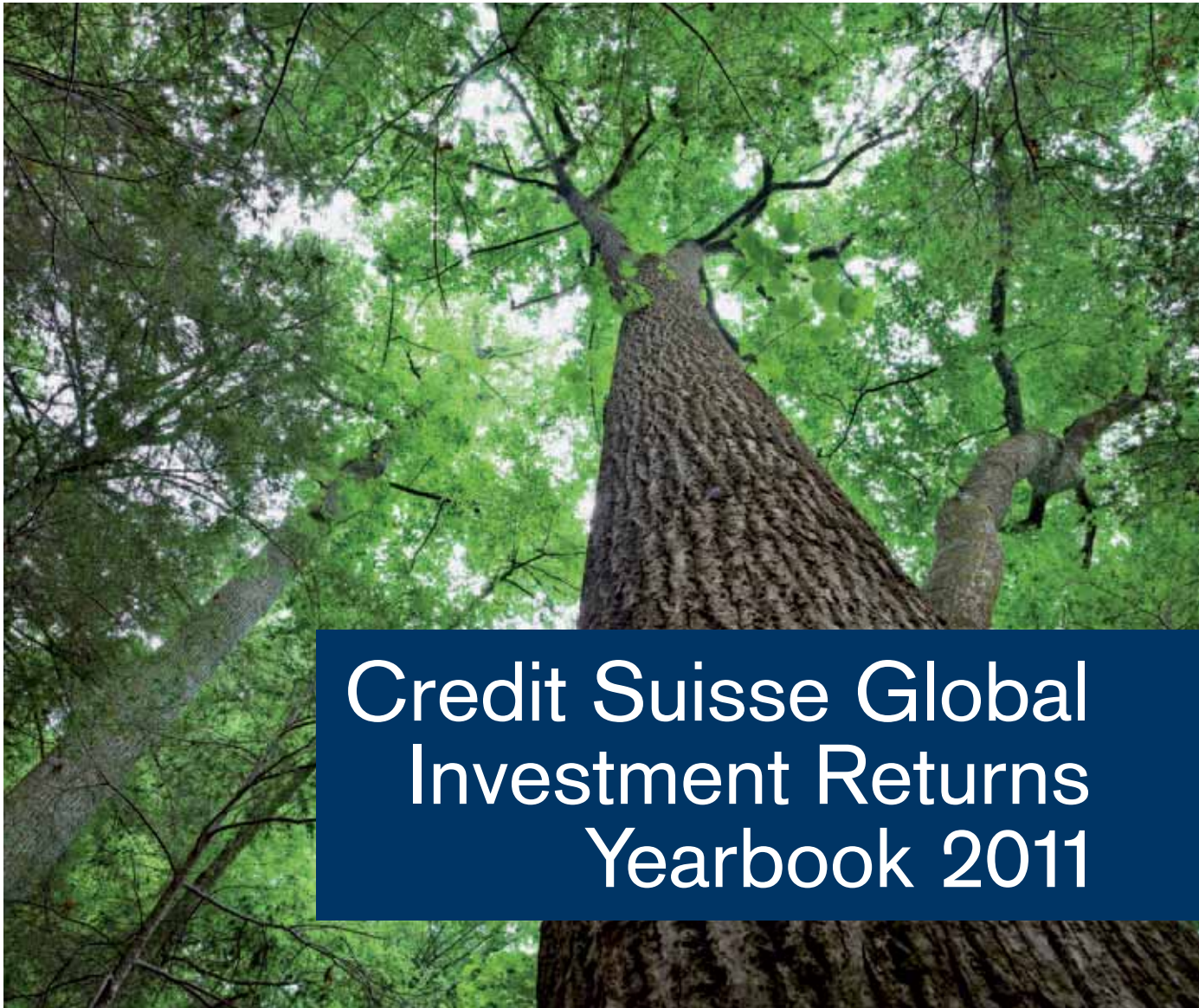


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**Credit Suisse Global  
Investment Returns  
Yearbook 2011**

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To contact the authors or to order printed copies of the Yearbook or of the accompanying Sourcebook, see page 55.

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## Introduction

The Credit Suisse Global Investment Returns Yearbook 2011 provides 111 years of data on financial market returns in 19 countries, from 1900 to date, making it the definitive record on long-run market returns, and helping to put into context the current outlook for asset prices as the global economic recovery gathers pace.

The Yearbook is complemented by the Credit Suisse Global Investment Returns Sourcebook, which extends the scale of the analysis to an examination of investment styles and contains detailed tables, charts, listings, background, sources and references for every country.

More specifically, since the publication of the 2010 Yearbook, the global business cycle has shown considerable improvement, and inflation rather than deflation is now the leading issue of concern for investors. In this context, Elroy Dimson, Paul Marsh and Mike Staunton of the London Business School examine two very relevant issues.

First, following the decades-long bull market in fixed income since 1982, they ask whether investors should now be fearful of falling bonds. This article examines periods when there have been sharp falls, or draw-downs, in government bonds and how long these have persisted. From a cross-asset class point of view, this article also investigates correlations between bonds and stocks and how these have changed over time. They find that bond drawdowns tend to be worse in inflationary periods.

The next article focuses on the “quest for yield” where it examines whether income, per se, should matter to equity investors, and focuses on the contribution of income and long-run dividend growth to long-term stock returns. Within equity markets, it looks at the performance of yield-tilt strategies, and at the risk and risk-to-reward ratios of different income-oriented approaches. In general, the authors highlight that investment strategies favoring high-dividend-yielding equities tend to pay off handsomely in the long run.

In a third article, the Yearbook takes a different, market-based view on risk premia by asking what discount rates are implied by current market levels. David Holland, Senior Advisor to Credit Suisse and Bryant Matthews of HOLT, use our proprietary HOLT framework to quantify what equity markets are currently pricing in. They conclude that, in the case of developing and resource-rich markets, future growth and optimism are already embedded in market expectations. Mature, developed markets look attractive in comparison.

We are proud to be associated with the work of Elroy Dimson, Paul Marsh, and Mike Staunton, whose book *Triumph of the Optimists* (Princeton University Press, 2002) has had a major influence on investment analysis. The Yearbook is one of a series of publications from the Credit Suisse Research Institute, which links the internal resources of our extensive research teams with world-class external research.

### Giles Keating

Head of Research for Private  
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PHOTO: KEVSTONE/STEFAN BINIKERT

# Fear of falling

After a decade with two savage bear markets, investors are wary of equities. Government bonds have been a bright spot, but capital values could fall. This article examines how far government bonds can decline, investigates the role of bonds as a diversifier, shows how the crucial stock-bond correlation has changed over time, and compares the performance of corporate, long- and mid-maturity government bonds, and Treasury bills. A global study of government bonds reveals the pain and potential reward from exposure to inflation risk.

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

Over the long haul, equities have beaten inflation, they have beaten treasury bills, and they have beaten bonds. And as we show in this [Credit Suisse Global Investment Returns Yearbook](#), the same pattern has been repeated in every market for which we have long-term data. With 111 years of returns for 19 [Yearbook](#) countries, representing almost 90% of global stock market value, we can be confident of the historical superiority of equities. In the USA, for example, equities gave an annualized total return over the 111 years of 6.3% in real terms, far ahead of the 1.8% real return on government bonds

Yet that superiority has been dented by the striking performance of bonds over intervals that exceed the investment horizon of most individuals and institutions. Looking back from 2011, bond investors have enjoyed several decades of outstanding performance. The [Credit Suisse Global Investment Returns Sourcebook](#) is the companion volume to this [Yearbook](#). The [Sourcebook](#) reports that for the USA, over the period from the start of 1980 to the end of 2010, the annualized real (inflation adjusted) return on government bonds was 6.0%, broadly matching the 6.3% long-term performance of equities. Over the preceding 80

years, US government bonds had provided an annualized real return of only 0.2%.

Similarly, for the UK, from 1980 to 2010 the annualized real return on government bonds was 6.3%. Over the preceding 80 years, UK government bonds had provided an annualized real return of just -0.5%. While equities have disappointed in recent times, bonds have exceeded most investors' expectations. Bonds – the lower risk asset – have met or exceeded the performance of risky equities. After such a good run, investors are wary that bond prices could fall. In this article, we therefore examine the extent to which bonds expose investors to potentially large drawdowns on their portfolios. We examine the correlation between stocks and bonds, which underpins the role of bonds in a balanced portfolio. Finally, with inflationary concerns in the ascendancy, we examine the impact of both unexpected and expected inflation on real bond returns.

## Risk and return

For each of our 19 countries, we plot the realized equity risk premium, relative to government bonds, over the entire [Yearbook](#) history and for the sub-



period since 2000. These premia are depicted in Figure 1. In blue, we show the annualized equity risk premia that were achieved over the last 111 years. In red, we show the annualized risk premia that were realized over the 11 years from the start of 2000 to the end of 2010 – every red bar being smaller than the long-term premium in blue.

Over the very long term, equities performed better than bonds, and the blue bars are all positive with an average premium of 3.8% per annum. But from the start of the new century, equities were superior to bonds in only four countries –

three of which were resource rich economies. For 15 of the 19 countries, equities underperformed bonds. On average, the realized equity risk premium versus bonds over 2000–10 was –3.2% per year. As is apparent in the country profiles (see page 31), government bonds have so far tended to be the asset of choice in the 21st century.

One interpretation of this outcome is that the reward for equity investing has disappeared, and that bonds have a continuing attraction for investors. An alternative view is that bonds have become expensive, and that investors should be concerned about the possibility of capital losses. This raises the question of how large the losses can be from equities and from bonds.

Figure 1

### Equity risk premium versus to bonds, 1900–2010 and 2000–10

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, *Triumph of the Optimists*; authors' updates. Germany excludes 1922–23.

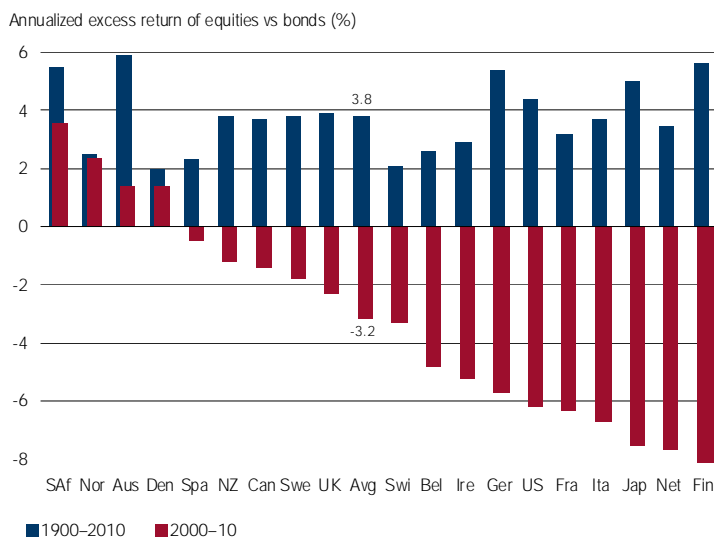
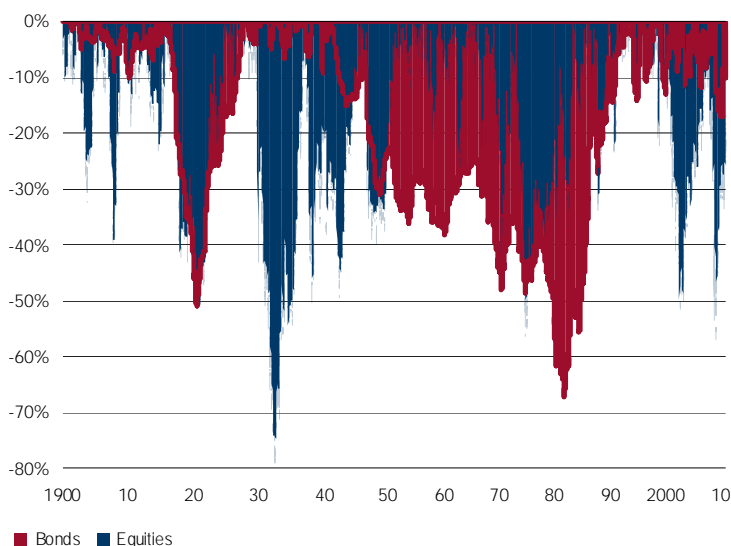


Figure 2

### Drawdown on US equities and bonds, real terms 1900–2010

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, *Triumph of the Optimists*; authors' updates



Basophobia, or fear of falling, is an ailment that often afflicts investors. They are concerned about buying at the top, and then experiencing a dramatic fall in the value of their purchase. One way to express this is to measure the drawdown in value, relative to a portfolio's running maximum value or high-water mark. The drawdown is defined as the difference between the portfolio's value on a particular date and its high-water mark. The interval from the date of the high-water mark to breaching the high-water mark again is the recovery period. The investment is said to be underwater from the date of the high-water mark to the end of the recovery period.

A crucial question is how deep portfolio drawdowns can be, and how long it takes to recover from them. To answer this question, we compute the cumulative percentage decline in real value from an index high to successive subsequent dates. This indicates just how bad an investor's experience might have been if the investor had the misfortune to buy at the top of a bull market. As we shall see, although equities have provided a higher return than bonds, they can experience deeper drawdowns – yet there have also been long intervals of deep bond drawdowns. All returns include reinvested dividends and, unless stated to the contrary, are in real (inflation adjusted) terms.

Using daily data from 1900 to date, we look first at drawdowns for US equities, the historical record of which is shown in Figure 2 in blue. Equity investors have suffered large extremes of performance. After the Wall Street Crash, US stocks fell to a trough in July 1932 that was in real terms 79% below the September 1929 peak; they did not recover until February 1945. This deep drawdown and long recovery period, sets more recent setbacks in context.

From January 1973, stock prices collapsed until, by October 1974, the equity index was down in nominal terms by 48%, and in real terms by 56%. It took only 26 months to recover the nominal high; however, in real terms equities were underwater until April 1983. After the tech-bubble burst in March 2000, equity prices also col-

lapsed and, by October 2002, the real equity index was down in nominal terms by 48%, and in real terms by 52%. While the nominal recovery took only 47 months, in real terms the market remains underwater to this day. Similarly, during the 2007–09 financial crisis, real equity values fell by 56%, and they have not yet fully recovered.

After the meltdowns of 1973–74, 2000–02 and 2007–09, investors were left with between 44% and 48% of their peak-level real wealth. But this was still more than twice as much as those who endured the 1929 Crash. Recent setbacks in the USA, while severe, were not on the scale of the 1930s, and equity portfolios were less underwater. However, it can take a long time for recovery in real terms – even ignoring costs and taxes.

British stock market experience, shown in Figure 3 in blue, was similar. Whereas we have daily data starting in 1900 for the USA, our daily data for the UK starts in 1930. Compared to the USA, the UK suffered greater extremes of poor stock market performance. After October 1936, the approach and arrival of war led to a real stock market decline of 59% by June 1940, though recovery was complete by October 1945.

Before the oil crisis, the equity market had hit a high in August 1972, but UK equities entered 1975 down from that peak by 74% in real terms, and recovery took till February 1983. The tech-crash in March 2003 generated a real loss of 49%, which was recovered by October 2006. After June 2007, the financial crisis hit the UK hard, and by March 2009 equities were down by 47% in real terms; they are still underwater.

### Bond drawdowns

The scope for deep and protracted losses from stocks makes fixed-income investing look, to some, like a superior alternative. But how well do bonds protect an investor's wealth? In Figures 2 and 3, we plot in red the corresponding drawdowns for government bonds. For those who are seeking safety of real returns, these charts are devastating. Historically, bond market drawdowns have been larger and/or longer than for equities.

In the US bond market, there were two major bear periods. Following a peak in August 1915, there was an initially slow, and then accelerating, decline in real bond values until June 1920 by which date the real bond value had declined by 51%; bonds remained underwater in real terms until August 1927. That episode was dwarfed by the next bear market, which started from a peak on December 1940, followed by a decline in real value of 67%; the recovery took from September 1981 to September 1991. The US bond market's drawdown, in real terms, lasted for over 50 years.

The UK had a similar experience. The first bond bear market started in January 1935, and by September 1939 the real value of bonds had fallen by 33%; the recovery took until April 1946. But in October 1946, bonds began to slide again

in real terms, having lost 73% of their value by December 1974. UK government bonds were underwater, in real terms, for 47 years until December 1993. While bonds appeared less risky in nominal terms, it is clear that their real value can be destroyed by inflation.

### Balanced portfolios

Figure 4 presents the drawdown on an illustrative balanced portfolio of 50% equities and 50% bonds. The drawdown is plotted for both the USA (in blue, upper panel) and UK (in red, lower

Figure 3

### Drawdown on UK equities and bonds, real terms 1930–2010

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, *Triumph of the Optimists*; authors' updates

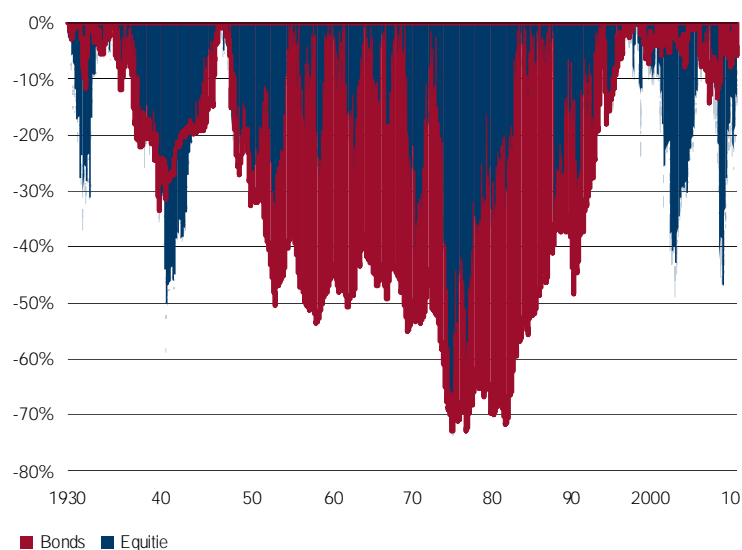
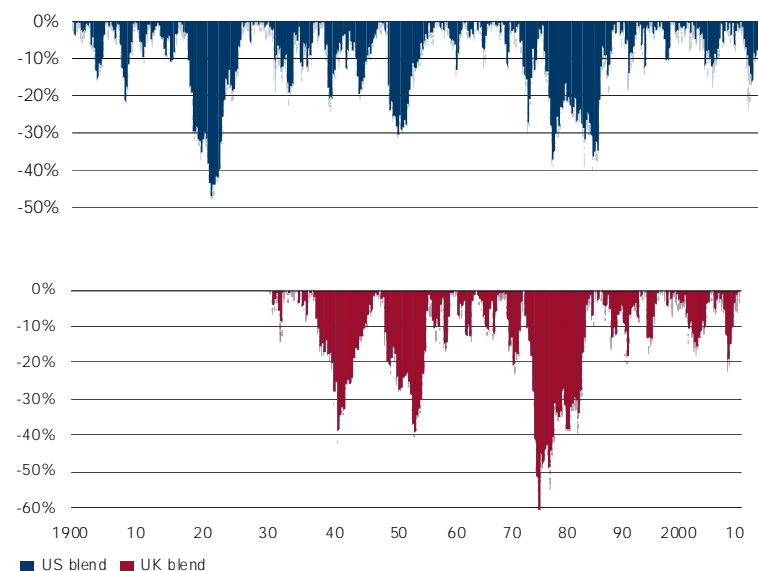


Figure 4

### Drawdown on 50:50 stock-bond blend, real terms 1900–2010

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, *Triumph of the Optimists*; authors' updates



panel). Individually, equities and bonds have on several occasions lost more than 70% in real terms. But since 1900, this 50:50 blend has never (USA) or virtually never (UK) suffered a decline of over 50%. Furthermore, the duration of drawdowns is briefer for the blend portfolio than for the supposedly low-risk fixed income asset.

Measured in local currency adjusted for inflation, the long-term annualized real return on US equities was 6.3% (6.1% in the UK, from 1930). Meanwhile, US government bonds had a real return of 1.8% (2.1% in the UK, from 1930). The

50:50 blend portfolio returned an annualized 4.5% in the US (4.4% in the UK, from 1930).

While a 50:50 equity/bond blend has had a lower expected return than an all-equity portfolio, it has also had a lower volatility. Since 1900, the standard deviation of real equity returns has been 20.3% in the USA and 20.0% in the UK, as compared to bonds which has a standard deviation of 10.2% in the USA and 13.7% in the UK. For the blend portfolio, the standard deviation was attractively low: 11.7% in the US and 14.4% in the UK.

There is nothing special about a 50:50 asset mix and, in reality, investors should diversify across more assets than just local stocks and bonds. However, this example serves to highlight the risk-reducing potential of a balanced portfolio of bonds and stocks.

Figure 5

### Rolling stock-bond correlations: real terms, 1900–2010

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, *Credit Suisse Global Investment Returns Sourcebook 2011*, and authors' extensions.

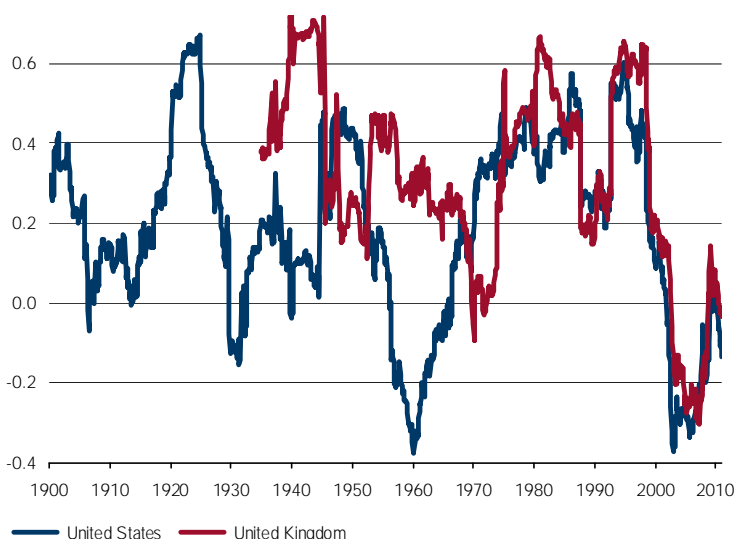
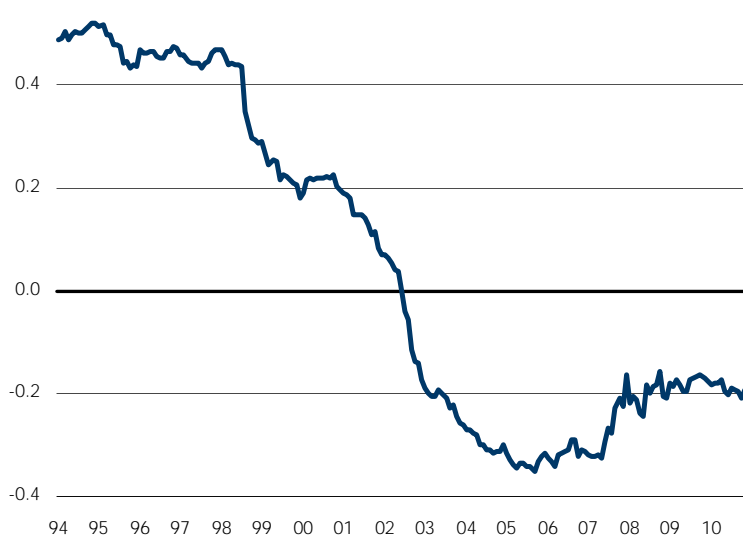


Figure 6

### Global average of rolling stock-bond correlations

Source: Elroy Dimson, Paul Marsh, and Mike Staunton; MSCI and Citigroup; Antti Ilmanen



### Bonds as a diversifier

Why is the downside risk of the blended stock/bond portfolio lower? There are two reasons. First, bonds are less volatile than equities. The country profiles (page 31 onwards) show that in all 22 *Yearbook* markets, bonds have had a lower standard deviation (averaging 12.5% across our 19 countries) than equities (which average 23.4%).

Second, bonds are imperfectly correlated with stocks. Figure 5 plots the correlation between stock and bond returns computed in real terms over a rolling window of 60 months. The correlations are shown for both the USA and UK. The stock-bond correlations as at end-2010 are negative: for the USA a correlation of  $-0.14$ , and for the UK  $-0.03$ .

In contrast to recent experience, the stock-bond correlation has been positive, although fairly low, over the very long term. In the USA, using real returns over the period 1900–2010, it averaged  $+0.19$  with a range of  $-0.38$  (in January 1960) to  $+0.67$  (in October 1924). In the UK, using real returns over the period 1930–2010, it averaged  $+0.31$  with a range of  $-0.31$  (in May 2007) to  $+0.74$  (in December 1939).

When inflation accelerated and subsided, from the 1970s to the 1990s, changes in inflation expectations drove both stock and bond markets in tandem. Stock-bond correlations were briefly negative around the 1929 Crash and for a longer period in the late 1950s and early 1960s. But, in the turmoil of the 2000s, when bonds became a desirable safe-haven asset, the correlation became strongly negative in both countries.

In Figure 6, we display rolling 60-month stock-bond correlations averaged across the *Yearbook's* 19 countries. The indices are the MSCI equity and Citigroup WGBI bond indices (except South Africa for which we use swap rates), starting in 1989 for most countries. They are denominated in local currency and adjusted by local inflation. Figure 6 provides clear confirmation that the US and UK pattern of relatively low stock-bond correlations after the 1990s was prevalent worldwide. The key



question is this: Will low correlations persist into the future?

While we cannot predict the future, we can read the tea leaves of history. We therefore examine how stock-bond correlations behaved over the very long term in all 19 *Yearbook* countries. Our aim is to see whether the relatively low correlations we have found for the US and UK – and for other countries more recently – have been repeated elsewhere.

We therefore compute stock-bond correlations for all 19 *Yearbook* countries, based on annual real returns for the entire 111 years from 1900, and also for the years from 1950 to 2010. These correlations are shown in Figure 7. They are generally positive, with an average of +0.24 over the entire period starting in 1900, and +0.19 over the period starting in 1950. In Figure 7, we also display stock-bond correlations based on returns over 60 months to the end of 2010. For every country, the correlation estimated over the recent period 2006–10 is lower than the average of the correlations estimated over the longer intervals of 1900–2010 and 1950–2010.

Consistent with the last observation at the right of Figure 6, the average of all 19 countries' monthly stock-bond correlations in Figure 7 is -0.19. But even if correlations rise towards the long-term averages depicted in Figure 7, they will still be low. With a low correlation to equities, bonds offer diversification opportunities.

### The maturity premium

Over the horizon spanned by the *Yearbook*, long-maturity government bonds provided a superior return compared to holding Treasury bills. In the USA, an investment of USD 1 in 1900 in a long bond index, representing the returns on government bonds with an approximate maturity of 20 years, grew by the end of 2010 to a real value of USD 7.5, an annualized real return of 1.8%. A comparable investment in US government Treasury bills – which typically have a very short-term maturity of around one month – grew to a real value of USD 2.9, an annualized real return of 1.0%.

These long-term real returns on US bonds and bills are portrayed in Figure 8. We also show the real return from investing in mid-maturity US government bonds, with an average maturity of five years. Since this mid-maturity bond index starts in 1926, we have set its initial value equal to the then value of the long-maturity bond index. Over the 85-year period from 1926 to 2010, investors would have ended up with almost as much from holding mid-maturity as from long-maturity bonds. Finally, we show the performance of corporate bonds, which grew in real value from USD 1 to USD 15.9, an annualized real return of 2.5%.

The pattern of UK long bond returns is similar. We measure their performance by UK government 2½% consols until 1954, and thereafter by a

portfolio of dated bonds with an average maturity of 20 years. Starting in 1900, investment in this long bond index of GBP 1 grew by the end of 2010 to a real value of GBP 4.6, an annualized real return of 1.4%. A comparable investment in Treasury bills grew to a real value of GBP 3.1, equivalent to an annualized real return of 1.0%. More details on long-term returns for the UK are provided in the *Credit Suisse Global Investment Returns Sourcebook*.

In both the USA and the UK, the history of bond investment was not a tale of steady pro-

Figure 7

### Stock-bond correlations: Various time horizons, 1900–2010

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, MSC data; Antti Ilmanen

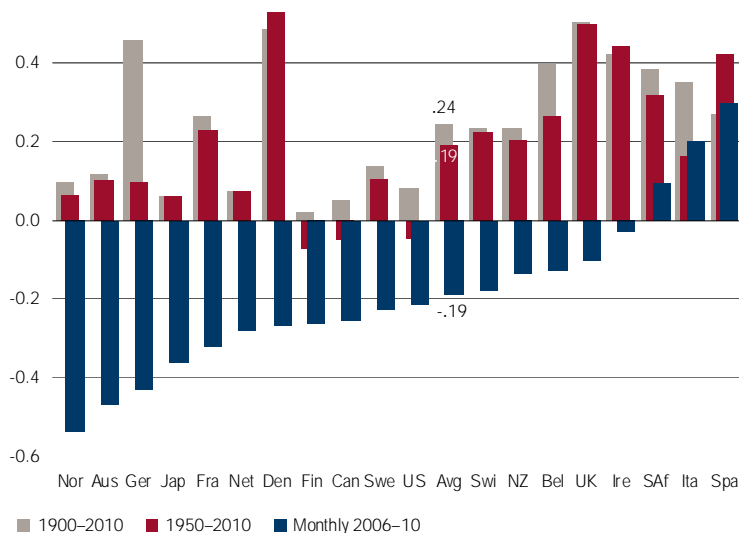
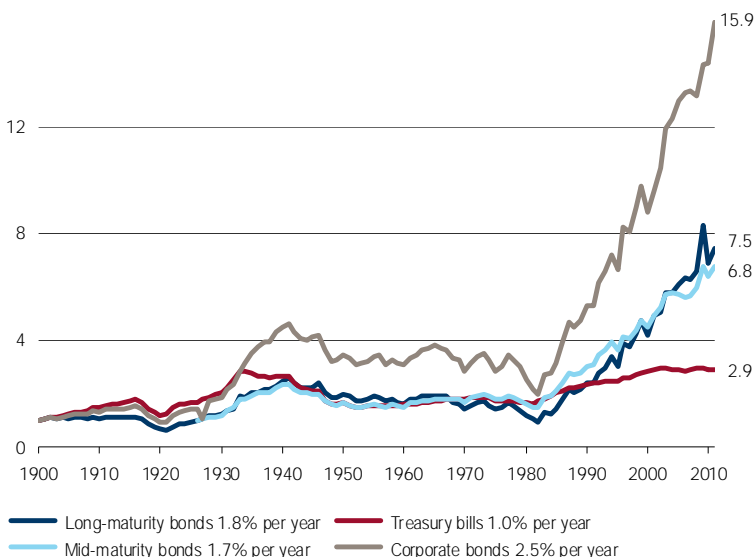


Figure 8

### Cumulative real return from US bonds, 1900–2010

Source: Elroy Dimson, Paul Marsh, and Mike Staunton *Triumph of the Optimists*; authors' updates, Morningstar /Ibbotson Associates, Global Financial Data



gress. As described earlier, there were two bear markets, the second of which was especially lengthy, and in real terms, US and UK government bonds were below their high-water mark from about half a century. There were also two strong bull phases. The first bull market was one in which real bond returns were underpinned by the deflation of the 1930s, while the second was underpinned by gradual success in conquering the inflationary pressures of the 1970s. We have discussed long-maturity government bonds in the US and UK, but what about worldwide evidence?

Figure 9

### Extreme real returns in bond market history, 1900–2010

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, *Credit Suisse Global Investment Returns Sourcebook* 2011

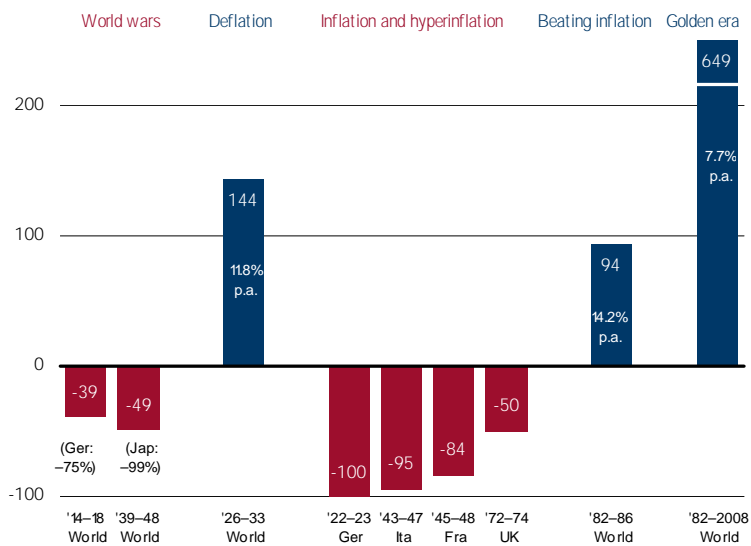
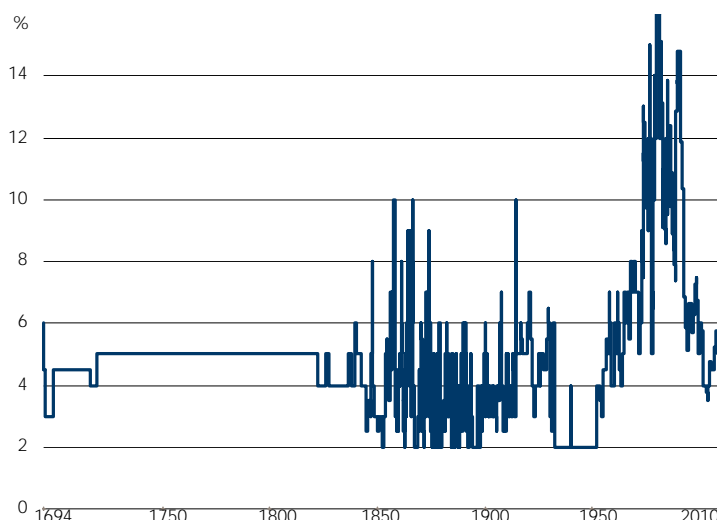


Figure 10

### Short-term nominal interest rates in the UK, 1694–2010

Source: Bank, minimum lending, minimum band 1, repo and official bank rates from Bank of England



### Global bond performance

In the second half of this *Yearbook*, the Country Profiles show that the annualized real bond return in the 19 countries averaged 1.0%. For our world bond index, the annualized real (USD) return was 1.6%.

While the USA and UK are broadly in line with global financial history, there is considerable variation across countries. Six countries – Belgium, Finland, France, Germany, Italy and Japan – had real bond returns over the last 111 years that were negative. For these countries, we can be completely sure that realized returns fell short of investors' expectations. Although bonds have been less volatile than equities, they have been hampered by lower average long-run rates of return. There have consequently been lengthy periods when bond performance lagged behind inflation. As we showed in the drawdown charts, bonds have therefore sometimes experienced prolonged periods of remaining underwater, offset by interludes with excellent performance.

As Figure 9 indicates, the two world wars were generally periods of poor performance for bond investors. During World War I, the world bond index lost 39% of its real value, while World War II and its aftermath were accompanied by a 49% decline in real terms. Though wars are bad, deflation has been good news for bond investors: during the deflationary period 1926–33, the 144% real return on the world bond index was equivalent to 11.8% per year. Figure 9 depicts some of these episodes of extreme bond market performance. The worst periods for bond investors were episodes of exceptionally high inflation, as experienced in Germany (1922–23), Italy and France (1940s), and the UK (1972–74).

During 1982–86, the world bond index rose by a real 94% (14.2% per year) and, over 1982–2008, it gave a real return of 649% (7.7% per year). These high returns have arisen from a remarkable decline in interest rates since the inflationary 1970s.

### Interest rates and inflation

The extent to which interest rates have fallen is highlighted in Figure 10. This graph plots the level of the short-term interest rate in the UK, linking together data for the bank rate, minimum lending rate, minimum band 1 dealing rate, repo rate and official bank rate. As we show in the chart, nominal interest rates have never been as low in the UK as today – not only during the 21st and 20th centuries, but even in the 19th, 18th and 17th centuries. These low interest rates ought to be good news for borrowers (though, in reality, borrowers frequently face loan limits and pay significant credit spreads). For bond investors, the decline in interest rates has been good in retrospect, since bond prices rose. But that means they are



poorer in prospect, since the forward-looking return from fixed income securities is now low.

Today's yields on sovereign bonds are small, regardless of maturity or geography, except for countries where credit risk is a concern. Yet, as we have seen, fixed income investors can be exposed to major drawdowns if inflation and interest rates accelerate ahead of expectations. Meanwhile, there is reduced scope for return enhancement through further cuts in interest rates or unconventional measures such as quantitative easing. The only exceptions are issuers that are regarded as a credit risky. Here, there are opportunities to increase expected returns, although only by exposing portfolios to corporate or sovereign default risk.

### Inflation reduces bonds' safe-haven status

When higher inflation is a threat, bond yields will obviously rise and prices will fall. But price falls are likely to be greater than can be explained just from the impact of higher expected inflation on the real cash flows from bonds. The real yield is also likely to rise because of three intertwined factors.

First, when the purchasing power derived from a fixed-interest investment is uncertain, it loses some of its attraction as a refuge from financial market volatility. Second, when inflation is higher it is typically more volatile, and the required premium for exposure to inflation uncertainty will rise. And third, when inflation is high it hurts company values as well as bond prices, increasing the stock-bond correlation and reducing the diversification benefits from bonds. These pressures limit the safe-haven attribute of bonds and, at the same time, increase their beta relative to equities.

Thus during periods of continuing and variable inflation, expected bond returns are higher, not only in nominal terms, but also in real terms. The yield curve can be expected to slope upwards so as to provide long-bond investors, who predominately care about real returns, with a positive term premium. This premium increases with duration, as longer bonds face greater inflation uncertainty.

Conversely, during a period when consumer prices fall, bonds have favorable investment characteristics. They are the only asset class that provides a hedge against deflation and they are a safe haven during stock market crises. So when deflation is a concern, government bonds come into their own. Also, at such times, bonds are more likely to be a hedge against the equity market (see Figures 5 and 6).

Consistent with this story, we have shown that over recent periods, stock-bond correlations have been lower than correlations based on long-term, data (see Figure 7). The expected return for a low- or negative-beta asset should reflect its risk-reducing attributes. Consequently, as the beta of government bonds fell during the 1990s and into the 2000s, they were re-priced to offer a smaller

forward-looking risk premium. Yields declined, and realized returns were therefore high.

Looking to the future, if bonds retain their safe-haven attributes, they can be expected to deliver low but positive performance in the years ahead. If, however, higher and uncertain inflation reappears, then bonds will be perceived as riskier, yields and expected returns will increase, and prices will fall. In recent months, as inflationary concerns have moved into the ascendancy, we have already seen a move in this direction.

### Inflation risk

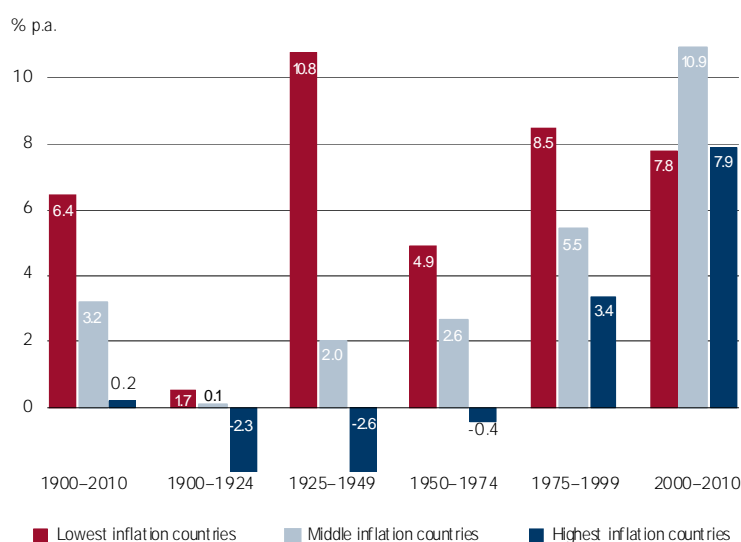
When inflation accelerates, bond prices will therefore fall because future cash flows decline in real terms, while the real yield increases. The rise in real yields is needed to increase the forward-looking real return to a level that attracts investors to hold these securities. We confirm this in Figure 11. At each New Year, countries are ranked by the annual inflation they will experience over the year ahead. Note that, while this enables us to quantify the impact of inflation on real bond values, it is not an implementable strategy, since year-ahead inflation is not known in advance.

We assign the 19 Yearbook countries to quintiles that comprise four countries (three for the middle quintile). Each portfolio is allocated equally to the constituent countries' bonds. Income is reinvested, and at the end of each year, countries are re-ranked and portfolios rebalanced. Figure 11 reports returns in real USD. The leftmost bars in Figure 11 show the annualized real returns from quintiles 1, 3 and 5 over the full 111 year period. The countries with the lowest inflation performed best, while bonds in high-inflation countries underperformed. This pattern was evident over all

Figure 11

### Real returns: ranking by concurrent inflation, 1900–2010

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, *Triumph of the Optimists*; authors' updates



subperiods of the 20th and 21st centuries, other than the 11-year period since the year 2000.

With a perfect year-ahead forecast of the 19 inflation rates, this could be a profitable trading rule – buy the bonds of those countries that are destined to report the lowest inflation rates. However, no investor has access to a crystal ball. The investor could buy the bonds of countries that have reported low inflation for the preceding year, but as we show next, that is a quite different strategy and it is not a recipe for investment success.

### The inflation premium

In terms of purchasing power, bonds are riskier when inflation is higher and uncertain. During periods of higher inflation, government bonds can therefore be expected to have a higher expected real return. Do they on average deliver a higher real return when inflation rates are higher? We look again at the long-term history of the 19 *Yearbook* countries to address this question.

As before, at each New Year, countries are ranked by their annual inflation rate – but now we use inflation for the year preceding investment. We assign the 19 *Yearbook* countries to quintiles that comprise four countries. Each portfolio is allocated equally to the constituent countries' bonds. Income is reinvested, and at the end of each year, countries are re-ranked and portfolios rebalanced. Returns are in real USD.

The leftmost bars in Figure 12 show the annualized real returns from each quintile over the full 111 year period. Bonds in the countries with the

highest inflation rates tended to have higher real returns over the subsequent year, confirming that bonds were priced so as to provide a higher forward-looking return. This pattern was evident over all subperiods of the 20<sup>th</sup> and 21<sup>st</sup> centuries, other than the first quarter-century of the 1900s.

We also find that the volatility of real returns in high-inflation countries is larger than that of low-inflation countries: over the entire period 1900–2010, the standard deviation of real bond returns in the high-inflation countries was 17.6%, as compared to 14.6% in the low-inflation countries. The higher long-run real return from high-inflation countries provided some compensation for uncertainty about the purchasing power of bonds in the bond issuer's economy, and the risk of underperforming in terms of USD returns.

### Avoiding accidents

Since the beginning of the 21st century, government bonds have achieved excellent performance, beating equities in most of the 19 countries in the *Yearbook*. Over the long term, equities have beaten fixed income investments, and the 21st century has so far deviated from historical precedent. Bond yields have fallen, and investors are now concerned about capital losses on their portfolios.

We have documented the scale of drawdowns from bond portfolios in the UK and USA, and compared them to drawdowns from equity portfolios. Government bonds have suffered two big bear markets, followed by recoveries. On both sides of the Atlantic, bonds were underwater in real terms for about half a century.

We show that simple domestic diversification between stocks and bonds can reduce downside risk, although the expected investment performance of a blended bond-plus-equity portfolio is naturally lower than an all-equity portfolio. The scope for diversification between bonds and stocks depends crucially on the correlation between the returns on these two asset classes. We report on how the stock-bond correlation has varied over time. We show that it is typically quite low, and that from the 1990s to the 2000s it moved, globally, from positive to negative.

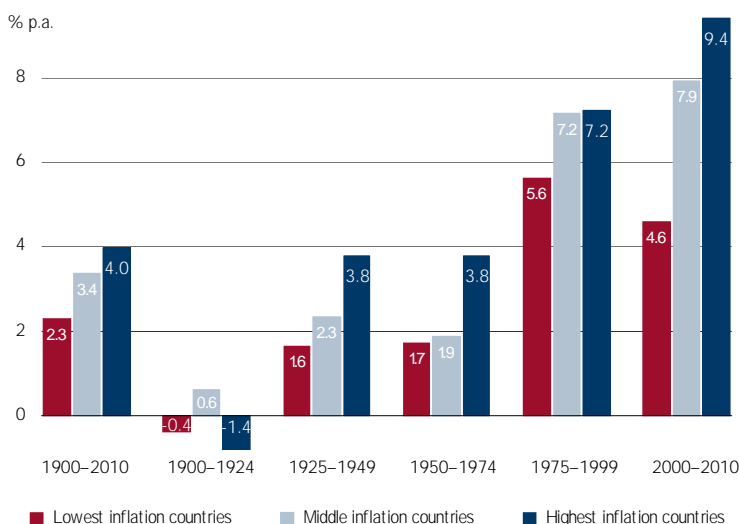
The bad times for bond investors have included times that are inflationary, and when interest rates are low and then subsequently rise more than expected. We present evidence on the extremes of global bond market performance since 1900, and on the magnitude of current interest rates compared to the ultra-long-term historical record. This motivates us to undertake a cross-country study of the impact of inflation on the real (inflation-adjusted) investment performance of government bonds.

We demonstrate the decimating impact of inflation on contemporaneous bond returns. But we also show that attempts to avoid these risks, by

Figure 12

### Real returns: ranking by prior-year inflation, 1900–2010

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, *Triumph of the Optimists*; authors' updates





investing in the bonds of low-inflation countries, may provide lower returns.

An alternative strategy is to buy bonds issued by governments that have experienced high rates of inflation, rebalancing the portfolio annually to maintain exposure to high-inflation markets. This approach is more risky, and has a higher volatility of returns. While it has generated a higher return over the long term, this may be no more than a risk premium for exposure to the bonds issued by inflation-prone countries.

Of course, inflation expectations are not the sole driver of conventional bond prices, and the broader supply-demand dynamic is also important. The supply side includes factors such as the impact of the deficit, changes in the scale of bond issuance, and the choice of instrument to issue. On the demand side, there are regulatory changes that affect investor behavior, like minimum funding requirements for pension funds and capital requirements for life companies. Nevertheless, over the long term, the investment performance of bonds has depended crucially on real interest rates and the impact of inflation.

As inflation receded, interest rates fell and the demand for a safe haven increased, leading to outstanding investment performance from government bonds. But the golden age of the last 28 years cannot continue indefinitely, and we must expect returns to revert towards the mean. Only a raging optimist would believe that, given today's bond yields, the future can resemble the more recent past. It is sheer fantasy to expect bond performance to match the period since 1982.

Yet expecting bond returns to be lower than in the golden era is not the same as asserting they will enter a protracted period of negative performance. A popular view is that bonds are in a bubble, or that yields, even on long bonds, will go up, giving rise to capital losses. While this is entirely possible, the fact that real returns have been unusually high over several decades does not mean that in future they will be unusually low. Current bond yields – which despite recent rises remain historically quite low – may simply reflect what we can expect.

While the long-run return from investing in government bonds has been lower than equities, this is what we should expect, given their lower risk. And government bonds have unique properties and an important role in asset allocation. They continue to provide a safe haven to investors, a hedge against deflation, and opportunities for portfolio diversification.





# The quest for yield

Low interest rates on cash and government bonds are causing investors to seek income elsewhere, especially from equities and corporate bonds. While investors remain nervous about equities, there is a belief that higher-yielding stocks not only provide enhanced income, but are less risky. This article examines whether income, per se, should matter. It shows the contribution of income and dividend growth to long-term returns. It investigates the performance and risks of strategies tilted towards higher yield, both within and across equity markets. Finally, it looks at the risk and return from corporate bonds.

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

In autumn 2010, US 10-year Treasury yields fell to 2.4%, just above their post-Lehman crisis level, which marked their low point in over half a century (see Figure 1). Shorter rates were lower still. 5-year Treasury yields dipped below 1%, while cash yielded close to zero. These historically low rates were mirrored in most developed countries, except those where credit risk was a concern.

Although bond yields rose sharply by the year-end, they were still low by historical standards. Year-end equity yields were also well below their historical means, but equities nevertheless still appeared competitive, relative to bonds, in terms of income. Over the last 50 years, US bond yields exceeded equity yields by an average of 3.9% – the so-called “reverse yield gap” (see Figure 1). In the depths of the credit crunch, the US yield gap briefly turned positive. While now negative again, it remains low by the standards of the last 50 years – as it does in other major world markets.

Many investors view the yield gap as a crude indicator of the relative attractiveness of equities. They argue that if equity yields are close to, or only a little below those on government bonds, then equities are the more attractive since, unlike fixed income bonds, they offer the prospect of

income growth. Furthermore, by tilting their portfolios towards higher-yielding shares and markets, investors can obtain a prospective yield higher than that from bonds. Moreover, in uncertain times, tilting towards higher yielders is widely viewed as “safer.” But can it be that simple?

## Mind the (yield) gap

Setting aside countries whose governments face appreciable credit risk, equity investors should expect a return premium compared to government bonds because stocks have higher risk. Equities provide a current dividend yield plus an expected growth rate of dividends, while the expected bond return is the current redemption yield. The yield gap is therefore equal to the equity premium versus bonds **minus** the expected growth rate in dividends. Expressing this in real terms, the yield gap equals the expected equity premium versus bonds, **minus** the expected real growth rate in dividends, **minus** the expected inflation rate.

This decomposition of the yield gap into its underlying components helps explain the pattern we see in Figure 1. We would expect the yield gap to be lower when the expected inflation rate is

higher; to be lower when the expected risk premium is lower; and to be lower when the expected growth rate of dividends is higher. Figure 1 shows that the US yield gap was mostly positive (i.e. equities yielded more than long bonds) until the mid-1950s, while since then it has been mostly negative. The most obvious driver has been inflation and inflationary expectations. From 1900 to 1959, US inflation averaged 2.1% per year; since then, it has averaged 4.1%. Year-on-year inflation peaked at 15% in 1980, while the reverse yield gap peaked at over 10% in 1981.

Figure 1

### US bond and equity yields, 1900–2010

Source: Elroy Dimson, Paul Marsh and Mike Staunton; Global Financial Data.

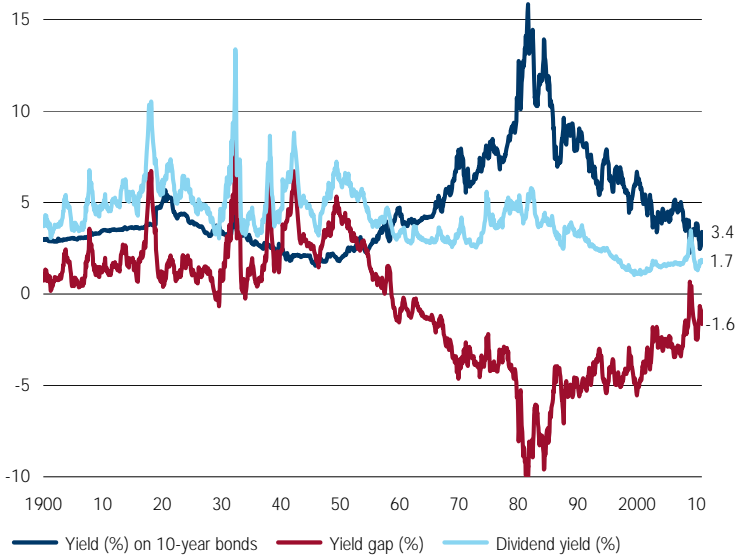
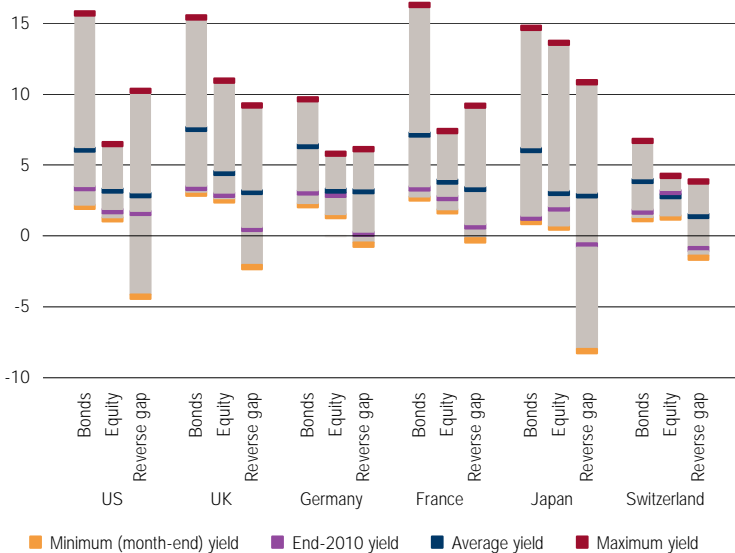


Figure 2

### Yields and reverse yield gap, 1950–2010

Sources: Elroy Dimson, Paul Marsh and Mike Staunton; Thomson Datastream; Global Financial Data



Our decomposition of the yield gap also helps explain why it turned positive in December 2008, rising to 1% in the USA at the height of the financial crisis. First, inflationary expectations had fallen sharply, and there were significant deflationary concerns. Second, expected dividend growth had been revised downwards. Third, the equity risk premium had increased. The premium is the reward per unit of risk that investors require to invest in risky equities rather than less risky government bonds. In December 2008, equities had fallen sharply, making investors poorer and more risk averse, while risk had greatly increased.

Fortunately, the extreme conditions of the credit crunch were fairly short-lived, and the yield gap in most countries has again fallen. Nevertheless, Figure 2 shows that by end-2010, yield gaps in the world's major markets remained high by the standards of the last 50 years. The yield gap was -1.6% in the USA, -0.7% in France, -0.5% in the UK, -0.2% in Germany, and actually positive in Japan and Switzerland. These yield gaps simply reflect the current consensus about market conditions, rather than signaling a buying opportunity for stocks. Yet despite this, continuing low interest rates have led many investors to look increasingly to equities and dividends for income.

### Why dividends matter

From day to day, investors focus mostly on price movements, which is where the action is. In contrast, dividends seem slow moving. Indeed, over a single year, Figure 3 shows that equities are so volatile that most of an investor's performance is attributable to share price movements (the blue bars). Dividend income (the red area plot) adds a relatively small amount to each year's gain or loss.

On balance over the years, capital gains outweigh losses. The blue line plot in Figure 3 shows that a US equity portfolio, which started in 1900 with an investment of one dollar, would have ended 2010 valued at USD 217, even without reinvesting dividends. In nominal terms, this is an annualized capital gain of 5.0%.

While year-to-year performance is driven by capital gains, long-term returns are heavily influenced by reinvested dividends. The red line plot in Figure 3 shows that the total return from US equities, including reinvested dividends, grows cumulatively ever larger than the capital appreciation, reaching USD 21,766 by the end of 2010, an annualized return of 9.4%. The terminal wealth from reinvesting income is thus almost 100 times larger than that achieved from capital gains alone.

This effect is not specific to the USA, but is true for all equity markets. Indeed, the longer the investment horizon, the more important is dividend income. For the seriously long-term investor, the value of a portfolio corresponds closely to the present value of dividends. The present value of the (eventual) capital appreciation dwindles greatly in significance.



### Dividend growth

Unlike fixed-income investments, equities offer the prospect of dividend growth. Historically, dividends have grown in nominal terms in every Yearbook country. But what matters is real, inflation-adjusted growth. Figure 4 shows the Yearbook countries and world index ranked by their annualized real dividend growth over 1900–2010 (the gray bars). Real dividend growth has been lower than is often assumed. Figure 4 shows that 10 out of 19 Yearbook countries recorded negative real dividend growth since 1900, and only four enjoyed real dividend growth above 1% per year. Real dividends on the world index grew by 0.83% per year, bolstered by the heavy weighting of the USA. Dividends, and probably earnings, have barely outpaced inflation.

Dividend growth was lower in the turbulent first half of the last century, with real dividends on the world index falling by 0.9% per year. Real dividends grew in just three countries: the USA, Australia, and New Zealand. But from 1950 to 2010, real dividends grew everywhere except New Zealand, and the world index enjoyed far healthier real growth of 2.3% per year. Figure 4 also shows how dividend yields have changed over the long run. The red bars show the annualized change in the price/dividend ratio (the reciprocal of the yield) from 1900 to 2010. Over the last 111 years, price/dividend ratios have risen (dividend yields have fallen) in 16 of the 19 countries. The price/dividend ratio of the world index grew by 0.48% per year.

Finally, the blue bars in Figure 4 show the mean dividend yield in each country from 1900 to 2010. By definition, the real annualized equity return in each country is equal to the sum of the three bars shown for that country, i.e. the mean dividend yield plus the real growth rate in dividends plus the annualized change in the price/dividend ratio. Dividends have invariably been the largest component of real returns.

### The sense in which dividends are irrelevant

Dividends are thus a key component of long-run returns, but what does this mean for investors? It would be trite to advise that dividends should be reinvested – and this would be inappropriate for investors who need income. It would also be wrong to conclude from the analysis above that investors should prefer dividends to capital gains or seek out high-yielding stocks. But there are two conclusions we can draw. First, investors should focus on the long term and not be too influenced, or daunted, by short-term price fluctuations. Second, dividends are central to stock valuation.

From the earliest days of formal security analysis, dividends have played a central role in valuation. John Burr Williams, the father of investment analysis, wrote the following stanza in his 1938

classic, *The Theory of Investment Value* (but bear in mind that financial poetry seldom rhymes):

A cow for her milk,  
A hen for her eggs,  
And a stock by heck  
For her dividends.

Williams’ point remains true today. When analyzing investments, the key issue is to assess the company’s potential to distribute cash to shareholders – not necessarily today, but over the long run. The value of a share is simply the discounted value of its future, long-term dividend stream.

Figure 3

### Impact of dividends, United States, 1900–2010

Source: Elroy Dimson, Paul Marsh and Mike Staunton; *Triumph of the Optimists*; authors’ updates

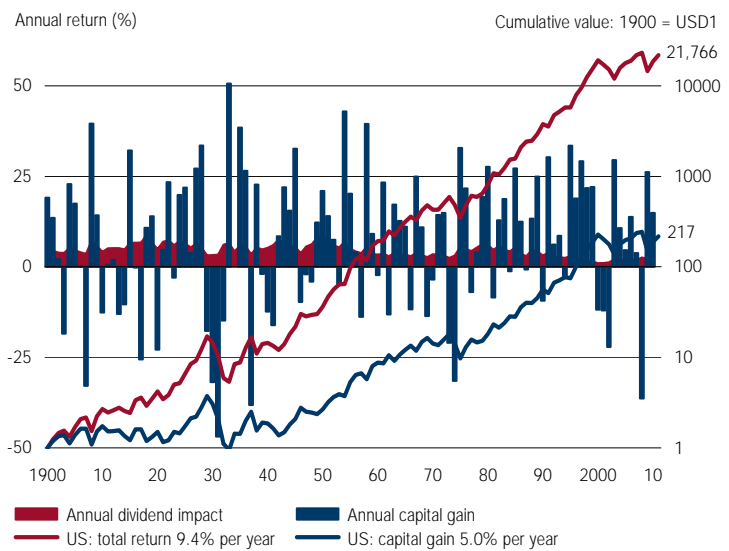
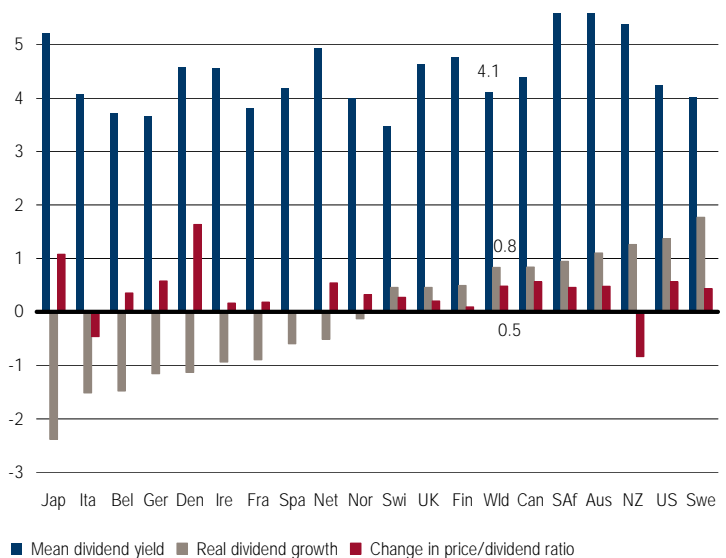


Figure 4

### Components of equity returns globally, 1900–2010

Source: Elroy Dimson, Paul Marsh and Mike Staunton



Fifty years ago, Franco Modigliani and Merton Miller pointed out that, setting aside taxes and dealing costs, investors should be indifferent between dividends and capital gains. They argued that if investors received too little income from dividends, they could make up the difference by selling stock. And if dividends exceeded their needs, they could reinvest them. This insight helped Merton Miller to win a Nobel Prize.

Tax, of course, matters since dividends are usually treated as income and stock sales as capital gains. This, plus factors such as withhold-

ing taxes, may lead some investors to prefer either income or capital gains – indeed, the latter may be favored in many tax jurisdictions. Similarly, dealing costs matter, as investors with lower current income needs may favor low-yielding shares, to avoid reinvestment costs; while those with high income needs may prefer high-yielders, to avoid selling costs. Thus, while there may be no overall market preference for dividends versus capital gains, there will be clienteles of investors that prefer one rather than the other.

**Dividend tilts**

Despite the arguments put forward by Modigliani and Miller, a number of US researchers have, since the 1970s, documented a marked historical return premium from US stocks with an above-average dividend yield. The most up-to-date analysis is by Kenneth French of Dartmouth University. Figure 5 shows his most recent data, covering the performance since 1927 of US stocks that rank each year in the highest- or lowest-yielding 30% of dividend-paying companies, the middle 40%, and stocks that pay no dividends. Non-dividend paying stocks gave a total return of 8.4% per year, while low-yield stocks returned 9.1% and high-yielders gave 11.2%.

The longest study of the yield effect by far is our 111 year research for the UK. Prior to the start of each year, the 100 largest UK stocks are ranked by their dividend yield, and divided 50:50 into higher- and lower-yield stocks. The capitalization weighted returns on these two portfolios are calculated over the following year, and this procedure is repeated each year. Figure 6 shows that an investment of GBP 1 in the low-yield strategy at the start of 1900 would have grown to GBP 5,122 by the end of 2010, an annualized return of 8.0%. But the same initial investment allocated to high-yield stocks would have generated GBP 100,160, which is almost 20 times greater, and equivalent to an annual return of 10.9% per year.

Figure 7 shows that the yield effect has been evident in almost every country examined. This chart covers 21 countries – all the *Yearbook* countries except South Africa, plus Austria, Hong Kong, and Singapore. The underlying portfolio returns data were again generously provided by Ken French. For most countries, the period covered is the 36 years from 1975 to 2010, with the premium based on the highest- and lowest-yielding 30% of dividend-paying companies. For a few countries, the data starts after 1975, while for the USA and UK, the yield premia are taken from the much longer studies reported above.

The bars in Figure 7 show the annualized yield premium, defined as the geometric difference between the returns on high- and low-yielders. The dark blue bars show the premiums over the longest period available for each country. In 20 of the 21 countries, high-yielding stocks outperformed low-yielders. The exception was New

Figure 5

**Returns on US stocks by yield, 1927–2010**

Source: Professor Kenneth French, Tuck School of Business, Dartmouth (website)

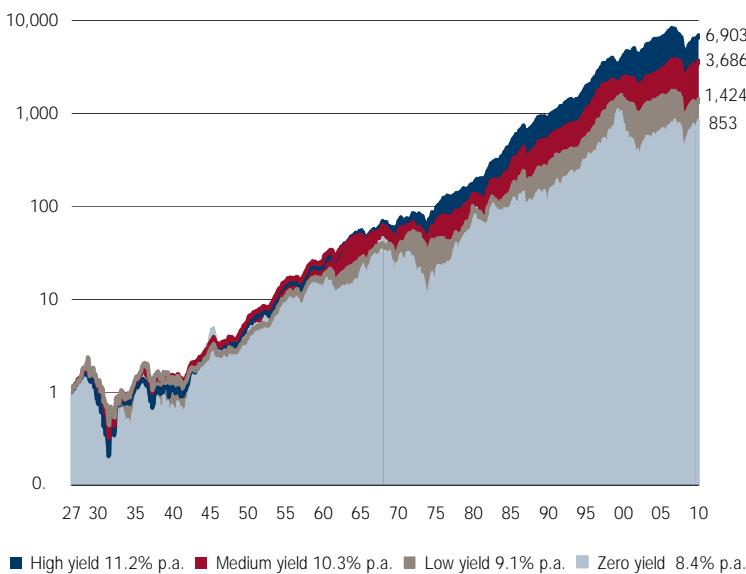
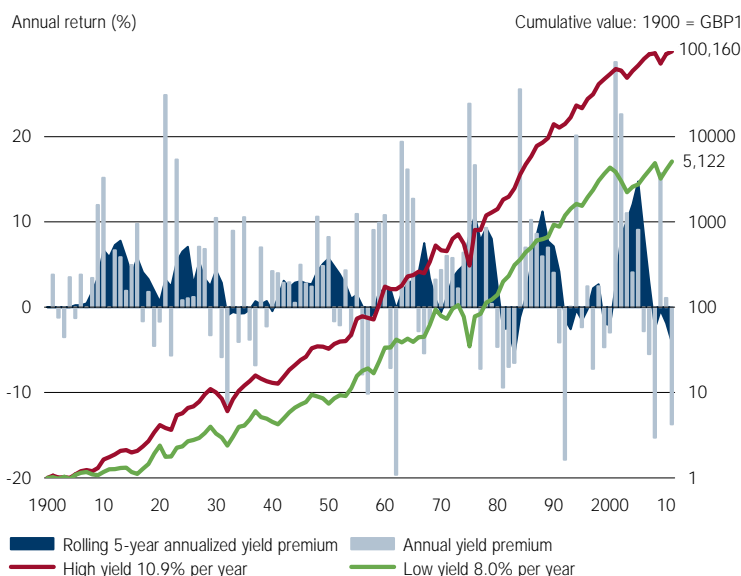


Figure 6

**Returns on UK stocks by yield, 1900–2010**

Source: Elroy Dimson, Paul Marsh and Mike Staunton: *Triumph of the Optimists*; authors' updates



Zealand, which is a very small market, where the analysis was based on a sample of just 20 stocks.

In most other countries, the yield premium was appreciable, except in Denmark and Ireland, two other small markets, where it was less than 1% per year. Across all 21 countries, the average premium was a striking 4.4% per year. The light blue bars in Figure 7 show the yield premium over the 21st century to date, namely, the 11 years since the start of 2000. Over this period, the premium was positive in 19 of the 21 countries, and averaged a staggering 9.1%, more than twice the level of the longer-term period reported above.

This period embraces the dot-com bust, when technology, media and telecommunications stocks – mostly zero- or low-yielders – tumbled from their dizzy heights as investors re-engaged in stocks with strong fundamentals, including dividends. But this period also spans the credit and financial crisis. This helps explain why Ireland and Belgium experienced a negative yield premium. Both markets were heavily weighted towards banks which, while previously high yielding, subsequently experienced very poor performance.

### Explanations for the yield premium

The yield premium is now widely viewed as a manifestation of the value effect. Value stocks are those that sell for relatively low multiples of earnings, book value, dividends or other fundamental variables. In the context of yield, value stocks or high-yielders may be mature businesses, or else dividend payers with a depressed share price that reflects recent or anticipated setbacks.

Growth stocks, in contrast, often pay low or no dividends, since the companies wish to reinvest in future growth. They sell on relatively high valuation ratios, because their stock prices anticipate cash flows (and dividends) that are expected to grow. While many studies document the yield effect, even more show that value stocks have, over the long run, outperformed growth stocks – for a review, see our companion [Sourcebook](#).

Why have high-yielders outperformed low- and zero-yielders? There are four possibilities. First, it may simply be by chance and hence unlikely to recur. But this is hard to sustain, as while there can be lengthy periods when the effect fails to hold, it has nevertheless proved remarkably resilient both over the long run and across countries.

A second possibility is that we are observing a tax effect, since many countries' tax systems have favored capital gains, perhaps causing growth stocks to sell at a premium. The impact of tax is controversial, but tax alone cannot explain the large premium. Furthermore, in the UK, there was a yield premium pre-1914, when income tax was just 6%. Also, if tax were the major factor, alternative definitions of value and growth stocks would work far less well than dividend yield as an indicator of high or low subsequent performance. We have analyzed the most commonly used alter-

native measure, book-to-market, based on the same 21 markets over the identical time periods, and found that it performs almost as well as yield.

A third possibility is that investors become enthused about companies with good prospects, and bid the prices up to unrealistic levels, so growth stocks sell at a premium to fundamental value.

Evidence for this was provided in 2009 by Rob Arnott, Feifei Li, and Katrina Sherrerd in a study entitled *Clairvoyant Value and the Value Effect* (*The Journal of Portfolio Management*, 35: 12–26). They analyzed the constituents of the S&P 500 in the mid 1950s, comparing the stock prices at the time with what they termed “clairvoyance value.” This was the price investors should have paid if they had then had perfect foresight about all future dividends and distributions. Arnott classified growth stocks as those selling at a premium, i.e. on a lower dividend yield or at a higher price-to-earnings, price-to-book or price-to-sales.

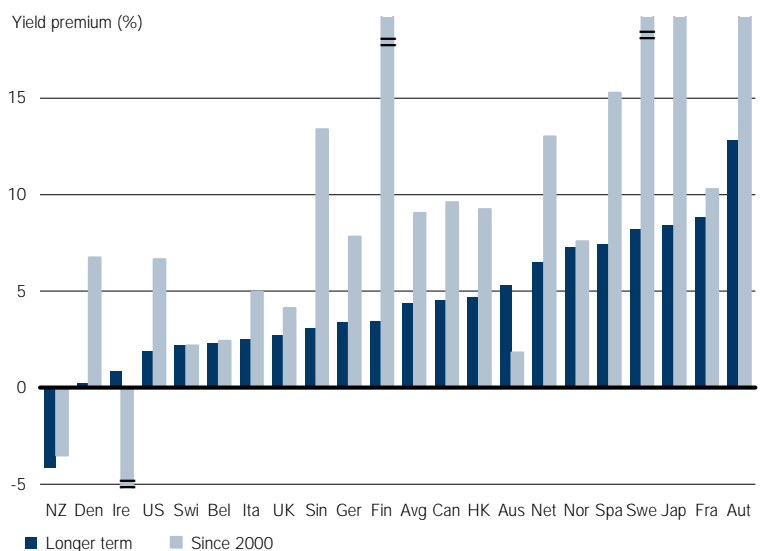
Arnott and his colleagues found that the market had correctly identified the growth stocks, in that they did indeed exhibit superior future growth. However, they also concluded that investors had overpaid for this growth, by up to twice as much as was subsequently justified by the actual dividends and distributions to shareholders.

The final possibility is that the outperformance of value stocks is simply a reward for their greater risk. Indeed, hard-line believers in market efficiency argue that, whenever we see persistent anomalies, risk is the prime suspect. Since value stocks are often distressed companies, the risk argument seems plausible. This could also explain Arnott's findings if the discount rates used to compute “clairvoyance value” had failed to cater adequately for differences in risk. But are high-yielders really riskier than low-yielders?

Figure 7

### The yield effect around the world

Sources: Elroy Dimson, Paul Marsh and Mike Staunton analysis using style data from Professor Ken French, Tuck School of Business, Dartmouth (website and private correspondence) and Dimensional Fund Advisors





**Risk and return from high-yield strategies**

The key question, therefore, is whether yield-tilt strategies lead to higher risk. If they do, the yield premiums reported in Figure 7 could just be risk premiums.

Many investors would find this counterintuitive, believing instead that high-yielding stocks not only provide enhanced income, but are less risky. This belief may stem from the view that a bird in the hand (a dividend in the bank) is more secure than two in the bush (future returns). If so, this reflects a misunderstanding. To see the fallacy, we need to hold constant the investor’s desired holding in stocks. To maintain this exposure, investors will need to reinvest their dividends, but once reinvested, the funds are again exposed to equity risk. While cash is certainly safer than stocks, this should have been factored in when deciding on the desired exposure to equities in the first place.

Investors may also perceive high-yielding stocks to be lower risk because of sector membership. Utilities tend to have higher yields and are also generally of lower risk. But investors may well once have thought the same about bank shares. Furthermore, many high-yielding stocks are “involuntary” high yielders. They have acquired their high yield because their stock price has fallen. Such companies may be struggling or distressed, and their future dividend may be far from assured.

To establish whether high-yield strategies are higher or lower risk, we therefore need to analyze the data. For each of the 21 countries represented in Figure 7, we estimate the risks and risk-to-reward ratios from investing in higher-yielders (the highest yielding 30% of dividend payers), lower-yielders (the lowest yielding 30%), zero yielders, and the overall market. Our measure of the market is provided by the MSCI country indices, since the data that we are using are based on each country’s MSCI universe. For the USA, where we use Ken French’s much longer series starting in 1926, we use the DMS US index for the market.

For each of the four investment strategies, Figure 8 shows the average values for the 21 countries of the standard deviation of returns (left-hand panel), betas (middle panel) and Sharpe ratios (right-hand panel). Looking first at the left-hand panel, there is clearly no evidence that higher-yield strategies are more volatile. On the contrary, the standard deviation of returns on the lower and zero yielders were both larger than on the higher-yielding stocks.

The least volatile of the four strategies is an investment in the market, i.e. an index fund holding in each country. This is to be expected, as volatility is reduced by diversification, and the country index is far better diversified than the other strategies, which at most embrace 30% of the stocks in the market. What is more surprising is that the average standard deviation of returns from invest-

Figure 8

**Risk and return from alternative yield strategies**

Sources: Elroy Dimson, Paul Marsh and Mike Staunton analysis using style data from Professor Ken French, Tuck School of Business, Dartmouth, Dimensional Fund Advisors, MSCI and Thomson Reuters

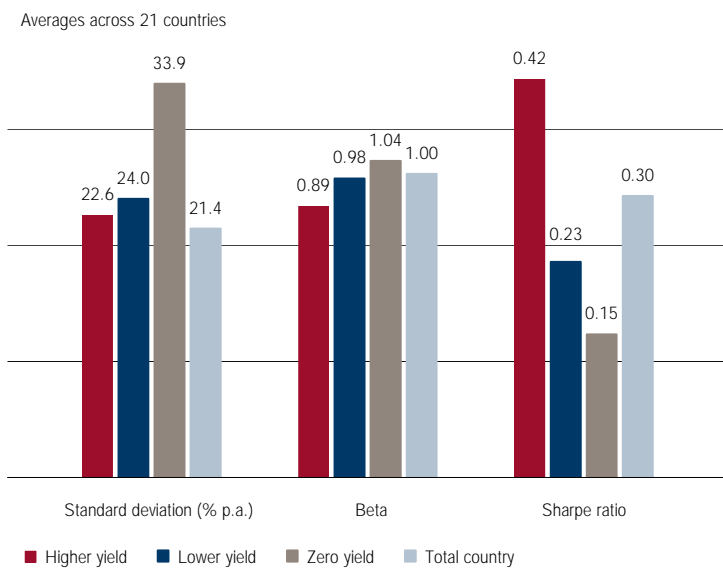
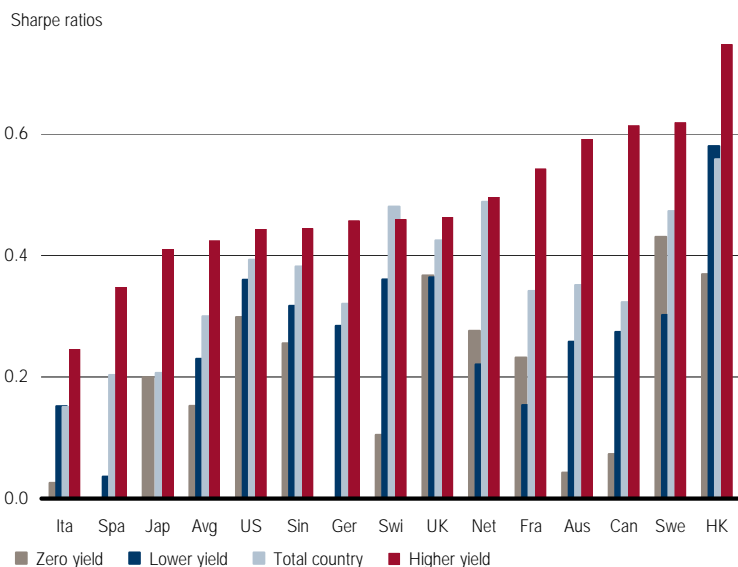


Figure 9

**Sharpe ratios from alternative yield strategies**

Sources: Elroy Dimson, Paul Marsh and Mike Staunton analysis using style data from Professor Ken French, Tuck School of Business, Dartmouth, Dimensional Fund Advisors, MSCI and Thomson Reuters



ing in high-yielders (22.6%) is only marginally higher than that from an index fund (21.4%).

Beta measures systematic risk, or the contribution to the risk of a diversified portfolio. The center panel of Figure 8 shows that the higher-yield strategy not only had a lower average beta (0.89) than both the lower- and zero-yield strategies, but it also had a lower average beta than an investment in the market (1.0 by definition).

Finally, the right-hand panel of Figure 8 shows the historical average Sharpe ratios. The Sharpe ratio is defined as the average historical excess return (the return over and above the risk free or Treasury bill return) divided by the historical volatility of excess returns. It thus measures the reward per unit of volatility. The Sharpe ratio of the higher-yield strategy (0.42) was almost twice that of the lower-yield strategy, and almost treble that of the zero-yield strategy. It was also appreciably higher than the average Sharpe ratio achieved by investing in the country index funds.

Figure 9 shows the Sharpe ratios for the larger countries in the sample (the smaller country results paint a similar picture, but are “noisier” due to less diversified portfolios). It shows that, in terms of reward for risk, the higher-yield strategy beat the lower- and zero-yield strategies in every country. It also dominated an index fund investment in every country except Switzerland, where it was a close runner-up.

It is therefore hard to explain the superior performance of yield-tilt strategies in terms of risk, at least as conventionally defined. Indeed, when growth and value stocks are defined based on dividend yield, it is the value stocks that have the lower volatility and beta.

## Country yield tilts

Higher-yielding stocks have outperformed lower-yielders, so perhaps higher-yielding markets have also outperformed lower-yielders. We investigate this by examining the 19 Yearbook countries over 111 years. At each New Year, countries are ranked by their dividend yield at the old year-end. We assign countries to quintiles, each comprising four countries, except the middle quintile which contains three. Each quintile portfolio has an equal amount invested in each country, and all income is reinvested. Portfolios are held for one year. We then re-rank the countries and rebalance the portfolios, repeating the process annually.

The leftmost set of bars in Figure 10 shows the annualized returns from the quintiles over the full 111-year period. There is a perfect ranking by prior yield and the differences between quintiles are large. An investment of one dollar in the lowest-yielding countries at the start of 1900 would have grown to USD 370 by the end of 2010, an annualized return of 5.5%. But the same initial investment allocated to the highest-yielding countries would have grown to an end-2010 value of more than USD 1,000,000 – some 2,700 times

as much, and equivalent to an annual return of 13.4% per year.

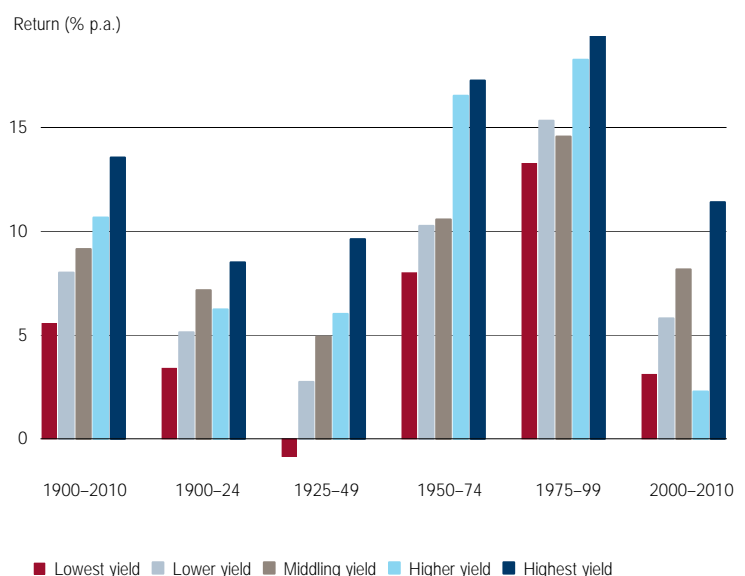
These figures are before tax and transaction costs, but the performance gap is too big to be attributable to tax. The returns shown in Figure 10 are measured in US dollars from the perspective of a US-based global investor. However, the pattern would look the same from the perspective of a global investor from any other country. The returns would just need to be multiplied by the appropriate common currency scale factor (published in the Sourcebook).

The remaining five sets of bars in Figure 10 show the returns over the four quarter-century periods making up the 20th century as well as the returns over the 21st century to date. Over all of these sub-periods, the high-yielding countries outperformed the low-yielding countries by an appreciable margin. The results are not therefore period-specific. Nor are they attributable to risk. The returns from investing in the lowest-yielding countries were slightly more volatile than investing in the highest-yielders; the betas against the 19-country world index were approximately the same; and the Sharpe ratio was 0.72 for the portfolio of highest-yielding countries versus just 0.35 for the lowest yielders. Clearly, this multi-country trading rule based on prior yield would have generated significant profits at no higher risk.

Figure 10

## Returns from selecting markets by yield

Sources: Elroy Dimson, Paul Marsh and Mike Staunton



**Corporate bonds and the quest for income**

Equities are not the only income-bearing security issued by corporations. Companies also issue preference stock, and more importantly, corporate bonds. Recently, low interest rates, coupled with continued restraints on bank lending, have led to a flood of corporate bond issues. Similarly, the higher coupons promised from corporate, rather than sovereign, bonds have proved tempting to investors who are on the quest for income.

For corporate bonds, the promised yield can appear misleadingly high because it is predicated on the assumption that all the cash flows from the bond – the coupon and repayments – will be paid on time, with no defaults. Corporate bonds are subject to credit risk, which refers to the probability of, and potential loss arising from, a credit event such as defaulting on scheduled payments, filing for bankruptcy, restructuring, or a change in credit rating.

Historically, the promised yield on US bonds rated by Moody's as Aaa (the highest quality bonds issued only by blue chip companies) has been 0.7% higher than on US Treasuries. Baa bonds, the lowest grade bonds deemed by Moody's still to be "investment grade," and which they judge to be "moderate credit risk" have had a yield spread of 1.9% above Treasuries. But the key question for investors is not what the promised yields have been, but what returns investors have really achieved.

To answer this question, we look at the long-run evidence. We have to rely here on the US experience, as this is the only country for which there is good quality, long-run data. Elsewhere, consistent, reliable corporate bond data has been available only since the 1990s, and for some countries even later, and this fails to qualify as "long run" by the standards of the *Yearbook*.

Figure 8 of the companion article, *Fear of Falling*, showed that the long-run return on the highest grade US corporate bonds over the 111 years from 1900 to 2010 was 2.52% per year, which was 0.68% per year more than on US Treasuries. This is remarkably close to the promised yield spread on Aaa bonds, which was 0.70% above Treasuries.

It is interesting to see whether this return experience is consistent with default rates. The red line plot in Figure 11 shows the default rate over time on investment grade bonds. This has averaged just 0.15%. Furthermore, the actual default losses are smaller than the default rates. Annual losses can be estimated by multiplying the default rate by one minus the recovery rate, and the latter has averaged around 40% over time. The average loss from default on investment grade bonds has thus been just 0.09% per annum.

Naturally, the default rates on non-investment grade corporate bonds have been higher. The light blue line plot in Figure 11 shows the default rates on all rated bonds, including speculative grade or high-yield bonds, i.e., those rated below Baa. Here, the default rate has averaged 1.14% per year, while for high-yield bonds, the average was 2.8%.

Figure 11 shows that there are several spikes in default rates, all coinciding with a recession. Default rates were highest following the Wall Street Crash and during the Great Depression, with the blue line plot in Figure 11 hitting an off-the-scale 8.4% in 1933, while high-yield bonds had a default rate that year of 15.4%. The second worst episode for default rates followed the recent credit crisis and, in 2009, the default rate on all rated bonds was 5.4%, while that on high-yield bonds was 13%.

Given the low default rates shown in Figure 11 on investment grade bonds, the long-run return premium of 0.68% per year for high grade Aaa rated corporate bonds – which would have had even lower default rates – seems puzzlingly high.

**Figure 11**

**Corporate bond spreads, default rates and equity volatility**

Sources: Elroy Dimson, Paul Marsh and Mike Staunton, *Expected Returns* (Wiley, 2011), Moody's, Bloomberg, Barclays Capital, Global Financial Data

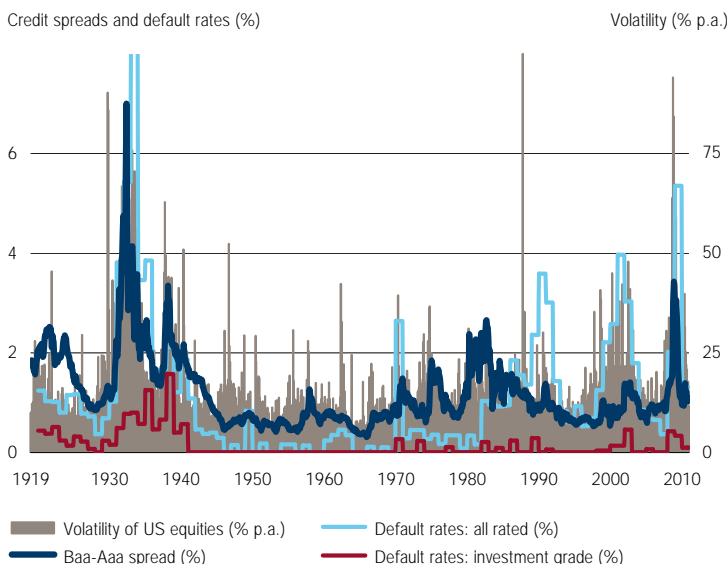


Figure 11: Corporate bond spreads, default rates and equity volatility. Source: Elroy Dimson, Paul Marsh and Mike Staunton, *Expected Returns* (Wiley, 2011), Moody's, Bloomberg, Barclays Capital, Global Financial Data.



Part of this credit premium is undoubtedly a risk premium, but given that the risk has generally been low, it seems likely that other factors are at work. For example, corporate bonds are typically much less liquid than Treasuries, so part of the credit premium may be compensation for illiquidity.

Sensible investors will, of course, hold a diversified portfolio of corporate bonds, and will thereby eliminate much of the idiosyncratic risk associated with corporate bond credit risk. This raises the question of why corporate bond holders should expect any risk premium at all. The reason is that in addition to idiosyncratic risk, corporate bonds also have market risk (i.e. positive betas) because, as we have seen from Figure 11, default is more likely to occur in recessions when all businesses are doing poorly.

Figure 11 shows that there is a high correlation between credit spreads (the dark blue line plot shows the spread between Baa and Aaa yields) and US equity market volatility (the grey shaded area), providing further evidence that corporate bonds face considerable market risk. But there is asymmetry here, with corporate bonds facing appreciable tail risk. While relatively safe for most of the time, corporate bonds are highly exposed to the risk of severe recessions.

### Yielding to caution

In this article, we have documented the importance of dividends to investors. We have shown that, historically, investment strategies tilted towards higher-yielding stocks have generally proved profitable. Further, we have shown that an equity investment strategy tilted towards higher-yielding markets would have paid off handsomely.

These findings have been robust over long periods and across most countries. While higher risk would seem an obvious explanation, our research indicates that portfolios of higher-yielding stocks (and countries) have actually proved less risky than an equivalent investment in lower-yielding growth stocks.

Some cautionary notes are clearly in order. First, the strategies we have described require a rigorous rebalancing regime. The resultant portfolios can then often appear unappetizing. High-yield is frequently synonymous with challenged, troubled or even distressed. It can require courage to invest in such stocks (and markets). If things go wrong, as they often do, and surely will with at least some of the portfolio stocks, it is harder to defend having made such investments. More popular growth stock stories are easier to justify.

Second, as with all investment styles, there can be extended periods when the yield premium goes into reverse and low-yielders outperform. The dark shaded area in Figure 6 on page 18 shows the annualized, rolling five-year yield premium in the UK over the last 111 years. It reveals that there have been extended periods when even the rolling five-year premium has remained negative. These

include the early 1980s, much of the 1990s, and the present time.

At such times, high-yield investors have needed to remind themselves that no investment style remains out of fashion indefinitely. But such periods can be long enough to severely try the patience even of those whom we would normally regard as long-term investors.

Third, we should always be cautious of any phenomenon when we do not fully understand its causes. Perhaps part of the historical yield premium has arisen from taxation. If so, tax systems today are more neutral between income and capital gains than was the case in the past. Thus future yield effects may be more muted. While we have seen that the yield premium is not related to risk as conventionally defined, perhaps there is some dimension of risk that we are missing. If so, it may reveal itself in an unwelcome way to high-yield investors of the future.

The yield premium across markets may reflect historical periods when countries were not integrated internationally, and when market rotation was not feasible for the majority of investors. An investor who chases markets that offer a high dividend yield may also be more exposed to political risks and an inability to access assets than an investor who diversifies globally. The transaction costs and fees for a globally rotated equity portfolio are also larger than for an international buy-and-hold strategy.

Many believe that the yield effect is driven by behavioral factors, and the tendency of investors to fall in love with, and overpay for growth. If so, then maybe, just maybe, investors will one day learn their lesson and stop rising to the bait of growth.



# Market-implied returns: Past and present

Estimates of the cost of equity and its equity risk premium (ERP) are based on historical equity returns and highly dependent on the period studied. The long history of the Global Investment Returns Yearbook is an outstanding resource for understanding this time dependency and how it has behaved in various countries. For example, the country profiles in the Yearbook reveal that the premium earned over the past decade in many developing countries has far exceeded that of their developed counterparts. Will this be the case going forward? Spot, forward-looking estimates of market-implied returns coupled with long-term benchmarks make excellent additions to the toolkit of fund managers and risk managers, so they can look ahead with a sense of historical balance.

David Holland and Bryant Matthews, Credit Suisse HOLT

This article complements findings presented in the Global Investment Returns Yearbook and Sourcebook by presenting market-implied returns. The HOLT framework was used to calculate the forward-looking real cost of capital, which we term the HOLT discount rate. Historical forward-looking results are presented for US industrials that indicate that, under certain assumptions, the real cost of capital and its corresponding ERP appear to fluctuate significantly. We use the results to identify risk regimes and comment on interesting periods. We identify key drivers to explain the real cost of capital, which should prove beneficial in discussions aimed at understanding the future direction of this discount rate.

Finally, we conclude by showing present discount rates for a number of countries and comment on their market expectations. For instance, developing and resource-rich markets have optimistic expectations embedded in their equity prices and trade at lower implied returns than their developed counterparts. Investors might ask whether they are being properly compensated for the risk they are taking in developing markets. This paper provides a practical means of assess-

ing risk and its corresponding return, which can be used in making equity allocation decisions.

## What is the HOLT discount rate?

The HOLT market-implied discount rate is a real cost of capital solved by equating the market value of equity and debt to the discounted value of future Free Cash Flow (FCF) generated by HOLT's algorithmic forecasts, a process similar to calculating a yield-to-maturity on a bond. The relationship is diagrammed as follows:

$$\begin{array}{ccc}
 \text{Given} & & \text{Forecast} \\
 \downarrow & & \downarrow \\
 \text{Enterprise Value} & = & \sum_{i=1}^N \frac{FCF_i}{(1+DR)^i} \\
 & & \uparrow \\
 & & \text{Solve}
 \end{array}$$

HOLT uses consensus analyst estimates and its proprietary fade algorithms to forecast future asset growth and profitability, which provide the necessary ingredients to estimate a firm's future free cash flow. This calculation is performed on a



weekly basis for various countries and regions. Once company-specific market-implied discount rates are determined, regression is used to determine the average forward-looking expected cost of capital. This forward-looking proxy may differ from the historical asset return series provided in the Yearbook and Sourcebook since it is dependent on a forecast of cash flows, a challenging task indeed, and naturally susceptible to forecasting errors.

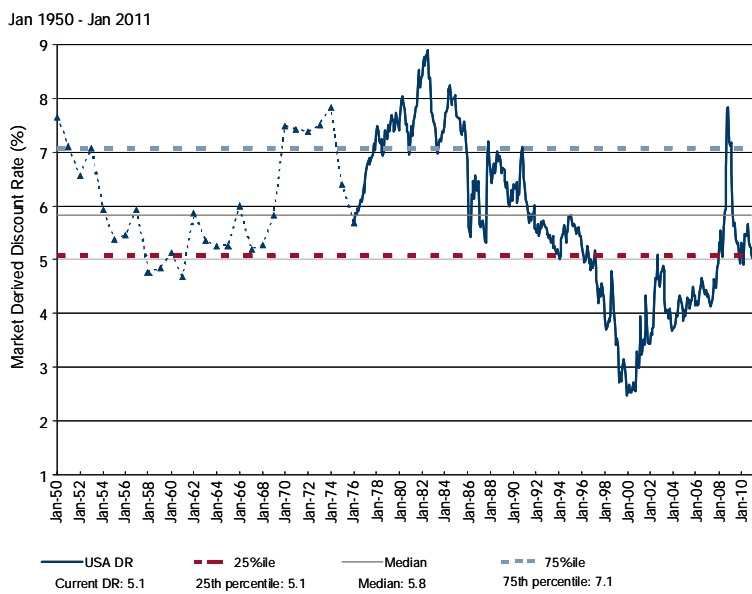
The vital link which lends credibility to this exercise, however, is not the basis of the near-term

cash flow estimates, which are derived from consensus analyst earnings expectations, but rather the application of mean-reverting, empirical fade rates to the profitability (CFROI) and growth forecasts. The use of empirical fade rates provides a compelling case-study since it synthesizes invaluable historical data with the contemporaneous views of analysts and investors. When analyst and/or investor expectations become overly buoyant or pessimistic, the empirical fade framework guides the forecast back within the bounds of normalcy. The resulting cost of capital is crucially sensitive, therefore, to periods of euphoria and despair, providing a powerful signal during these moments for investors who place faith in mean reversion. The results in this paper are enterprise value-weighted discount rates for industrial firms, i.e., non-financials, in each country or region studied.<sup>1</sup>

Figure 1

### Time series of market-derived discount rates – USA

Source: Credit Suisse HOLT, 17 January 2011



### Historical US market-implied discount rate

We've calculated the weighted-average real discount rate for US industrial firms back to 1950 using the HOLT framework. Monthly results were calculated as of 1975. A high discount rate is indicative of a risk-averse market where investors demand more return on their capital due to fears about the future. Extraordinarily high discount rates indicate panic and excessive fear. A low discount rate is symptomatic of a market with a greedy risk appetite. Extraordinarily low discount rates indicate euphoria and excessive greed. The results can be seen in Figure 1.

The first thing to note is that the market-implied discount rate rarely rests at its median of 5.8%. The market veers between states of greed and panic, or, in today's parlance, "risk on" and "risk off." To give a sense for different risk regimes, we divided the chart into quartiles. The top quartile sits at 7.1% and indicates a super-chilled risk-averse market. The bottom quartile sits at 5.1% and yields below it are indicative of an overheated, risk-hungry market. These states are illustrated in Figure 2.

From 1970 to 1985, except for a brief respite in the mid-1970s, the chart indicates that the US real discount rate was marooned above 7%. Ronald Reagan spoke of the "days of malaise" when running for the US presidency – it was more like a decade and a half of malaise. Matters were flipped on the head in the 1990s. Corporate profitability improved dramatically and risk appetite swelled, with the discount rate falling from 6.4% in January 1990 to a low yield of 2.5% at the peak of the Tech Bubble in early 2000.

Figure 2

### Discount rate thermometer

Source: Credit Suisse HOLT



<sup>1</sup> Please contact the HOLT team at Credit Suisse for more details about the HOLT framework and the discount rate calculation. If you would like to study the CFROI framework and its mechanics, please see "Beyond Earnings: A User's Guide to Excess Return Models and the HOLT CFROI® Framework" by David Holland and Tom Larsen.

The US discount rate remained below 5% from 1996 until 2008. After Lehman Brothers collapsed in September 2008, the US discount rate rocketed to a bearish 7.8%. At the time, many investors were of the view that the discount rate would remain elevated for years to come. In fact, risk appetite returned with hibernating hunger. Today, the US discount rate is 5.1%.

The HOLT discount rate is useful as a quantitative gauge of the market's risk appetite. Disagreement about its level and implicit signal should be welcomed because it can lead to a healthy debate about future projections within a well-defined framework. Will future profitability and growth really be brighter in times of blue-sky optimism, or will the world really be so dark in times of pessimism? The signal is only as good as the forecast assumptions. Extreme bouts of optimism and pessimism generally indicate a loss of faith in mean reversion.

By knowing the discount rate DR, the market leverage  $x_D$  and estimating the corporate cost of debt  $r_D$ , we can estimate the market-implied ERP via these equations:

$$DR = x_D r_D + (1 - x_D) r_E$$

$$r_E = r_f + ERP$$

The risk-free rate is denoted by  $r_f$  and the market-implied cost of equity by  $r_E$ . We use the 10-year Treasury bond as a proxy for the risk-free rate. Please note that there is no tax shield term in the discount rate equation due to the fact that HOLT captures tax shields in its cash flow calculation. Our estimate of the market-implied ERP is shown in Figure 3.

Again, we have divided the chart into quartiles to give an indication of different risk regimes. Readers should remember that the ERP at each point in time is forward-looking: risk hungry markets will have a low ERP and risk-averse markets will have a high ERP. Since 1960, the median ERP for the US has been 4%, which is in line with the long-term findings of the Yearbook, i.e., 4.4% is the premium for the US equities versus bonds over the past 111 years.

The market-implied ERP varies significantly. It dipped below 0% during the Tech Bubble, indicating that risk appetite was overzealous. At the peak of the Credit Bubble in the "Noughties," the ERP sat at 2% or less, again indicating a ravenous appetite for risk. The ERP estimate over the past year has been attractive in large part due to the low real yields of US Treasuries. We've seen the bond yield increase since November due to greater confidence in a global recovery. This increase has put a squeeze on the US ERP and will take the shine off equities if it continues to climb to its norm. Today's US ERP estimate has dropped to 5.1%.

Readers with an eye for contradiction might be asking the question, "How do you reconcile the sell signal of Figure 1 with the buy signal of Figure 3?" Times are anything but ordinary, and we see this argument occurring in today's financial press. Analysts looking at long-term valuation metrics such as Robert Shiller's CAPE generally refer to today's US stock market as expensive. Those who focus on yields relative to Treasuries label the US stock market attractive. Our results agree with both findings, i.e. the discount rate signal (Figure 1) indicates that equities are expensive relative to their long-term history, while the ERP is attractive (Figure 3). We would caution bullish investors that the risk premium will only stay high so long as Treasury yields remain low. A robust global recovery would stoke inflation and long-term Treasury yields. This is not to say that markets will not run further; the charts show that risk appetite is far from outright euphoria. If anything, our results indicate that markets are as much psychological and irrational as they are fundamental and rational, so good news can translate into positive market momentum leading to higher share prices, which are reflected in lower discount rates.

### Discount rate driver model

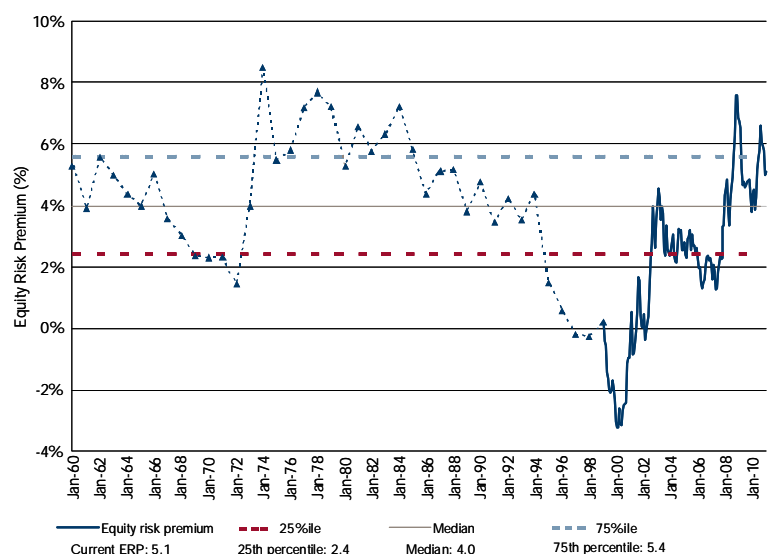
We have seen that the discount rate is a powerful quantitative signal, especially in times of euphoria and despair. This prompts the question, "can it be explained and possibly predicted?" In this section, we identify explanatory factors and generate a set of questions investors should ask themselves.

Figure 3

### Market-implied equity risk premium – USA

Source: Credit Suisse HOLT, 17 January 2011

Jan 1960 - Jan 2011



Investors' required rate of return is influenced by historical and current events, based on the assumption that the future will in some sense be similar to the past. Expectations of future outcomes also drive risk concerns. HOLT's discount rate can be decomposed into key economic drivers to highlight how the risk premium has evolved historically, and which factors are contributing most at any given point in time.

Intuitively, investors demand a rate of return on equities at least as much as the risk-free rate. In fact, a premium is required for investing in less-safe equities over Treasuries. The first two statistically significant discount rate drivers are the real risk-free rate and the spread of BBB credit over the risk-free rate.

Investor tax rates also influence the cost of capital as they diminish investors' after-tax return. Capital gains and dividends tax rates tested as significant drivers, and could drive the discount rate higher if governments chasing tax revenue punish investors. Volatility creates uncertainty, which feeds into a higher cost of capital. We found that the industrial production volatility proved to be a significant driver of the discount rate. Expectations of higher inflation fuel higher effective real tax rates for investors. Consequently, inflation is also a significant discount rate driver. The effect of each driver over time can be seen in Figure 4.

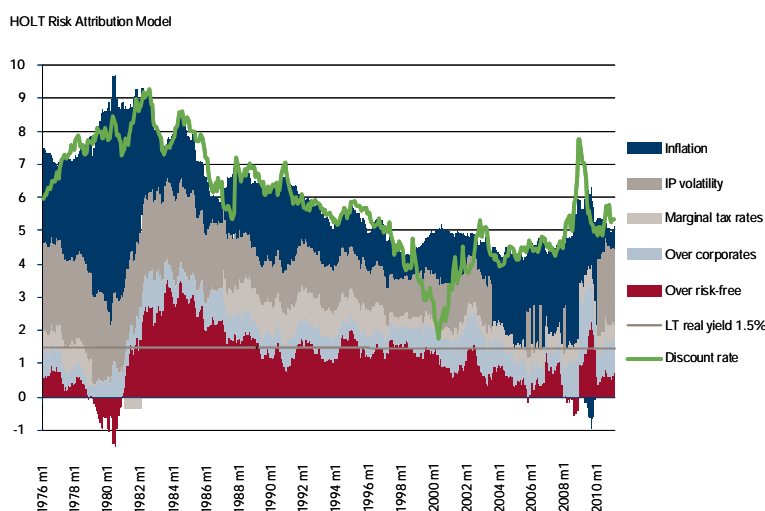
Table 1 shows an investor's average required return per economic indicator. These results provide more than mathematical curiosities. Shrewd investors can take positions on the future direction of each driver and contemplate the direction of future discount rate moves. Key questions to ask when considering which way the discount rate might move include:

- Where is the yield on the 10-year Treasury heading?
- Will credit spreads tighten?
- Will volatility remain subdued or increase?
- Will investor taxes increase?
- Will markets experience hyper-inflation, deflation or moderate inflation?

Figure 4

### Contribution of various discount rate drivers

Source: Credit Suisse HOLT 17 January 2011



### Worldwide market-implied discount rates

What about today's real discount rate for other markets? Are they expensive or cheap? How do they compare to their respective histories? We have plotted the results for the G20 (plus Switzerland) in a box-and-whisker chart in Figure 5. The chart shows today's discount rate for each country along with its minimum, median and maximum values over the past decade, and the 25th and 75th percentile values.

The chart goes from countries with low market-implied returns at the left to countries with high returns at the right, i.e., greatest to the least risk appetite. It is clear that developing and resource-rich markets dominate the left-hand side of the chart. Clearly, investors have pushed the valuations of these markets into dear territory. Behavioral studies routinely show that human beings tend to overestimate growth and are overly optimistic. These hallmarks appear to be embedded in market expectations for developing markets, so caution is warranted. At the other end of the spectrum, we can see that markets are not particularly sanguine about Europe and Japan. The notion of risk appears to have been flipped on its head and mirrors investor enthusiasm for emerging markets in 2010. Investors need to ask if they are being properly compensated for the risk they are taking in developing markets. Bullish investors are encouraged to compare their forecasts to the mean reverting assumptions employed in the HOLT estimates.

Table 1

### Component risk contribution

Source: Credit Suisse HOLT

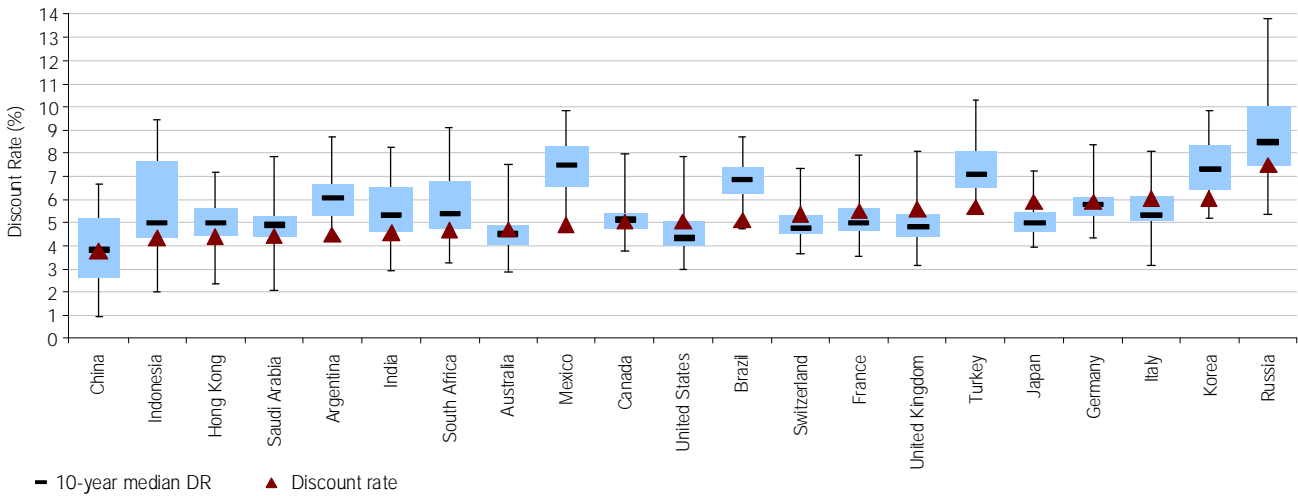
Explanatory factor	Average	Min.	Date	Max.	Date
Inflation	1.87	-0.95	2009m7	6.69	1980m3
Industrial production volatility	1.72	1.09	1989m1	2.68	1976m2
US Treasury yield (real rate)	1.20	-1.52	1980m6	3.53	1983m8
Corporate bond yield	0.73	0.31	1978m12	2.04	2008m12
Marginal tax rates	0.49	-0.37	1981m1	1.00	1988m1
<b>Average real discount rate</b>	<b>6.00</b>				



Figure 5

Enterprise value-weighted market-derived discount rates – by country

Source: Credit Suisse HOLT, 17 January 2011



When using this chart, it is recommended that you consider the absolute yield relative to the long-term discount rate thermometer, and then each country relative to itself. Bearing the first condition in mind, all countries below 5% should beg the question, "Is the valuation for this market rich?" The degree of alarm can be gauged from the country's behavior relative to itself over the past decade, which is the second test in the event of idiosyncratic issues. Argentina, Mexico and Brazil lie below 5% and are trading at decade low yields. They appear to be overbought unless investors believe our mean reverting forecasts for them are too pessimistic. Russia and Korea trade at high yields due to idiosyncratic risks but are presently trading at low yields relative to their respective histories. In the case of Russia, investors are particularly concerned about corporate governance and we believe this concern is reflected in the discount rate. Investors who believe these fears are overblown should view Russia as attractive value.

indicates an expensive market, while today's ERP for the USA indicates that it is attractive.

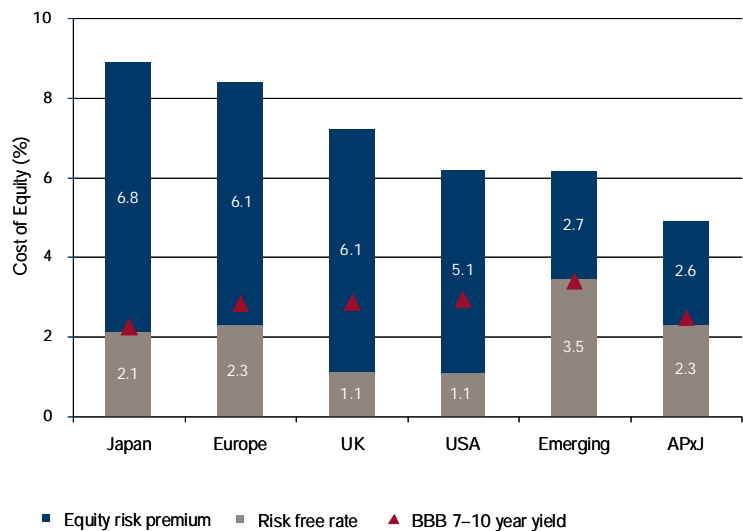
We investigated and quantified drivers of the discount rate. We translated those drivers into questions investors should consider when trying to understand the future trajectory of the discount rate. We concluded the paper by commenting on today's discount rates for the G20 (plus Switzerland). Today's yields indicate that developing and resource-rich markets are trading at relatively expensive prices. One could conclude that future growth and optimism are already embedded in their market expectations. Mature, developed markets look attractive in comparison.

We estimate the ERP for key regions in Figure 6, and see that the ERP for developed markets is far more attractive than the ERP for developing markets. This prompts the question of whether equity investors will be compensated for the extra risk they are taking in developing markets. Contrarians might counter that developed markets are riskier but would benefit from reflecting on the wide gap in the ERP estimates.

Figure 6

Market-implied ERP estimates for various regions

Source: Credit Suisse HOLT 17 January 2011



Gauging market attractiveness

We have shown how the HOLT discount rate can be used to quantify risk appetite and indicate stock market attractiveness. Results for the USA over the past 60 years give a long-term sense for risk appetite regimes and were used to estimate a market-implied ERP time series. Suffice to say, risk appetite can vary significantly! Today's US discount rate







## Guide to the country profiles

# Individual markets

Elroy Dimson, Paul Marsh and Mike Staunton  
London Business School

The *Credit Suisse Global Investment Returns Yearbook* covers 22 countries and regions, all with index series that start in 1900. Figure 1 shows the relative sizes of world equity markets at our base date of end-1899. Figure 2 shows how they had changed by end-2010. Markets that are not included in the *Yearbook* dataset are colored in black. As these pie charts show, the *Yearbook* covered 89% of the world equity market in 1900 and 83% by end-2010.

In the country pages that follow, there are three charts for each country or region. The upper chart reports, for the last 111 years, the real value of an initial investment in equities, long-term government bonds, and Treasury bills, all with income reinvested. The middle chart reports the annualized premium achieved by equities relative to bonds and to bills, measured over the last decade, quarter-century, half-century, and full 111 years. The bottom chart compares the 111-year annualized real returns, nominal returns, and standard deviation of real returns for equities, bonds, and bills.

The country pages provide data for 19 countries, listed alphabetically starting on the next page, and followed by three broad regional groupings. The latter are a 19-country world equity index denominated in USD, an analogous 18-country world ex-US equity index, and an analogous 13-country European equity index. All equity indexes are weighted by market capitalization (or, in years before capitalizations were available, by GDP). We also compute bond indexes for the world, world ex-US and Europe, with countries weighted by GDP.

Extensive additional information is available in the *Credit Suisse Global Investment Returns Sourcebook 2011*. This 200-page reference book, which is available through London Business School, contains bibliographic information on the data sources for each country. The underlying data are available through Morningstar Inc.

## The Yearbook's global coverage

The *Yearbook* contains annual returns on stocks, bonds, bills, inflation, and currencies for 19 countries from 1900 to 2010. The countries comprise two North American nations (Canada and the USA), eight euro-currency area states (Belgium, Finland, France, Germany, Ireland, Italy, the Netherlands, and Spain), five European markets that are outside the euro area (Denmark, Norway, Sweden, Switzerland, and the UK), three Asia-Pacific countries (Australia, Japan, and New Zealand), and one African market (South Africa). These countries covered 89% of the global stock market in 1900, and 83% of its market capitalization by the start of 2011.

Figure 1  
Relative sizes of world stock markets, end-1899

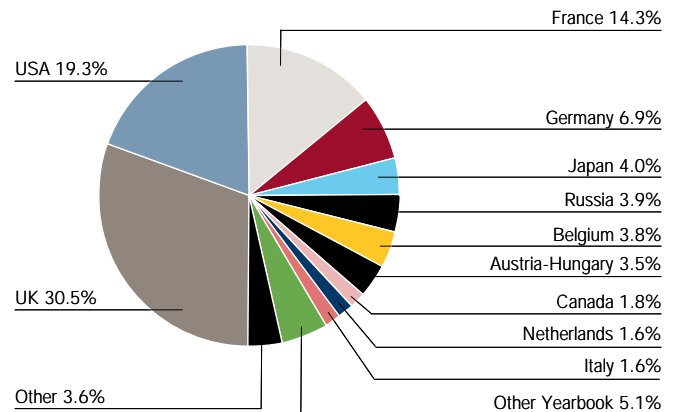
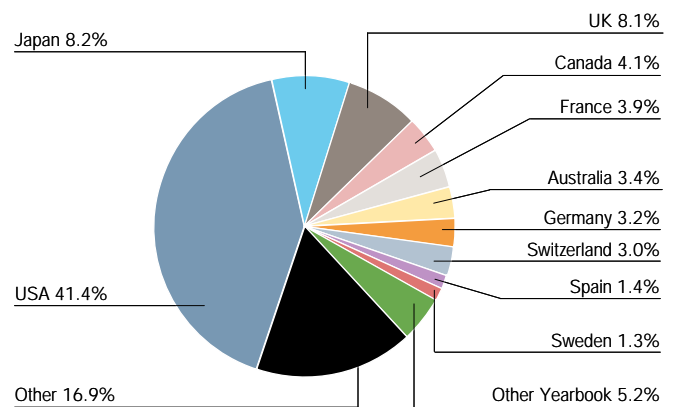


Figure 2  
Relative sizes of world stock markets, end-2010



Source: Elroy Dimson, Paul Marsh and Mike Staunton, *Credit Suisse Global Investment Returns Sourcebook 2011*.

## Bibliography and data sources

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3. Dimson, E., P. R. Marsh and M. Staunton, 2011, *Credit Suisse Global Investment Returns Sourcebook 2011*, Zurich: Credit Suisse Research Institute
4. Dimson, E., P. R. Marsh and M. Staunton, 2011, *The Dimson-Marsh-Staunton Global Investment Returns Database*, Morningstar Inc. (the "DMS" data module)



Australia

# The lucky country

Australia is often described as “the Lucky Country” with reference to its natural resources, prosperity, weather, and distance from problems elsewhere in the world. But maybe Australians make their own luck: in 2011 the Heritage Foundation ranked Australia as the country with the highest economic freedom in the world, beaten only by a couple of city-states that also score highly. Whether it is down to luck or good economic management, Australia has been the best-performing equity market over the 111 years since 1900, with a real return of 7.4% 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 to form the Commonwealth of Australia in 1901. The ASX is now the world’s sixth-largest stock exchange. More than half the index is represented by banks (28%) and mining (23%), while the largest stocks at the start of 2011 are BHP Billiton, Commonwealth Bank of Australia, and Westpac.

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. Sydney is a major global financial center.

## Capital market returns for Australia

Figure 1 shows that, over the last 111 years, the real value of equities, with income reinvested, grew by a factor of 2862.1 as compared to 4.9 for bonds and 2.1 for bills. Figure 2 shows that, since 1900, equities beat bonds by 5.9% and bills by 6.7% per year. Figure 3 shows that the long-term real return on Australian equities was an annualized 7.4% as compared to bonds and bills, which gave a real return of 1.4% and 0.7% respectively. For additional explanations of these figures, see page 31.

Figure 1 Annualized performance from 1900 to 2010

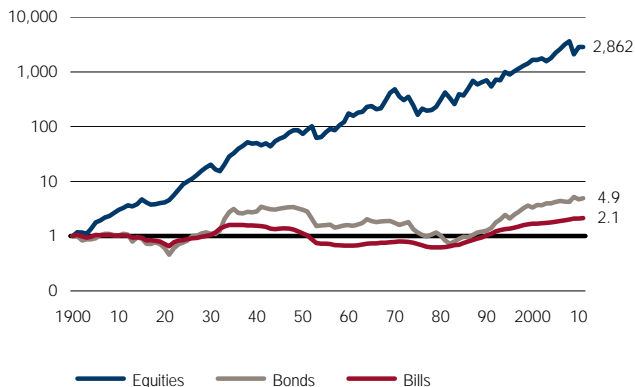


Figure 2 Equity risk premium over 10 to 111 years

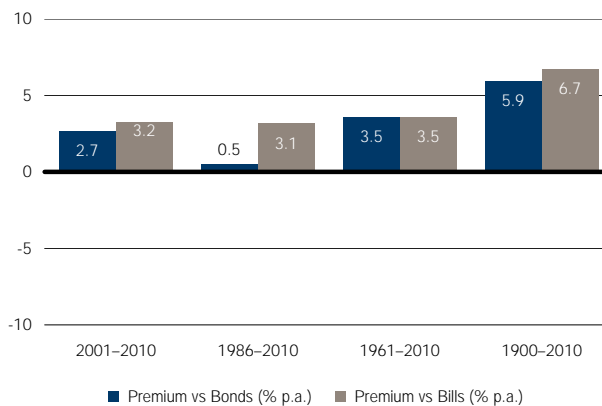
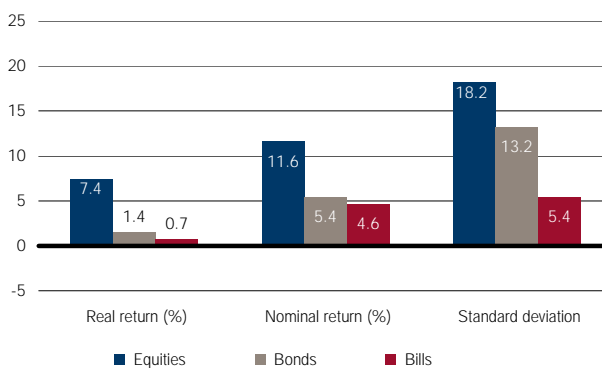


Figure 3 Returns and risk of major asset classes since 1900



Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2011.





Belgium

# At the heart of Europe

Lithuania claims to lie at the geographical heart of Europe, but Belgium can also assert centrality. It lies at the crossroads of Europe's economic backbone and its key transport and trade corridors, and is the headquarters of the European Union. In 2010, Belgium was ranked the most globalized of the 181 countries that are evaluated by the KOF Index of Globalization.

Belgium's strategic location has been a mixed blessing, making it a major battleground in two world wars. 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 two worst-performing equity markets and the sixth worst performing bond market.

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

Its importance has gradually declined, and Euronext Brussels suffered badly during the recent banking crisis. Three large banks made up a majority of its market capitalization at start-2008, but the banking sector now represents only 6% of the index. At the start of 2011, more than half of the index was invested in just two companies: Anheuser-Busch (45%) and Delhaize (7%).

## Capital market returns for Belgium

Figure 1 shows that, over the last 111 years, the real value of equities, with income reinvested, grew by a factor of 16.2 as compared to 0.9 for bonds and 0.7 for bills. Figure 2 shows that, since 1900, equities beat bonds by 2.6% and bills by 2.9% per year. Figure 3 shows that the long-term real return on Belgium equities was an annualized 2.5% as compared to bonds and bills, which gave a real return of -0.1% and -0.3% respectively. For additional explanations of these figures, see page 31.

Figure 1 Annualized performance from 1900 to 2010

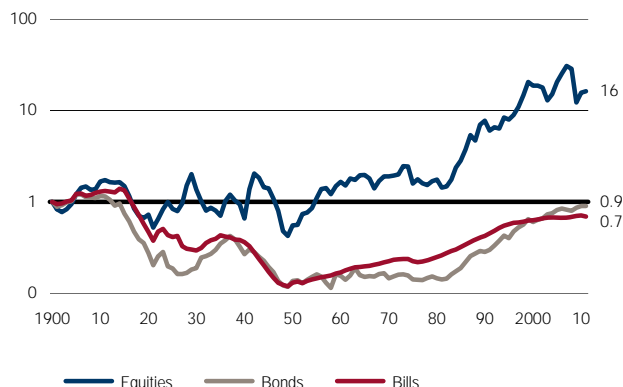


Figure 2 Equity risk premium over 10 to 111 years

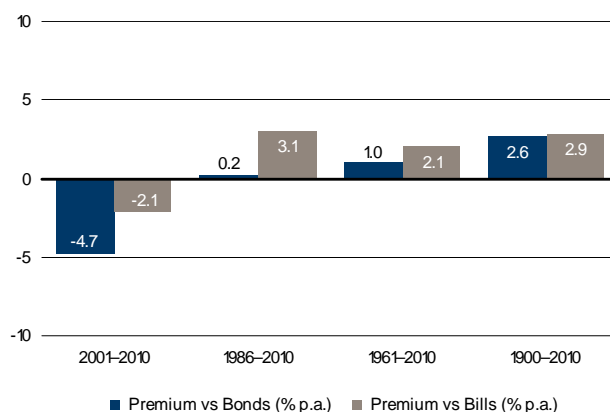
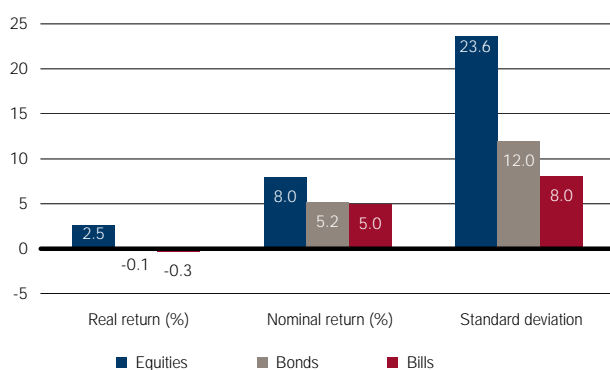


Figure 3 Returns and risk of major asset classes since 1900



Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2011.



Canada

# Resourceful country

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 one out of 110 countries monitored in the latest 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 is the world's fourth-largest, accounting for 4.1% of world capitalization. Canada also has the world's ninth-largest bond market.

Given Canada's natural endowment, it is no surprise that oil and gas and mining stocks have a 38% weighting in its equity market, while a further 33% is accounted for by financials. The largest stocks are currently Royal Bank of Canada, Toronto-Dominion Bank and Suncor Energy.

Canadian equities have performed well over the long run, with a real return of 5.9% per year. The real return on bonds has been 2.1% per year. These figures are close to those for the United States.

## Capital market returns for Canada

Figure 1 shows that, over the last 111 years, the real value of equities, with income reinvested, grew by a factor of 550.9 as compared to 10.0 for bonds and 5.7 for bills. Figure 2 shows that, since 1900, equities beat bonds by 3.7% and bills by 4.2% per year. Figure 3 shows that the long-term real return on Canadian equities was an annualized 5.9% as compared to bonds and bills, which gave a real return of 2.1% and 1.6% respectively. For additional explanations of these figures, see page 31.

Figure 1 Annualized performance from 1900 to 2010

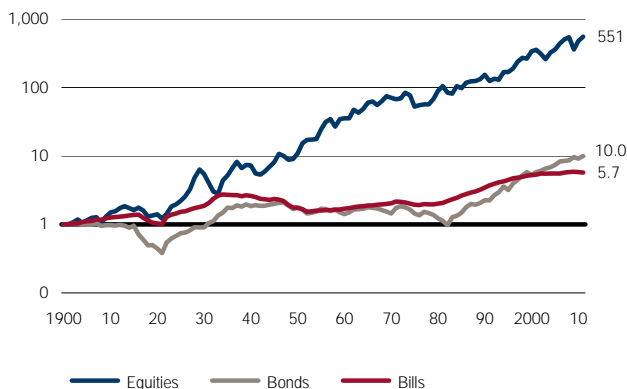


Figure 2 Equity risk premium over 10 to 111 years

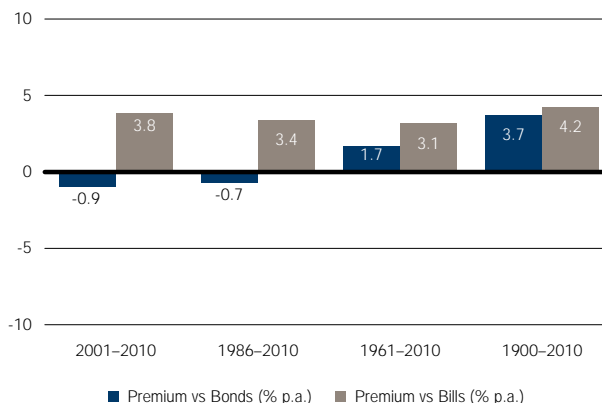
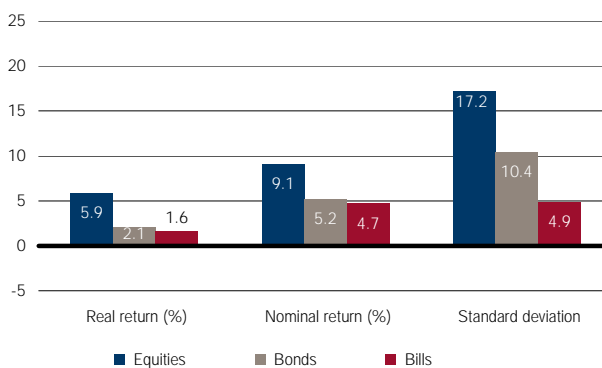


Figure 3 Returns and risk of major asset classes since 1900



Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2011.



Denmark

# Happiest nation

In a 2011 meta-survey published by the National Bureau of Economic Research, Denmark was ranked the happiest nation on earth, closely followed by Sweden, Switzerland, and Norway.

Whatever the source of Danish happiness, it does not appear to spring from outstanding equity returns. Since 1900, Danish equities have given an annualized real return of 5.1%, which, while respectable, is below the world return of 5.5%.

In contrast, Danish bonds gave an annualized real return of 3.0%, the highest among the [Yearbook](#) countries. This is because our Danish bond returns, unlike those for the other 18 countries, include an element of credit risk. The returns are taken from a study by Claus Parum, 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 can trace its roots back to the late 17th century. The Danish equity market is relatively small. It has a high weighting in healthcare (51%) and industrials (19%), and the largest stocks listed in Copenhagen are Novo-Nordisk, Danske Banking, and AP Moller-Maersk.

## Capital market returns for Denmark

Figure 1 shows that, over the last 111 years, the real value of equities, with income reinvested, grew by a factor of 247.6 as compared to 27.9 for bonds and 11.9 for bills. Figure 2 shows that, since 1900, equities beat bonds by 2.0% and bills by 2.8% per year. Figure 3 shows that the long-term real return on Danish equities was an annualized 5.1% as compared to bonds and bills, which gave a real return of 3.0% and 2.3% respectively. For additional explanations of these figures, see page 31.

Figure 1 Annualized performance from 1900 to 2010

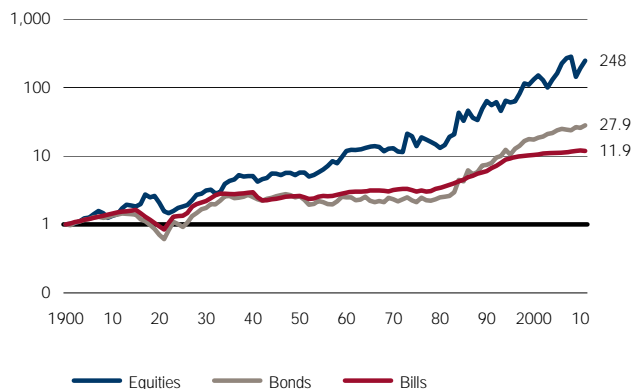


Figure 2 Equity risk premium over 10 to 111 years

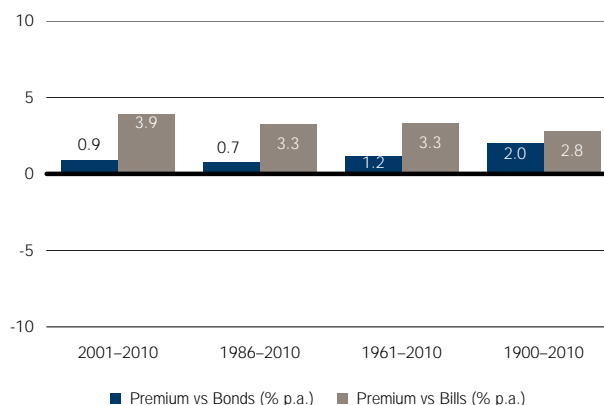
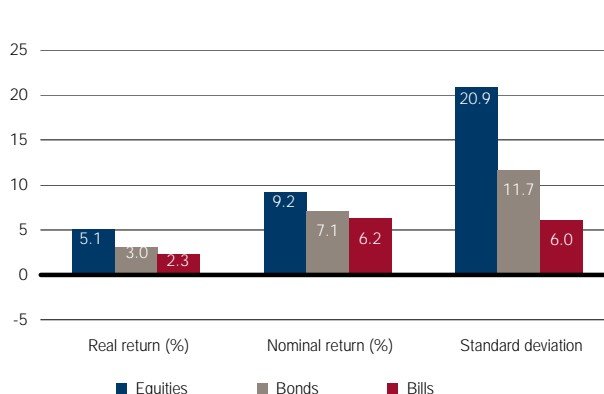


Figure 3 Returns and risk of major asset classes since 1900



Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2011.



Finland

# East meets West

With its proximity to the Baltic 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.

Newsweek magazine ranks Finland as the best country to live in the whole world in its August 2010 survey of education, health, quality of life, economic competitiveness, and political environment of 100 countries. A member of the European Union since 1995, Finland is the only Nordic state in the euro currency area.

The Finns have transformed their country from a farm and forest-based community to a diversified industrial economy operating on free-market principles. The OECD ranks Finnish schooling as the best in the world. Per capita income is among the highest in Western Europe.

Finland excels in high-tech exports. It is home to Nokia, the world’s largest manufacturer of mobile telephones, which has been rated the most valuable global brand outside the USA. Forestry, an important export earner, provides a secondary occupation for the rural population.

Finnish securities were initially traded over-the-counter or overseas, and 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 is a highly concentrated stock market. The largest Finnish companies are currently Nokia (31% of the market), Sampo, and Fortum.

## Capital market returns for Finland

Figure 1 shows that, over the last 111 years, the real value of equities, with income reinvested, grew by a factor of 334.2 as compared to 0.8 for bonds and 0.6 for bills. Figure 2 shows that, since 1900, equities beat bonds by 5.6% and bills by 5.9% per year. Figure 3 shows that the long-term real return on Finnish equities was an annualized 5.4%, as compared to bonds and bills, which gave a real return of –0.2% and –0.5% respectively. For additional explanations of these figures, see page 31.

Figure 1 Annualized performance from 1900 to 2010

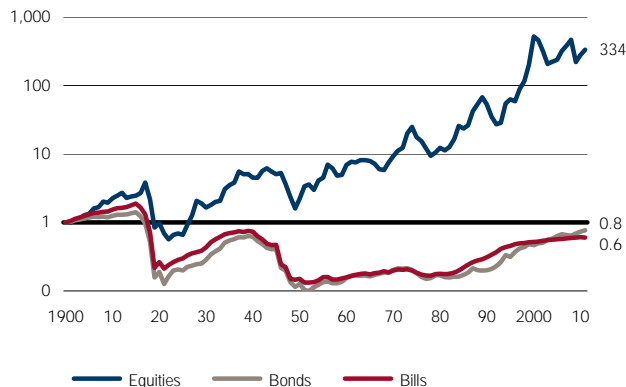


Figure 2 Equity risk premium over 10 to 111 years

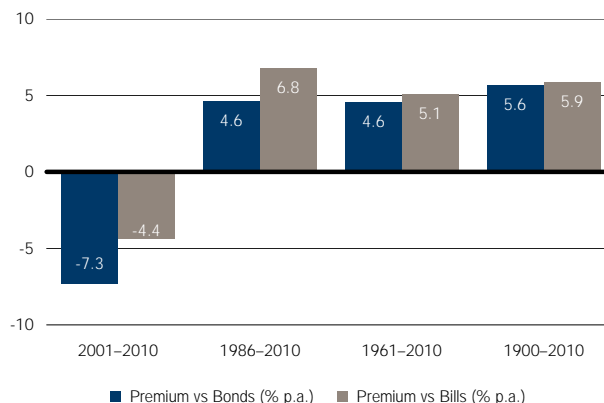
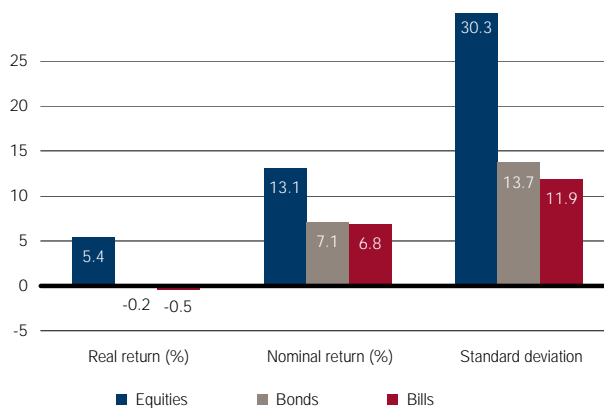


Figure 3 Returns and risk of major asset classes since 1900



Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2011.





France

# European center

Paris and London competed vigorously as financial centers 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 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 has remained at the center of Europe, being a founder member of the European Union and the euro. France is Europe's second-largest economy. It has the largest equity market in Continental Europe, ranked fifth in the world, and the fourth-largest bond market in the world. At the start of 2011, France's largest listed companies were Total, Sanofi-Aventis, and BNP-Paribas.

Long-run French asset returns have been disappointing. France ranks 16th out of the 19 Yearbook countries for equity performance, 15th for bonds and 18th for bills. It has had the third-highest 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.

## Capital market returns for France

Figure 1 shows that, over the last 111 years, the real value of equities, with income reinvested, grew by a factor of 28.5 as compared to 0.8 for bonds and 0.04 for bills. Figure 2 shows that, since 1900, equities beat bonds by 3.2% and bills by 6.0% per year. Figure 3 shows that the long-term real return on French equities was an annualized 3.1%, as compared to bonds and bills, which gave a real return of -0.1% and -2.8% respectively. For additional explanations of these figures, see page 31.

Figure 1 Annualized performance from 1900 to 2010

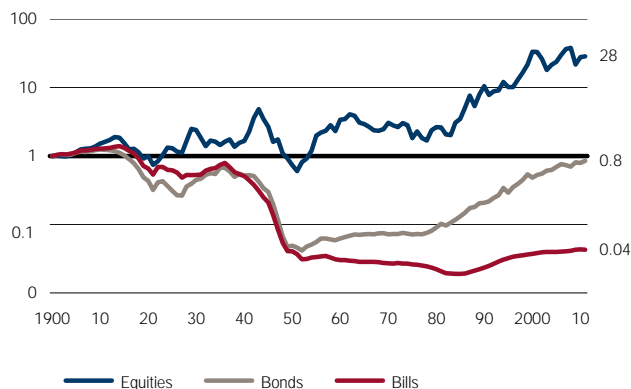


Figure 2 Equity risk premium over 10 to 111 years

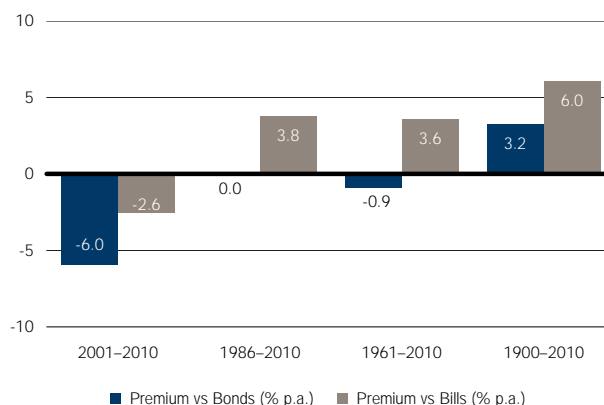
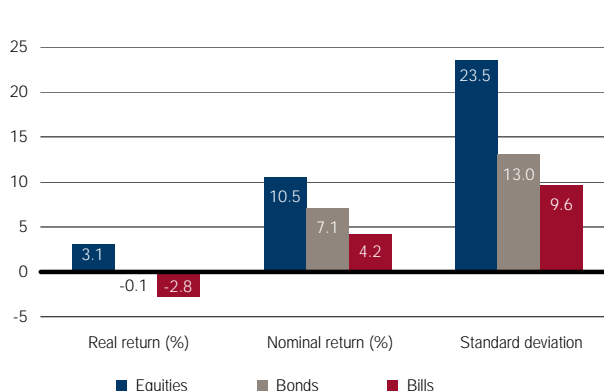


Figure 3 Returns and risk of major asset classes since 1900



Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2011.



Germany

# Locomotive of Europe

German capital market history changed radically after World War II. In the first half of the 20th century, German equities lost two-thirds of their value in World War I. In the hyperinflation of 1922–23, inflation hit 209 billion percent, and holders of fixed income securities were wiped out. In World War II and its immediate aftermath, equities fell by 88% in real terms, while bonds fell by 91%.

There was then a remarkable transformation. In the early stages of its “economic miracle,” German equities rose by 4,094% 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 enjoyed the world’s lowest inflation rate, its strongest currency (now the euro), and the second best-performing 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 seventh in the world by size, while its bond market is the world’s sixth-largest.

The German stock market retains its bias towards manufacturing, with weightings of 20% in industrials, 19% in consumer goods, and 19% in basic materials. The largest stocks are Siemens, BASF, Daimler, and E.ON.

## Capital market returns for Germany

Figure 1 shows that, over the last 111 years, the real value of equities, with income reinvested, grew by a factor of 28.3 as compared to 0.12 for bonds and 0.07 for bills. Figure 2 shows that, since 1900, equities beat bonds by 5.4% and bills by 5.9% per year. Figure 3 shows that the long-term real return on German equities was an annualized 3.1% as compared to bonds and bills, which gave a real return of –1.9% and –2.4% respectively. We exclude 1922–23 for all series except real equity returns. For further explanations of these figures, see page 31.

Figure 1 Annualized performance from 1900 to 2010

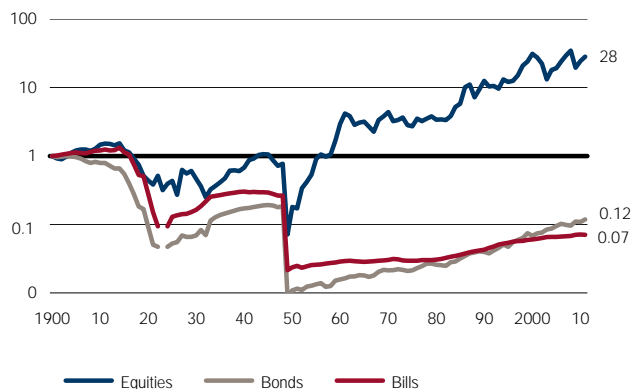


Figure 2 Equity risk premium over 10 to 111 years

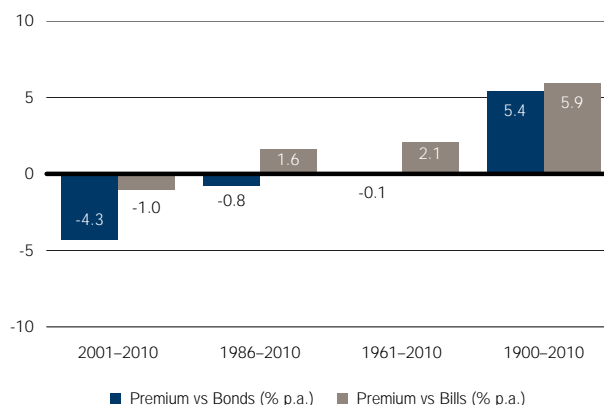
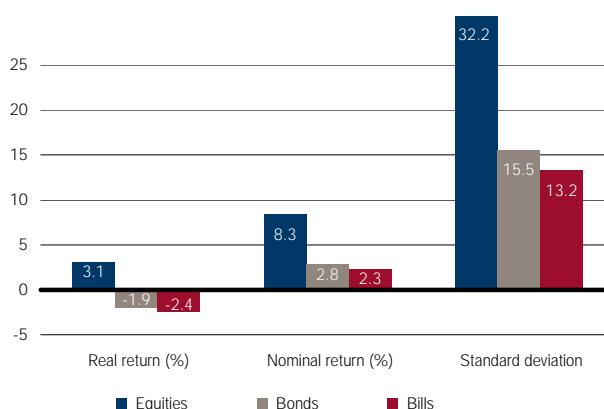


Figure 3 Returns and risk of major asset classes since 1900



Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2011.



Ireland

# Born free

Ireland was born as an independent country in 1922 as the Irish Free State, free at last after 700 years of Norman and later British involvement and control. By the 1990s and early 2000s, Ireland experienced great economic success and became known as the Celtic Tiger. The financial crisis changed that, and the country is now facing hardship. Just as the Born Free Foundation aims to free tigers from being held captive in zoos, Ireland now needs to be saved from being a captive of the economic system.

By 2007, Ireland 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 the second-highest real equity return of any Yearbook country. The country is one of the smallest Yearbook markets, and sadly, it has shrunk since 2006. Too much of the market boom was based on real estate, financials and leverage, and Irish stocks are now worth only one-third of their value at the end of 2006. At that date, the Irish market had a 57% weighting in financials, but by the beginning of 2011 they represented only 6% of the index. The captive tiger now has a smaller bite.

Though Ireland gained its independence in 1922, stock exchanges had existed from 1793 in Dublin and Cork. In order to monitor Irish stocks from 1900, we constructed an index for Ireland based on stocks traded on these two exchanges. 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 economy improved. It switched its currency from the punt to the euro in January 2002, and all investment returns reflect the start-2002 currency conversion factor.

## Capital market returns for Ireland

Figure 1 shows that, over the last 111 years, the real value of equities, with income reinvested, grew by a factor of 59.8 as compared to 2.6 for bonds and 2.2 for bills. Figure 2 shows that, since 1900, equities beat bonds by 2.9% and bills by 3.0% per year. Figure 3 shows that the long-term real return on Irish equities was an annualized 3.8% as compared to bonds and bills, which gave a real return of 0.9% and 0.7% respectively. For additional explanations of these figures, see page 31.

Figure 1 Annualized performance from 1900 to 2010

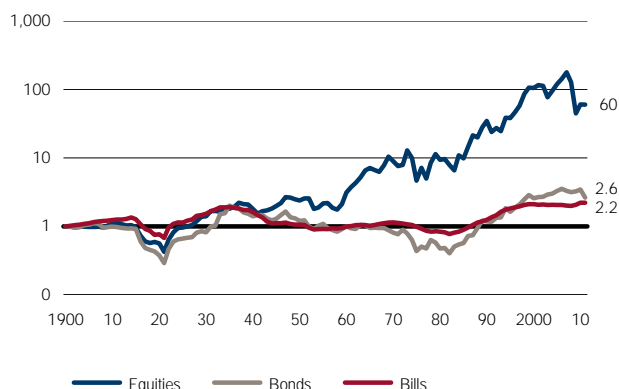


Figure 2 Equity risk premium over 10 to 111 years

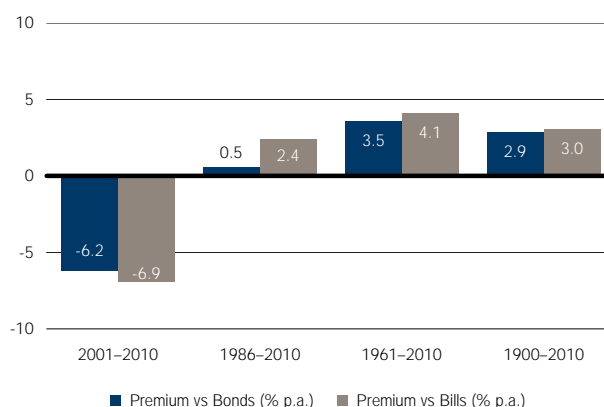
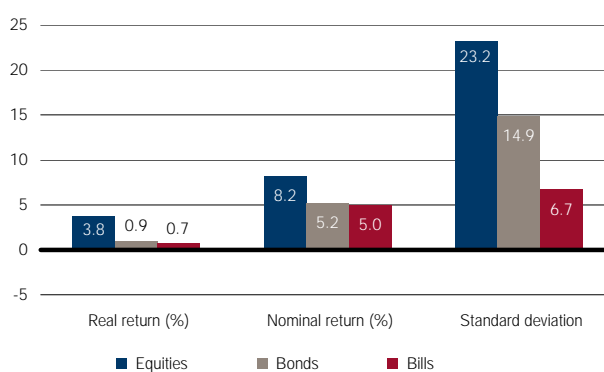


Figure 3 Returns and risk of major asset classes since 1900



Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2011.



Italy

# Banking innovators

While banking can trace its roots back to Biblical times, Italy can claim a key role in the early development of modern banking. North Italian bankers, including the Medici, dominated lending and trade financing throughout Europe in the Middle Ages. These bankers were known as Lombards, a name that was then synonymous with Italians. Indeed, banking takes its name from the Italian word "banca," the bench on which the Lombards used to sit to transact their business.

Italy retains a large banking sector to this day, with financials still accounting for 36% of the Italian equity market. Oil and gas accounts for a further 23%, and the largest stocks traded on the Milan Stock Exchange are Eni, Unicredito, and Enel.

Sadly, Italy has experienced some of the poorest asset returns of any Yearbook country. Since 1900, the annualized real return from equities has been 2.0%, the lowest return out of 19 countries. Apart from Germany, with its post-World War I and post-World War II hyperinflations, Italy has experienced the second-worst real bond and worst bill returns of any Yearbook country, and the highest inflation rate and weakest currency.

Today, Italy's stock market is the world's 17th largest, but its highly developed bond market is the world's third-largest.

## Capital market returns for Italy

Figure 1 shows that, over the last 111 years, the real value of equities, with income reinvested, grew by a factor of 9.1 as compared to 0.2 for bonds and 0.02 for bills. Figure 2 shows that, since 1900, equities beat bonds by 3.7% and bills by 5.8% per year. Figure 3 shows that the long-term real return on Italian equities was an annualized 2.0% as compared to bonds and bills, which generated annualized real returns of -1.7% and -3.6% respectively. For additional explanations of these figures, see page 31.

Figure 1 Annualized performance from 1900 to 2010

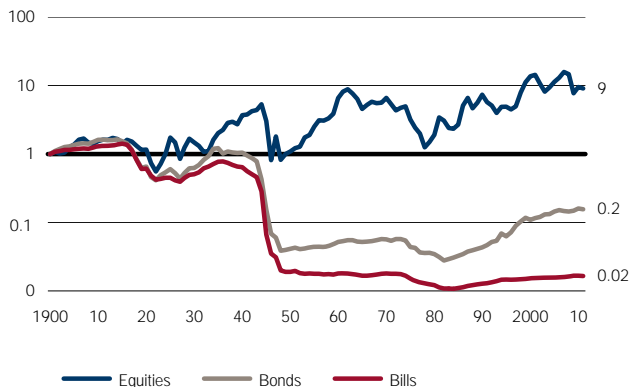


Figure 2 Equity risk premium over 10 to 111 years

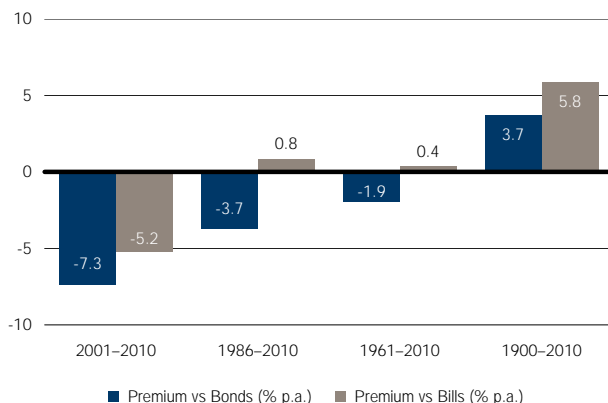
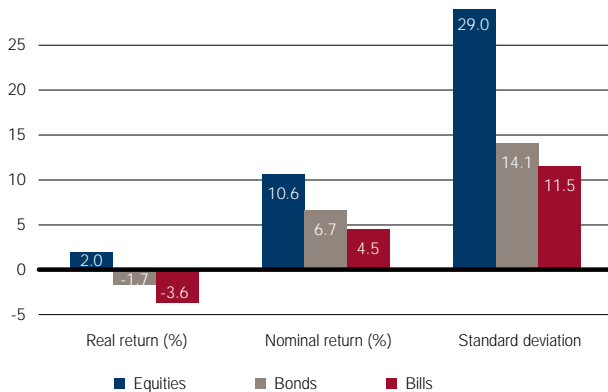


Figure 3 Returns and risk of major asset classes since 1900



Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2011.





Japan

# Birthplace of futures

Japan has a long heritage in financial markets. Trading in rice futures had been initiated around 1730 in Osaka, which created its stock exchange in 1878. Osaka 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, also 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 40% weighting in the world index versus 32% for the USA. Real estate values were also riding high and it was alleged that the grounds of the Imperial palace in Tokyo were worth more than the entire State of California.

Then the bubble burst. From 1990 to the start of 2009, Japan was the worst-performing stock market. At the start of 2011 its capital value is still only one-third of its value at the beginning of the 1990s. Its weighting in the world index fell from 40% to 8%. Meanwhile, Japan suffered a prolonged period of stagnation, banking crises and deflation. Hopefully, this will not form the blueprint for other countries that are hoping to emerge from their own financial crises.

Despite the fallout from the bursting of the asset bubble, Japan remains a major economic power, with the world's second-largest GDP. 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.

## Capital market returns for Japan

Figure 1 shows that, over the last 111 years, the real value of equities, with income reinvested, grew by a factor of 63.9 as compared to 0.3 for bonds and 0.12 for bills. Figure 2 shows that, since 1900, equities beat bonds by 5.0% and bills by 5.9% per year. Figure 3 shows that the long-term real return on Japanese equities was an annualized 3.8% as compared to bonds and bills, which gave a real return of -1.1% and -1.9% respectively. For additional explanations of these figures, see page 31.

Figure 1 Annualized performance from 1900 to 2010

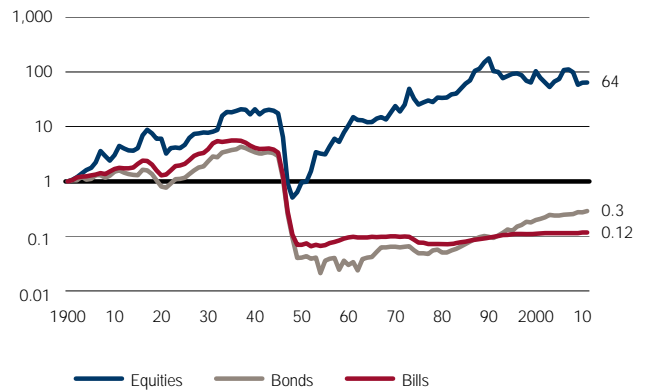


Figure 2 Equity risk premium over 10 to 111 years

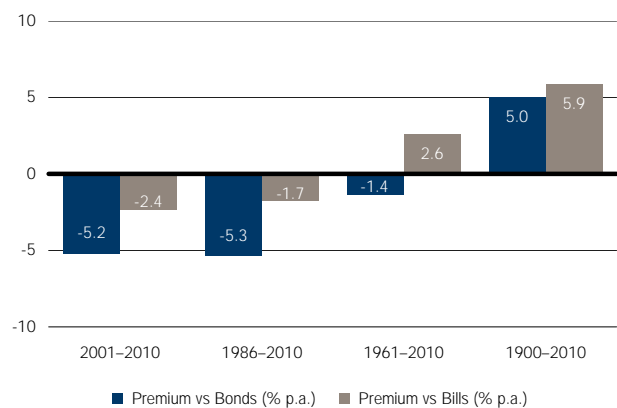
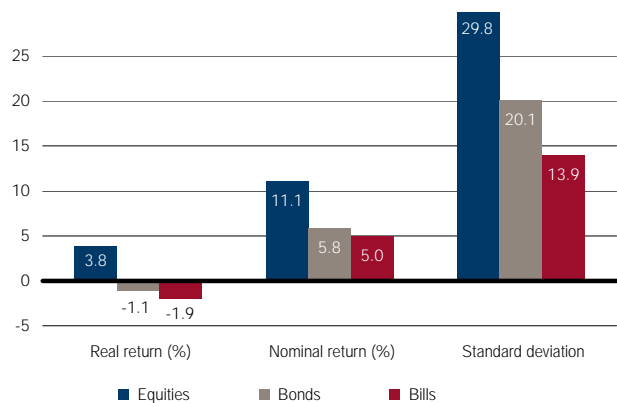


Figure 3 Returns and risk of major asset classes since 1900



Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2011.



Netherlands

# Exchange pioneer

Although some forms of stock trading occurred in Roman times, organized trading did not take place until 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 today as part of Euronext. Over the years, Dutch equities have generated a mid-ranking real return of 5.0% per year. The Netherlands also has a significant bond market, which is the world's 12th-largest. The Netherlands has traditionally been a low inflation country and, since 1900, has enjoyed the second-lowest inflation rate among the *Yearbook* countries (after Switzerland).

The Netherlands has a prosperous open economy. The largest energy company in the world, Royal Dutch Shell, now has its primary listing in London and a secondary listing in Amsterdam. But the Amsterdam Exchange still hosts more than its share of major multinationals, including Unilever, ArcelorMittal, ING Group, and Philips.

## Capital market returns for the Netherlands

Figure 1 shows that, over the last 111 years, the real value of equities, with income reinvested, grew by a factor of 218.0 as compared to 4.8 for bonds and 2.2 for bills. Figure 2 shows that, since 1900, equities beat bonds by 3.5% and bills by 4.2% per year. Figure 3 shows that the long-term real return on Dutch equities was an annualized 5.0% as compared to bonds and bills, which gave a real return of 1.4% and 0.7% respectively. For additional explanations of these figures, see page 31.

Figure 1 Annualized performance from 1900 to 2010

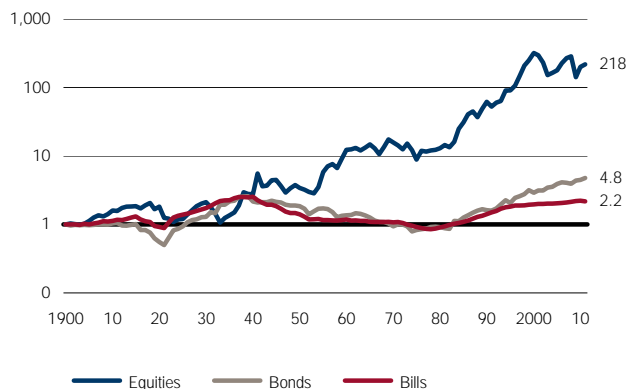


Figure 2 Equity risk premium over 10 to 111 years

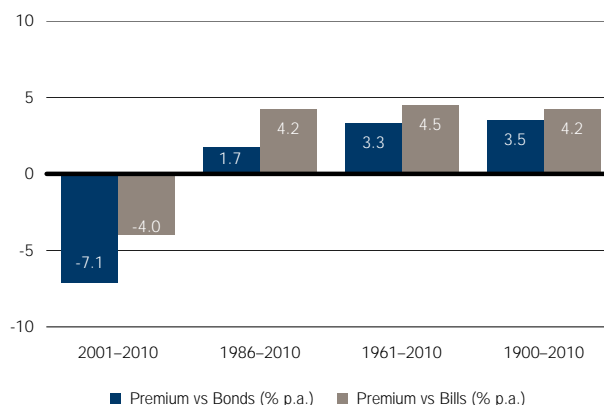
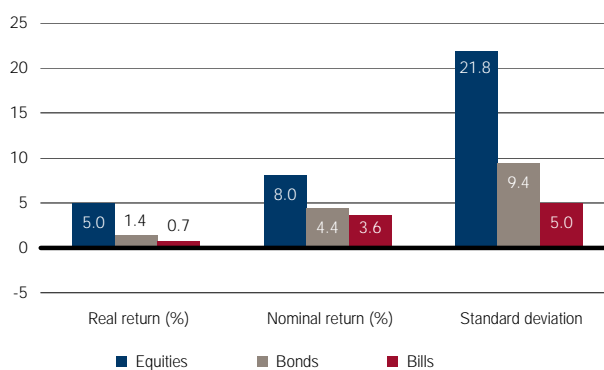


Figure 3 Returns and risk of major asset classes since 1900



Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2011.



New Zealand

# Purity and integrity

For a decade, 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. According to Transparency International, in 2010 New Zealand was perceived as the least corrupt country in the world. The Wall Street Journal ranks New Zealand as the best in the world for business freedom. The Global Peace Index for 2011 rates the country as the most peaceful in the world.

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

Over the last two 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.

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 Fletcher Building and Telecom Corporation of New Zealand.

## Capital market returns for New Zealand

Figure 1 shows that, over the last 111 years, the real value of equities, with income reinvested, grew by a factor of 533.4 as compared to 8.8 for bonds and 6.3 for bills. Figure 2 shows that, since 1900, equities beat bonds by 3.8% and bills by 4.1% per year. Figure 3 shows that the long-term real return on New Zealand equities was an annualized 5.8% as compared to bonds and bills, which gave a real return of 2.0% and 1.7% respectively. For additional explanations of these figures, see page 31.

Figure 1 Annualized performance from 1900 to 2010

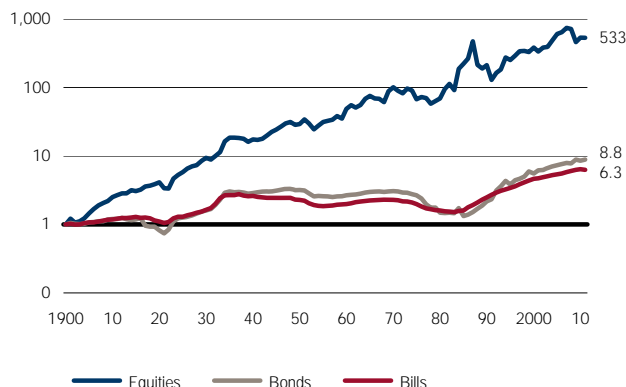


Figure 2 Equity risk premium over 10 to 111 years

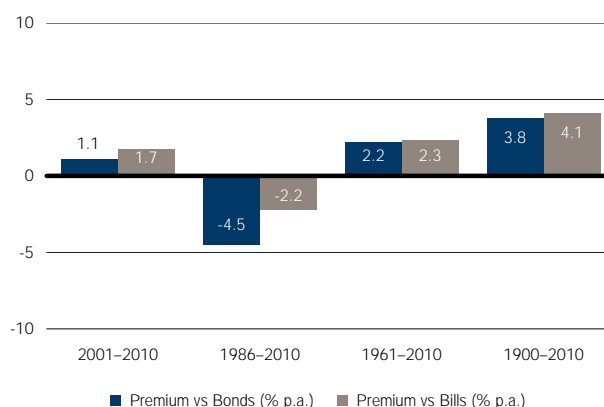
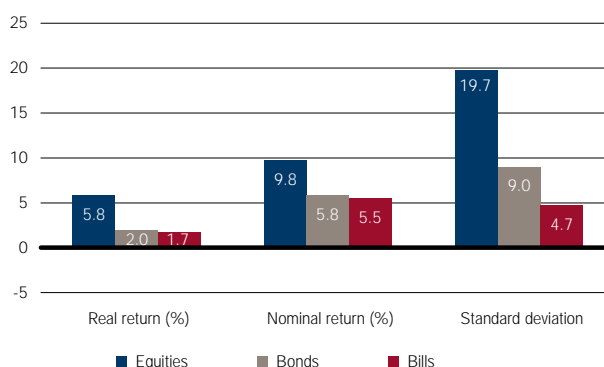


Figure 3 Returns and risk of major asset classes since 1900



Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2011.



Norway

# Nordic oil kingdom

Norway is a very small country (ranked 115th by population and 61st by land area) surrounded by large natural resources that make it the world's fourth-largest oil exporter and the second-largest exporter of fish.

The population of 4.8 million enjoys the second-largest GDP per capita in the world and lives under a constitutional monarchy outside the Eurozone (a distinction shared with the UK). The United Nations, through its Human Development Index, ranks Norway the best country in the world for life expectancy, education and standard of living.

The Oslo stock exchange (OSE) 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 Government established its petroleum fund to invest the surplus wealth from oil revenues. This has grown to become the largest fund in Europe and the second-largest in the world, with a market value above USD 0.5 trillion. The fund invests predominantly in equities and, on average, it owns more than one percent of every listed company in the world.

The largest OSE stocks are Statoil, DnB NOR, and Telenor.

## Capital market returns for Norway

Figure 1 shows that, over the last 111 years, the real value of equities, with income reinvested, grew by a factor of 97.2 as compared to 6.6 for bonds and 3.6 for bills. Figure 2 shows that, since 1900, equities beat bonds by 2.5% and bills by 3.0% per year. Figure 3 shows that the long-term real return on Norwegian equities was an annualized 4.2% as compared to bonds and bills, which gave a real return of 1.7% and 1.2% respectively. For additional explanations of these figures, see page 31.

Figure 1 Annualized performance from 1900 to 2010

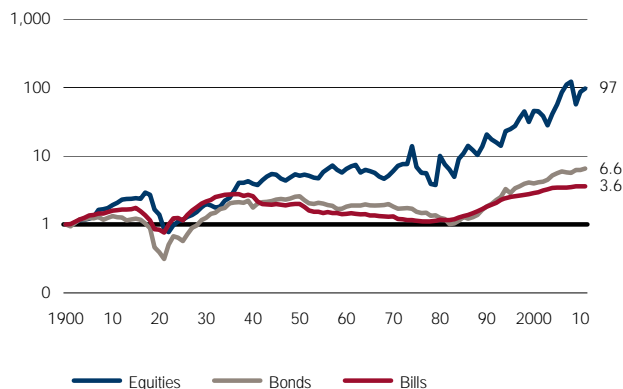


Figure 2 Equity risk premium over 10 to 111 years

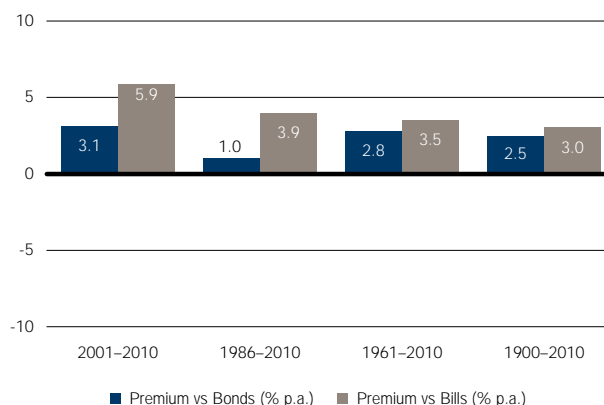
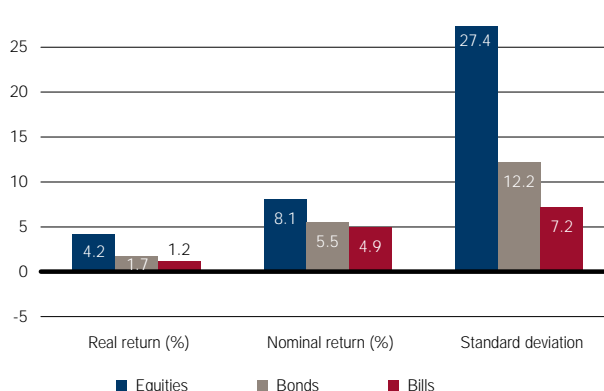


Figure 3 Returns and risk of major asset classes since 1900



Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2011.





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. Today, South Africa has 90% of the world's platinum, 80% of its manganese, 75% of its chrome and 41% of its gold, as well as vital deposits of diamonds, vanadium and coal.

The 1886 gold rush led to many mining and financing companies opening up, and to cater for 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 real equity returns of 7.3% per year, the second-highest return among the *Yearbook* countries.

Today, South Africa is the largest economy in Africa, with a sophisticated financial structure. Back 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 it today ranks as the fifth-largest emerging market.

Gold, once the keystone of South Africa's economy, has declined in importance as the economy has diversified. Resource stocks, however, are well over a quarter of the JSE's market capitalization. The largest JSE stocks are MTN, Sasol, and Standard Bank.

## Capital market returns for South Africa

Figure 1 shows that, over the last 111 years, the real value of equities, with income reinvested, grew by a factor of 2524.6 as compared to 7.0 for bonds and 3.2 for bills. Figure 2 shows that, since 1900, equities beat bonds by 5.5% and bills by 6.2% per year. Figure 3 shows that the long-term real return on South African equities was an annualized 7.3% as compared to bonds and bills, which gave a real return of 1.8% and 1.0% respectively. For additional explanations of these figures, see page 31.

Figure 1 Annualized performance from 1900 to 2010

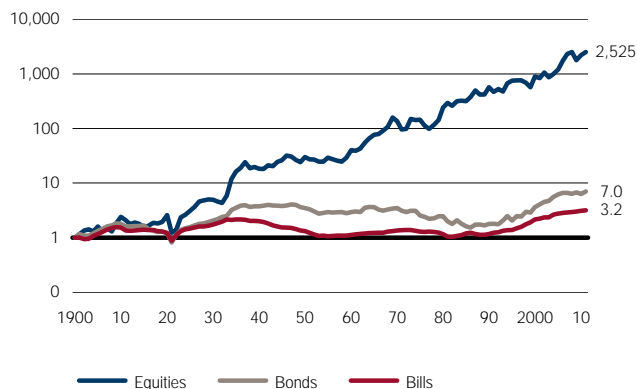


Figure 2 Equity risk premium over 10 to 111 years

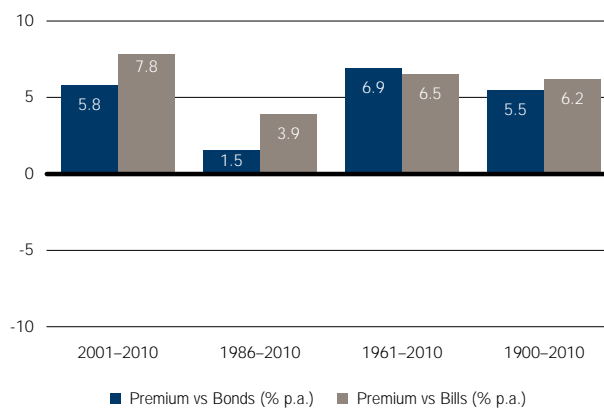
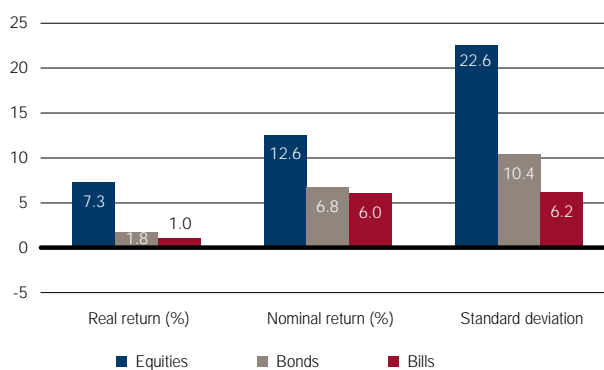


Figure 3 Returns and risk of major asset classes since 1900



Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2011.



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 way beyond its Southern European borders, and carries weight throughout Latin America.

The modern style of Spanish bullfighting is described as daring and revolutionary, and that is an apt description of real equity returns over the century. While the 1960s and 1980s saw Spanish real equity returns enjoying a bull market and ranked second in the world, the 1930s and 1970s saw the very worst returns among our countries.

Though 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 its energy needs.

The Madrid Stock Exchange was founded in 1831 and it is now the 15th largest in the world, helped by strong economic growth since the 1980s. The major Spanish companies retain strong presences in Latin America combined with increasing strength in banking and infrastructure across Europe. The largest stocks are Telefonica, Banco Santander, and BBVA.

## Capital market returns for Spain

Figure 1 shows that, over the last 111 years, the real value of equities, with income reinvested, grew by a factor of 48.7 as compared to 4.1 for bonds and 1.5 for bills. Figure 2 shows that, since 1900, equities beat bonds by 2.3% and bills by 3.2% per year. Figure 3 shows that the long-term real return on Spanish equities was an annualized 3.6% as compared to bonds and bills, which gave a real return of 1.3% and 0.3% respectively. For additional explanations of these figures, see page 31.

Figure 1 Annualized performance from 1900 to 2010

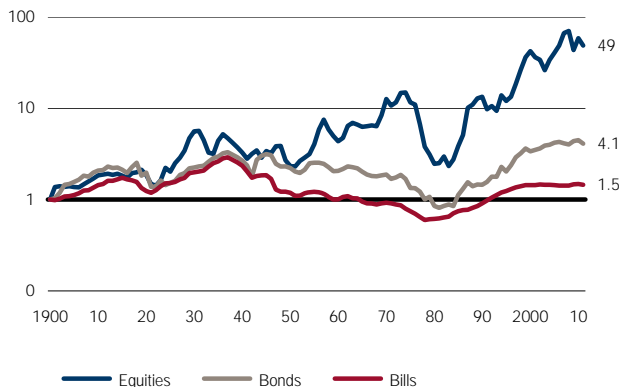


Figure 2 Equity risk premium over 10 to 111 years

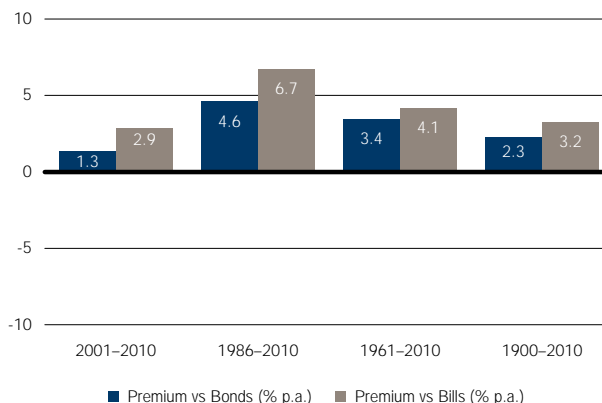
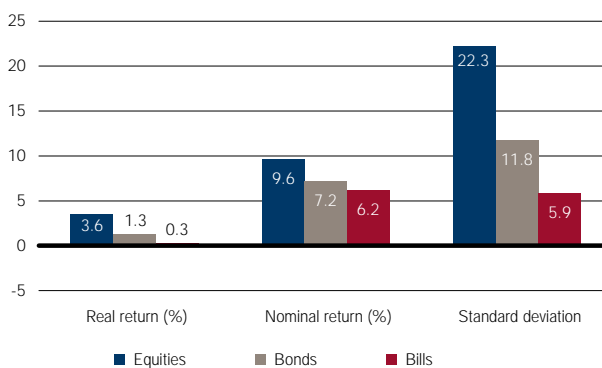


Figure 3 Returns and risk of major asset classes since 1900



Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2011.



Sweden

# Nobel prize returns

Alfred Nobel bequeathed 94% of his total assets to establish and endow the five Nobel Prizes (first awarded in 1901), instructing that the capital be invested in safe securities. Were Sweden to win a Nobel prize for its investment returns, it would be for its achievement as the only country to have real returns for equities, bonds and bills all ranked in the top three.

Real Swedish equity returns have been supported by a policy of neutrality through two world wars, and the benefits of resource wealth and the development, in the 1980s, of industrial holding companies. Overall, they have returned 6.3% per year, behind the two highest-ranked countries, Australia and South Africa.

The Stockholm stock exchange was founded in 1863 and is the primary securities exchange of the Nordic countries. Since 1998, has been part of the OMX grouping. The largest SSE stocks are Nordea Bank, Ericsson, and Svenska Handelsbank.

Despite the high rankings for real bond and bill returns, current Nobel prize winners will rue the instruction to invest in safe securities as the real return on bonds was only 2.4% per year, and that on bills only 1.9% per year. Had the capital been invested in domestic equities, the winners would have enjoyed immense fortune as well as fame.

## Capital market returns for Sweden

Figure 1 shows that, over the last 111 years, the real value of equities, with income reinvested, grew by a factor of 903.4 as compared to 14.6 for bonds and 8.1 for bills. Figure 2 shows that, since 1900, equities beat bonds by 3.8% and bills by 4.3% per year. Figure 3 shows that the long-term real return on Swedish equities was an annualized 6.3% as compared to bonds and bills, which gave a real return of 2.4% and 1.9% respectively. For additional explanations of these figures, see page 31.

Figure 1 Annualized performance from 1900 to 2010

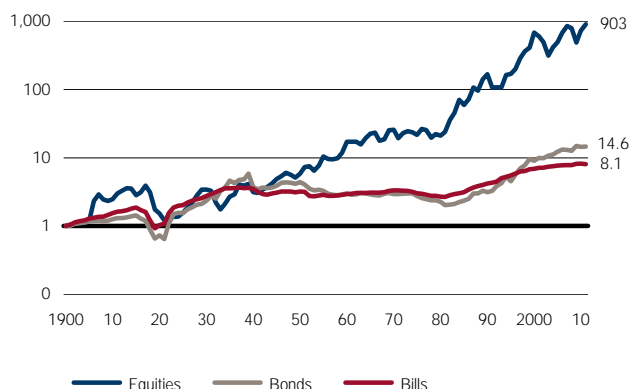


Figure 2 Equity risk premium over 10 to 111 years

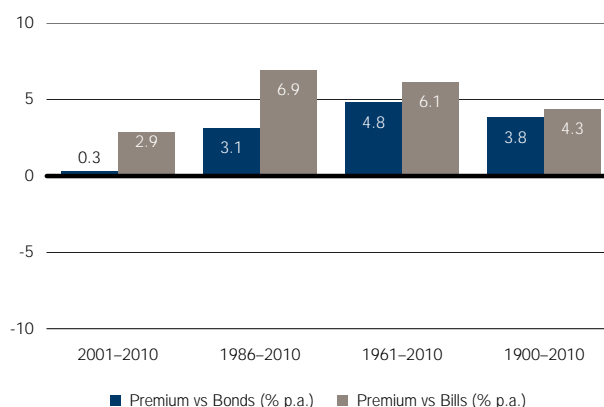
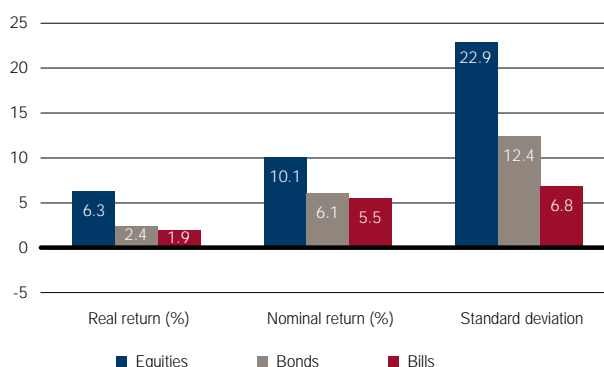


Figure 3 Returns and risk of major asset classes since 1900



Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2011.



Switzerland

# Traditional safe haven

For a small country with just 0.1% of the world's population and 0.008% of its land mass, Switzerland punches well above its weight financially and wins several gold medals in the global financial stakes. In the Global Competitiveness Report 2010–2011, Switzerland is top ranked in the world.

The Swiss stock market traces its origins to exchanges in Geneva (1850), Zurich (1873) and Basel (1876). It is now the world's eighth-largest equity market, accounting for 3.0% of total world value.

Since 1900, Swiss equities have achieved a mid-ranking real return of 4.2%, while Switzerland has been one of the world's three best-performing government bond markets, with an annualized real return of 2.1%. Switzerland has also enjoyed the world's lowest inflation rate: just 2.3% per year since 1900. Meanwhile, the Swiss franc has been the world's strongest currency.

Switzerland is, of course, 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 all bolstered the country's reputation as a safe haven. Today, close to 30% of all cross-border private assets invested worldwide are managed in Switzerland.

Switzerland's listed companies include world leaders such as Nestle, Novartis and Roche.

## Capital market returns for Switzerland

Figure 1 shows that, over the last 111 years, the real value of equities, with income reinvested, grew by a factor of 100.0 as compared to 10.1 for bonds and 2.4 for bills. Figure 2 shows that, since 1900, equities beat bonds by 2.1% and bills by 3.4% per year. Figure 3 shows that the long-term real return on Swiss equities was an annualized 4.2% as compared to bonds and bills, which gave a real return of 2.1% and 0.8% respectively. For additional explanations of these figures, see page 31.

Figure 1 Annualized performance from 1900 to 2010

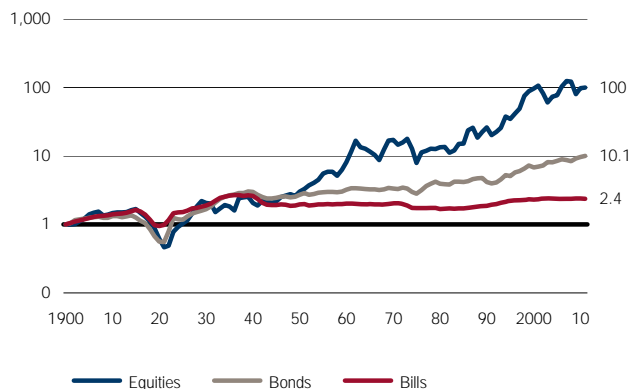


Figure 2 Equity risk premium over 10 to 111 years

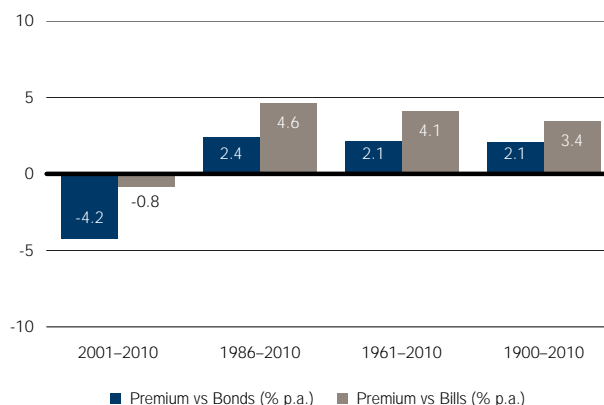
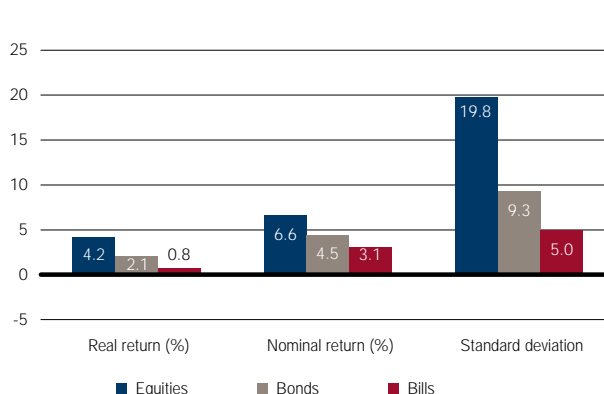


Figure 3 Returns and risk of major asset classes since 1900



Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2011.





United Kingdom

# Global center

Organized stock trading in the UK dates from 1698. This mostly took place in City of London coffee houses until 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, both New York and Tokyo are larger than London as financial centers. 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 centre in the Global Financial Centres Index, Worldwide Centres 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 London foreign exchange market is the largest in the world, and London has the world's third-largest stock market, third-largest insurance market, and eighth-largest bond market.

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 in London. 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.

## Capital market returns for the United Kingdom

Figure 1 shows that, over the last 111 years, the real value of equities, with income reinvested, grew by a factor of 317.4 as compared to 4.6 for bonds and 3.1 for bills. Figure 2 shows that, since 1900, equities beat bonds by 3.9% and bills by 4.3% per year. Figure 3 shows that the long-term real return on UK equities was an annualized 5.3% as compared to bonds and bills, which gave a real return of 1.4% and 1.0% respectively. For additional explanations of these figures, see page 31.

Figure 1 Annualized performance from 1900 to 2010

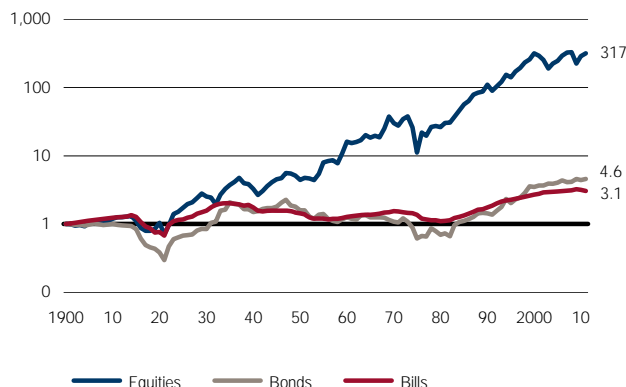


Figure 2 Equity risk premium over 10 to 111 years

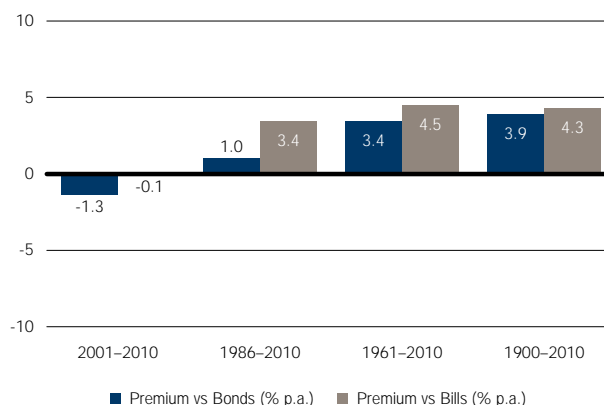
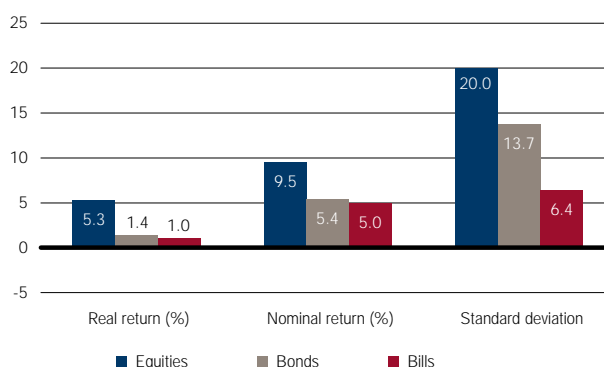


Figure 3 Returns and risk of major asset classes since 1900



Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2011.



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 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 41% of total world value, which is over five times as large as Japan, its closest rival. The USA also has the world's largest bond market.

US financial markets are also the best documented in the world and, until recently, most of the long-run evidence cited on historical asset returns drew almost exclusively on the US experience. Since 1900, US equities and US bonds have given real returns of 6.3% and 1.8%, 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 a 41% 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 returns, rather than just those from the USA.

## Capital market returns for the United States

Figure 1 shows that, over the last 111 years, the real value of equities, with income reinvested, grew by a factor of 850.7 as compared to 7.5 for bonds and 2.9 for bills. Figure 2 shows that, since 1900, equities beat bonds by 4.4% and bills by 5.3% per year. Figure 3 shows that the long-term real return on US equities was an annualized 6.3% as compared to bonds and bills, which gave a real return of 1.8% and 1.0% respectively. For additional explanations of these figures, see page 31.

Figure 1 Annualized performance from 1900 to 2010

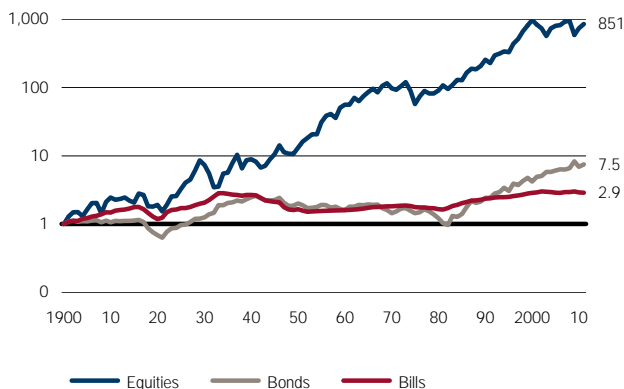


Figure 2 Equity risk premium over 10 to 111 years

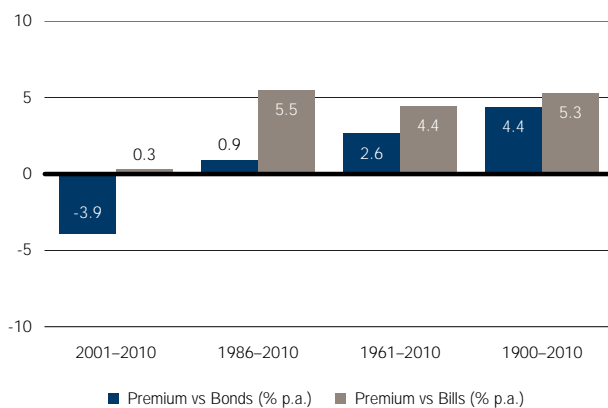
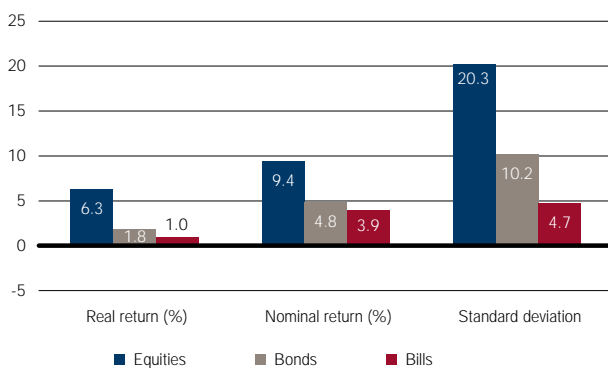


Figure 3 Returns and risk of major asset classes since 1900



Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2011.



World

# Globally diversified

It is interesting to see how the 19 *Yearbook* countries have performed in aggregate over the long run. We have therefore created a 19-country world equity index denominated in a common currency, in which each country is weighted by its starting-year equity market capitalization, or in years before capitalizations were available, by its GDP. We also compute a 19-country world bond index, with each country weighted by GDP.

These indexes 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 indexes 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 111 years from 1900 to 2011, Figure 1 shows that the real return on the world index was 5.5% per year for equities, and 1.6% per year for bonds. It also shows that the world equity index had a volatility of 17.7% per year. This compares with 23.4% per year for the average country and 20.3% per year for the USA. The risk reduction achieved through global diversification remains one of the last “free lunches” available to investors.

## Capital market returns for World (in USD)

Figure 1 shows that, over the last 111 years, the real value of equities, with income reinvested, grew by a factor of 374.8 as compared to 6.1 for bonds and 2.9 for US bills. Figure 2 shows that, since 1900, equities beat bonds by 3.8% and US bills by 4.5% per year. Figure 3 shows that the long-term real return on World equities was an annualized 5.5% as compared to bonds and US bills, which gave a real return of 1.6% and 1.0% respectively. For additional explanations of these figures, see page 31.

Figure 1 Annualized performance from 1900 to 2010

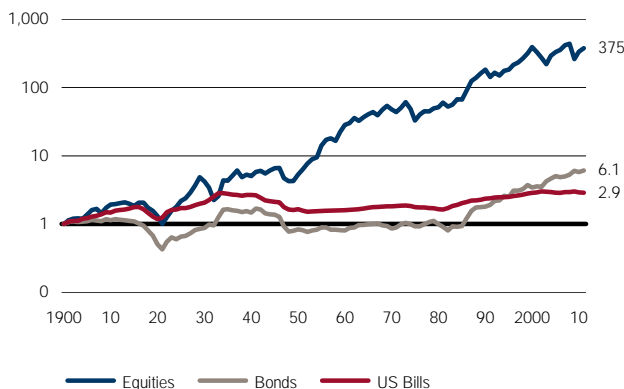


Figure 2 Equity risk premium over 10 to 111 years

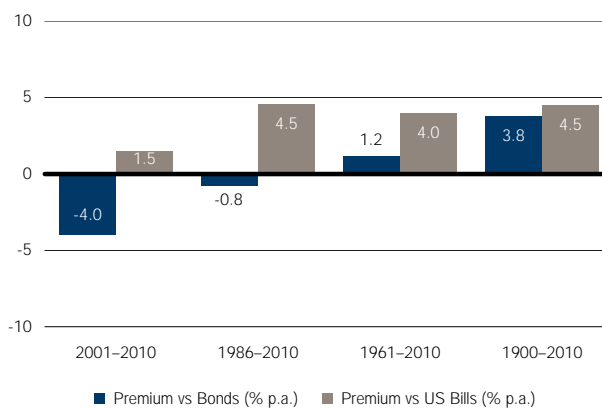
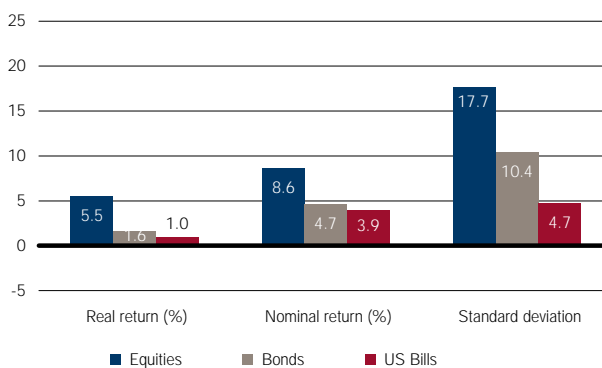


Figure 3 Returns and risk of major asset classes since 1900



Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2011.



World ex-US

# Rest of the world

In addition to the two world indexes, we also construct two world indexes that exclude the USA, using exactly the same principles. Although we are excluding just one out of 19 countries, the USA accounts for roughly half the total equity market capitalization of our 19 countries, so the 18-country world ex-US equity index represents approximately half the total value of the world index.

We noted above that, until 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 5.0% per year, which is 1.3% per year below that for the USA. This suggests that, although the USA has not been a massive outlier, it is nevertheless important to look at global returns, rather than just focusing on the USA.

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

Figure 1 shows that, over the last 111 years, the real value of equities, with income reinvested, grew by a factor of 234.7 as compared to 3.8 for bonds and 2.9 for US bills. Figure 2 shows that, since 1900, equities beat bonds by 3.8% and US bills by 4.0% per year. Figure 3 shows that the long-term real return on World ex-US equities was an annualized 5.0% as compared to bonds and US bills, which gave a real return of 1.2% and 1.0% respectively. For additional explanations of these figures, see page 31.

Figure 1 Annualized performance from 1900 to 2010

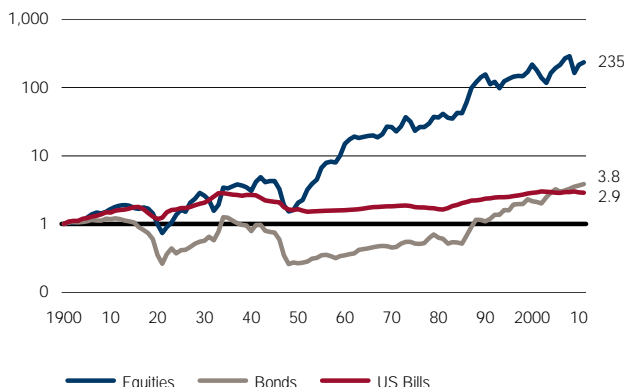


Figure 2 Equity risk premium over 10 to 111 years

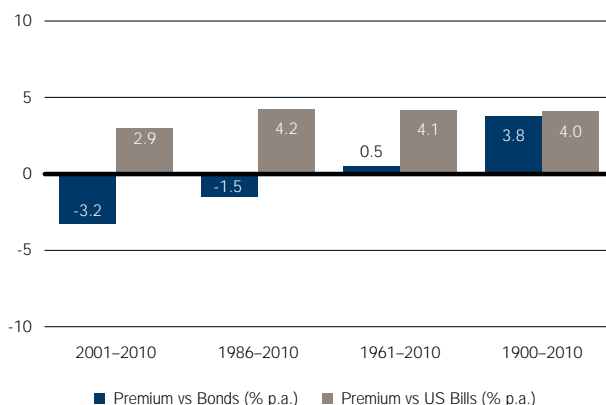
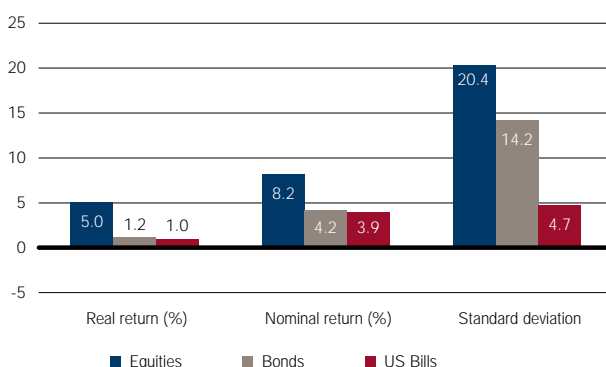


Figure 3 Returns and risk of major asset classes since 1900



Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2011.





Europe

# The Old World

The *Yearbook* documents investment returns for 13 European countries. They comprise eight euro currency area states (Belgium, Finland, France, Germany, Ireland, Italy, the Netherlands and Spain) and five European markets that are outside the euro area (Denmark, Sweden and the UK; and from outside the EU, Norway and Switzerland). Loosely, we might argue that these 13 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 13-country European index using the same methodology as for the world index. As with the world index, this European index can be designated in any desired common currency. For consistency, the figures opposite are in US dollars from the perspective of a US international investor.

Figure 1 opposite shows that the real equity return on European equities was 4.8%. This compares with 5.5% for the world index, indicating that the Old World countries have underperformed. This may relate to the destruction from the two world wars, where Europe was at the epicenter; or to the fact that many of the New World countries were resource-rich; or perhaps to the greater vibrancy of New World economies.

## Capital market returns for Europe (in USD)

Figure 1 shows that, over the last 111 years, the real value of equities, with income reinvested, grew by a factor of 175.3 as compared to 2.5 for bonds and 2.9 for US bills. Figure 2 shows that, since 1900, equities beat bonds by 3.9% and US bills by 3.8% per year. Figure 3 shows that the long-term real return on European equities was an annualized 4.8% as compared to bonds and US bills, which gave a real return of 0.8% and 1.0% respectively. For additional explanations of these figures, see page 31.

Figure 1 Annualized performance from 1900 to 2010

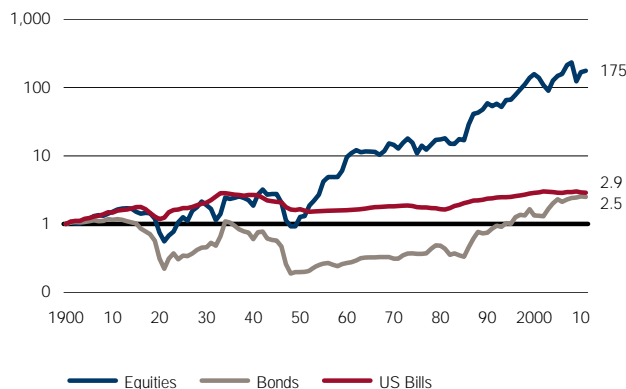


Figure 2 Equity risk premium over 10 to 111 years

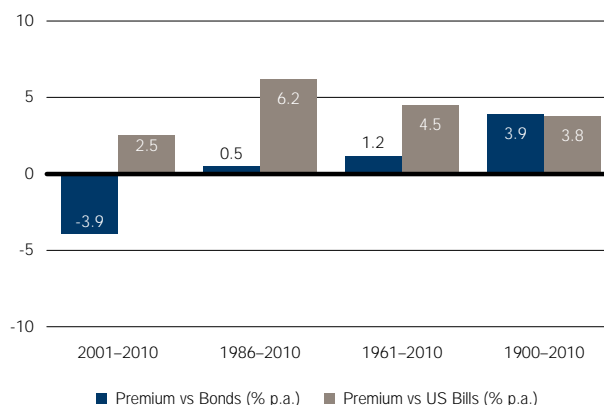
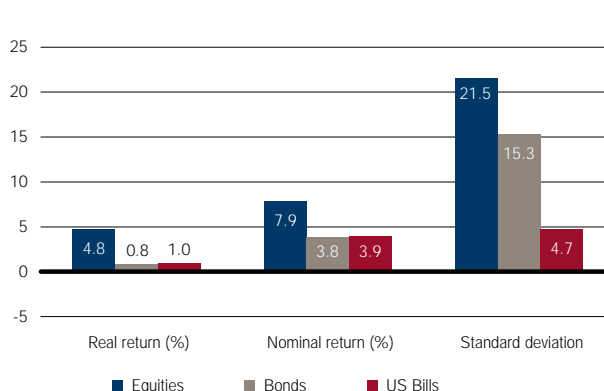


Figure 3 Returns and risk of major asset classes since 1900



Source: Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2011.

# About the authors

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Elroy Dimson is Emeritus Professor of Finance at London Business School, where he has been a Governor, Chair of the Finance and Accounting areas, and Dean of the MBA and EMBA programs. He chairs the Strategy Council of the Norwegian Government Pension Fund – Global, and is a member of the investment committees of Guy's & St Thomas' Charity, London University, and UnLtd – The Foundation for Social Entrepreneurs. He is a Director and Past President of the European Finance Association and is an elected member of the Financial Economists Roundtable. He has been appointed to Honorary Fellowships of Cambridge Judge Business School, the Society of Investment Professionals, and the Institute of Actuaries. He has published articles in *Journal of Business*, *Journal of Finance*, *Journal of Financial Economics*, *Journal of Portfolio Management*, *Financial Analysts Journal*, and other journals. His PhD in Finance is from London Business School.

## Paul Marsh

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