested, grew by a factor of 460 compared to 1.3 for bonds and 0.6 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 5.4%, bonds 0.2%, and bills –0.4%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 5.9%. For additional explanations of these figures, see page 37.

Figure 1

Cumulative real returns from 1900 to 2015

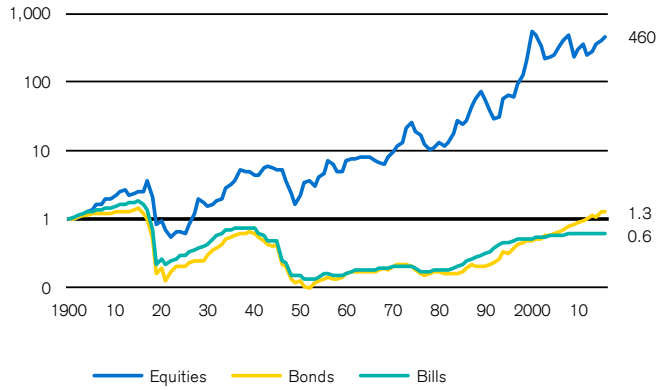


Figure 2

Annualized real returns on major asset classes (%)

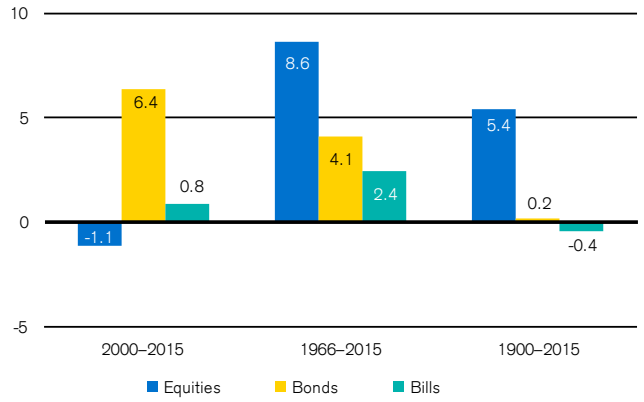
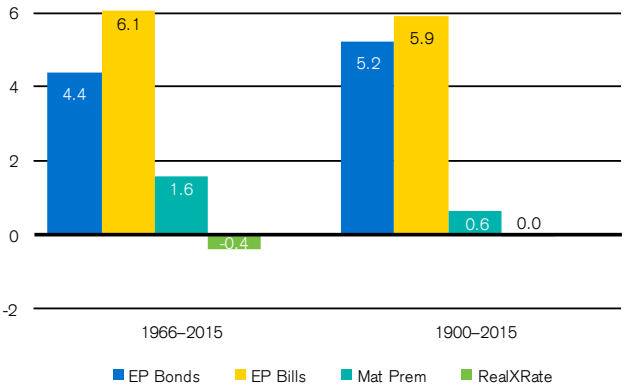


Figure 3

Annualized equity, bond, and currency premia (%)



Note: EP Bonds denotes the equity premium relative to long-term government bonds; EP Bills denotes the equity premium relative to Treasury bills; Mat Prem denotes the maturity premium for government bond returns relative to bill returns; and RealXRate denotes the real (inflation-adjusted) change in the exchange rate against the US dollar.

Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2016

France

European center

No country is more popular to visit than France. The United Nations World Tourism Organization (UNWTO) records a markedly higher number of tourist visits there than to any other country. Of course, France has produced inspired wine and wonderful cheese for centuries, but it has a lot more to attract visitors than its food and cuisine. With origins that date back to the Iron Age, France has played a major role in European and world history.

As financial centers, Paris and London competed vigorously in the 19th century. After the Franco-Prussian War in 1870, London achieved domination. But Paris remained important, especially (to its later disadvantage) in loans to Russia and the Mediterranean region, including the Ottoman Empire. As Kindelberger, the famous economic historian put it, "London was a world financial center; Paris was a European financial center."

Paris has continued to be an important financial center, while France remains at the center of Europe, being a founder of the European Union (EU) and the Eurozone. France is the second most populous country in the EU and is ranked third by GDP. It has the largest equity market in Continental Europe and one of the largest bond markets in the world.

Long-run French asset returns have been disappointing. France ranks in the bottom quartile of countries with a complete history for equity performance, for bonds and for bills, but in the top quartile for inflation – hence the poor fixed income returns. However, the inflationary episodes and poor performance date back to the first half of the 20th century and are linked to the world wars. Since 1950, French equities have achieved mid-ranking returns.

At the start of 2016, France's largest listed companies were Sanofi, Total, and BNP Paribas.

Capital market returns for France

Figure 1 shows that, over the last 116 years, the real value of equities, with income reinvested, grew by a factor of 41 compared to 1.3 for bonds and 0.04 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 3.2%, bonds 0.2%, and bills –2.7%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 6.2%. For additional explanations of these figures, see page 37.

Figure 1

Cumulative real returns from 1900 to 2015

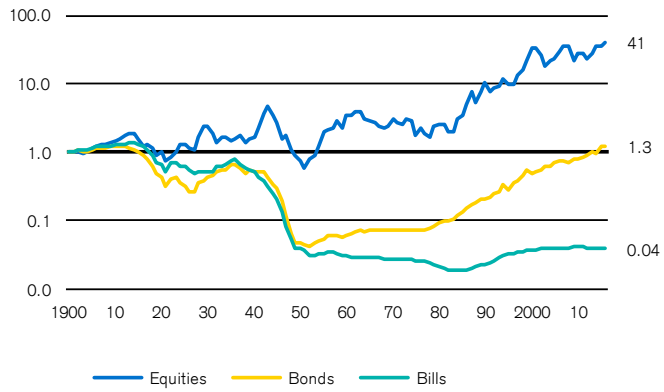


Figure 2

Annualized real returns on major asset classes (%)

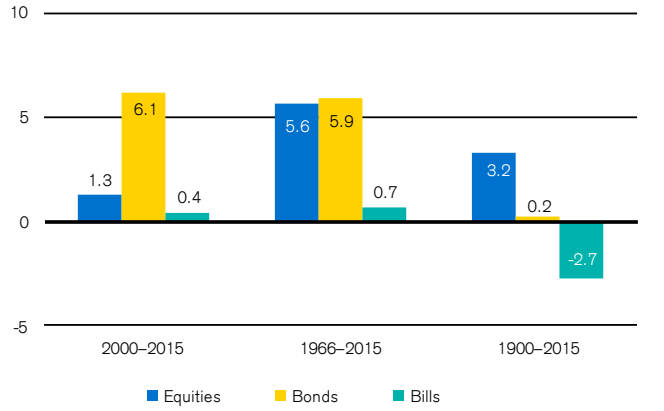
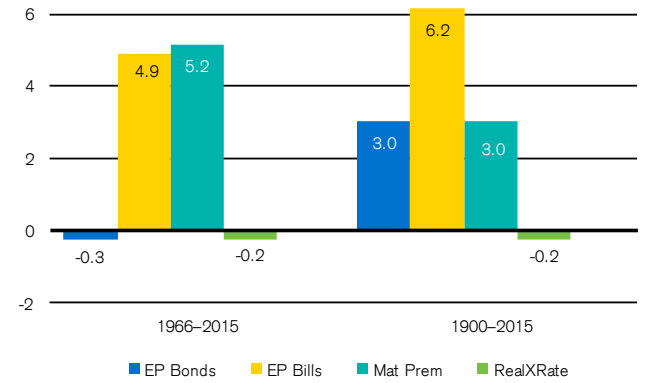


Figure 3

Annualized equity, bond, and currency premia (%)



Note: EP Bonds denotes the equity premium relative to long-term government bonds; EP Bills denotes the equity premium relative to Treasury bills; Mat Prem denotes the maturity premium for government bond returns relative to bill returns; and RealXRate denotes the real (inflation-adjusted) change in the exchange rate against the US dollar.

Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2016

Germany

Locomotive of Europe

Germany is a social market economy. The Best Countries report released in January 2016 at the World Economic Forum states that Germany is the best country in the world. The report examined some 60 nations, looking at factors that included sustainability, adventure, cultural influence, entrepreneurship and economic influence. Germany is Europe's most populous nation, with a skilled and affluent (albeit aging) workforce, and is a popular destination for migrants.

In the first half of the 20th century, German equities lost two-thirds of their value in World War I and, during 1922–23, inflation hit 209 billion percent. In World War II and its immediate aftermath, equities fell by 88% in real terms, while bonds fell by 91%. After WWII there was a remarkable transformation. In the early stages of its "economic miracle" German equities rose by 4,373% in real terms from 1949 to 1959. Germany rapidly became known as the "locomotive of Europe." Meanwhile, it built a reputation for fiscal and monetary prudence. From 1949 to date, it has had the world's second-lowest inflation rate and its strongest currency (now the euro), and an especially strong bond market.

Today, Germany is Europe's largest economy. Formerly the world's top exporter, it has now been overtaken by China. Its stock market, which dates back to 1685, ranks fifth in the world by size, while its bond market is among the world's largest.

The German stock market retains its bias toward manufacturing, with weightings of 21% in basic materials, 23% in consumer goods, and 13% in industrials. The largest stocks are Bayer, Siemens, BASF, Allianz, Daimler, SAP, and Deutsche Telekom. Small and medium enterprises are also important. Our German data incorporates new estimates of historical returns provided to us by Richard Stehle, whose work is cited in the Credit Suisse Global Investment Returns Sourcebook 2016.

Capital market returns for Germany

Figure 1 shows that, over the last 116 years, the real value of equities, with income reinvested, grew by a factor of 42 compared to 0.2 for bonds and 0.1 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 3.3%, bonds –1.4%, and bills –2.4%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 6.1%. For additional explanations of these figures, see page 37.

Figure 1

Cumulative real returns from 1900 to 2015

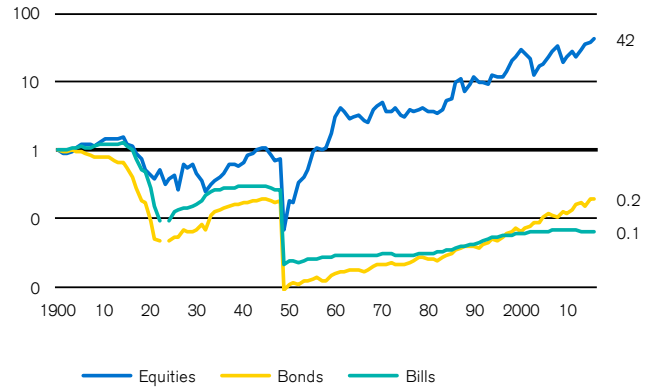


Figure 2

Annualized real returns on major asset classes (%)

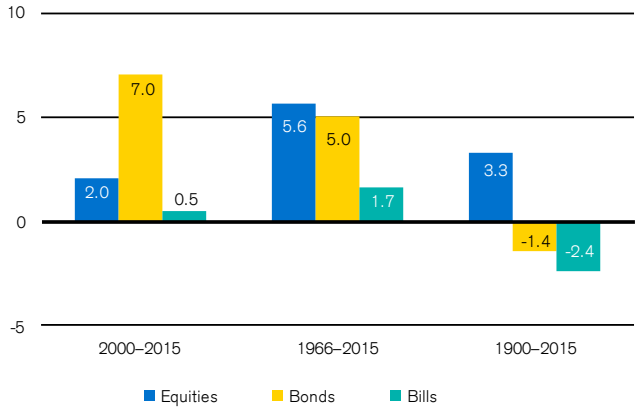
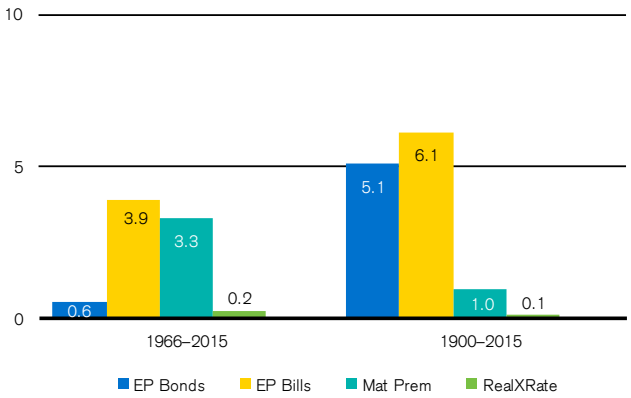


Figure 3

Annualized equity, bond, and currency premia (%)



Note: EP Bonds denotes the equity premium relative to long-term government bonds; EP Bills denotes the equity premium relative to Treasury bills; Mat Prem denotes the maturity premium for government bond returns relative to bill returns; and RealXRate denotes the real (inflation-adjusted) change in the exchange rate against the US dollar.

Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2016

Ireland

Born free

In 1800, the British and Irish parliaments approved Acts of Union that merged the Kingdom of Ireland and the Kingdom of Great Britain to create a United Kingdom of Great Britain and Ireland. After civil war in the early 20th century, the Republic of Ireland was born as an independent country in 1922, named the Irish Free State. Northern Ireland remained with the United Kingdom.

In the period following independence, economic growth and stock market performance were weak and, during the 1950s, the country experienced large-scale emigration. Ireland joined the European Union in 1973 and, from 1987, the country's economic situation improved.

By the 1990s and early 2000s, Ireland experienced great economic success and became known as the Celtic Tiger. By 2007, it had become the world's fifth-richest country in terms of GDP per capita, the second-richest in the EU, and was experiencing net immigration. Over the period 1987–2006, Ireland had experienced the second-highest real equity return of any Yearbook country. The financial crisis changed that, and the country faced hardship.

The country is one of the smallest Yearbook markets and, sadly, it became smaller. Too much of the boom was based on real estate, financials and leverage, and Irish stocks were decimated after 2006. After a burgeoning deficit, austerity measures were introduced which lasted until 2014. However, Ireland is now once again prospering. The export sector, dominated by multinationals, has become a key component of its economy, supported by a low rate of corporate taxation.

There have been stock exchanges in Dublin and Cork since 1793. To monitor Irish stocks from 1900, we constructed an index based on stocks traded on these two exchanges. Currently, Ireland's largest index constituents are Kerry Group (32% of the FTSE Ireland index), Bank of Ireland (26%) and Ryanair (18%).

Capital market returns for Ireland

Figure 1 shows that, over the last 116 years, the real value of equities, with income reinvested, grew by a factor of 151 compared to 5.9 for bonds and 2.3 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 4.4%, bonds 1.5%, and bills 0.7%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 3.7%. For additional explanations of these figures, see page 37.

Figure 1

Cumulative real returns from 1900 to 2015

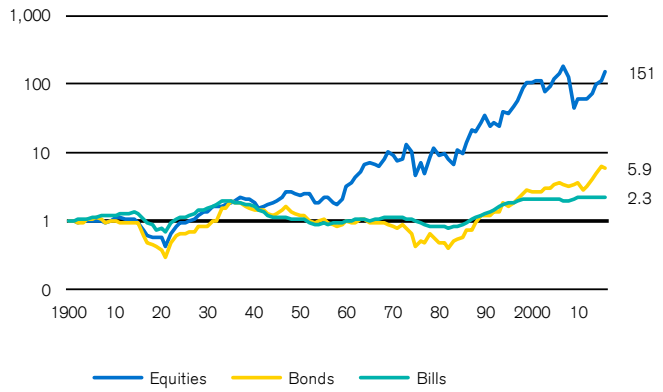


Figure 2

Annualized real returns on major asset classes (%)

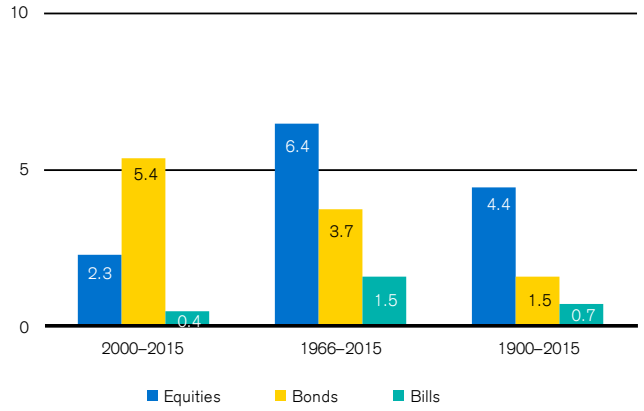
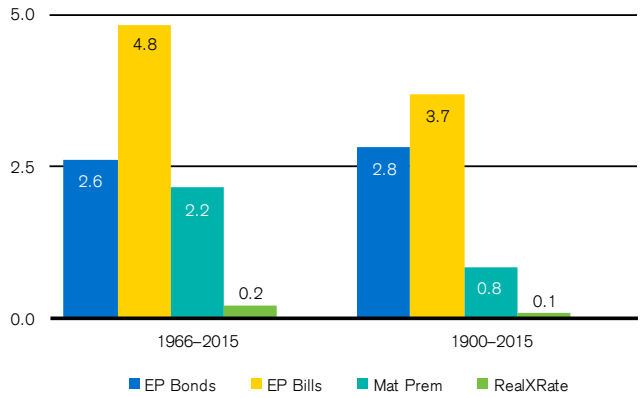


Figure 3

Annualized equity, bond, and currency premia (%)



Note: EP Bonds denotes the equity premium relative to long-term government bonds; EP Bills denotes the equity premium relative to Treasury bills; Mat Prem denotes the maturity premium for government bond returns relative to bill returns; and RealXRate denotes the real (inflation-adjusted) change in the exchange rate against the US dollar.

Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2016

Italy

Banking innovators

Italy is home to more artistic and globally important historical sites than any other country. It is also famous worldwide for its cuisine, fashion, automobiles and scenery. In 2016, the International Organization of Vine and Wine estimated that Italy's wine production from the previous year's harvest made it the most prolific wine-producing country worldwide.

Italy is a member of the European Union and the Eurozone. After the Global Financial Crisis took hold, debt levels increased until 2013, when concerns about the euro-crisis peaked. Italy's GDP remains below its pre-crisis level and persistent problems include sluggish growth, high unemployment, corruption and disparities between southern Italy and the more prosperous north.

Despite the setbacks, banking is still important in Italy. While banking can trace its roots back to Biblical times, Italy can claim a key role in its development. In the Middle Ages, North Italian bankers, including the Medici family, dominated lending and trade financing throughout Europe. These bankers were known as Lombards, a name that was synonymous with Italians.

Italy retains a large banking sector to this day, with banks still accounting for over a quarter (30%) of the FTSE Italy index, and insurance for a further 9%. Oil and gas accounts for 12%. The largest stocks traded on the Milan Stock Exchange are Intesa Sanpaolo (15% of the index), Eni (12%), Enel, Unicredit and Generali.

Italy has experienced some of the lowest asset returns of any Yearbook country. Since 1900, the annualized real equity return has been 2.0%, the second lowest among all Yearbook countries with a 116-year history. Alongside Germany and Austria, which suffered severe hyperinflations, Italy had real bond and real bill returns that were among the very worst of theYearbook countries, as well as high inflation and a weak currency.

Capital market returns for Italy

Figure 1 shows that, over the last 116 years, the real value of equities, with income reinvested, grew by a factor of 10 compared to 0.3 for bonds and 0.02 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 2.0%, bonds –1.1%, and bills –3.5%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 5.8%. For additional explanations of these figures, see page 37.

Figure 1

Cumulative real returns from 1900 to 2015

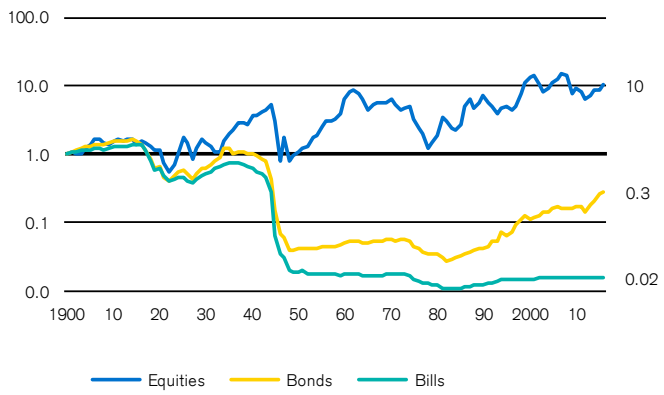


Figure 2

Annualized real returns on major asset classes (%)

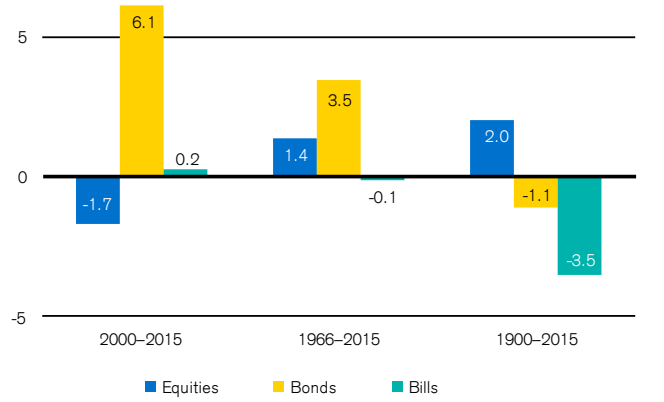
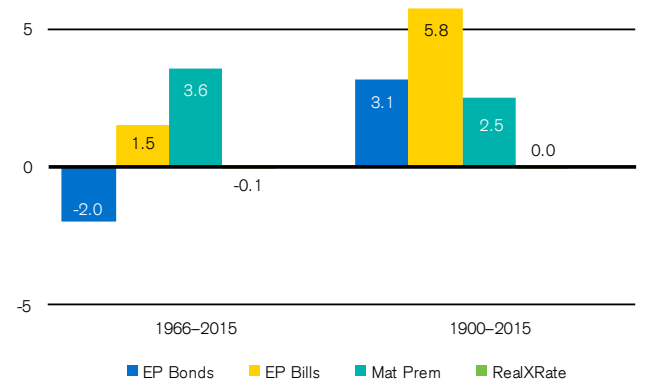


Figure 3

Annualized equity, bond, and currency premia (%)



Note: EP Bonds denotes the equity premium relative to long-term government bonds; EP Bills denotes the equity premium relative to Treasury bills; Mat Prem denotes the maturity premium for government bond returns relative to bill returns; and RealXRate denotes the real (inflation-adjusted) change in the exchange rate against the US dollar.

Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2016

Japan

Birthplace of futures

Looking forward, Japan is ranked by the Future Brand Index as the world's number one country brand. But, futures have a long history in financial markets and, by 1730, Osaka started trading rice futures. The city was to become the leading derivatives exchange in Japan (and the world's largest futures market in 1990 and 1991), while the Tokyo Stock Exchange, founded in 1878, was to become the leading market for spot trading.

From 1900 to 1939, Japan was the world's second-best equity performer. But World War II was disastrous and Japanese stocks lost 96% of their real value. From 1949 to 1959, Japan's "economic miracle" began and equities gave a real return of 1,565%. With one or two setbacks, equities kept rising for another 30 years.

By the start of the 1990s, the Japanese equity market was the largest in the world, with a 41% weighting in the world index, as compared to 30% for the USA. Real estate values were also riding high: a 1993 article in the Journal of Economic Perspectives reported that, in late 1991, the land under the Emperor's Palace in Tokyo was worth about the same as all the land in California.

Then the bubble burst. From 1990 to the start of 2009, Japan was the worst-performing stock market. At the start of 2016, its capital value is still close to one third of its value at the beginning of the 1990s. Its weighting in the world index fell from 41% to 9%. Meanwhile, Japan has suffered a prolonged period of stagnation, banking crises and deflation. Hopefully, this will not form the blueprint for other countries.

Despite the fallout after the asset bubble burst, Japan remains a major economic power. It has the world's second-largest equity market as well as its second-biggest bond market. It is a world leader in technology, automobiles, electronics, machinery and robotics, and this is reflected in the composition of its equity market. One quarter of the market comprises consumer goods.

Capital market returns for Japan

Figure 1 shows that, over the last 116 years, the real value of equities, with income reinvested, grew by a factor of 118 compared to 0.4 for bonds and 0.1 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 4.2%, bonds –0.9%, and bills –1.9%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 6.2%. For additional explanations of these figures, see page 37.

Figure 1

Cumulative real returns from 1900 to 2015

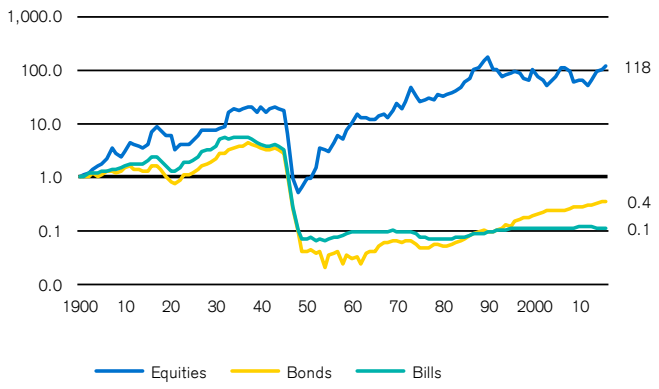


Figure 2

Annualized real returns on major asset classes (%)

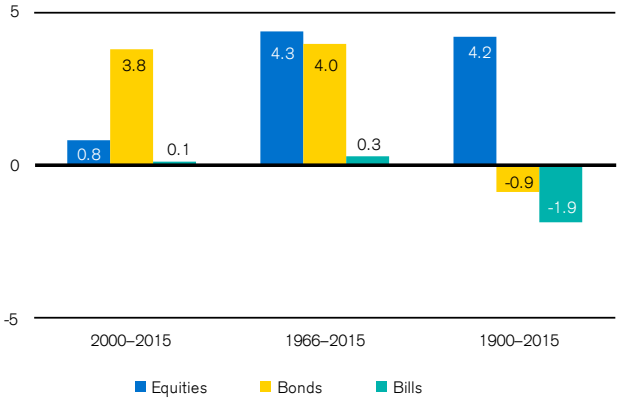
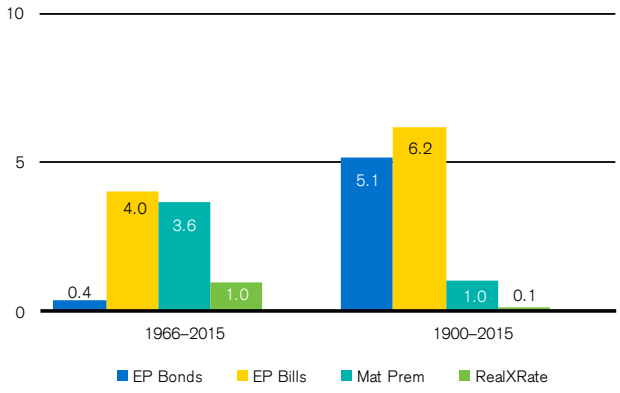


Figure 3

Annualized equity, bond, and currency premia (%)



Note: EP Bonds denotes the equity premium relative to long-term government bonds; EP Bills denotes the equity premium relative to Treasury bills; Mat Prem denotes the maturity premium for government bond returns relative to bill returns; and RealXRate denotes the real (inflation-adjusted) change in the exchange rate against the US dollar.

Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2016

Netherlands

Exchange pioneer

The Netherlands is a low-lying land, half of which is one meter or less above sea level and much of which has been reclaimed from the sea and lakes. The Dutch port of Rotterdam is the largest port in Europe. Constitutionally, the Netherlands has been a monarchy since 1815, and a parliamentary democracy since 1848. Dutch politics and governance are often driven by an effort to achieve consensus on important issues. The country has a market-based mixed economy.

Though some forms of stock trading occurred in Roman times and 14th century Toulouse mill companies' securities were traded, transferable securities appeared in the 17th century. The Amsterdam market, which started in 1611, was the world's main center of stock trading in the 17th and 18th centuries.

A book written in 1688 by a Spaniard living in Amsterdam (appropriately entitled Confusion de Confusiones) describes the amazingly diverse tactics used by investors. Even though only one stock was traded – the Dutch East India Company – they had bulls, bears, panics, bubbles and other features of modern exchanges.

The Amsterdam Exchange continues to prosper as part of Euronext. Over the years, Dutch equities have generated a mid-ranking real return of 5.0% per year. The Netherlands has traditionally been a low inflation country and, since 1900, has enjoyed the lowest inflation rate among the EU countries and the second-lowest (after Switzerland) from among all countries in the Yearbook.

The Netherlands has a heavy exposure to consumer goods and consumer services (each 29% of the stock market's capitalization). Although Royal Dutch Shell now has its primary listing in London, and a secondary listing in Amsterdam, the Amsterdam exchange still hosts more than its share of major multinationals, including Unilever, Koninklijke Philips, ING Group, ASML Holding, Heineken, Akzo Nobel, Heineken and Unibail-Rodamco.

Capital market returns for the Netherlands

Figure 1 shows that, over the last 116 years, the real value of equities, with income reinvested, grew by a factor of 288 compared to 7.0 for bonds and 1.9 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 5.0%, bonds 1.7%, and bills 0.6%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 4.4%. For additional explanations of these figures, see page 37.

Figure 1

Cumulative real returns from 1900 to 2015

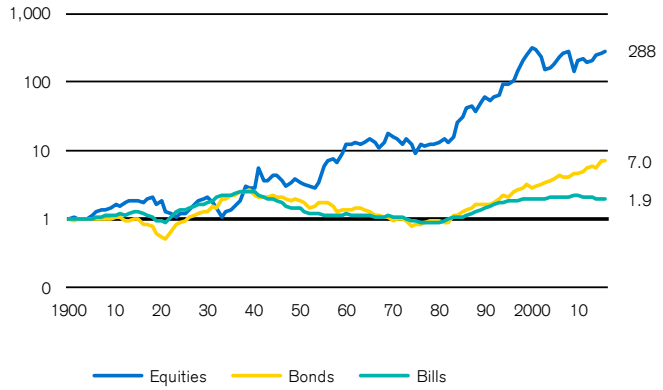


Figure 2

Annualized real returns on major asset classes (%)

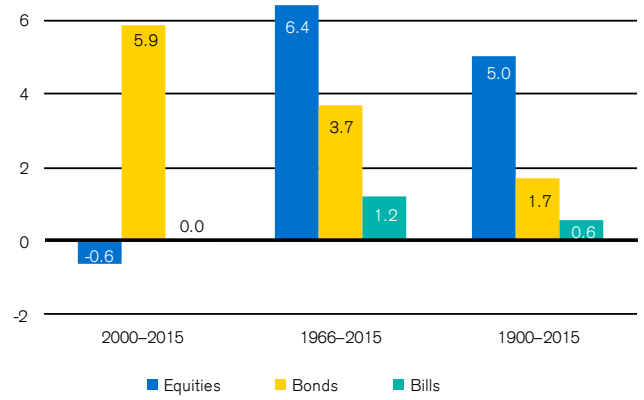
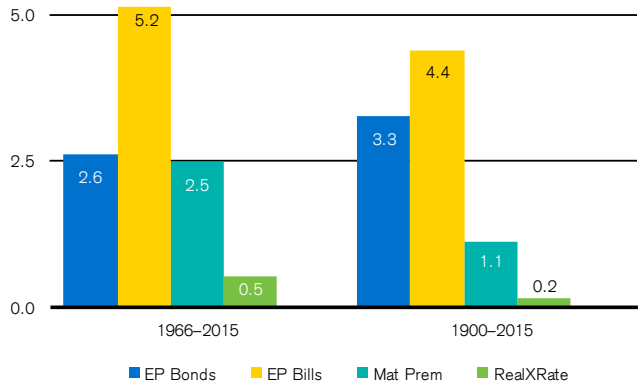


Figure 3

Annualized equity, bond, and currency premia (%)



Note: EP Bonds denotes the equity premium relative to long-term government bonds; EP Bills denotes the equity premium relative to Treasury bills; Mat Prem denotes the maturity premium for government bond returns relative to bill returns; and RealXRate denotes the real (inflation-adjusted) change in the exchange rate against the US dollar.

Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2016

New Zealand

Purity and integrity

Since 1999, New Zealand has been promoting itself to the world as "100% pure" and Forbes calls this marketing drive one of the world's top ten travel campaigns. But the country also prides itself on honesty, openness, good governance, and freedom to run businesses. In 2016, the Heritage Foundation ranked New Zealand as the Yearbook country with the highest economic freedom. The Wall Street Journal ranks New Zealand as the best place in the world for business freedom.

The British colony of New Zealand became an independent dominion in 1907. Traditionally, New Zealand's economy was built upon a few primary products, notably wool, meat and dairy products. It was dependent on concessionary access to British markets until British accession to the European Union.

Over the last three decades, New Zealand has evolved into a more industrialized, free market economy. It competes globally as an export-led nation through efficient ports, airline services, and submarine fiber-optic communications. New Zealand took up a non-permanent seat on the UN Security Council for the 2015–16 term.

The New Zealand Exchange traces its roots to the Gold Rush of the 1870s. In 1974, the regional stock markets merged to form the New Zealand Stock Exchange. In 2003, the Exchange demutualized and officially became the New Zealand Exchange Limited.

The largest firms traded on the exchange are Spark New Zealand (15% of the market capitalization of the FTSE New Zealand index), plus Fletcher Building, Auckland International Airport and F&P Healthcare (each representing 12% of the value of the index).

Capital market returns for New Zealand

Figure 1 shows that, over the last 116 years, the real value of equities, with income reinvested, grew by a factor of 1028 compared to 11.3 for bonds and 6.9 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 6.2%, bonds 2.1%, and bills 1.7%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 4.4%. For additional explanations of these figures, see page 37.

Figure 1

Cumulative real returns from 1900 to 2015

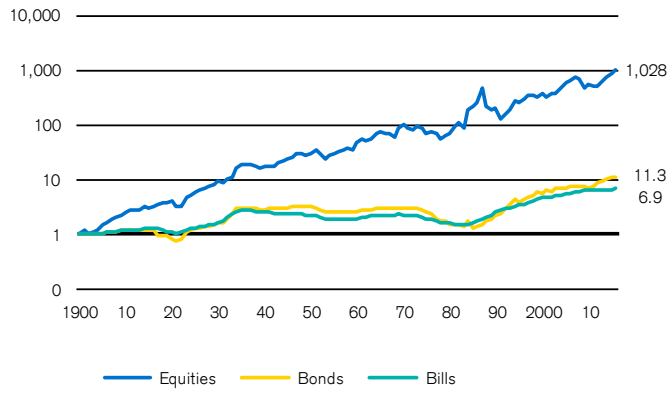


Figure 2

Annualized real returns on major asset classes (%)

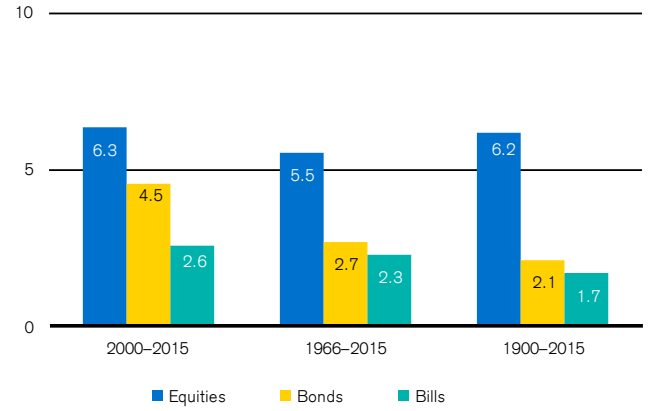
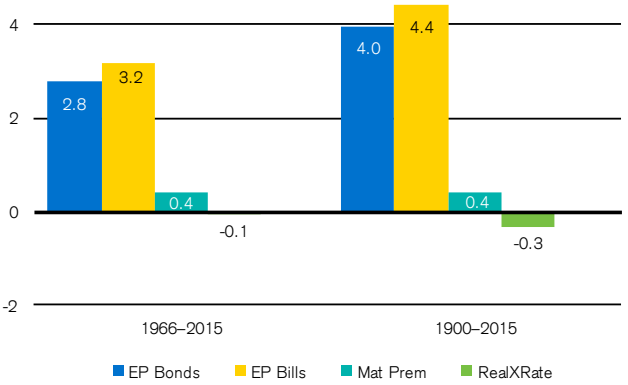


Figure 3

Annualized equity, bond, and currency premia (%)



Note: EP Bonds denotes the equity premium relative to long-term government bonds; EP Bills denotes the equity premium relative to Treasury bills; Mat Prem denotes the maturity premium for government bond returns relative to bill returns; and RealXRate denotes the real (inflation-adjusted) change in the exchange rate against the US dollar.

Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2016

Norway

Nordic oil kingdom

Norway is a small country and, as of January 2016, it ranks 117th by population and 61st by land area. However, it is blessed with large natural resources. It is the only country that is self sufficient in electricity production (through hydro power) and it is one of the world's largest exporters of oil. Norway is the second-largest exporter of fish.

The population in 2016 of 5.2 million enjoys the largest GDP per capita in the world, apart from a few city states. Norwegians live under a constitutional monarchy outside the Eurozone. In 2015, the United Nations, through its Human Development Index, ranked Norway the best country in the world for life expectancy, education and overall standard of living. Norway was number one in the 2015 Social Progress Index. In the 2015 Legatum Prosperity Index, Norway comes top of 142 countries due to the freedom it offers its citizens, the quality of its healthcare system and social bonds between its people. The Global Gender Gap Report 2015, published by the World Economic Forum, compares opportunities for women in 142 countries and ranks Norway above every other Yearbook country.

The Oslo Stock Exchange was founded as Christiania Bors in 1819 for auctioning ships, commodities, and currencies. Later, this extended to trading in stocks and shares. The exchange now forms part of the OMX grouping of Scandinavian exchanges.

In the 1990s, the country established the Norwegian Government Pension Fund Global to invest surplus oil wealth. This has grown to become the world's largest fund, with a market value over 0.8 trillion US dollars. The fund invests in equities and debt; on average it owns 1.3% of the equity of every listed company in the world. It also owns 0.9% of the global bond market.

The largest Oslo Stock Exchange stocks are Statoil and DNB (each 18% of the index), and Telenor (16%).

Capital market returns for Norway

Figure 1 shows that, over the last 116 years, the real value of equities, with income reinvested, grew by a factor of 120 compared to 8.4 for bonds and 3.6 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 4.2%, bonds 1.9%, and bills 1.1%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 3.1%. For additional explanations of these figures, see page 37.

Figure 1

Cumulative real returns from 1900 to 2015

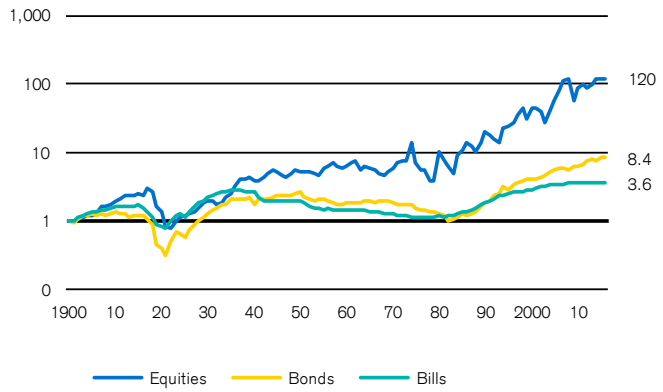


Figure 2

Annualized real returns on major asset classes (%)

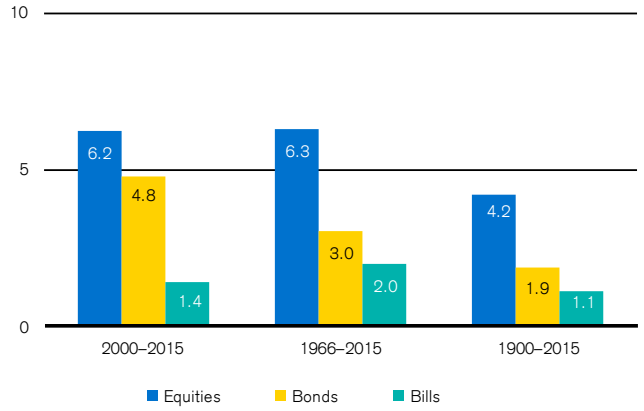
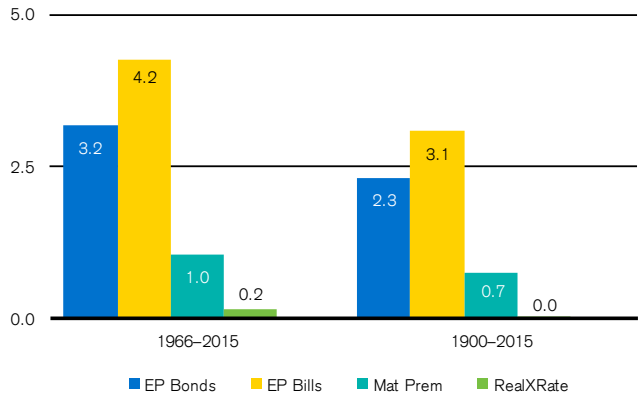


Figure 3

Annualized equity, bond, and currency premia (%)



Note: EP Bonds denotes the equity premium relative to long-term government bonds; EP Bills denotes the equity premium relative to Treasury bills; Mat Prem denotes the maturity premium for government bond returns relative to bill returns; and RealXRate denotes the real (inflation-adjusted) change in the exchange rate against the US dollar.

Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2016

Portugal

Land of discoverers

In the 15th century, during The Age of the Discoveries, a rudimentary centralized market existed in Lisbon. It solved two problems: how to assemble the substantial funds necessary to finance fleets and voyages, and how to agree on the premia for insurance contracts to cover the associated risks. In general, this was not a formally organized market, and transactions were conducted in the open air at a corner of a main street in downtown Lisbon. Nevertheless, that market offered opportunities to trade commodities, especially those brought from distant lands by this nation of mariners.

The Portuguese monarchy was deposed in 1910, and the country was then run by repressive governments for some six decades. Modern Portugal emerged in 1974 from the Carnation Revolution, a military coup which overthrew the former regime. The following year, Portugal granted independence to all its African colonies. The country joined the European Union in 1986 and was among the first to adopt the euro.

In the second decade of the 21st century, the Portuguese economy suffered its most severe recession since the 1970s. Austerity measures were implemented, and they exacerbated the country's record level of unemployment and encouraged emigration on a scale not seen since the 1960s.

The Euronext Lisbon stock exchange (a part of the NYSE Euronext) trades a range of major Portuguese corporations. The companies with the largest market capitalizations are in the utility and energy groups, comprising 44% in utilities and 29% in oil and gas. The biggest companies traded in Lisbon are EDP, Galp Energia, and Jeronimo Martins.

The data for Portuguese equities comes from a study by da Costa, Mata, and Justino (2012), whose research is cited in full in the Credit Suisse Global Investment Returns Sourcebook 2016.

Capital market returns for Portugal

Figure 1 shows that, over the last 116 years, the real value of equities, with income reinvested, grew by a factor of 57 compared to 2.6 for bonds and 0.3 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 3.5%, bonds 0.8%, and bills –1.1%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 4.7%. For additional explanations of these figures, see page 37.

Figure 1

Cumulative real returns from 1900 to 2015

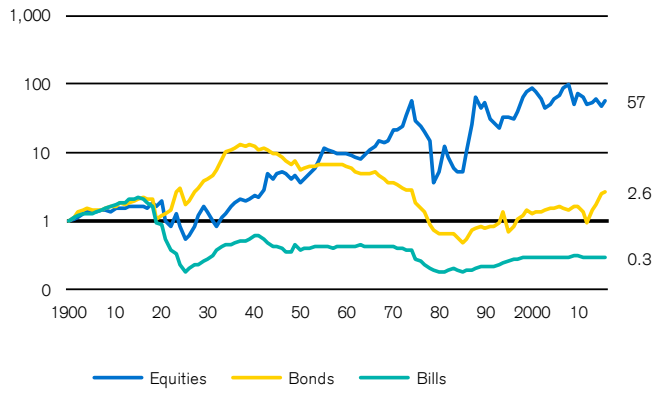


Figure 2

Annualized real returns on major asset classes (%)

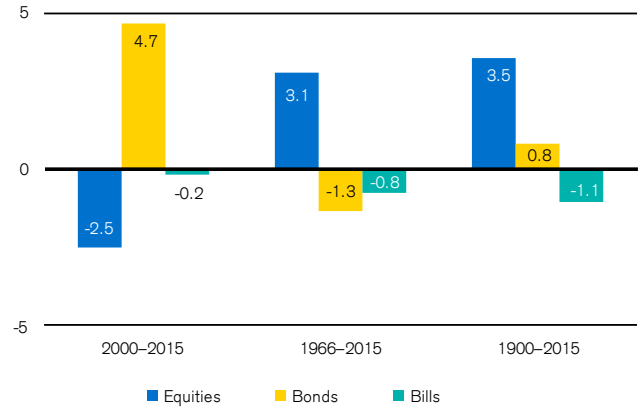
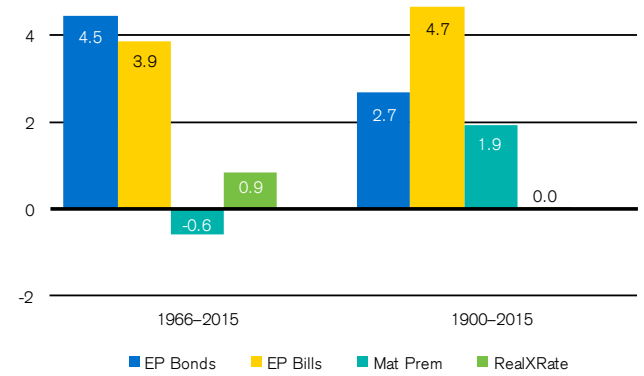


Figure 3

Annualized equity, bond, and currency premia (%)



Note: EP Bonds denotes the equity premium relative to long-term government bonds; EP Bills denotes the equity premium relative to Treasury bills; Mat Prem denotes the maturity premium for government bond returns relative to bill returns; and RealXRate denotes the real (inflation-adjusted) change in the exchange rate against the US dollar.

Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2016

Russia

Wealth of resources

Russia is the world's largest country, covering more than one-eighth of the Earth's inhabited land area, spanning nine time zones, and located in both Europe and Asia. Formerly, it even owned one-sixth of what is now the USA. It is the world's leading oil producer, second-largest natural gas producer, and third-largest steel and aluminium exporter. It has the biggest natural gas and forestry reserves and the second-biggest coal reserves.

After the 1917 revolution, Russia ceased to be a market economy. We can identify three periods. First, the Russian Empire up to 1917. Second, the long interlude following Soviet expropriation of private assets and the repudiation of Russia's government debt. Third, the Russian Federation, following the dissolution of the Soviet Union in 1991. The 1917 revolution is deemed to have resulted in complete losses for domestic stock- and bondholders. Very limited compensation was eventually paid to British and French bondholders in the 1980s and 1990s, but foreign investors in aggregate still lost more than 99% in present value terms. Russian returns are incorporated into the world, world ex-US, and Europe indices, including the total losses in 1917.

In 1998, Russia experienced a severe financial crisis, with government debt default, currency devaluation, hyperinflation and an economic meltdown. However, there was a surprisingly swift recovery and, in the decade after the 1998 crisis, the economy averaged 7% annual growth. In 2008–09, there was a major reaction to global setbacks and commodity price swings. Fuelled by a persistently volatile political situation, Russian stock market performance has likewise been volatile.

By the beginning of 2016, over half (56%) of the Russian stock market comprised oil and gas companies, the largest being Gazprom and Lukoil. Adding in basic materials, resources represent two-thirds of Russia's market capitalization.

Capital market returns for Russia

In addition to the performance from 1900 to 1917, Figure 1 shows that, over 1995-2015, the real value of equities, with income reinvested, grew by a factor of 2.2 compared to 2.4 for bonds and 0.7 for bills. Figure 2 displays the annualized real returns from 1995–2015, with equities giving 3.8%, bonds 4.2%, and bills –1.9%. Figure 3 expresses the annualized real returns as premia. Since 1995, the annualized equity risk premium relative to bills has been 5.8%. For additional explanations of these figures, see page 37.

Figure 1

Cumulative real returns from 1900 to 2015

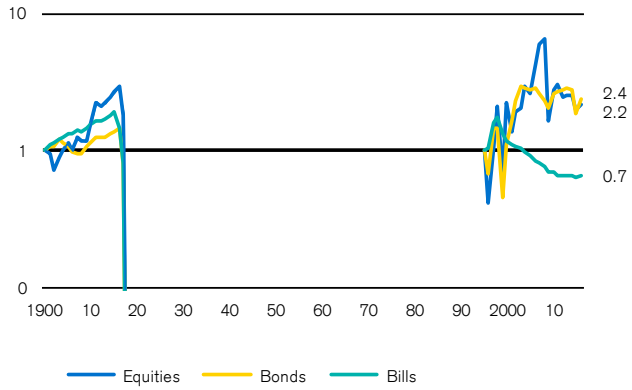


Figure 2

Annualized real returns on major asset classes (%)

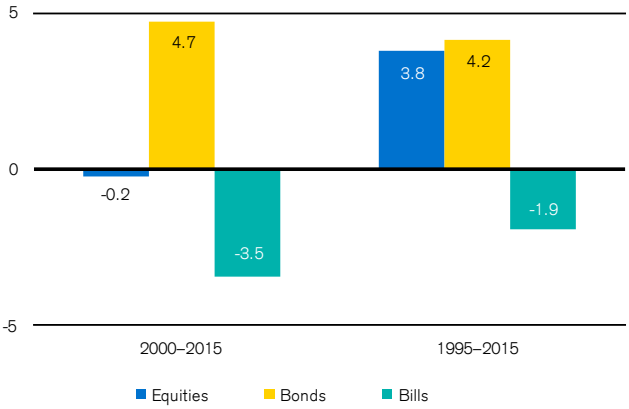
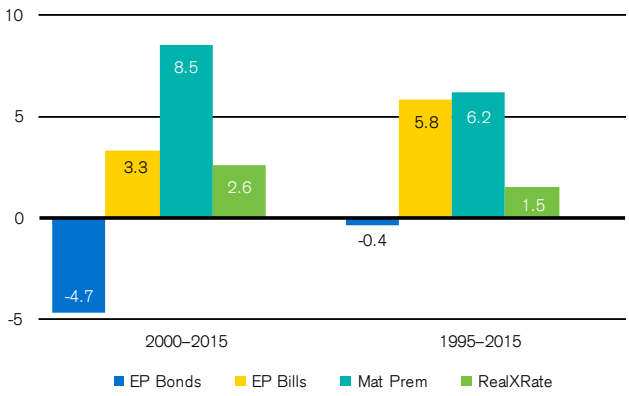


Figure 3

Annualized equity, bond, and currency premia (%)



Note: EP Bonds denotes the equity premium relative to long-term government bonds; EP Bills denotes the equity premium relative to Treasury bills; Mat Prem denotes the maturity premium for government bond returns relative to bill returns; and RealXRate denotes the real (inflation-adjusted) change in the exchange rate against the US dollar.

Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2016

South Africa

Golden opportunity

The discovery of diamonds at Kimberley in 1870 and the Witwatersrand gold rush of 1886 had a profound impact on South Africa's subsequent history. Gold and diamond production have declined from their peaks, although South Africa is still the fifth-biggest gold producer globally. Today, South Africa is the world's largest producer of chrome, manganese, platinum, vanadium and vermiculite. The country is also a major producer of coal, iron ore and other minerals such as ilmenite, palladium, rutile and zirconium.

The 1886 gold rush led to many mining and financing companies opening up. To cater to their needs, the Johannesburg Stock Exchange (JSE) opened in 1887. Over the years since 1900, the South African equity market has been one of the world's most successful, generating a real equity return of 7.3% per year, which is the highest return among the Yearbook countries.

South Africa held its first multi-racial elections in 1994 and the apartheid era was replaced by a government run by the African National Congress. The country is still struggling to resolve apartheid-era inequities related to education, health and housing. Still, South Africa is the second-largest economy in Africa (Nigeria is the largest) and it has a sophisticated financial system.

In 1900, South Africa, together with several other Yearbook countries, would have been deemed an emerging market. According to index compilers, it has not yet emerged and today ranks as the fourth-largest emerging market, below China, India and Taiwan.

Gold, once key to South Africa's wealth, has declined in importance as the economy has diversified. Financials account for 24%, while basic minerals lag behind with only 12% of the market capitalization. Taken together, media and mobile telecoms account for 31% of the market index. The largest JSE stocks are Naspers (23% of the index), and Sasol and MTN (each 6%).

Capital market returns for South Africa

Figure 1 shows that, over the last 116 years, the real value of equities, with income reinvested, grew by a factor of 3,547 compared to 7.7 for bonds and 3.1 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 7.3%, bonds 1.8%, and bills 1.0%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 6.3%. For additional explanations of these figures, see page 37.

Figure 1

Cumulative real returns from 1900 to 2015

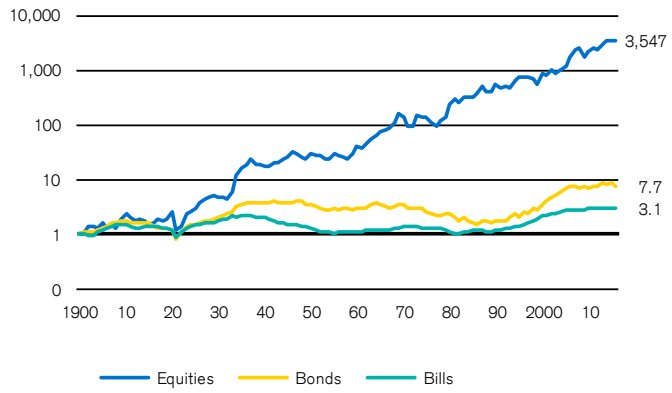


Figure 2

Annualized real returns on major asset classes (%)

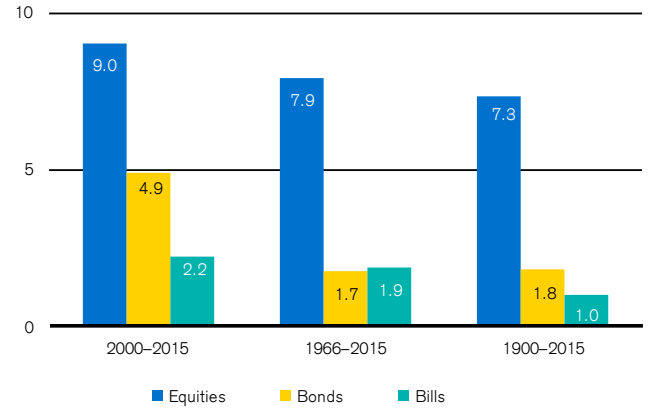
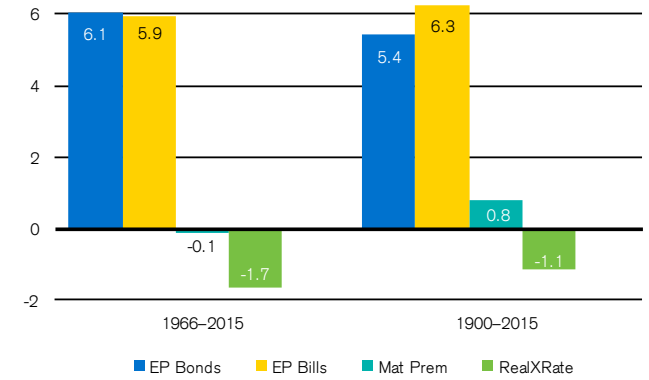


Figure 3

Annualized equity, bond, and currency premia (%)



Note: EP Bonds denotes the equity premium relative to long-term government bonds; EP Bills denotes the equity premium relative to Treasury bills; Mat Prem denotes the maturity premium for government bond returns relative to bill returns; and RealXRate denotes the real (inflation-adjusted) change in the exchange rate against the US dollar.

Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2016

Spain

Key to Latin America

Spanish is the most widely spoken international language after English, and has the fourth-largest number of native speakers after Chinese, Hindi and English. Partly for this reason, Spain has a visibility and influence that extends far beyond its Southern European borders, and carries weight throughout Latin America.

While the 1960s and 1980s saw Spanish real equity returns enjoying a bull market and ranked second in the world, the 1930s and 1970s witnessed the very worst returns among our countries. Over the entire 116 years covered by the Yearbook, Spain's long-term equity premium (measured relative to bonds) was 1.8%, which is lower than for any other country that we cover over the same period.

Although Spain stayed on the sidelines during the two world wars, Spanish stocks lost much of their real value over the period of the civil war during 1936–39, while the return to democracy in the 1970s coincided with the quadrupling of oil prices, heightened by Spain's dependence on imports for 70% of the country's energy needs.

Spain joined the European Union in 1986. It was hit hard by the Global Financial Crisis, and faced a major budget deficit. The country's banks were exposed to the collapse of the depressed real estate and construction industries. The austerity measures that were set in place led to one of the highest unemployment rates in Europe. However, Spain is now returning to growth.

The Madrid Stock Exchange was founded in 1831 and is now the fourteenth-largest in the world, helped by strong economic growth since the 1980s. The major Spanish companies retain a strong presence in Latin America combined with increasing strength in banking and infrastructure across Europe. The largest stocks are Banco Santander (18% of the FTSE Spain index), BBVA and Telefonica (each 12%), and Inditex (9%).

Capital market returns for Spain

Figure 1 shows that, over the last 116 years, the real value of equities, with income reinvested, grew by a factor of 61 compared to 7.8 for bonds and 1.4 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 3.6%, bonds 1.8%, and bills 0.3%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 3.3%. For additional explanations of these figures, see page 37.

Figure 1

Cumulative real returns from 1900 to 2015

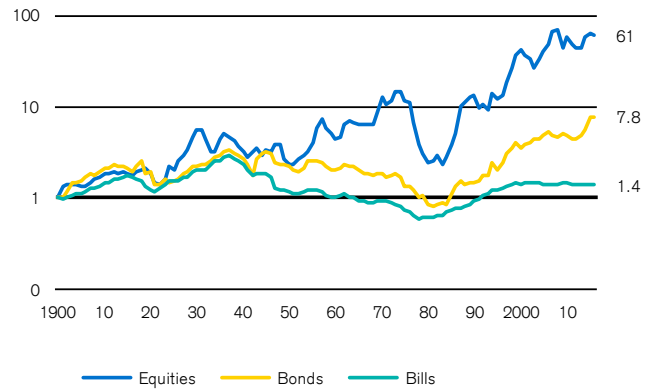


Figure 2

Annualized real returns on major asset classes (%)

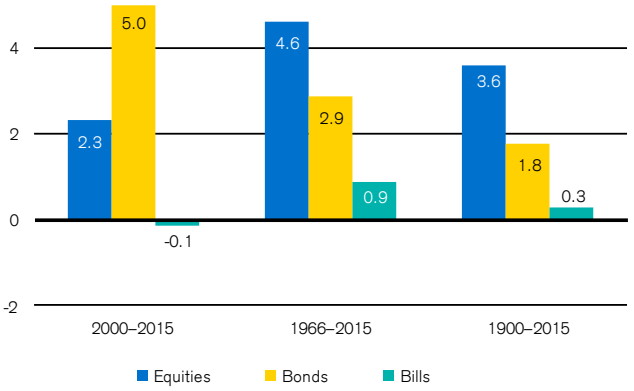
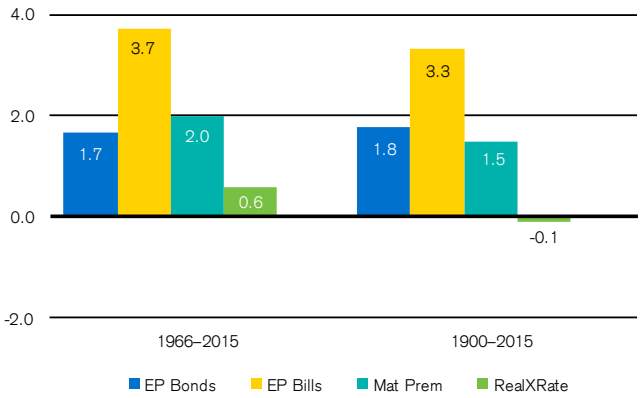


Figure 3

Annualized equity, bond, and currency premia (%)



Note: EP Bonds denotes the equity premium relative to long-term government bonds; EP Bills denotes the equity premium relative to Treasury bills; Mat Prem denotes the maturity premium for government bond returns relative to bill returns; and RealXRate denotes the real (inflation-adjusted) change in the exchange rate against the US dollar.

Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2016

Sweden

Nobel prize returns

Alfred Nobel bequeathed 94% of his wealth to establish and endow the five Nobel Prizes (first awarded in 1901). On a per capita basis, and including the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel, Sweden has had more Nobel Laureates than any country (apart from small "city states").

Alfred Nobel had instructed that the prize fund be invested in safe securities. Were a Nobel prize to be awarded for investment returns, it would be given to Sweden for its achievement as the only country to have real returns for equities, bonds and bills all ranked in the top five.

The country is often praised. In the 2015 RobecoSAM Country Sustainability Ranking, Sweden came top out of 60 countries for its commitment to corporate social responsibility. In a 2015 survey by GoEuro, a passport from Sweden was found to be the most powerful in the world. The Stockholm Stock Exchange was founded in 1863 and is the primary securities exchange of the Nordic countries. Since 1998, it has been part of the OMX grouping. Over the long haul, Swedish equity returns were supported by a policy of neutrality through two world wars, and the benefits of resource wealth and the development of industrial holding companies in the 1980s. Overall, equities returned 5.9% per year in real terms.

In Sweden, the financial sector accounts for a third (35%) of the market capitalization of the FTSE Sweden index, while industrials account for another quarter (27%). The largest single companies are Nordea Bank and Hennes and Mauritz (each 10% of the index), followed by Ericsson (8%). In 2014, we made enhancements to our series for Swedish equities, drawing on work by Daniel Waldenström (2014), whom we acknowledge in the Credit Suisse Global Investment Returns Sourcebook 2016.

Capital market returns for Sweden

Figure 1 shows that, over the last 116 years, the real value of equities, with income reinvested, grew by a factor of 753 compared to 21.7 for bonds and 8.5 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 5.9%, bonds 2.7%, and bills 1.9%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 3.9%. For additional explanations of these figures, see page 37.

Figure 1

Cumulative real returns from 1900 to 2015

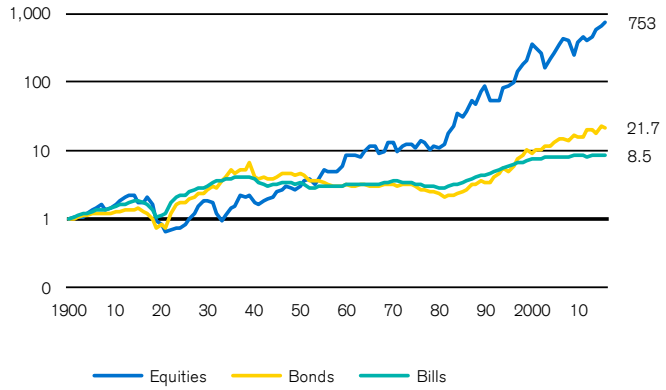


Figure 2

Annualized real returns on major asset classes (%)

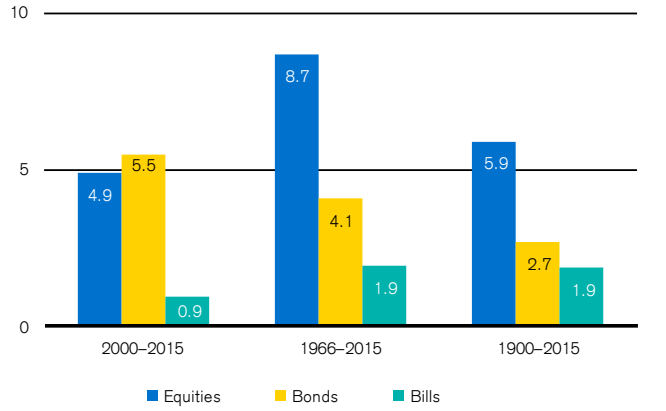
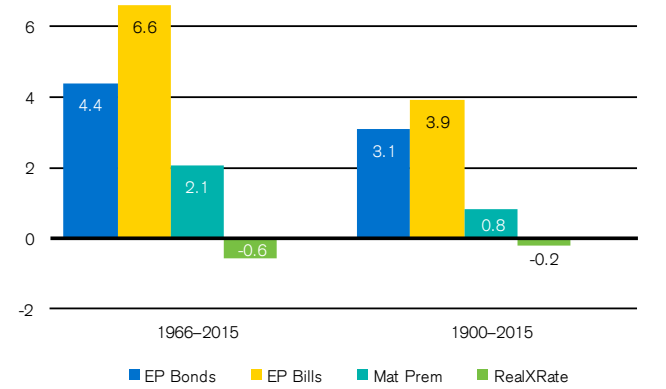


Figure 3

Annualized equity, bond, and currency premia (%)



Note: EP Bonds denotes the equity premium relative to long-term government bonds; EP Bills denotes the equity premium relative to Treasury bills; Mat Prem denotes the maturity premium for government bond returns relative to bill returns; and RealXRate denotes the real (inflation-adjusted) change in the exchange rate against the US dollar.

Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2016

Switzerland

Traditional safe haven

For the seventh consecutive year, in 2016 the World Economic Forum ranked Switzerland top of its Global Competitiveness Index. The United Nations World Happiness Report, published in 2015 by the Sustainable Development Solutions Network, concluded that Switzerland is the happiest country in the world. That includes old people: the Global AgeWatch Index 2015 examines the wellbeing of the elderly in 96 countries, and Switzerland is best. Nevertheless, they live in an expensive country: The Economist reported in late 2015 that Switzerland is the most expensive country on the globe, as judged by their Big Mac index.

For a small country with just 0.1% of the world's population and less than 0.01% of its land mass, Switzerland punches well above its weight financially and wins several gold medals in the global financial stakes. The Swiss stock market traces its origins to exchanges in Geneva (1850), Zurich (1873), and Basel (1876). It is now the world's seventh-largest equity market, accounting for 3.3% of total world value. Since 1900, Swiss equities have achieved a real return of 4.5% (equal to the median across our countries). Meanwhile, Switzerland has been one of the world's three best-performing government bond markets, with an annualized real return of 2.4%. The country also had the world's lowest 116-year inflation rate of just 2.2%.

Switzerland is one of the world's most important banking centers, and private banking has been a major Swiss competence for over 300 years. Swiss neutrality, sound economic policy, low inflation and a strong currency have bolstered the country's reputation as a safe haven. A large proportion of all cross-border private assets invested worldwide is still managed in Switzerland.

Switzerland's pharmaceutical sector accounts for a third (35%) of the value of the FTSE Switzerland index. Novartis, Roche and Nestle together account for over half of the index's value.

Capital market returns for Switzerland

Figure 1 shows that, over the last 116 years, the real value of equities, with income reinvested, grew by a factor of 162 compared to 14.8 for bonds and 2.5 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 4.5%, bonds 2.4%, and bills 0.8%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 3.7%. For additional explanations of these figures, see page 37.

Figure 1

Cumulative real returns from 1900 to 2015

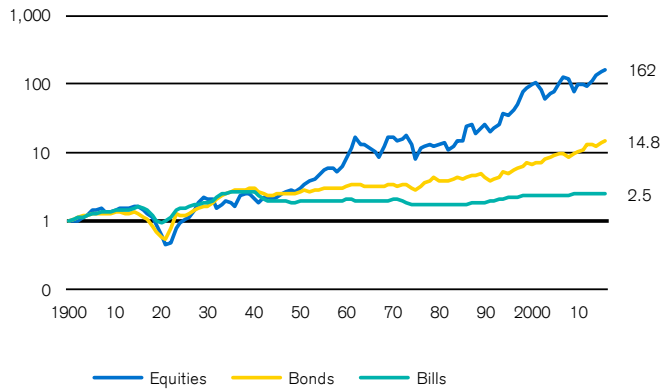


Figure 2

Annualized real returns on major asset classes (%)

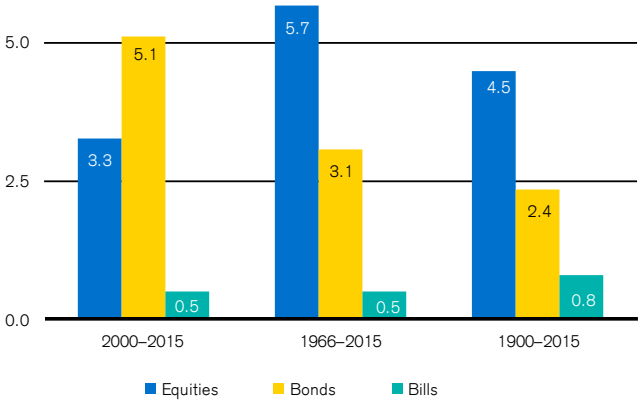
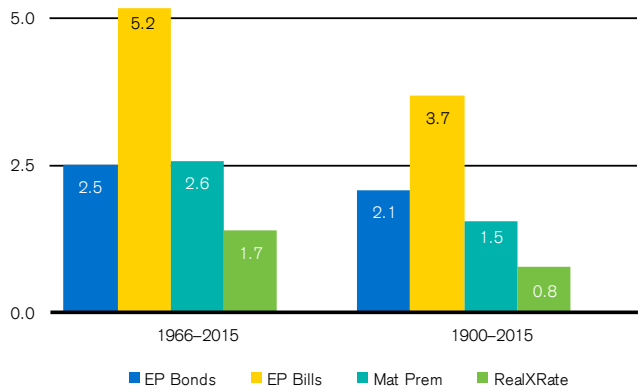


Figure 3

Annualized equity, bond, and currency premia (%)



Note: EP Bonds denotes the equity premium relative to long-term government bonds; EP Bills denotes the equity premium relative to Treasury bills; Mat Prem denotes the maturity premium for government bond returns relative to bill returns; and RealXRate denotes the real (inflation-adjusted) change in the exchange rate against the US dollar.

Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2016

United Kingdom

Global center for finance

Organized stock trading in the United Kingdom dates from 1698, and the London Stock Exchange was formally established in 1801. By 1900, the UK equity market was the largest in the world, and London was the world's leading financial center, specializing in global and cross-border finance. Early in the 20th century, the US equity market overtook the UK and, nowadays, New York is a larger financial center than London. What continues to set London apart, and justifies its claim to be the world's leading international financial center, is the global, cross-border nature of much of its business.

Today, London is ranked as the top financial center in the Global Financial Centers Index, Worldwide Centers of Commerce Index, and Forbes' ranking of powerful cities. It is the world's banking center, with 550 international banks and 170 global securities firms having offices in London. The UK's foreign exchange market is the biggest in the world, and Britain has the world's number-three stock market, number-three insurance market, and one of the largest bond markets.

London is the world's largest fund management center, managing almost half of Europe's institutional equity capital, and three-quarters of Europe's hedge fund assets. More than three-quarters of Eurobond deals are originated and executed there. More than a third of the world's swap transactions and more than a quarter of global foreign exchange transactions take place in London, which is also a major center for commodities trading, shipping and many other services.

Pre-eminence comes with responsibilities. The UK has the highest participation of all Yearbook countries in charitable giving, according to the World Giving Index 2015, a Charities Aid Foundation survey of 145 nations.

Royal Dutch Shell now has its primary listing in the UK. Other major companies include HSBC, BP, Vodafone, British American Tobacco and GlaxoSmithKline.

Capital market returns for the United Kingdom

Figure 1 shows that, over the last 116 years, the real value of equities, with income reinvested, grew by a factor of 445 compared to 7.1 for bonds and 3.3 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 5.4%, bonds 1.7%, and bills 1.0%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 4.3%. For additional explanations of these figures, see page 37.

Figure 1

Cumulative real returns from 1900 to 2015

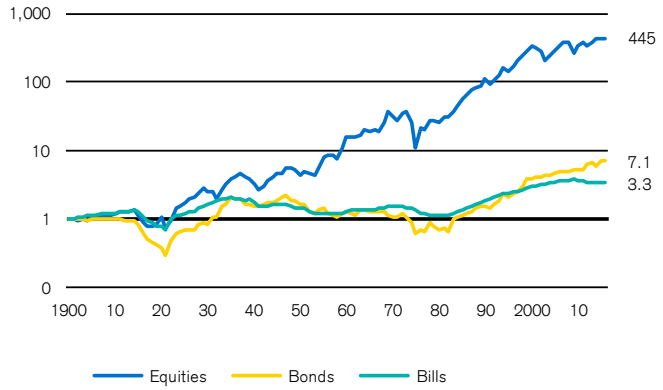


Figure 2

Annualized real returns on major asset classes (%)

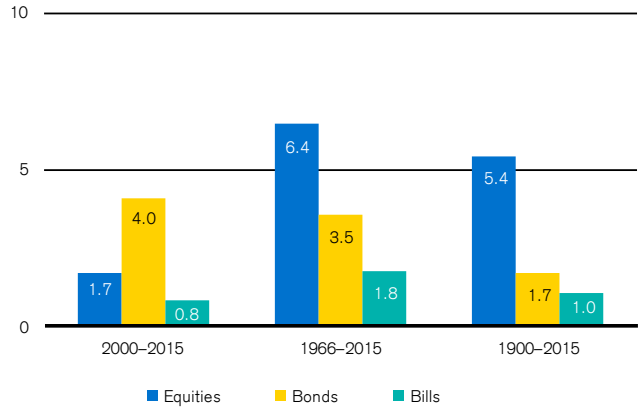
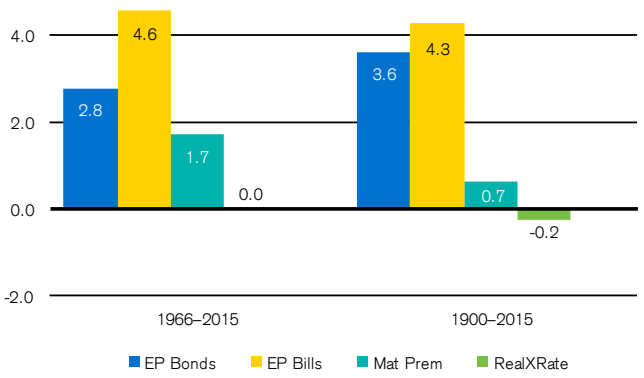


Figure 3

Annualized equity, bond, and currency premia (%)



Note: EP Bonds denotes the equity premium relative to long-term government bonds; EP Bills denotes the equity premium relative to Treasury bills; Mat Prem denotes the maturity premium for government bond returns relative to bill returns; and RealXRate denotes the real (inflation-adjusted) change in the exchange rate against the US dollar.

Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2016

United States

Financial superpower

In the 20th century, the United States rapidly became the world's foremost political, military, and economic power. After the fall of communism, it became the world's sole superpower. The International Energy Agency predicted recently (but before the oil-price collapse) that the USA will be the world's number one oil producer by 2017. Americans are proud of their country: the Pew Research Center reported in 2015 that a larger proportion of Americans have a favorable opinion of the USA than people in any other Yearbook country.

The USA is also a financial superpower. It has the world's largest economy, and the dollar is the world's reserve currency. Its stock market accounts for 52% of total world value (on a free-float, investible basis), which is more than five times as large as Japan, its closest rival. The USA also has the world's largest bond market.

US financial markets are by far the best-documented in the world and, until recently, most of the long-run evidence cited on historical investment performance drew almost exclusively on the US experience. Since 1900, equities and government bonds in the United States have given annualized real returns of 6.4% and 2.0%, respectively.

There is an obvious danger of placing too much reliance on the excellent long-run past performance of US stocks. The New York Stock Exchange traces its origins back to 1792. At that time, the Dutch and UK stock markets were already nearly 200 and 100 years old, respectively. Thus, in just a little over 200 years, the USA has gone from zero to more than a majority share of the world's equity markets.

Extrapolating from such a successful market can lead to "success" bias. Investors can gain a misleading view of equity returns elsewhere, or of future equity returns for the USA itself. That is why this Yearbook focuses on global investment returns, rather than just US returns.

Capital market returns for the United States

Figure 1 shows that, over the last 116 years, the real value of equities, with income reinvested, grew by a factor of 1,271 compared to 9.8 for bonds and 2.7 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 6.4%, bonds 2.0%, and bills 0.8%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 5.5%. For additional explanations of these figures, see page 37.

Figure 1

Cumulative real returns from 1900 to 2015

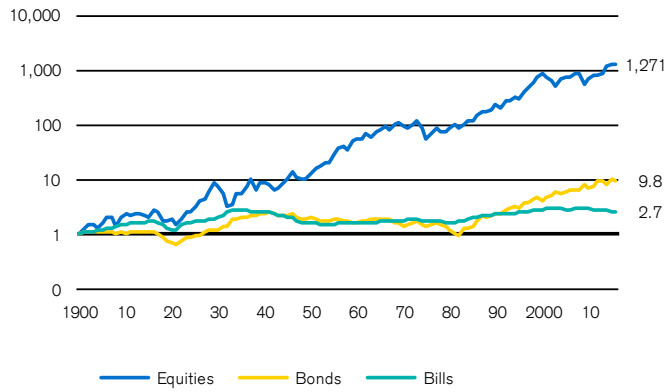


Figure 2

Annualized real returns on major asset classes (%)

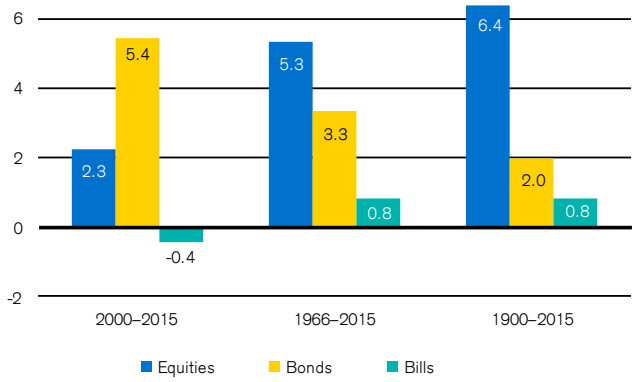
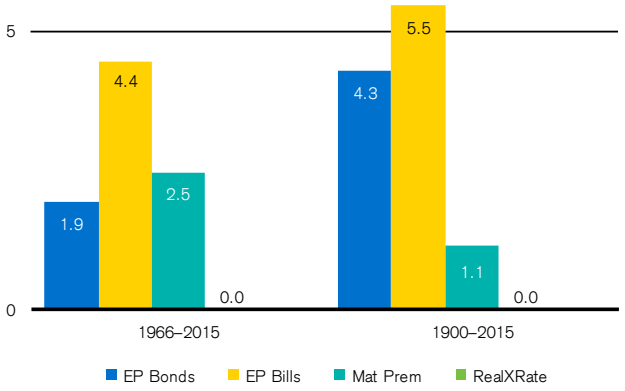


Figure 3

Annualized equity, bond, and currency premia (%)



Note: EP Bonds denotes the equity premium relative to long-term US government bonds; EP Bills denotes the equity premium relative to US Treasury bills; and Mat Prem denotes the maturity premium for US government bond returns relative to US bill returns.

Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2016

World

Globally diversified

It is interesting to see how the Global Investment Returns Yearbook countries have performed in aggregate over the long run. We have therefore created an all-country world equity index denominated in a common currency, in which each of the 23 countries is weighted by its starting-year equity market capitalization. We also compute a similar world bond index, weighted by GDP.

These indices represent the long-run returns on a globally diversified portfolio from the perspective of an investor in a given country. The charts opposite show the returns for a US global investor. The world indices are expressed in US dollars; real returns are measured relative to US inflation; and the equity premium versus bills is measured relative to US Treasury bills.

Over the 116 years from 1900 to 2015, the middle chart shows that the real return on the world index was 5.0% per year for equities and 1.8% per year for bonds. The bottom chart also shows that the world equity index had an annualized equity risk premium, relative to Treasury bills, of 4.2% over the last 116 years, and an almost identical premium over the most recent 50 years.

We follow a policy of continuous improvement with our data sources, introducing new countries when feasible, and switching to superior index series as they become available. Over the past three years, we have added Austria, Portugal, China and Russia. Austria and Portugal have a continuous history, but China and Russia do not.

To avoid survivorship bias, all these countries are fully included in the world indices from 1900 onward. Two markets register a total loss – Russia in 1917 and China in 1949. These countries then re-enter the world indices after their markets reopened in the 1990s.

Capital market returns for World (in USD)

Figure 1 shows that, over the last 116 years, the real value of equities, with income reinvested, grew by a factor of 300 compared to 8.0 for bonds and 2.7 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 5.0%, bonds 1.8%, and bills 0.8%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 4.2%. For additional explanations of these figures, see page 37.

Figure 1

Cumulative real returns from 1900 to 2015

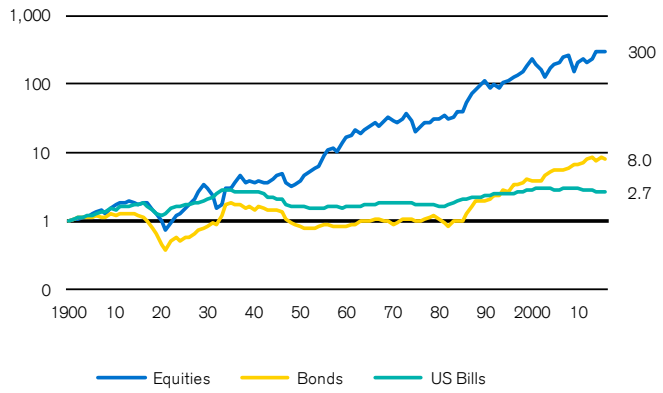


Figure 2

Annualized real returns on major asset classes (%)

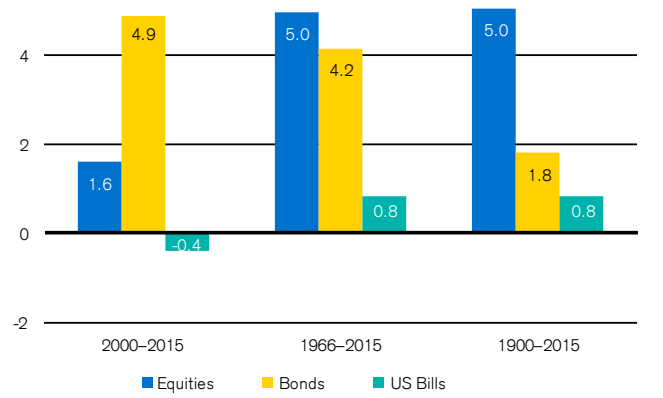
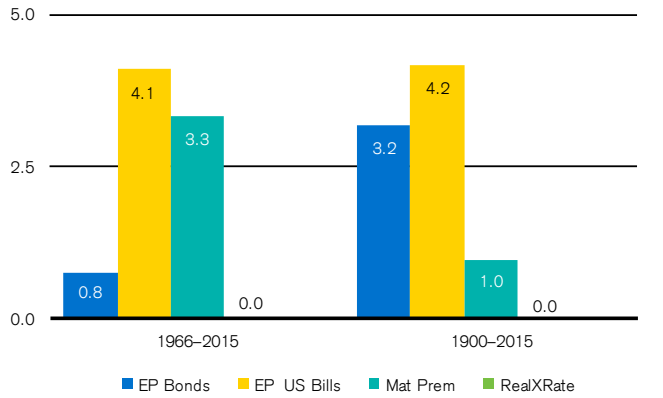


Figure 3

Annualized equity, bond, and currency premia (%)



Note: EP Bonds denotes the equity premium relative to long-term US government bonds; EP Bills denotes the equity premium relative to US Treasury bills; and Mat Prem denotes the maturity premium for US government bond returns relative to US bill returns.

Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2016

World ex-USA

Beyond America

In addition to the two world indices, we also construct two world indices that exclude the USA, using exactly the same principles. Although we are excluding just one out of 23 countries, the USA accounts for over half the total stock market capitalization of the Yearbook countries, so that the 22-country, world ex-US equity index represents less than half the total value of the world index today.

We noted above that, until relatively recently, most of the long-run evidence cited on historical asset returns drew almost exclusively on the US experience. We argued that focusing on such a successful economy can lead to "success" bias. Investors can gain a misleading view of equity returns elsewhere, or of future equity returns for the USA itself.

The charts opposite confirm this concern. They show that, from the perspective of a US-based international investor, the real return on the world ex-US equity index was 4.3% per year, which is 2.1% per year below that for the USA. This suggests that, although the USA has not been the most extreme of outliers, it is nevertheless important to look at global returns, rather than just focusing on the USA.

We follow a policy of continuous improvement with our data sources, introducing new countries when feasible, and switching to superior index series as they become available. In 2013 and 2014, we added Austria, Portugal, China and Russia. Austria and Portugal have a continuous history, but China and Russia do not.

To avoid survivorship bias, the additional countries are fully included in the world indices from 1900 onward. Two markets register a total loss: Russia in 1917 and China in 1949. These countries then re-enter the world and world ex-USA indices after their markets reopened in the 1990s.

Capital market returns for World ex-US (in USD)

Figure 1 shows that, over the last 116 years, the real value of equities, with income reinvested, grew by a factor of 140 compared to 5.7 for bonds and 2.7 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 4.3%, bonds 1.5%, and bills 0.8%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 3.5%. For additional explanations of these figures, see page 37.

Figure 1

Cumulative real returns from 1900 to 2015

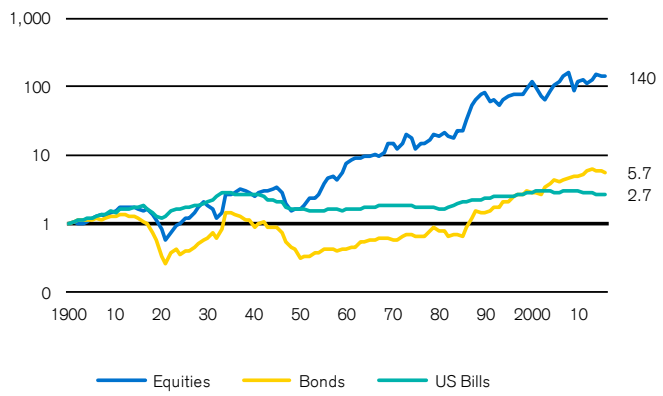


Figure 2

Annualized real returns on major asset classes (%)

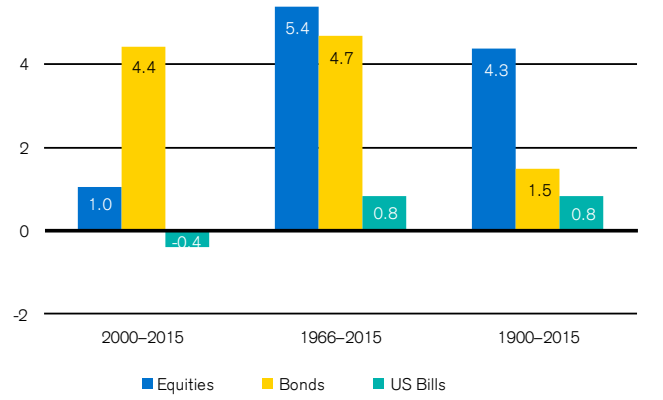
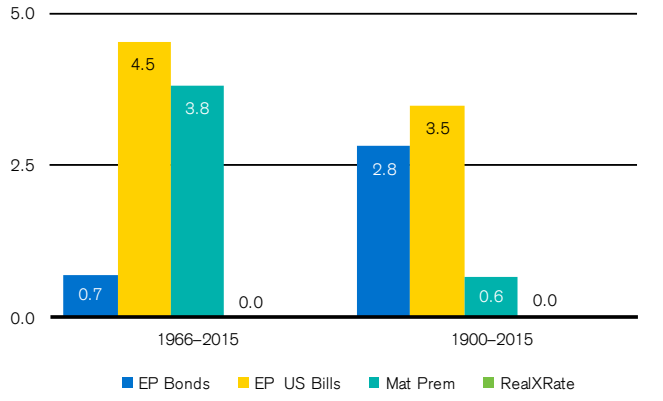


Figure 3

Annualized equity, bond, and currency premia (%)



Note: EP Bonds denotes the equity premium relative to long-term US government bonds; EP Bills denotes the equity premium relative to US Treasury bills; and Mat Prem denotes the maturity premium for US government bond returns relative to US bill returns.

Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2016

Europe

The Old World

The Yearbook documents investment returns for 16 European countries, most (but not all) of which are in the European Union. They comprise 10 EU states in the Eurozone (Austria, Belgium, Finland, France, Germany, Ireland, Italy, the Netherlands, Portugal, and Spain), three EU states outside the Eurozone (Denmark, Sweden and the UK), two European Free Trade Association states (Norway and Switzerland), and the Russian Federation. Loosely, we might argue that these 16 EU/EFTA countries represent the Old World.

It is interesting to assess how well European countries as a group have performed, compared with our world index. We have therefore constructed a 16-country European index using the same methodology as for the world index. As with the latter, this European index can be designated in any desired common currency. For consistency, the figures on this page are in US dollars from the perspective of a US international investor.

The middle chart opposite shows that the real equity return on European equities was 4.2%. This compares with 5.0% for the world index, indicating that the Old World countries have underperformed. This may relate to some nations' loss of imperial powers and colonial territories, the destruction from the two world wars (where Europe was at the epicenter), the fact that many New World countries were resource-rich, or perhaps to the greater vibrancy of New World economies.

We follow a policy of continuous improvement with our data sources, introducing new countries when feasible, and switching to superior index series as they become available. As we noted above, we recently added three new European countries, Austria, Portugal and Russia. Two of them have a continuous history, but Russia does not; however, all of them are fully included in the Europe indices from 1900 onward, even though Russia registered a total loss in 1917. Russia re-enters the Europe index after her markets reopened in the 1990s.

Capital market returns for Europe (in USD)

Figure 1 shows that, over the last 116 years, the real value of equities, with income reinvested, grew by a factor of 124 compared to 3.4 for bonds and 2.7 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 4.2%, bonds 1.1%, and bills 0.8%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 3.4%. For additional explanations of these figures, see page 37.

Figure 1

Cumulative real returns from 1900 to 2015

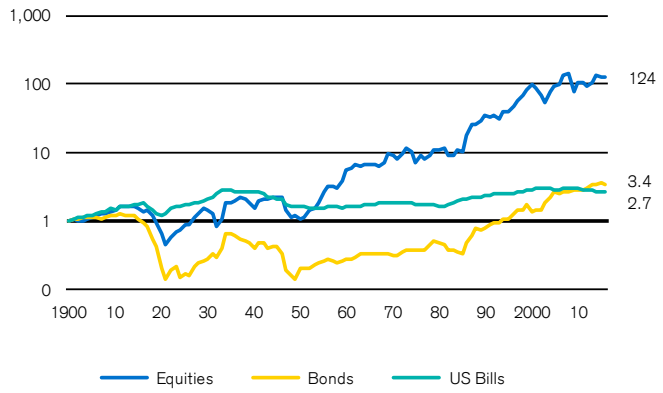


Figure 2

Annualized real returns on major asset classes (%)

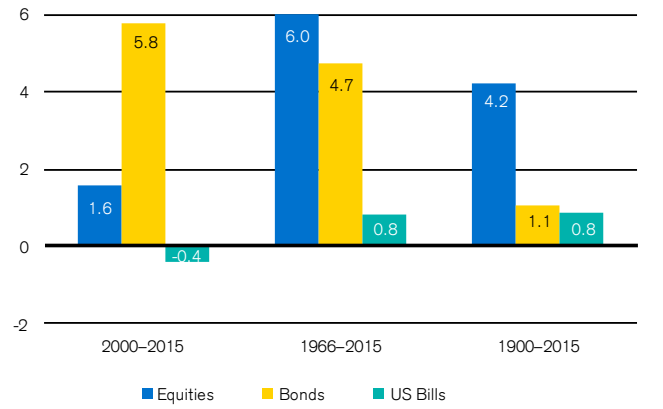
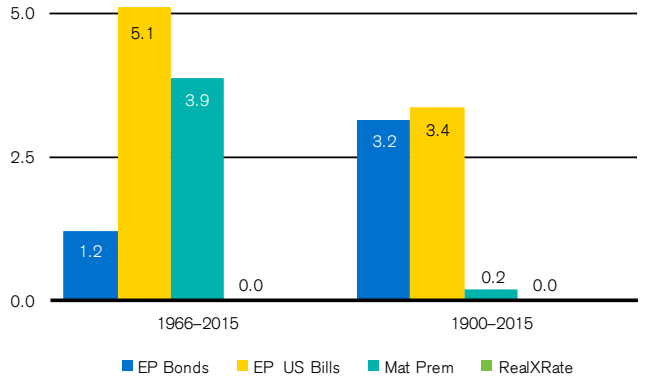


Figure 3

Annualized equity, bond, and currency premia (%)



Note: EP Bonds denotes the equity premium relative to long-term US government bonds; EP Bills denotes the equity premium relative to US Treasury bills; and Mat Prem denotes the maturity premium for US government bond returns relative to US bill returns.

Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2016

PHOTO: SCREENY / PHOTOCASE.DE

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