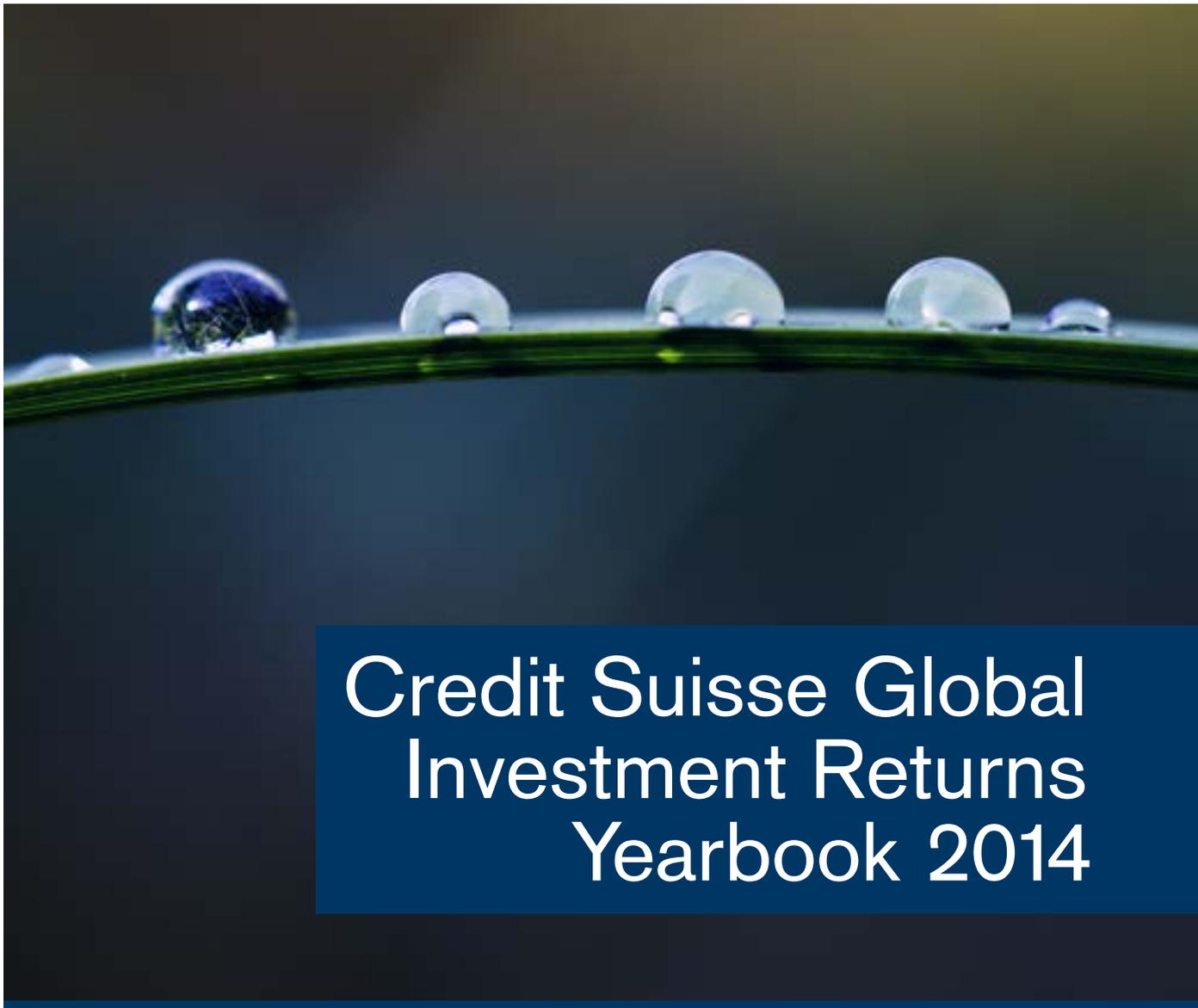


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Credit Suisse Global
Investment Returns
Yearbook 2014

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To contact the authors or to order printed copies of the Yearbook or of the accompanying Sourcebook, see page 66.



Introduction

The recovery in developed world economies now appears to be well under way, with the Federal Reserve beginning to reduce its third program of quantitative easing. In particular, European financial markets and economies are in much better health than this time last year. However, with the business cycle upturn manifest in countries like the USA and UK, there are concerns that some emerging countries will find that higher interest rates create a more challenging market environment. In this context, the Credit Suisse Global Investment Returns Yearbook 2014 examines the relationship between GDP growth, stock returns and the long-run performance of emerging markets.

The 2014 Yearbook now contains data spanning 114 years of history across 25 countries. The companion publication, the Credit Suisse Global Investment Returns Sourcebook 2014 extends the scale of this resource further with detailed tables, graphs, listings, sources and references for every country. Elroy Dimson, Paul Marsh and Mike Staunton from the London Business School analyze this rich dataset in order to help investors understand what they might expect from the markets in coming years.

While there is considerable attention on emerging markets today, the Yearbook takes the long view by examining the historical performance of emerging markets over the past century. By constructing an index of emerging market performance from 1900 to the present day, the authors document the historical equity premium from the viewpoint of a global investor. They then show how volatility dampens as countries develop, study trends in international correlations, document style returns in emerging markets, and explore trading strategies for long-term investors in the emerging world.

With a focus on the recovery in developed economies, the report also revisits the analysis of the 2010 Yearbook that demonstrated a weak, negative relationship between past GDP growth and stock-market returns over time. While stock markets do anticipate economic growth, the authors fail to find a strong relationship between robust economic growth and subsequent equity performance, and explore the possible reasons for this finding.

Finally, Michael Mauboussin brings to bear his extensive expertise in the area of behavioral finance in discussing the well-documented tendency for investors to buy after the market has risen and to sell following a drop. He shows that the asset-weighted returns investors earn are almost always less than the time-weighted returns of the funds in which they invest. This is particularly topical with 2013 having been an impressive year for many equity markets. He then provides advice on how investors can overcome this behavioral bias by placing more weight on the long-run and less on recent outcomes.

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 and Deputy
Global CIO, Credit Suisse Private
Banking and Wealth Management

Stefano Natella

Head of Global Securities Research,
Credit Suisse Investment Banking



Emerging markets revisited

After exceptional performance during the first decade of the 21st century, emerging market equities have recently faced setbacks and underperformed. In this article, we step back from short-term performance concerns and examine the long-run evidence. We construct an index of emerging market performance from 1900 to the present day and document the historical equity premium from the perspective of a global investor. We show how volatility is dampened as countries develop, study trends in international correlations and document style returns in emerging markets. Finally we explore trading strategies for long-term investors in the emerging world.

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

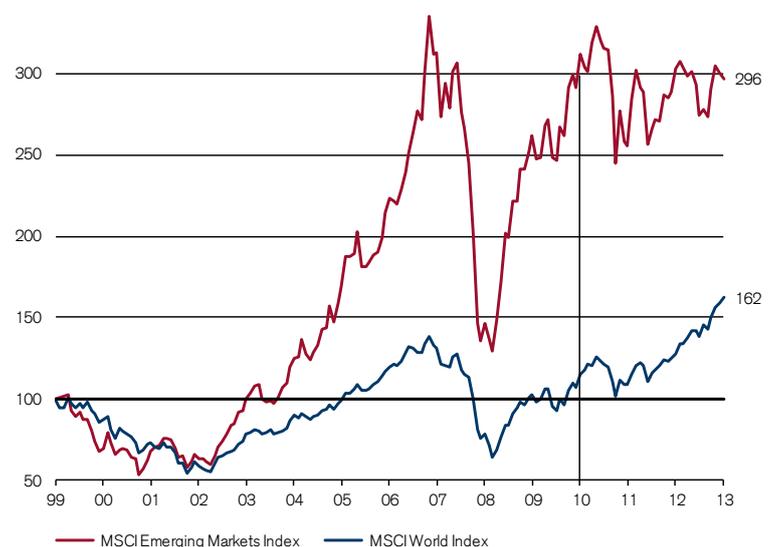
While the start of the 21st century was a lost decade for developed markets, emerging-market equities powered ahead. From 2000 to 2010, the annualized return on the MSCI Emerging Markets index was 10.9% versus just 1.3% for developed markets. Since then, euphoria has segued into disappointment (see Figure 1). emerging market equities, bonds, and currencies fell sharply in mid-2013, following indications of possible tapering in US quantitative easing. Some commentators even predicted a full-scale emerging market crisis. This triggered headlines such as “West is best” and “Emerging market mania a costly mistake.” Investors’ concerns have been well documented and include slower growth, over-reliance on excess liquidity arising from US quantitative easing, growing consumer debt, concerns that vital structural reforms have not been undertaken, unease over corporate governance and, for some countries, moves into deficits, possible property bubbles, and street protests and political unrest.

While many of these concerns are legitimate, emerging markets are in far better shape today than in the 1980s and 1990s. It is also clear from Figure 1 that the mid-2013 fall was more like a dip in the road than the full-scale crises of the

Figure 1

Recent performance of emerging market equities, 2000–13

Source: Elroy Dimson, Paul Marsh and Mike Staunton using data from MSCI Barra



past. Indeed most markets have since recovered from their June 2013 lows. Despite recent setbacks, Figure 1 shows that from 2000 to 2013, the terminal wealth accruing from investing in emerging markets was almost twice that from an equivalent investment in developed markets.

Looking ahead, the key question is whether investors can expect to experience future emerging-market returns comparable in relative and absolute terms to those achieved since the start of 2000. We have regularly warned of the dangers of generalizing from relatively short periods of market history such as one, or even two decades. To obtain a longer-term perspective, we therefore construct an index of emerging-market performance from 1900 to the present day.

Classifying countries

The terms “emerging markets” and “emerging economies” first “emerged” in the early 1980s. They are attributed to World Bank economist Antoine van Agtmael who has continued to popularize them (Agtmael, 2007). Before then, investors mostly used the arguably more accurate term “less developed” – as there is no guarantee that markets will emerge. However, “emerging markets” moved into the lexicon, perhaps because of its more optimistic overtone.

The first emerging markets index, the S&P/IFCG Emerging Markets Composite appeared in 1985. MSCI’s index started three years later, with FTSE following in 1994. Clearly, the relative recency of these indexes is unhelpful for investors seeking a longer-term performance record. To provide a longer-term perspective, we can use our extensive long-run returns database to construct an emerging markets index since 1900. To do

this, however, we need criteria for deciding which countries should be classified as emerging and which as developed at each date in the past.

Today, investors rely on the major index providers to classify countries. They consider multiple factors. MSCI uses 23 variables, FTSE has 13 criteria, and S&P uses ten, with ten more coming into play if a change is indicated. The criteria used differ but typically include economic development, size and liquidity requirements, and market accessibility. Investor and market opinion also matters. As S&P explains, “Country classification is both an art and a science. While we use quantitative criteria as a guide ... the opinions and experiences of global investors are equally important.”

Despite the multiplicity of different criteria, there is strong agreement between index providers on the developed/emerging boundary. Currently, there are just two disagreements. First, South Korea is now deemed developed by S&P and FTSE, while MSCI still regards it as emerging, but “on watch.” Second, Greece has been downgraded to emerging by MSCI and S&P, while FTSE still counts it as developed.

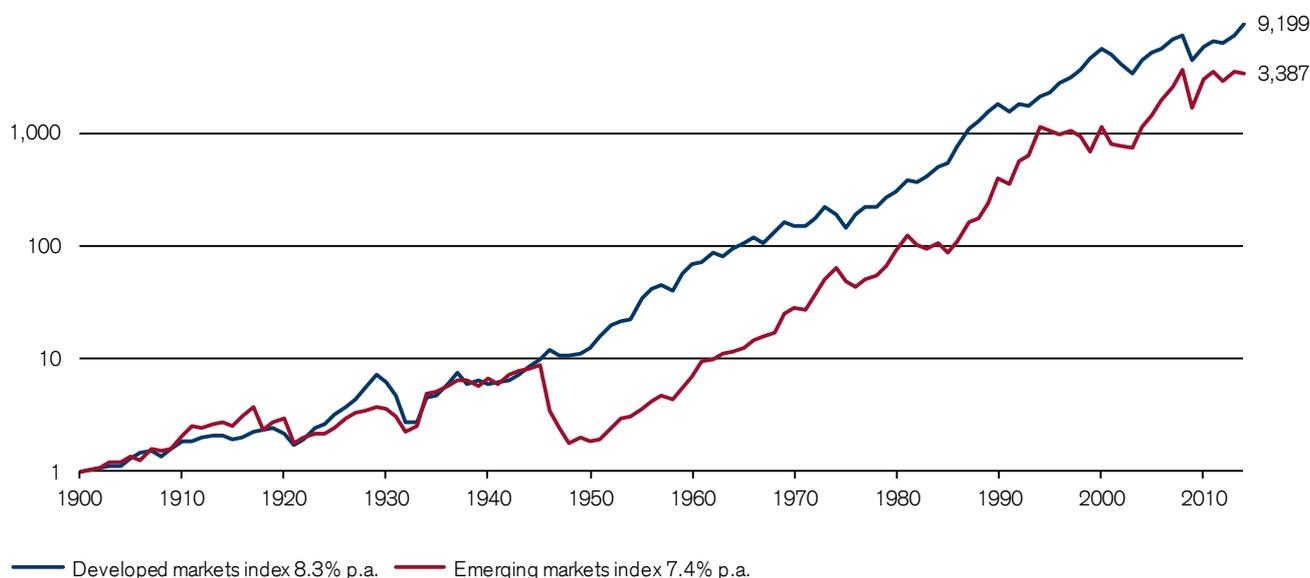
In the 2010 *Yearbook*, we pointed out that, despite the complexity of index compilers’ procedures, there was a simple rule that replicated their decisions very accurately. The rule was to categorize countries as developed if they had GDP per capita in excess of USD 25,000.

Applying this rule today (inflation-adjusted) to IMF estimates of GDP per capita for 2013, only one market currently classified as developed falls below this cut-off (Portugal at USD 20,663). Every country with GDP per capita above this limit was classified as developed, except for three oil-rich Gulf States; Kuwait, Qatar and the UAE.

Figure 2

Long-run emerging and developed market returns, 1900–2013

Source: Elroy Dimson, Paul Marsh and Mike Staunton using data from DMS database, MSCI Barra, and S&P/IFCG



The rule also sheds light on the current disagreements over Greece and Korea. GDP per capita for Greece fell from USD 26,074 in 2010 to USD 21,617 in 2013, correlating with its demotion by two of the three key index providers. Korea's GDP per capita is currently USD 23,838, projected to rise to USD 25,189 in 2014; hence it sits on the cusp.

Given the success of this rule, we apply it to historical GDP per capita data from Maddison's historical database, adjusting the cut-off for US inflation to obtain the equivalent figure for earlier years. For the 23 countries in our database in 1900, seven would have been deemed emerging markets: China, Finland, Japan, Portugal, Russia, South Africa, and Spain. Three are still emerging today – 114 years later – namely, China, Russia, and South Africa. Using the GDP per capita rule, we estimate that Finland would have moved to developed in 1932, Japan in 1967, and Spain in 1974, while Portugal would still be emerging today (despite being promoted to developed by S&P, FTSE and MSCI in 1997–98).

Long-run emerging market returns

Using the GDP per capita rule, we construct a long-run emerging markets index starting in 1900 initially with seven countries. Rather than restricting this to the emerging countries in the DMS database, we add in further markets once returns data becomes available. Thus, in 1955, we add Brazil and India; in 1963, Korea and Hong Kong (until the latter moved to developed in 1977); in 1966, Singapore (until it moved to developed in 1980); in 1970, Malaysia; in 1976, Argentina, Chile, Greece, Mexico, Thailand, and Zimbabwe; in 1978, Jordan; in 1985, Colombia, Pakistan, Philippines and Taiwan; and in 1987, Turkey. We then link into the MSCI Emerging Markets index from its inception in 1988.

As a comparator, we create a developed markets index, using the same GDP per capita rule. This had 16 constituents in 1900, and was joined by Finland in 1932 and Japan in 1967. We then link into the MSCI Developed World Index from its start date in 1970. Our indexes are computed in US dollars, and include reinvested dividends.

Figure 2 shows the long-run performance of emerging versus developed markets. In the early part of the 20th century, emerging markets outperformed, but were hit badly by the October 1917 Revolution in Russia, when investors in Russian stocks lost everything. During the global bull market of the 1920s, emerging markets underperformed, but they were affected less badly than developed markets by the Wall Street Crash. From the mid-1930s until the mid-1940s, emerging-market equities moved in line with developed markets.

From 1945–49, Figure 2 shows that emerging markets collapsed. The largest contributor was Japan, which had a significant weight in the index

and where equities lost almost 98% of their value in US dollar terms. Another contributor was China, where markets were closed in 1949 following the communist victory, and where investors in Chinese equities effectively lost everything. Other markets such as Spain and South Africa also performed very poorly in the immediate aftermath of World War II.

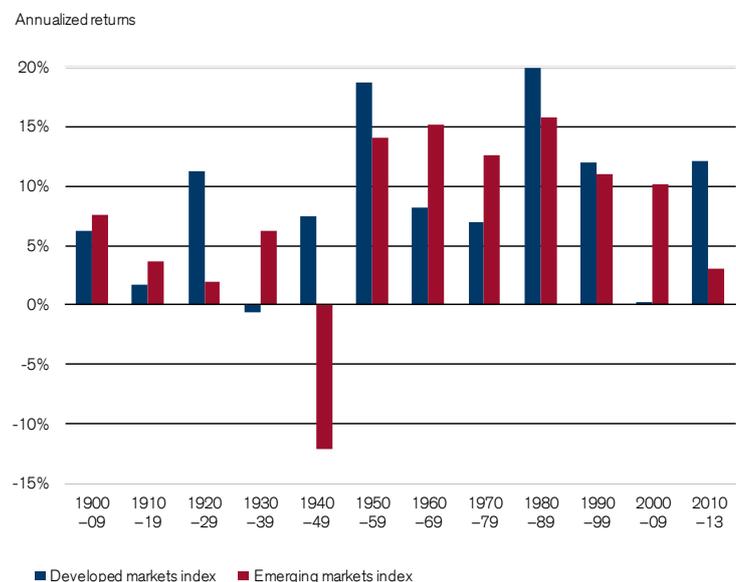
From 1950, emerging markets staged a long fight back, albeit with periodic setbacks. From 1950 to 2013, they achieved an annualized return of 12.5% versus 10.8% from developed markets. This was insufficient, however, to make up for their precipitous decline in the 1940s. Figure 2 shows that the terminal wealth achieved from a 114-year investment in emerging markets was appreciably less than from developed markets. The chart also shows that the annualized return from a 114-year investment in emerging markets was 7.4% compared with 8.3% from developed markets, and 8.3% from our overall DMS World index. The annualized historical equity risk premium for a US investor in emerging markets was 3.4%, compared with 4.3% for developed markets.

Figure 3 shows the relative performance of emerging and developed-market equities by decade. The worst performance was in the 1940s, followed by the 1920s, then the most recent period from 2010 onward. Figure 3 also helps put the performance during the first decade of the 21st century into perspective. Relative to developed markets, this was the best decade on record, followed by the 1930s, and then the 1960s and 1970s. Note that emerging markets underperformed in both the 1980s and 1990s.

Figure 3

Emerging and developed markets: Returns by decade

Source: Elroy Dimson, Paul Marsh and Mike Staunton using data from DMS, MSCI Barra, and S&P/IFCG



Volatility of emerging markets over time

Emerging equity markets tend to be more volatile than developed markets, but by how much, and does volatility dampen as countries develop?

To investigate this, we look at 50 countries, 21 of them developed and 29 emerging. We examine comparative volatilities and how volatility evolves over time. We use monthly equity returns data starting at end-1975, and estimate rolling standard deviations over a 60-month window. Our sample grows over time as data becomes available for additional countries. We start at end-1980 with volatility estimates for 26 countries, gradually building up to the full complement of 50 countries.

The results of our analysis are summarized in Figure 4. In the top part of the chart, we plot the average volatility of emerging equity markets. At end-1980, the average annualized historical volatility of emerging equity markets was 40%, while by end-2013 it had fallen to 27%. Figure 4 shows that volatility did not decline in a steady, linear fashion, but was subject to much variation over time with peaks and troughs.

Some fluctuations, such as the fall in December 1989, are noise arising from the expanding sample of countries. Mostly, however, the fluctuations reflect fundamentals. The peaks coincide with volatility shocks and crises, such as Chinese currency and trade status worries in 1992, Mexico's so-called Tequila crisis in 1994, the start of the Asian financial crisis in 1997, the Russian default in 1998, the bursting of the dot-com bubble in the early 2000s, and the global financial crisis of 2007–09. The troughs reflect the dampening down of volatility as the crises abated.

Some crises were centered on emerging markets, or a subset of them, while others, such as

the global financial crisis, impacted all countries. To abstract from the latter, we also compute the ratio of emerging-market to developed-market volatility at each point in time. This ratio is plotted in the bottom part of Figure 4.

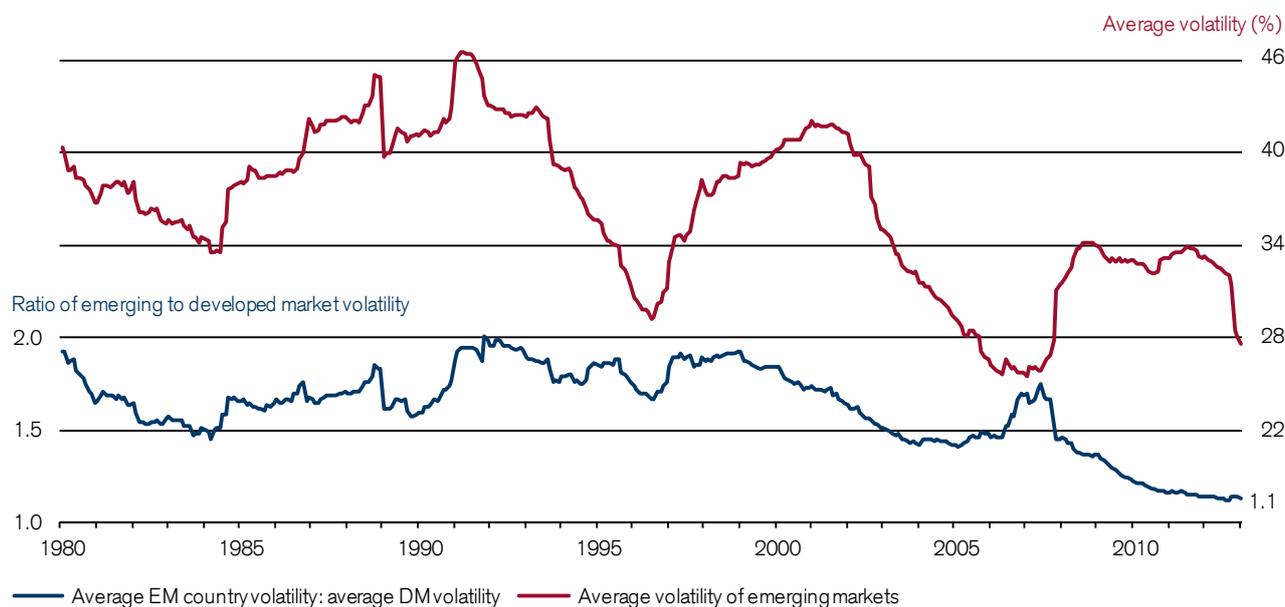
Figure 4 shows that, at end-1980, the average emerging market was almost twice as volatile as the average developed market. By end-2013, the ratio had fallen from 1.9 to 1.1, i.e., the average emerging market was by then only 10% more volatile than the average developed market. There is again considerable variation over time arising from shocks and crises. During the various emerging-market crises, emerging markets tended to become relatively more volatile, as one would expect. But the same held true during the global financial crisis. The relative, as well as the absolute, volatility of emerging markets appears to rise during all crises, irrespective of where the crisis originates. We provide further evidence on this below.

Whether we look at the absolute or relative volatility of emerging equity markets, it is clear from Figure 4 that, abstracting from the shocks and peaks and troughs, the overall trend has been downward. This is consistent with volatility declining over time as emerging countries develop.

Figure 4

Volatility of emerging markets over time, 1980–2013

Source: Elroy Dimson, Paul Marsh and Mike Staunton using data from MSCI Barra and S&P/IFCG



Trends in correlation

A strong rationale for investing in emerging markets is their diversification benefits. But have these fallen as emerging markets have advanced, and converged to being more like developed markets? To investigate this, we examine how correlations between markets have changed over time, using the same 50 countries analyzed above. At each point in time, we compute the average correlation between equity returns for each developed and emerging country pairing. Each correlation is estimated from 60 months prior data. The average correlations are then plotted in Figure 5 (see the blue bars) at five-yearly intervals, from end-1980 until end-2010, and also for end-2013. Clearly, correlations have risen sharply, from 0.10 for the earliest period to 0.67 for the 5-year period to end-2010. This last observation is elevated by the 2007–09 global financial crisis, as all correlations tend to rise during crises. The subsequent fall to 0.60 by end-2013 is due to the data for 2008 (the Lehman crisis year) dropping out of our 60-month window.

In Figure 5, correlations are computed from the perspective of a US investor using USD returns. We have reproduced these results from the perspective of investors from each of the 50 countries, with returns converted into their home currencies. In all cases, correlations rose sharply over time, although the numbers naturally vary. At end-2013, the average correlations were 0.60, 0.39, 0.65, 0.45, and 0.49 for US, German, Japanese, Swiss, and UK investors, respectively.

The rise in correlations shows that the scope for diversification has indeed declined. However, the average correlation of 0.60 between emerging markets and developed markets for a US investor remains low, showing there is still much scope for risk reduction. By end-2013, the average correlation between pairs of developed markets was appreciably higher at 0.76. For a developed-market investor, emerging markets continue to offer better diversification prospects than other developed markets.

Investors do not, of course, typically invest in single pairs of developed and emerging markets, but instead in developed markets or emerging markets as broad asset classes. The red bars in Figure 5 therefore show the correlations between developed-market and emerging-market indexes. These are the correlations that would apply to a US investor who already held a portfolio like the developed world index, and was considering diversifying into an emerging-market portfolio.

Figure 5 shows that the correlation between developed-market and emerging-market indexes was roughly constant in the 1980s. It fell in the 1990s, as emerging markets went their own way during the various emerging-market crises. Since then, it has risen sharply, but has now fallen from its global financial crisis peak. By end-2013, the correlation from the viewpoint of a US investor

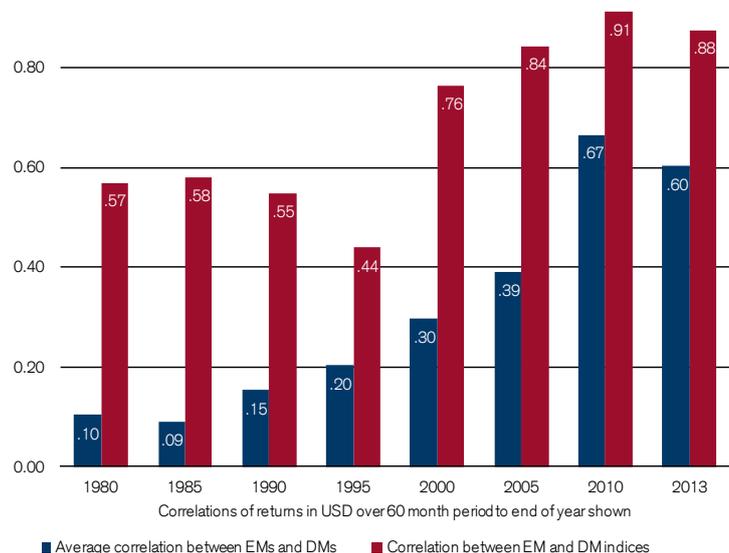
was 0.88. From the perspective of German, Japanese, Swiss and UK investors, the figures were 0.75, 0.89, 0.77, and 0.81, respectively. These show that emerging markets still offer useful diversification benefits, even though correlations are much higher than 20–35 years ago.

Correlations have risen because countries have matured, but also due to increased globalization. Today's emerging markets are dominated by larger, global companies. The bulk of their revenues and profits come from abroad, and their fortunes are closely linked to other global equities. Similarly, many of today's largest developed-market equities have extensive operations and interests in emerging markets. Indeed, a third of the revenues for constituents of the MSCI All-Country World Index come from emerging markets, while only 13% of the index is made up of emerging-market-based companies by market value. This provides an effective alternative indirect route for investors to obtain emerging-market exposure.

Figure 5

Correlations between EMs and DMs over time

Source: Elroy Dimson, Paul Marsh and Mike Staunton using data from MSCI Barra and S&P/IFCG



It is also informative to look at correlations from the perspective of individual countries. Figure 6 shows the world's eight largest developed (left) and emerging (right) equity markets. The blue and red bars show the correlations over the most recent 60-month period between each country's market and the emerging-market and developed-market indexes. Index returns are converted into each country's home currency. In estimating correlations between the largest developed markets and the developed-market index, we exclude the country in question from the developed-market index.

Figure 6 shows that, apart from Australia and Canada, developed-market country returns are more highly correlated with other developed markets than with emerging markets. Similarly, but to a greater extent, emerging-market returns are more closely linked to other emerging markets than developed markets. Thus, despite the disparate nature of emerging markets, treating them as an asset class has some logic, a view backed by Bekaert and Harvey (2013). From an investment perspective, they have more in common with each other than with developed markets. The same is true of developed markets, the exceptions being the resource-oriented Australian and Canadian markets.

Besides showing the diversification benefits of emerging markets for investors based in developed markets, Figure 6 also shows the potential diversification benefits for emerging market investors. It shows that the average correlation between the emerging-market countries and the emerging-market index is 0.72, while the average correlation with the developed-market index is just 0.46. Emerging-market investors can clearly reduce risk by diversifying across other emerging markets. However their greater scope for risk reduction is through diversification across developed markets.

A closer look at crises

We have noted the impact of emerging market crises on volatilities. Indeed, after the experience of the 1990s, the terms "emerging market" and "crisis" seemed a natural pairing. But crises are not restricted to emerging markets. The two big crises since 2000 – the global financial crisis and the Eurozone crisis – started in developed markets. We therefore investigate two issues. First, are emerging markets really more crisis-prone than developed markets? Second, what happens to risk and correlations during crisis periods?

To examine the prevalence of crises, we use Reinhart's database (Reinhart and Rogoff, 2010). This spans the period 1800–2010, and shows whether crises occurred in each country for each year. The types of crisis considered are banking, currency, inflation, stock market, and domestic and external sovereign bond crises. There can thus be up to six crisis types recorded per year. Reinhart provides data for 45 of the 50 countries that we examined in the previous section. We categorize these as either developed or emerging in each year from 1900–2010, based on GDP per capita. For both groupings, we compute the average number of crises per country per decade.

Figure 7 shows that, in some decades, developed countries were more crisis-prone, while in others, emerging countries took the lead. The decades that stand out, however, are the 1980s and the 1990s, when emerging countries experienced far more crises. On average, in these two decades, emerging countries averaged 15 or more crises per country per decade, compared with fewer than five for developed countries. If these two decades are excluded, emerging and developed countries experienced almost exactly the same number of crises per country. And in the most recent decade of Reinhart's database, developed markets experienced a higher incidence of crises than emerging markets.

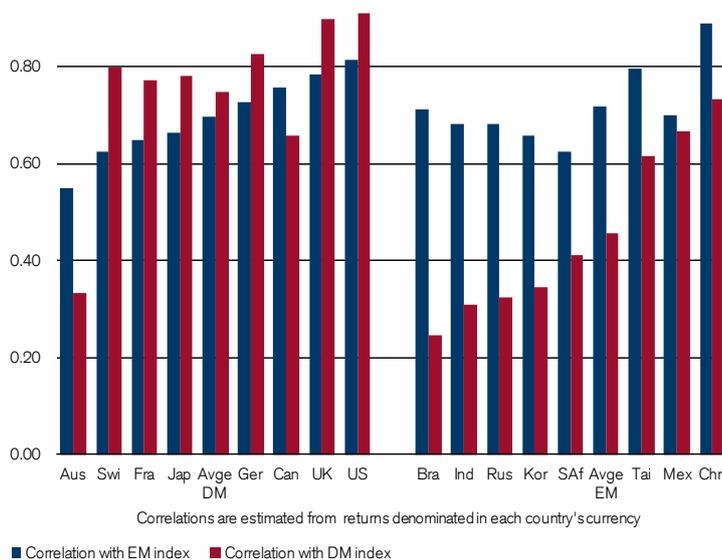
Crises and contagion

A common stereotype of an emerging-market crisis is an episode of rapid contagion. According to this typecast, a crisis in one country, such as a devaluation or default, triggers a chain reaction, first re-

Figure 6
Scope for diversification by investors in major DMs and EMs

Source: Elroy Dimson, Paul Marsh and Mike Staunton using data from MSCI Barra and S&P/IFCG

Correlations between country returns and EM and DM indices over five years from 2009 – 13



gionally, then across other emerging markets, perhaps even spilling over into developed markets (see Kaminsky, Reinhart and Végh (2003), Chamon, Ghosh and Kim (2010) and Lowell, Neu and Tong (1998)). The most frequently cited example is the 1998 Russian default, which impacted not only other ex-Soviet republics, but also Brazil, Mexico, and Hong Kong, with a spillover later into the USA via the LTCM bankruptcy.

Many explanations have been suggested for contagion, including herding by investors, trade connections, common creditors, financial linkages, and the “wake-up call” hypothesis (Goldstein, 1998). According to the latter, once a weakness is revealed in one country via a crisis, investors get a wake-up call, rapidly marking down other markets with similar characteristics.

But is contagion the typical crisis profile, and is it linked mostly to emerging-market crises? To investigate this, we examined 12 celebrated crises, originating in both emerging markets and developed markets. These were the 1982 Mexican default, the October 1987 crash, the 1990 Gulf War, the 1992 ERM crisis, the 1994 Mexican devaluation, the 1997 Asian crisis, the 1998 Russian default, the 9/11 attacks in 2001, the Lehman bankruptcy in 2008, the 2010 Greek crisis, the 2011 Eurozone crisis, and the 2013 emerging markets “taper wobble”. The latter was hardly a crisis, but was treated as such by the press, and remains fresh in our memories.

We examined each crisis from its onset until 50 trading days (10 weeks) later. We estimate the volatility of emerging and developed markets, and the correlations between them. Correlations estimated from daily data will be underestimates as returns from countries in different time zones are non-synchronous. We therefore focus on their relative, rather than absolute, magnitudes. To benchmark our findings, we also estimate volatilities and correlations over the whole of the last 25 years, including both crisis and “normal” periods.

Figure 8 summarizes our findings. Not surprisingly, during emerging-market crises, the average volatility of emerging markets is greatly elevated relative to the long-run (25-year) average. The same is true of average developed-market volatilities during developed-market crises, where the average crisis-level volatility is very similar to that of emerging markets during emerging-market crises. During emerging-market crises, however, the average volatility level of developed markets is no higher than normal. But during developed-market crises, the average volatility level of emerging markets is markedly higher.

The pattern of correlations is also interesting. During emerging-market crises, both the average correlation between emerging-market pairs (red bars) and pairs of emerging markets and developed markets (purple bars) are below their long-run (25-year) averages. This is not consistent with the idea that contagion is the norm during emerging-market crises. In contrast, during developed-market crises, all correla-

tions are greatly elevated, whether between developed markets as a group, emerging markets, or between emerging markets and developed markets. It appears that developed-market crises are far more contagious – both for developed markets and emerging markets. Emerging-market crises seem to be characterized by more effective firewalls.

Figure 7

Prevalence of crises within EM and DM countries over time

Source: Elroy Dimson, Paul Marsh and Mike Staunton using data from Carmen Reinhart’s website

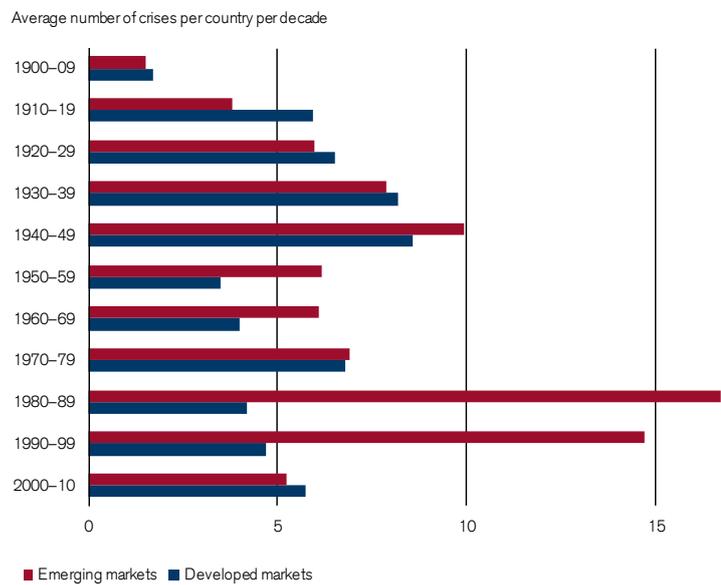
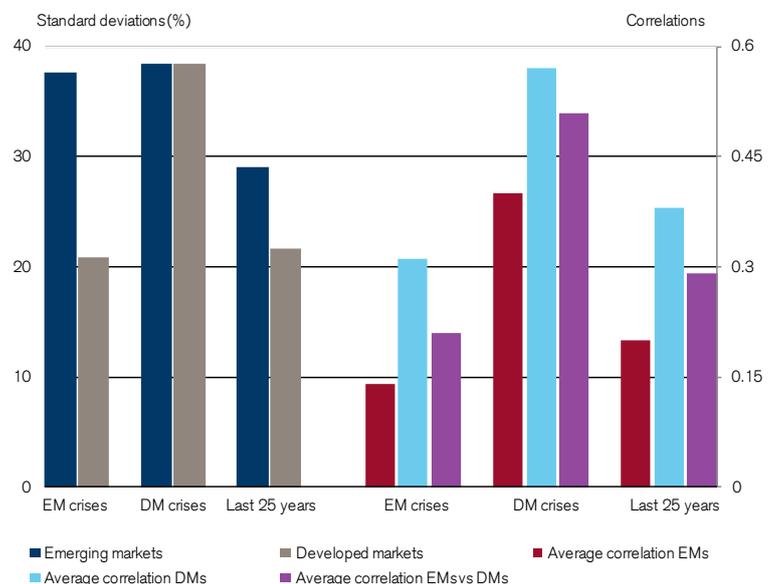


Figure 8

Volatilities and correlations during crises

Source: Elroy Dimson, Paul Marsh and Mike Staunton using data from Global Financial Data and Thomson Reuters Datastream



Factor returns in emerging markets

In developed markets, it is well known that portfolio performance is impacted by investment style, and in particular, whether a portfolio has favored large or small companies, value or growth stocks, or momentum or reversal strategies. The accompanying [Credit Suisse Global Investment Returns Sourcebook](#) shows that these factors – size, value, and momentum – are the longest established, best-documented regularities in equity markets.

It is important to distinguish between factor effects and factor premia. Factor effects refer to the observation that smaller companies tend to behave differently from larger ones, value and growth stocks tend to perform differently, and the subsequent performance of past winners tends to differ from past losers. Since most investors are wittingly or unwittingly exposed to these factors, they need to be taken into account when developing investment strategy or evaluating performance.

In contrast, factor premia refers to the long-run tendency documented in developed markets for smaller stocks, value stocks, and past winners to outperform – i.e. provide a premium over – larger stocks, growth stocks, and past losers. However, while long-term premia have been observed in most countries for which data is available, there can be long intervals when these factor effects fail to generate a premium, and when smaller stocks, value stocks, and past winners underperform.

The evidence on factor premia comes mostly from developed markets. This is probably explained by the absence of long-run data for emerging markets. Many exchanges opened or re-opened only in the 1990s (e.g. China, Russia, emerging Europe). Other markets with longer histories lack bias-free historical stock-level returns databases prior to the mid-1990s. To see whether factor effects in emerging markets are similar to those in developed markets, we analyze MSCI index data for the size and value effects, and Thomson Reuters Datastream stock-level data for momentum. MSCI publishes style indexes for developing markets, covering smaller, larger, value and growth stocks starting in mid-1994 (later for some markets). In Figures 9 and 10, we show the size and value premia for emerging markets based on this MSCI data from 2000 to 2013.

We chose 2000 as the start date in Figures 9 and 10 to facilitate comparisons with the accompanying [Sourcebook](#), which shows there has been an appreciable size and value premium in developed markets since then. Figure 9 shows that there was also a positive size premium in the majority of emerging markets over this period. However, the rightmost two bars show that the 1.8% size premium for emerging markets was smaller than the 6.6% premium for developed markets.

Figure 10 shows the value premium over this period was positive in all but three emerging markets. It also shows that the value premium was larger in emerging markets than in developed markets.

We also have emerging-market data from mid-1994 to start-2000. In developed markets, larger, growth stocks performed best over this period. The MSCI data shows that the same held true for emerging markets, which exhibit negative size and value premia in the second half of the 1990s. Over the entire period for which we have data, namely mid-1994 to date, the correlation between the monthly size premium in emerging markets and the premium in developed markets was 0.16.

Figure 9

Size premiums in emerging markets, 2000–13

Source: Elroy Dimson, Paul Marsh and Mike Staunton using data from MSCI Barra

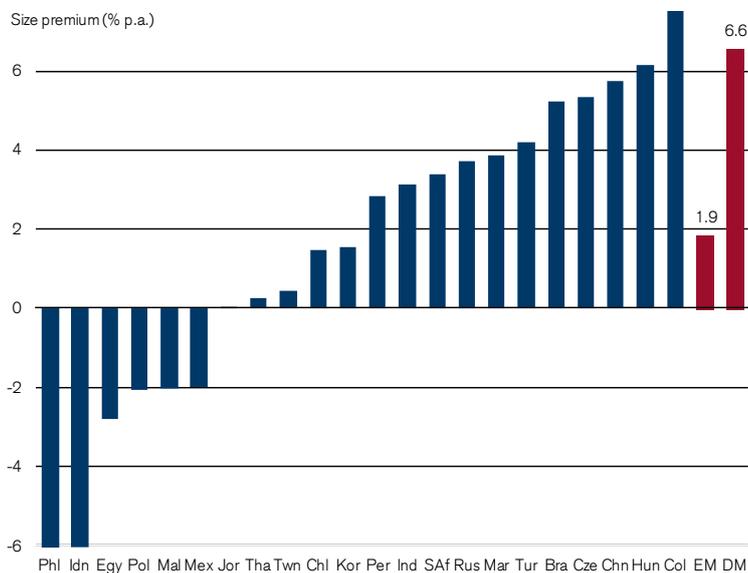
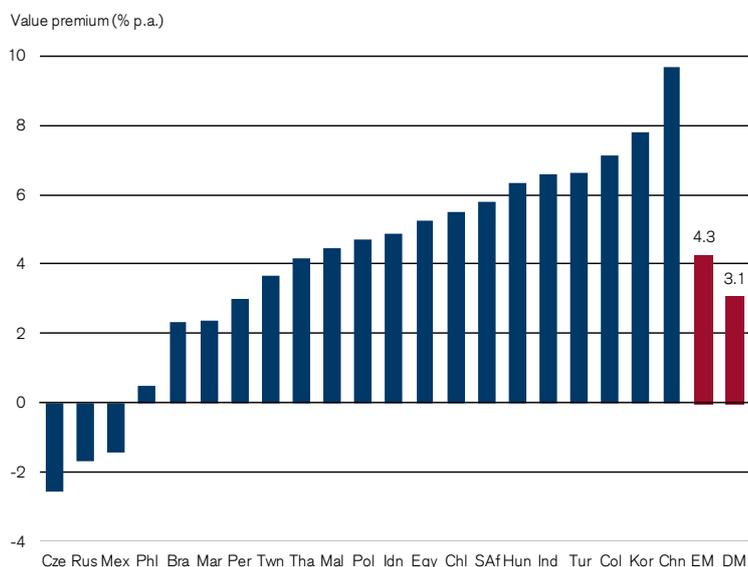


Figure 10

Value premiums in emerging markets, 2000–13

Source: Elroy Dimson, Paul Marsh and Mike Staunton using data from MSCI Barra



The corresponding figure for the value premium was 0.64.

We have also examined momentum returns in emerging markets. We have updated and extended the analysis by Griffin, Ji, and Martin (2003) that looked at winner-minus-loser (WML) returns in 16 emerging markets. Their analysis was based on a 6-1-6 momentum strategy, which involves ranking stocks by their returns over the past six months, waiting one month, and then investing for a 6-month period, before rebalancing by repeating the procedure. Stock returns are equally weighted, with a monthly rolling window, using 20%/80% breakpoints to define winners and losers. Griffin, Ji, and Martin's analysis spans the period up to end-2000, with the start date varying, based on data availability for each country. On average, their analysis covered a period of 11 years.

The gray bars in Figure 11 show Griffin, Ji and Martin's results, where the height of the bars shows the average WML return expressed as a percentage per month. We have updated their analysis to end-2013, adding 13 more years, and we have extended their sample to include five emerging markets not covered by their study; namely, Russia, Poland, Hungary, the Czech Republic, and Colombia. The dark blue bars in Figure 11 show the results over the full period to end-2013.

In the accompanying [Sourcebook](#), we provide a similar analysis for developed markets. With the sole exception of Japan, all developed markets showed positive momentum returns. For developed markets, Griffin, Ji and Martin found that winners outperformed losers by 0.70% per month. When we update their results to end-2013, over the full period, the WML return is even higher at 0.78% per month (see the rightmost pair of bars in Figure 11).

Figure 11 shows that the pattern for emerging markets has been quite different. Over the full period, seven emerging markets had negative WML returns, i.e. they were characterized by a pattern of reversals rather than momentum. While Griffin, Ji, and Martin found that the average WML for emerging markets was 0.40% per month, the average figure for the full period to end-2013 was 0.24% (see the penultimate pair of bars on the right of Figure 11). Clearly, over the period from 2001 to 2013, momentum returns in emerging markets were typically very weak. These findings are consistent with recent research by Hanauer and Linhart (2013) who find a strong and highly significant value effect in emerging markets and a less significant momentum effect.

Trading strategies in the emerging world

As well as looking at style returns within markets, we also look at their impact across countries. In particular, we examine whether emerging market

investors should favor smaller markets, "value" markets and/or "winner" markets.

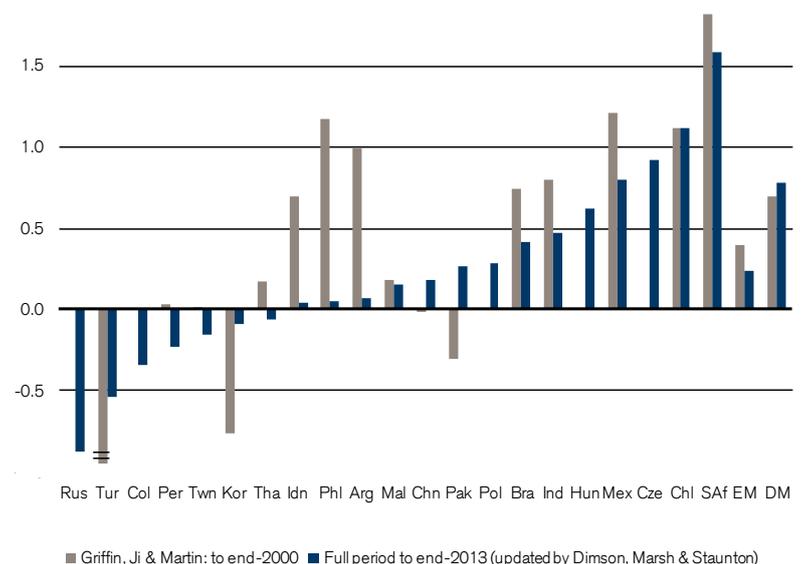
To investigate this, we use our 85-country database of annual returns, which covers numerous developing markets, including frontier, as well as emerging, markets. The start date for each country depends on data availability. The 23 [Yearbook](#) countries commence in 1900; several more countries start in the 1950s and 1960s, while the rest begin in the 1970s or later. From the mid-1970s onward, there are enough emerging markets to carry out our analysis, so we study the period from 1976 to 2013. The number of developing markets rises steadily from 14 in 1976 to 59 in 2013.

For each factor examined, we follow a market-rotation strategy. Each New Year, we rank emerging markets by the factor in question over a prior period, typically a year. We assign countries to quintiles from the lowest-ranked to the highest-ranked groupings. We invest on an equal-weighted basis in the markets of each quintile, and record the total return in US dollars. Markets are re-ranked annually, bringing in additional countries once data becomes available, and the strategy is repeated for the 38 years from 1976 to 2013.

Figure 11

Momentum returns in emerging markets

Source: Griffin, Ji and Martin (2003) and Elroy Dimson, Paul Marsh and Mike Staunton using data from Thomson Reuters Datastream



First, we examine a size-based strategy, where emerging markets are allocated to quintiles on the basis of country size, as measured by their GDP (in USD). The left set of bars (in dark blue) in Figure 12 shows the annualized returns over the 38 years from a rotation strategy of always investing in the smallest quintile of markets, through to the largest. There is no obvious relationship, and no evidence of a “small country premium”.

Next, we examine a momentum strategy of allocating countries to quintiles based on their equity market performance over the past year. For comparability, we measure performance in real terms, as many emerging markets experienced high inflation. Again, the set of gray bars in Figure 12 shows no clear pattern, and no evidence of a winner-minus-loser premium.

In contrast, a value rotation strategy showed a large premium. We define value markets as those with the highest start-year dividend yield, measured using historical dividends over the past year. The red bars in Figure 12 show that the markets with the highest yields provided an annualized return of 31%. Growth markets – those with the lowest start-year yields – gave an annualized return of 10%. The highest yielding countries thus outperformed the lowest yielders by 19% per year.

An obvious explanation might be that the highest yielding portfolio was more risky. It did, in fact, have a higher standard deviation of 41% per year versus 33% for the lowest yield quintile. However, the Sharpe ratio (reward to volatility) of the “value” quintile was still a massive 0.88 versus 0.44 for the “growth” quintile. We also computed the betas of the quintile portfolios against the world index. The highest and lowest yield quintiles both had betas quite close to one, but the lowest yield

quintile had the higher beta. The outperformance from investing in value-oriented markets is thus robust to standard forms of risk adjustment.

We also examined two other rotation strategies that we have reported on in previous *Yearbooks*, but which we now study in the context of emerging markets. In the 2012 *Yearbook*, we showed that equity returns tended to be higher following periods of currency weakness. The set of light blue bars in the centre of Figure 12 shows that this also holds true in emerging markets. These bars show the result of ranking developing countries by their currency return over the previous year, and assigning them to quintiles. We find that the annualized return from the quintile of weakest currencies was 34%, while the return from the strongest currencies was 18%. Again, this outperformance is robust to standard risk adjustments.

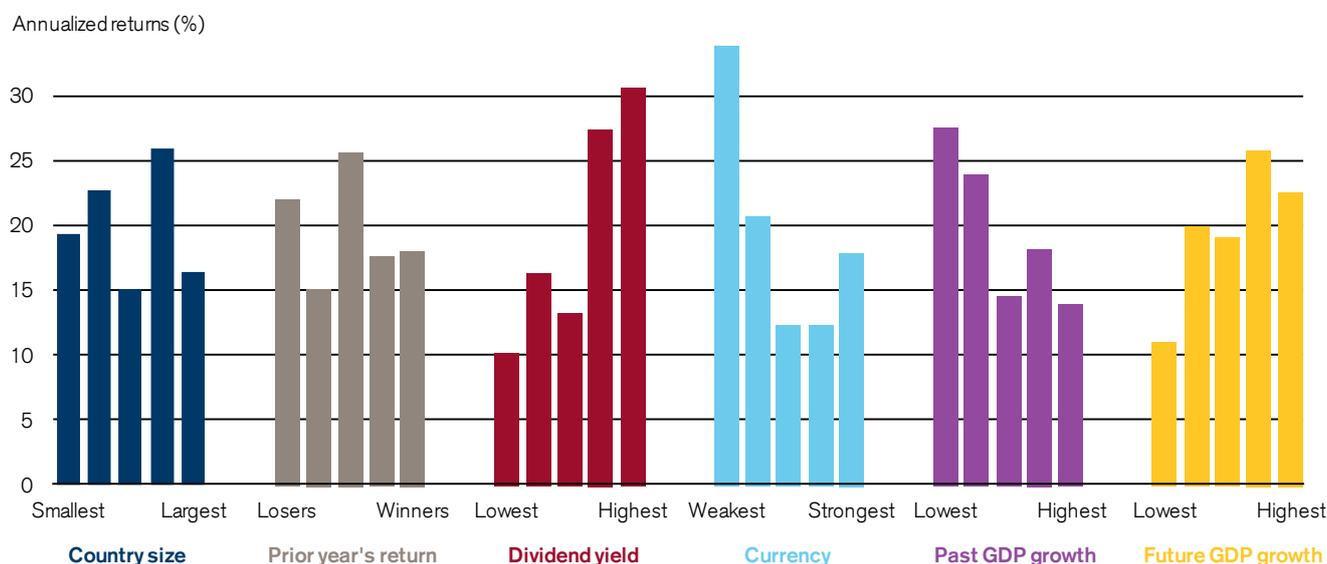
Finally, we return to a theme from the 2010 *Yearbook*, namely, a rotation strategy based on past economic growth to see if our earlier findings also hold within emerging markets. The penultimate set of bars in Figure 12 (in purple) shows the result of allocating countries to quintiles based on their real GDP growth over the previous five years. Contrary to many people’s intuition, investing in the countries that have recently experienced the lowest economic growth leads to the highest returns – an annualized return of 28% compared with just under 14% for the highest GDP growth quintile. Once again, standard risk adjustments do not explain this finding.

This does not imply that economic growth is either unimportant or perversely linked to equity returns. Indeed, as shown in the next chapter, stock prices are a leading indicator of future GDP growth. Furthermore, the rightmost set of bars in Figure 12 (in yellow) shows that perfect forecasts

Figure 12

Rotation strategies within developing markets, 1976–2013

Source: Elroy Dimson, Paul Marsh, and Mike Staunton using data from the DMS database, the IMF, Mitchell, Maddison, and Thomson Reuters Datastream



of GDP growth would be invaluable. These bars show the returns from the highest through to the lowest GDP growth countries, where the quintiles are formed on the basis of perfect foresight about the next five years' GDP growth. The highest growth countries now show an annualized return premium in excess of 10% relative to the lowest growth countries. This strategy is sadly not implementable, except by a clairvoyant who had perfect forecasting ability relating to future GDP growth.

So how can we explain the apparently perverse results in Figure 12, when we invest on the basis of past GDP growth? Buying growth markets fails to outperform because all information about past growth is already impounded in market valuations. But this would imply neutral performance from the highest growth countries, whereas Figure 12 shows underperformance.

The most likely explanation is that a period of low economic growth for a country, or a period of currency weakness, is simply another proxy for the value effect. Weak growth and weak currency countries are often distressed and higher risk. So investors demand a higher risk premium and real interest rate. The higher returns that follow are then simply a reflection of this. The puzzle though is why the outperformance persists even after standard risk adjustments. If this risk argument is correct, then our risk adjustments are failing to capture the nature of the risks involved.

A second, behavioral argument is that investors avoid distressed countries, or demand too high a premium for investing in them, while meanwhile enthusiastically overpaying for growth markets. Even if sophisticated investors can stop this overvaluation, it may be hard to exploit, as shorting fast-growing markets can be costly and risky.

Caution is needed in interpreting the return differences in Figure 12. Not all markets were open to global investors throughout this period. Our use of equal weights within quintiles involves investing the same amounts in tiny countries as in large ones. We have ignored transaction costs and taxes, including withholding taxes. It may be hard to trade in some countries' markets at the best of times, but our rotation strategies may target markets just when trading is hardest and most costly. Despite this, we believe this analysis reveals important relationships and key pointers to successful investment strategies in emerging markets.

Concluding remarks

Thirty years ago, emerging markets made up just 1% of world equity market capitalization and 18% of GDP. Today, they comprise 13% of the free float investable universe of world equities and 33% of world GDP. These weightings are likely to rise steadily as the developing world continues to grow faster than the developed world, as domestic markets open up further to global investors, and as free float weightings increase. Emerging markets are already too important to ignore.

Furthermore, developing markets still offer important diversification benefits for developed market investors. And for emerging-market-based investors, the benefits from spreading investments across their home markets, other emerging markets, and developed markets are even greater. Emerging markets provide exposure to additional economies, sectors, and types of business at different stages of growth. Moreover, despite legitimate concerns today over emerging economies, they mostly appear in better shape today and to be less risky than during the crisis prone 1980s and 1990s.

Sentiment toward emerging markets can shift rapidly, however. Until recently, the case for emerging markets was often put overenthusiastically with exaggerated claims, often based on GDP growth. Over the last three years, more, and sometimes overly, pessimistic views have prevailed. Hopefully, the long-run record presented here provides a more balanced picture. Over the very long run, emerging markets have underperformed. This underperformance can be traced back mostly to the somewhat distant 1940s. Since then, they have outperformed, which is unsurprising, given their higher beta. Looking ahead, we expect outperformance from emerging markets of no more than 1.5% per year as compensation for their higher risk.

Finally, we have seen that factor returns that are well documented in developed markets, such as size, value, and momentum are also present in emerging markets. The size and momentum effects appear weaker than in developed markets. In contrast, the value effect has been strong both within emerging markets, and as the basis for a successful rotation strategy between markets.



The growth puzzle

We revisit three controversial findings relating to economic growth and stock returns. First, in our 2002 book, *Triumph of the Optimists*, we found that in a broad cross-section of countries, long-term stock market returns are negatively related to growth in per capita GDP. Second, in our 2005 and 2010 *Yearbooks*, we tested a number of stock market rotation strategies, finding a negative relationship over time between past GDP growth and stock market returns. Finally, we have reported that real dividend growth has lagged behind per capita GDP growth, even though one would expect a close linkage. Why have stock prices apparently failed to mirror economic growth? In this chapter, we re-examine this puzzle, and offer potential explanations.

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

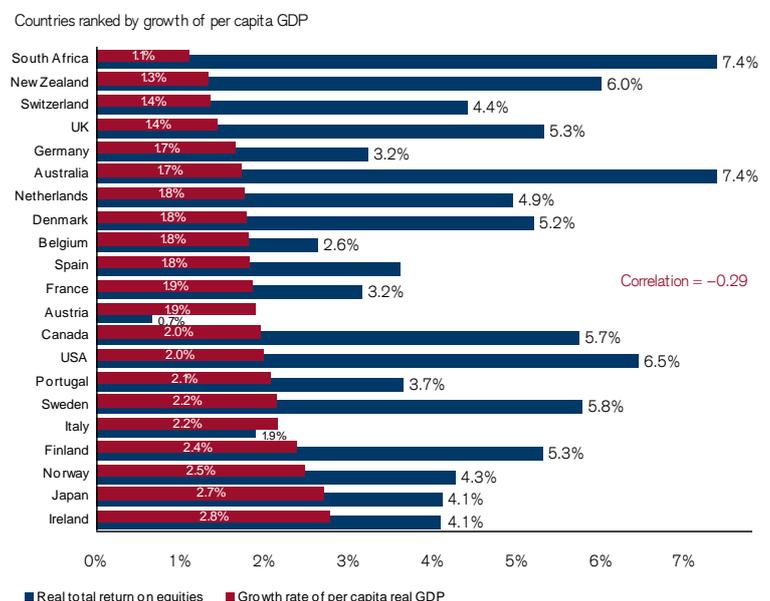
The most controversial finding in our 2002 book was probably the lack of correlation between economic growth and stock-market performance. We reported that: “Somewhat surprisingly, high economic growth was not associated with high real dividend growth—if anything, the relationship was perverse with a correlation of -0.53 ” (*Triumph of the Optimists*, page 156). We also reported a negative correlation since 1900 between growth in real Gross Domestic Product (GDP) per capita and real equity returns. Figure 1 provides an update of this finding: it depicts a correlation between real GDP changes, measured in international dollars using the Geary–Khamis formula, and real equity returns of -0.29 .

The lack of a positive correlation was not attributable to two catastrophic world wars. In the post-1950 period, the correlation between growth in per capita GDP and stock-market performance, whether judged by real dividend growth or by real returns, remained indistinguishable from zero. In the 2005 and 2010 editions of our *Yearbook*, we confirmed that this is not simply a mystifying cross-sectional relationship. It is also apparent in time-series tests of trading strategies based on

Figure 1

Real equity returns and per capita GDP, 1900–2013

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, using data from Barro and Maddison



past GDP growth. Buying the equities of countries that have experienced the highest economic growth also fails to give a superior return. The missing link between economic growth and equity returns is even more perplexing because common sense suggests that what is good for the economy is good for companies, and vice versa. The puzzle remains: can we be sure of the absence of a positive link between national economic advancement and stock-market performance?

Growth and returns

Figure 1 (on the previous page) portrays the correlation between the per capita growth rate in GDP and stock-market returns. The period covered is 1900–2013, the countries are all those with a complete history in the *Yearbook* database, rates are annualized, and GDPs and returns are adjusted for inflation – i.e. they are expressed in real terms. The cross-sectional correlation between growth and returns is –0.29.

Figure 2 presents the same analysis, but replacing the growth of per capita real GDP by the growth of aggregate real GDP. The cross-sectional correlation between aggregate growth and returns is 0.51. The latter correlation now has a sign that is at least consistent with the “growth is good” school of thought.

Furthermore, since we are focusing on the very long term, the growth rates of aggregate GDP are invariably influenced by population movements, births and deaths, national border changes, and other factors that cause national economic output to be shared among a larger pool of inhabitants. The first factor that can help us understand long-term patterns in economic wellbeing is the annualized growth of the populations of the *Yearbook* countries.

Figure 2

Real equity returns and aggregate GDP, 1900–2013

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, using data from Barro and Maddison

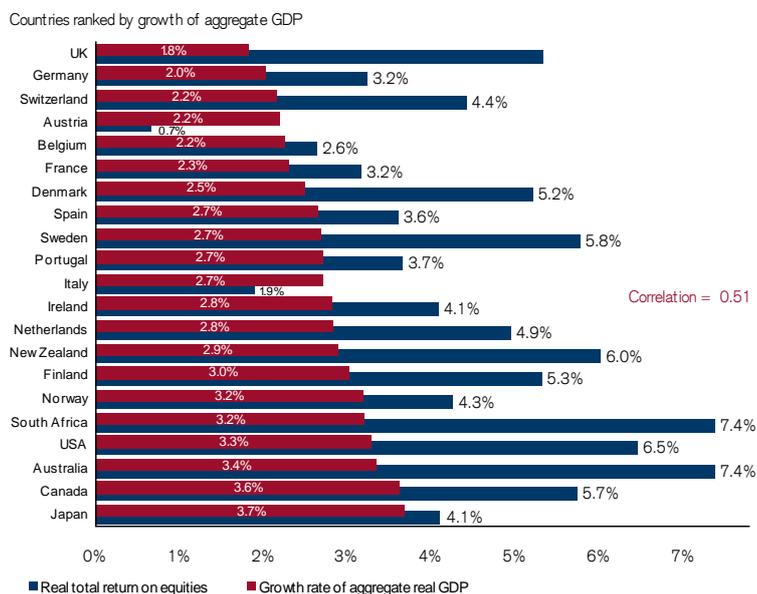
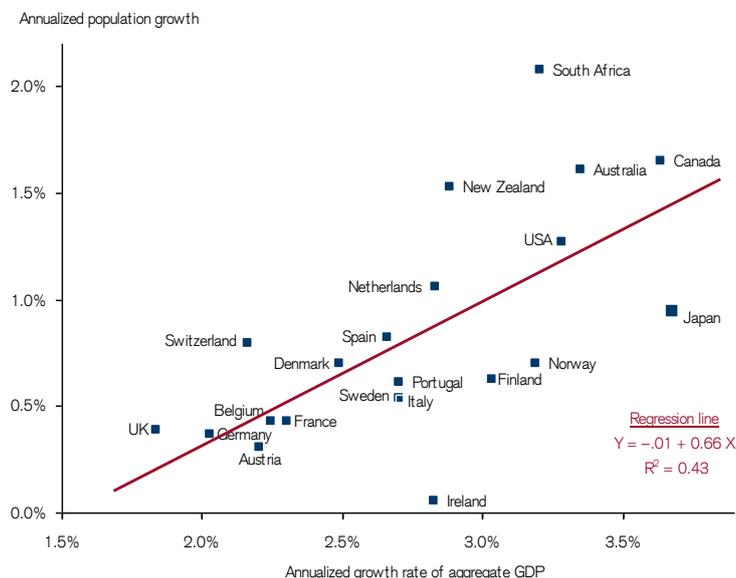


Figure 3

Population growth vs. growth in aggregate GDP, 1900–2013

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, using data from Barro and Maddison



Population growth

Growth in aggregate real GDP is in part attributable to an enlarged workforce. Figure 3 plots the annualized growth rate of each country’s population against the growth rate of aggregate GDP. It is clear that there is an association between a country becoming wealthier in aggregate and the increase in the size of its population, and the correlation coefficient for this scatter plot is 0.65 (the R-squared, reported in the chart, is the square of 0.65, namely 0.43). A similar chart relating population increases to growth in per capita real GDP reveals a negative relationship (the correlation coefficient is –0.45).

The direction of causality in the scatter plot is ambiguous. This is not simply because we are considering population changes without disaggregating into natural population expansion and net migration. Importantly, national progress can provide encouragement to non-nationals to immigrate, while economic stagnation can encourage emigration. Our observations are, in the main, for today’s economically advanced countries. Consequently, net population inflows are a credible explanation for the gap between aggregate and per capita improvements in the *Yearbook* economies.

Out of all the *Yearbook* countries, South Africa has had by far the largest population increase (2.1% per year). This has been accompanied by one of the biggest increases in aggregate real GDP, though per capita real GDP has grown at a below-average rate.

For each *Yearbook* country, the full height of the vertical bar in Figure 4 measures the growth rate of aggregate real GDP for each country. In each case, the growth rate of per capita real GDP (the blue segment of each bar) is smaller than that of aggregate GDP. The impact of sharing economic growth among a larger population (plotted in red) varies between 0.1% and 2.1%.

Looking at the bar chart from left to right, countries are ranked by their annual rates of population growth. The largest population expansions were in South Africa, Canada, Australia, New Zealand, and the USA. Without immigrants, the aggregate GDP of these prospering nations may not have grown so much. Increases in population both expanded and diluted economic growth.

There is a parallel that can be drawn here between a nation's human resources and a company's financial resources. When a company issues extra shares for cash, the money is invested to expand future earnings. Its total earnings can consequently expand. Yet while the financing may be beneficial for the original shareholders of the company, the new shares simultaneously dilute existing earnings. Earnings per share may be enlarged or reduced through this process of sharing the benefits among a larger pool of shareholders. Similarly, for a nation with an influx of population, GDP per capita may be enlarged or reduced through the process of sharing the benefits among a larger pool of citizens.

There have been recent headlines about the scale of immigration into Britain. Nonetheless, the UK has had one of the lowest annual rates, among *Yearbook* countries, of long-term population growth (0.4%). This has been accompanied by a below-average growth of aggregate GDP. Despite Ireland's high birth rate, compared to peers in the EU, population growth has been even lower than the UK, reflecting emigration by people who might otherwise have contributed to aggregate GDP. Only during the country's decade of hectic expansion starting in the mid-1990s, was there a spurt of immigration into Ireland.

Population growth may be associated with national prosperity in a variety of ways. The forces for immigration may differ from the origins of GDP growth. For example, discoveries of new resources and the creation of new job opportunities have often triggered a flow of settlers, whereas preparations for war can underpin growth in GDP without providing attractive inducements to new immigrants.

Foundations for growth

A widely held belief about global investing is that stronger economic growth generates expansion in corporate profits and dividends, which in turn engenders higher equity returns. That is why international investment decisions are so frequently based on forecasts of growth in each market.

The process of economic growth is often illustrated by the experience of societies with large reserves of under-utilized labor and very little capital. As Krugman (1994) and Young (1995) noted, the success stories are countries that were transformed by applying capital and imported technology, while shifting labor from subsistence agriculture to industrial businesses. Rapid industrialization underpinned not only the case for East Asia until the early 1990s, but also the case made for the BRIC economies starting in the early 2000s. The classic cases of high economic growth also include countries that went through a process of extensive re-industrialization. A striking example, that we highlighted in our article in the 2005 *Yearbook*, was German and Japanese rebuilding of their economies, after World War II.

Figure 4

Impact of population growth on aggregate GDP, 1900–2013

Source: Eloy Dimson, Paul Marsh, and Mike Staunton, using data from Barro and Maddison

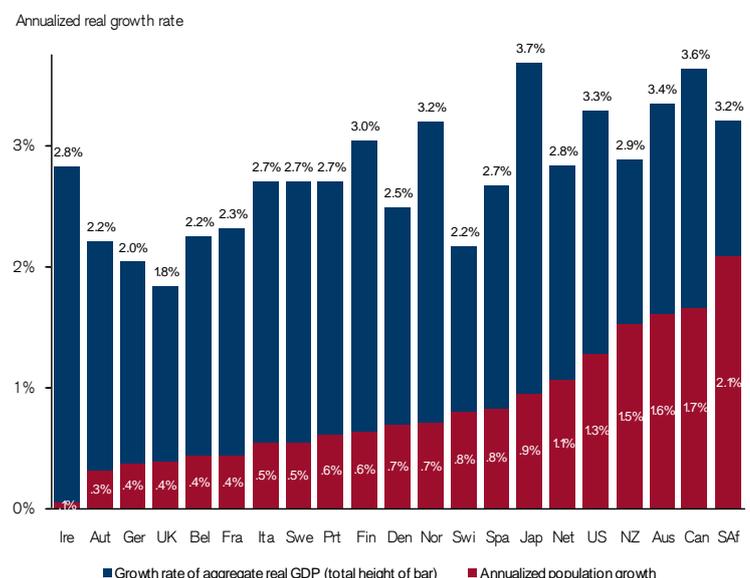
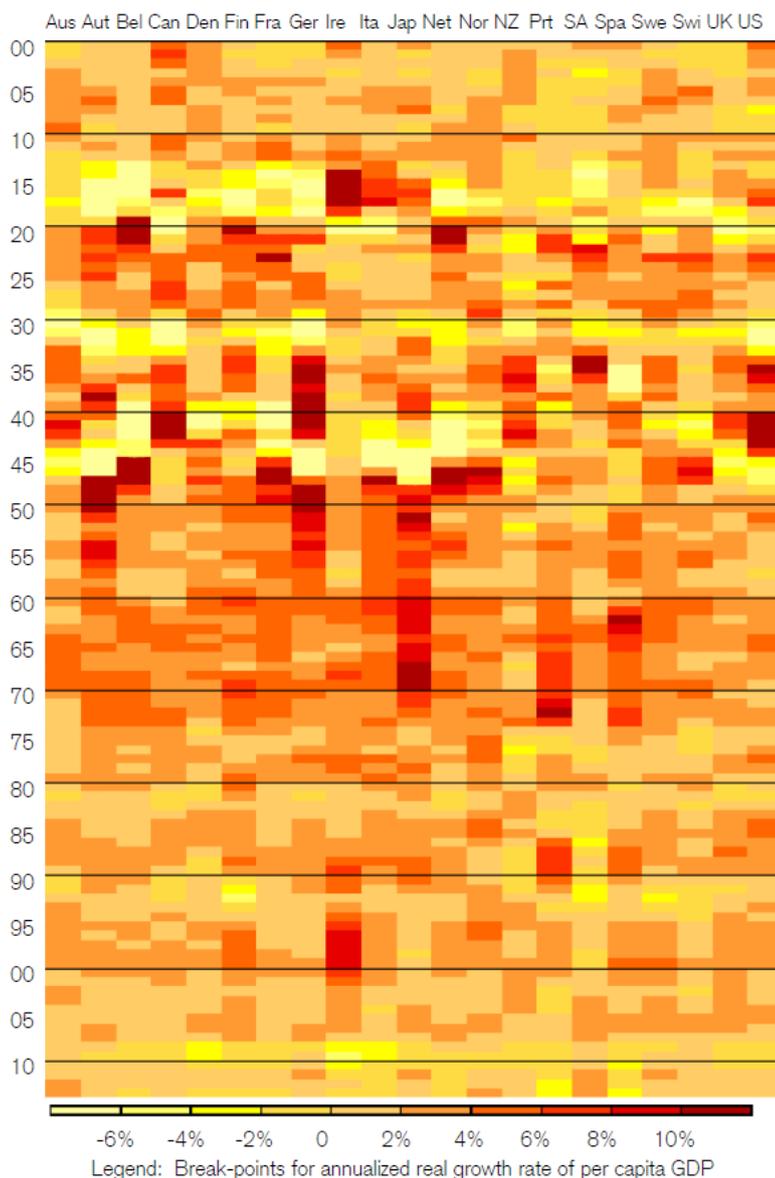


Figure 5

Triennial per capita real GDP growth rates, DMs 1900–2013

Sources: Elroy Dimson, Paul Marsh, and Mike Staunton, using data from Barro and Maddison



Some instances of economic growth have stemmed from positive resource shocks. These include the 21st century growth of fracking in the USA; the 20th century North Sea oil industry in Norway and other countries; and the late 19th century discovery of diamonds, gold, and other minerals in South Africa.

A less obvious source of favorable resource shocks is the “demographic dividend”. Countries that evolve from higher to lower birth rates (post-war Britain, “one child” China) gain a larger labor force when children grow up, enlarge the workforce as women switch from child-rearing to paid employment, and initially benefit from an improved dependency ratio. Roy, Punhani, and Hsieh (2013 a,b,c,d) describe these trends in a series of Credit Suisse reports.

Other examples of fast growth stem from economic, fiscal, and political initiatives. Ireland, in its Celtic Tiger period, boosted foreign direct investment through low corporate taxation and other policies. Britain during the Thatcherite revolution transformed business practice. Germany pursued restructuring for increased productivity in the early 21st century. Looking to the future, the intention of Japan’s “Abenomics” is likewise to generate a positive productivity shock.

More darkly, fuelling up for and fighting a war created a burst of higher growth for Germany and Japan. Finally, some intervals of economic growth may be attributed to economic bubbles, such as the Japanese bubble of the 1980s and early 1990s, the Spanish and Irish property booms, and the financial bubble in Britain, Iceland, and Ireland in the mid-2000s.

We turn later to the question of whether economic growth is beneficial for equity investors. First, we examine the extent to which periods of economic growth are persistent, or whether they are prone to last for a while and then self-destruct.

Do high-growth economies keep growing?

It is helpful to revert to our comparison with the corporate sector. Some companies keep expanding, but fail to convert bigger revenues into higher aggregate earnings. In addition, as noted above, some companies may also fail to convert higher aggregate earnings into larger earnings per share. The same is true of economic growth. GDP can grow without providing commensurate benefits. For example, think of major public projects that are subsequently terminated, or abandoned investments like unwanted infrastructure or bubble-era housing in Spain or Ireland. Expenditures on these wasteful projects are still counted as additions to aggregate GDP.

A fundamental premise behind the “growth is good for investors” story is that one can identify before the event those economies that are destined to experience continued value-additive growth in GDP. But even if we know that growth

is value additive, to what extent can economic growth be extrapolated into the future? Is there momentum in GDP growth rates?

We start with a long-term perspective on the *Yearbook* countries. This includes economies that, although regarded as developed today, were in a number of cases less developed for long periods, or spent periods exiting and re-entering developed status. They represent a range of economies that experienced growth from a wider variety of sources than the BRICs model that investors have more recently fixated on. The impetus for economic advancement in the *Yearbook* countries has included most of the foundations for growth that we listed earlier.

Figure 5 provides a pictorial representation of economic growth rates for the *Yearbook* countries. They are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, the Netherlands, Norway, New Zealand, Portugal, South Africa, Spain, Sweden, Switzerland, the United Kingdom, and the United States of America. The rows represent each year from 1900 to 2013. To aid visual interpretation, we present the annualized growth in real per capita GDP from 12 months before the year starts until 12 months after it ends. For example, the 1996 growth rate runs from start-1995 to end-1997. Though the annualized growth rates in this exhibit are based on per capita real GDP, aggregate real GDP tells a similar story (though the colors are a shade darker, reflecting the fact that aggregate GDP grows faster than per capita GDP).

Figure 6 presents similar material for a selection of emerging markets. The countries are Argentina, Brazil, Chile, China, Columbia, Egypt, Greece, India, Indonesia, Israel, Mexico, Nigeria, Peru, Singapore, South Korea, Sri Lanka, Taiwan, Turkey, Uruguay, Russia, and Venezuela. Because there are data gaps in the first half of the 20th century, we start in 1950. Some of these countries were considered developing in 1950, yet failed to deliver growth. However, a number have been included because they are important today, including some for which portfolio investment was until recently out of the question (such as Russia, which is back-linked in the chart to the USSR). Our selection of countries therefore exhibits success bias: there are more countries that experienced growth than if we had selected countries at random.

In the charts, growth rates are color-coded from a low, sub-zero real growth rate to a high, positive growth rate. The legend is at the foot of each chart. The lightest yellow represents severe contraction (annualized growth below -6%) and the darkest shade of burnt orange portrays growth in excess of 10%.

Our “heat chart” highlights three features of economic growth: first, episodes of high and of low economic growth rates are time-clustered;

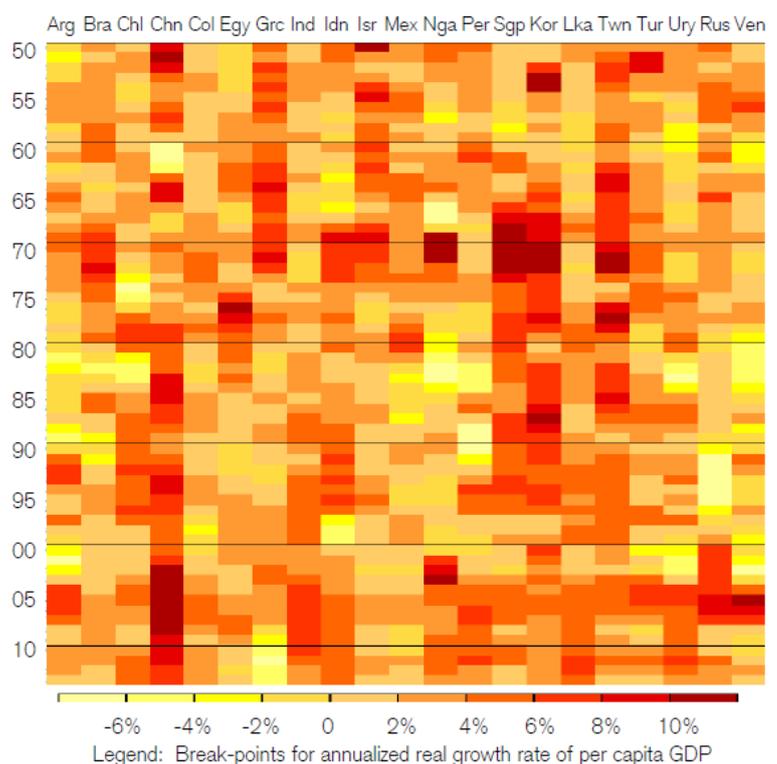
second, they suggest a degree of predictability (though, as we will see, this is something of an optical illusion, because they are overlapping multi-year returns); and third, they reveal a tendency for GDP growth rates to mean-revert. We discuss these aspects in turn.

First, periods of low or high growth are shared across countries, and tend to cluster in time. To illustrate in the context of developed markets (Figure 5), the periods following World War I and coinciding with the Great Depression and the periods centered on World War II were phases of low growth in most *Yearbook* countries. The same was true for the period after the global financial crisis engulfed developed markets.

Figure 6

Triennial per capita real GDP growth rates, EMs 1950–2013

Sources: Elroy Dimson, Paul Marsh, and Mike Staunton, using data from Barro and Maddison



Second, it is tempting to discern apparent runs of longer-term growth. A year showing a high annualized 3-year growth rate is likely to be followed the next year by another high annualized growth rate. However, that simply reflects the fact that the second annualized growth rate shares annual observations with its predecessor.

Third, there is a tendency for annualized growth rates over non-overlapping periods to mean-revert. The countries are in alphabetical order. Looking down each column, high annualized rates are generally followed a few years later by a more moderate rate. Ignoring wartime, in Figure 5 we observe strong growth-persistence across multiple non-overlapping intervals in just three developed markets: Germany and Japan during their extended post-war recoveries, and Ireland during its more recent Celtic Tiger boom. In Figure 6, we might pinpoint the emergence of Singapore, South Korea and Taiwan in the late 1960s and 1970s, and China in the 2000s.

Persistence

To what extent are there intervals of prolonged momentum in economic growth? To look in more detail at this question, we look at the historical durations of per capita real GDP growth that were consistently extraordinary (an unbroken period of growth at over 10% per year), consistently excellent (over 8%), or consistently superior (over 6%). Per capita growth is measured in real terms. Following Barro (2013), our inflation adjustment involves measuring growth in constant purchasing power. Our measurement units are international dollars (more precisely, Geary-Khamis dollars).

Many countries have had variable rates of economic growth, but few have had phases in which they grew without setbacks. We identify for each country the length of time for which extraordinary, excellent, or superior growth in per capita real GDP persisted over the historical period from 1900 to date. These growth rates are defined as an interval during which annualized growth exceeded a stated threshold, without any setbacks of intervening growth rates that fell below the threshold.

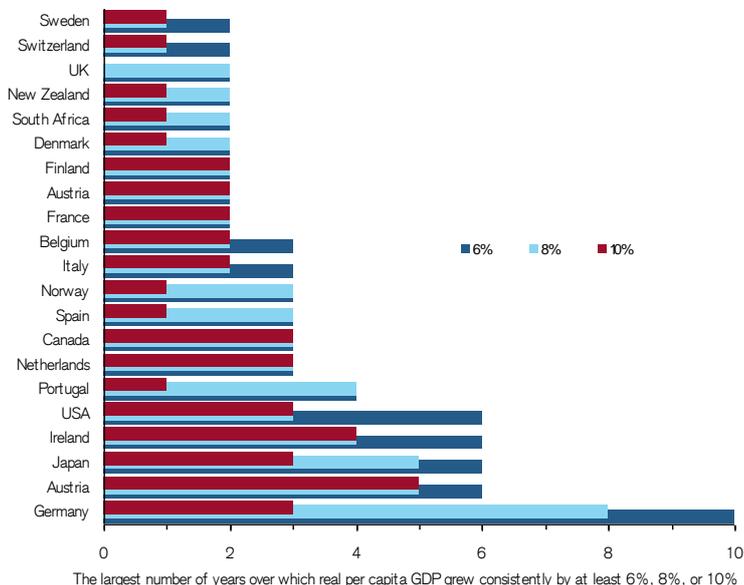
Our findings are presented as a sequence of bars, which identify the longest duration of consistent growth by developed markets over the course of the 20th and 21st centuries. Our estimates are presented in Figure 7. The dark blue bars report the longest sequence of years for which our measure of economic growth exceeded 6% per annum. The light blue bars represent the longest sequence of years over which GDP grew at an unbroken annualized rate of 8%. Red bars portray the longest sequence of years over which GDP grew at an unbroken annualized rate of 10%.

There is a small group of developed countries that benefitted from an extended phase of uninterrupted per capita real GDP growth in excess of 6% per year. The group includes Germany (1947–56), Austria (1946–51), Japan (during 1959–64), Ireland (1995–2000), and the United States (1939–44). These countries substantiate our observations that, historically, economic growth has been built on a variety of foundations. The first three are examples of postwar reconstruction, but the other two are periods of recent (pre-Global Crisis) growth and of war preparation. Over the long interval depicted in Figure 7, almost half our countries failed to record annualized growth of 10% for any multi-year period. The most extreme case is the UK, a country for which there was not a single year of real growth in excess of 10%. Other than post-war recovery, it was rare to find prolonged high growth rates in any developed economies, even those that spent part of the last century as a developing economy.

Figure 8 presents a companion analysis for the 23 emerging markets portrayed above in our second “heat chart.” Our data starts in 1900–01 for

Figure 7
Duration of unbroken, high real GDP growth, DMs 1900–2013

Source: Elroy Dimson, Paul Marsh, and Mike Staunton; Barro and Maddison. Real per capita GDP growth p.a.



11 countries and, in all cases, the data start no later than 1950. The average number of years for which we have emerging-market data is 95 years. The horizontal axis has the same scale as in the previous chart. It is striking that the experiences of emerging and developed markets tell a similar story. Economies rarely maintain a cracking pace of development over a sequence of years.

Our “heat charts” (Figures 5 and 6) reveal intervals of fast, but volatile growth – countries that do well, suffer a setback, and then prosper for a while. It is hard to find periods of steady, high economic growth uninterrupted by setbacks.

Momentum

National economic growth therefore appears to be “higgledy piggledy,” just as corporate earnings growth was shown in Little’s (1962) seminal paper to be disorderly. But there is another way to evaluate whether economies can be expected to maintain high growth rates. We examine the correlation between growth rates in successive intervals. If high (or low) economic growth tends to persist, we should find a positive correlation between growth “now” and growth in the “near future”. We therefore look at the predictability of growth over 1-year intervals.

Whereas a stock market index can be compiled at the end of the last day of the year, measures of economic output are collected over days, weeks and sometimes months. We therefore skip a year between annual observations (though, as it happens, this has only a very small impact on our findings). We examine whether economic growth that is large over the 12 months to the start of “this” year tends to remain large over the 12 months that starts at the end of “this” year.

In Figure 9, we pool observations across all countries and years since 1900. This scatter diagram plots the change in per capita real GDP in year t on the horizontal axis, and the change in per capita real GDP in year $t+2$ on the vertical axis. Across markets and time, there are well above 2000 such observations for developed markets, which are plotted in blue; and almost 2000 for emerging markets, which are plotted in red.

How should we interpret this chart? If there is momentum in growth rates, then there should be a tendency for observations to plot around a line that slopes upward from lower-left to upper-right. However, there is no such evidence of persistent growth trends. The lines of best fit indicate that there is no meaningful relationship between these successive growth rates. To illustrate, suppose that growth (measured on the x-axis) were larger by an incremental 2%. Our DM regression line (in blue) indicates that developed markets would tend to experience growth two years later that is elevated by 0.024% (i.e., $0.012 \times 2\%$). The explanatory power of this relationship, measured by its R^2 of 0.0002, is minuscule. Furthermore, looking at the slope and R-squared of the regressions,

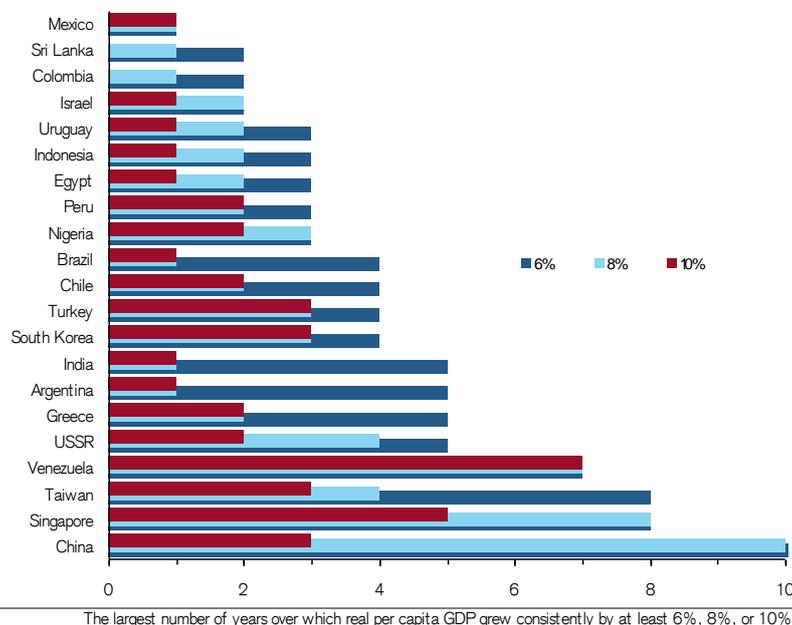
the predictability of GDP growth for our sample of emerging markets is indistinguishable from the sample of developed markets.

As well as investigating annual growth rates, we repeated this exercise using measurement intervals of up to 15 years, and we repeated our work substituting aggregate GDP for per capita GDP. We found no evidence of meaningful momentum in economic growth. While trends sometimes endure, there are also reversals, and these two patterns tend to offset one another. One should be cautious about projections of persistently high growth.

Figure 8

Duration of unbroken, high real GDP growth, EMs 1900–2013

Source: Elroy Dimson, Paul Marsh, and Mike Staunton; Barro and Maddison. Real per capita GDP growth p.a.



The value of clairvoyance

Our evidence that economic growth has limited persistence raises questions about the difficulty of forecasting GDP. But the lack of a cross-sectional link between economic growth and equity returns is even more perplexing, because common sense suggests that what is good for the economy is good for the stock market, and vice versa. This belief is sometimes founded on the apparent relationship between changes in a country's GDP and fluctuations in its stock market. However, one should be cautious about anecdotal evidence and casual empiricism.

One of our favorite financial columnists recently sent us a graph that shows how some asset managers demonstrate the link between economic growth and equity returns. Figure 10 extends the graph to our customary long time-span. The chart plots annual changes in per capita real GDP alongside year-by-year real returns on the US equity market in the preceding year.

There is a perceptible correspondence between the two measures, and the correlation between them is 0.46. It appears that, favorable economic news has tended to accompany favorable stock market performance. However, the time shifting in this graph demonstrates that stock market returns in a particular year are correlated with GDP improvements in the following year – not in the same year. In fact, the correlation between real US equity returns and contemporaneous per capita changes in real US GDP is essentially zero (0.06).

It is likely that the pattern depicted in Figure 9 reflects the fact that when the economic environment improves, investors on average discern the likelihood of improved cash flows in the future and/or a lowering of investment risk. Likewise, when the economic environment deteriorates, investors on average discern the likelihood of worse cash flows in the future and/or a need to apply higher discount factors to reflect increased investment risk.

Investors' decision-making tends to anticipate the economy's changed circumstances, and the empirical evidence supports this claim. For example, we showed in our *Yearbook* article four years ago that stock market fluctuations predict changes in GDP, but movements in GDP do not predict stock market returns. Over time, forward-looking predictions of economic change are impounded in today's fluctuations in the stock market. To illustrate this, we examine the benefit of knowing how the economy has performed up to the date of an investment, and compare this with the benefit that would be provided by a clairvoyant forecast of GDP changes.

Economic and stock market growth

In our 2005 and 2010 *Yearbook* studies on economic growth and stock market returns, we examined the importance of economic growth for global

Figure 9
Momentum in annual per capita real GDP growth, 1900–2013

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, using data from Barro and Maddison

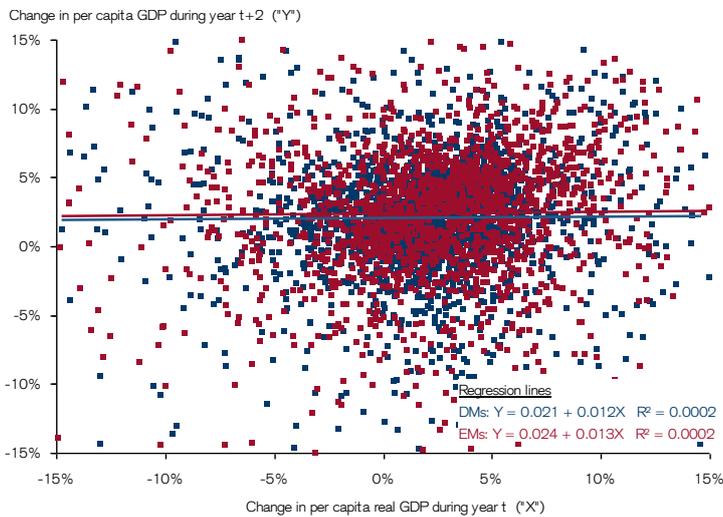
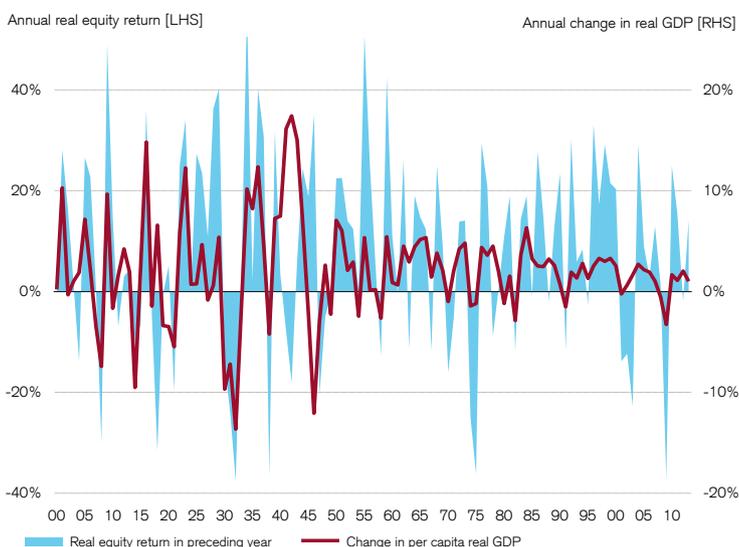


Figure 10
GDP changes and stock market returns in the USA, 1900–2013

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, using data from Barro and Maddison



In dark blue, we plot the annualized portfolio returns of the portfolios that are based on GDP growth over the past. There is no evidence of outperformance by economies that have had high growth on the past. Over the period covered by this exhibit, the total return from buying stocks in low-growth countries in fact surpassed the return from buying stocks in the high-growth economies.

In red, we report the results from selecting markets that are destined to experience growth in GDP *after* the portfolio undergoes investment. Buying the equities of economies that are going to have high growth over the years ahead would have generated a far higher annualized real return than buying into economies that are going to suffer poor growth. Accurate predictions of future economic growth would therefore be of much greater value than accurate statistics for historical economic growth.

Note that, because national statistics appear with a delay, and may be revised in subsequent quarters, investors do not have immediate knowledge of the growth rate for a year that has recently ended. Moreover, investors are in at least partial ignorance of GDP growth for the same year as that in which that are investing. We therefore supplement the dark blue (backward looking) and red (forward looking) bars in Figure 11 with rankings based on contemporaneous GDP growth. The latter are shaded in light blue.

As can be seen from the bars labeled 1 year, 2 years, 3 years, 4 years and 5 years, the pattern of equity returns reported here is robust to the length of the horizon for estimating GDP growth. It is also robust to whether inflation-adjusted performance is measured in common or local currency.

Furthermore, the light blue bars, labeled "0 years", show that a perfect prediction of economic growth for the *current* year also offers investment value. Needless to say, such forecasts are not easy. One might forecast on New Year's Day what the GDP growth rate will be from January through December. Yet the final GDP estimate may only be available a couple of years later.

There is a substantial challenge here for investors. They would like to divine future growth, but they need more than an extrapolation of historical growth into the future. They need to reliably out-guess the consensus of other investors about future economic growth.

How growth is shared out

When the economy prospers, the corporate sector stands to benefit. Yet we have demonstrated in *Triumph of the Optimists* and in our previous *Yearbook* articles that real dividends have lagged behind real growth in per capita GDP. This observation, new when we made it in 2002, is now accepted as fact; see, for example, Ilmanen (2011).

We now examine this observation in more detail. Usually, we take a demand-side view of ex-

pected returns. We do this by asking the question: "what is the required rate of return of stock market investors?" If equities are not offering the return demanded by investors, then stock prices will fall. They will fall to the point at which they once again provide the expected return that investors are looking for.

The demand-side perspective focuses on the twin rewards to stock market investors. First, they can expect to be rewarded for deferring consumption from their wealth – this reward is the interest rate. Second, they can expect to be rewarded for accepting the risks of businesses that face an uncertain financial future – this is usually quantified as the equity risk premium. Long-run estimates of interest rates and equity premiums are published annually in the *Credit Suisse Global Investment Returns Sourcebook*.

Ibbotson and Chen (2003) suggest an alternative, more macroeconomic, approach that involves focusing on the supply of returns that are provided by the real economy. The supply-side question is this: "what are economy-wide aggregate returns, and to what extent are they available to the owners of companies?" Basically, we would like to decompose GDP into the reward paid to each factor of production, identifying payments that represent profits, interest, rent, and wages.

In principle, we would like to divide GDP into two elements. The first would comprise the profits, interest, and rent of incorporated businesses, while the second would consist of human resource compensation and the entrepreneurial gains from private businesses.

We can proxy the profit growth of incorporated businesses as the rate at which dividends grow. Unfortunately, even ignoring government redistributions, we do not have sufficient data to make an independent, direct estimate of the value of human resource and entrepreneurial compensation. What we can do is to decompose returns, identifying the residual that bridges the gap between the real economy and financial market returns. While data limitations preclude measuring the value added by different factors of production, we can gain some insights into the shortfall between economic growth and corporate income.

Following this approach, we show how growth in aggregate GDP is shared out in the economy, reflecting, first, population flows and, second, the changing share of incorporated businesses. We then show how the resulting profit growth of listed companies is capitalized. Finally, we add in dividend income, so as to report each country's overall stock market performance.

Our analysis is contained in Table 1, in which countries are grouped by their physical distance from the epicenter of world-war conflict (top panel), those that maintained neutrality during the main conflicts of the 20th century (middle panel), and those that at some point experienced devastation through war (bottom panel).

Per capita GDP

As noted earlier, South Africa, which was one of the fastest-growing countries in terms of aggregate real GDP (column 1), had a large expansion of its population (column 2), and hence a particularly low per capita real GDP growth rate (column 3). The average of the per capita real GDP growth rates is 1.92% (bottom row of the table).

The countries that did not suffer the same level of destruction of physical capital during World War II, and which had above-average growth rates of aggregate GDP, achieved a slightly below-average per capita real GDP growth rate (1.62%). The countries that maintained neutrality during the war had a marginally higher per capita real GDP growth rate (2.04%).

Truly surprising is that countries that were plunged into the second world war also had a growth rate during the 114 years that exceeded the worldwide average of 1.92%. As Bernstein (2002) noted, entrepreneurship and re-industrialization in some countries, alongside resource discoveries in others, helped economies recover from wartime calamities.

Dilution of equity performance

As reported in *Triumph of the Optimists* and in Bernstein and Arnott (2003), there was a gap between economic growth and the growth of real dividends per share. The shortfall is large when a

comparison is made between aggregate real GDP growth and real dividend growth. However, it is also apparent as a difference between per capita real GDP growth and real dividend growth that is evident for every *Yearbook* country.

In column 4 we tabulate the difference between per capita real GDP growth (column 3) and per-share real dividend growth (column 5). The gap ranges from 0.14% for South Africa, where equity dividends outpaced inflation, to 6.27% for Austria, where dividend growth failed to keep pace with inflation. For the USA, the average gap was 0.35%.

The former British colonies, which were distant from Europe, had a dilution of their equity performance, as compared to per capita real GDP growth, averaging 0.72%. The countries that were neutral during the Second World War had a gap averaging 1.86%. Countries that were ravaged by war had a shortfall averaging 3.29%. Averaged across all countries, the shortfall averaged 2.34% (see the bottom row). This corresponds to the “Two Percent Dilution” first highlighted by Bernstein (2002).

The economic growth of countries, that were physically more distant from Europe's world-war battlefields, translated into real dividend growth averaging 1.24% (column 5). Neutral European countries had real dividend growth that was essentially zero (0.02%). Other European countries, together with Japan, had real dividend growth averaging -0.78%.

Table 1

Decomposition of real GDP growth and economic returns, 1900–2013

Source: Elroy Dimson, Paul Marsh, and Mike Staunton. Real GDP is inflation adjusted into International Dollar terms (the Geary–Khamis unit of currency.)

Country	Growth rate of aggregate real GDP	minus Annualized population growth	equals Growth rate of per capita real GDP	minus Dilution of equity performance	equals Growth rate of real dividends	minus Expansion in dividend yield	equals Real appreciation of equities	plus Annualized dividend yield	equals Real total return on equities
Canada	3.63%	1.65%	1.95%	1.31%	0.90%	-0.43%	1.34%	4.35%	5.75%
Australia	3.35%	1.61%	1.71%	0.74%	1.13%	-0.42%	1.56%	5.72%	7.37%
USA	3.29%	1.27%	1.99%	0.35%	1.63%	-0.54%	2.18%	4.18%	6.45%
South Africa	3.20%	2.08%	1.10%	0.14%	1.28%	-0.27%	1.55%	5.74%	7.39%
New Zealand	2.89%	1.53%	1.34%	1.03%	1.27%	0.66%	0.61%	5.37%	6.01%
Mean	3.27%	1.63%	1.62%	0.72%	1.24%	-0.20%	1.45%	5.07%	6.59%
Ireland	2.83%	0.05%	2.77%	2.98%	-1.11%	-0.72%	-0.40%	4.50%	4.09%
Portugal	2.70%	0.61%	2.08%	1.95%	-0.50%	-0.14%	-0.37%	4.04%	3.66%
Sweden	2.70%	0.54%	2.15%	1.07%	1.62%	-0.17%	1.79%	3.92%	5.77%
Spain	2.66%	0.82%	1.82%	2.39%	-0.58%	0.04%	-0.62%	4.26%	3.62%
Switzerland	2.16%	0.80%	1.36%	0.91%	0.69%	-0.21%	0.91%	3.47%	4.41%
Mean	2.61%	0.56%	2.04%	1.86%	0.02%	-0.24%	0.26%	4.04%	4.31%
Japan	3.68%	0.94%	2.71%	5.60%	-2.01%	-1.05%	-0.99%	5.14%	4.11%
Norway	3.19%	0.70%	2.47%	2.73%	0.07%	-0.15%	0.22%	4.03%	4.26%
Finland	3.04%	0.63%	2.39%	2.25%	0.55%	0.02%	0.53%	4.76%	5.31%
Netherlands	2.83%	1.06%	1.75%	2.23%	-0.55%	-0.60%	0.04%	4.90%	4.95%
Italy	2.71%	0.53%	2.17%	4.46%	-2.15%	-0.10%	-2.06%	4.05%	1.91%
Denmark	2.49%	0.70%	1.78%	2.50%	-0.38%	-1.05%	0.66%	4.51%	5.21%
France	2.30%	0.43%	1.87%	3.05%	-0.59%	0.05%	-0.64%	3.83%	3.17%
Belgium	2.25%	0.43%	1.81%	3.33%	-1.23%	-0.12%	-1.11%	3.79%	2.63%
Austria	2.21%	0.31%	1.89%	6.27%	-1.99%	-0.25%	-1.75%	2.46%	0.67%
Germany	2.03%	0.37%	1.66%	2.70%	-0.87%	-0.47%	-0.41%	3.66%	3.23%
UK	1.84%	0.39%	1.45%	1.10%	0.59%	-0.10%	0.69%	4.61%	5.33%
Mean	2.60%	0.59%	2.00%	3.29%	-0.78%	-0.35%	-0.44%	4.16%	3.71%
Overall mean	2.76%	0.83%	1.92%	2.34%	-0.11%	-0.29%	0.18%	4.35%	4.54%

Overall, *Yearbook* countries achieved long-term real growth rates of dividends that were slightly negative (−0.11%). In war-damaged economies, physical capital had to be replaced, and favorable GDP growth did not generate comparable cash flows for shareholders.

Yield expansion

When dividend yields expand – i.e., when the ratio of dividends per share to share price becomes higher – the price for each cent or each penny of dividends is falling, and vice versa. Expanding dividend yields represent shares selling at a lower price relative to fundamental value (where the dividend is our proxy for fundamental value).

Over the very long term, dividend yields on major stock markets have mostly fallen. However, in a few cases, yields expanded over the period from 1900 to date, to the detriment of long-term index performance. New Zealand's increasing dividend yield, which equated to 0.66% per year (column 6), meant that a high growth rate of real dividends (1.27%) gave rise to a rather disappointing real appreciation of 0.61% per year for that country's equity market (see column 7).

In contrast, the United States, which had a similar high growth rate of real dividends (1.63%), had a negative rate of expansion in its dividend yield (−0.54%). American yields became smaller, and the real appreciation of the US equity market was therefore a favorable 2.18% per year (column 7 again). Averaged over all markets, yield expansion was −0.29% per year, which provided a rather small boost to average stock market performance. On average, equities provided a near-zero (0.18%) rate of real price appreciation.

As we explain in the accompanying *Sourcebook*, the vast majority of long-term real returns are derived from equity income. Column 8 reports the annualized dividend yield for each country, which is added to the capital gain of each equity market. The final column of the table reports the real total return of each market, which, averaged across *Yearbook* countries, was 4.35% per year.

More detail is provided on the components of investment performance in Chapter 2 of the *Credit Suisse Global Investment Returns Sourcebook 2014*. Table 11 of the *Sourcebook* shows how the equity risk premium can be disaggregated into elements that are identified in the columns in the right-hand half of Table 1 above.

Expected returns

We can now examine what underpins the returns received by stock market investors. The scatter-plot in Figure 12 depicts all the markets listed in Table 1. The horizontal axis measures the growth in per capita real GDP, while the vertical axis displays the annualized real return, including reinvested dividends, from each equity market over the entire period since 1900. In the cross section of countries, it appears that equity investors do not capture benefits as a result of economic advancement, as measured by per capita real GDP.

The relationship between stock market performance and aggregate real GDP is plotted in Figure 13. The upward slope incorporates the differ-

Figure 12

Real equity returns and growth of per capita GDP, 1900–2013

Source: Elroy Dimson, Paul Marsh, and Mike Staunton; Barro and Maddison. Real per capita GDP growth p.a.

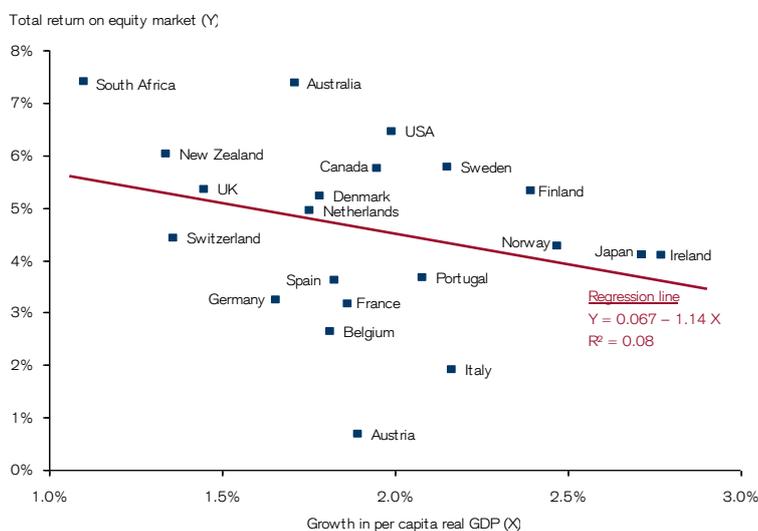
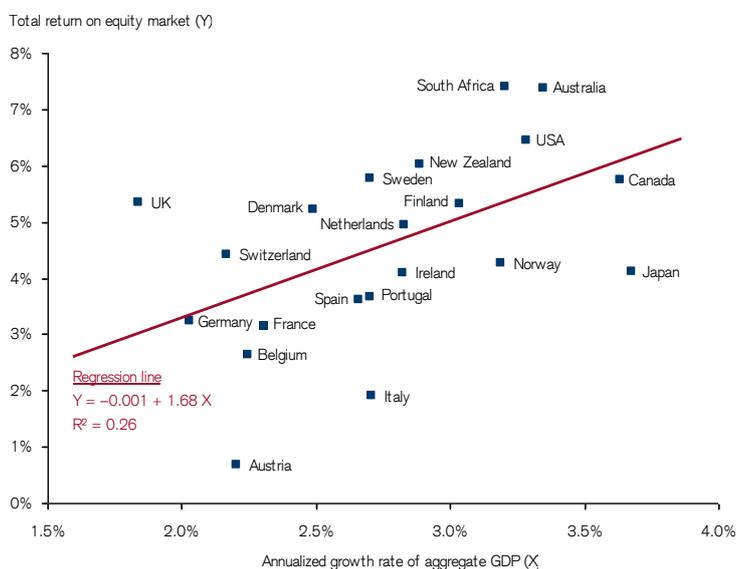


Figure 13

Real equity returns and growth of aggregate GDP, 1900–2013

Source: Elroy Dimson, Paul Marsh, and Mike Staunton; Barro and Maddison. Real per capita GDP growth p.a.



ing rates of population growth in the countries we depict. Though it slopes up, the line in this graph offers little evidence of an investment opportunity.

These findings can be explained in several ways. Bernstein and Arnott have pointed out that the growth of listed companies contributes only part of a nation's increase in GDP. In countries that historically had a small proportion of exchange-traded companies, unquoted businesses and the government sector may have been the drivers of economic growth. However, they have no impact on the dividends that are declared by listed corporations.

In entrepreneurial countries, new private enterprises are created outside the listed company sector. They contribute to economic growth, but not to the dividend growth of exchange-traded equities. There can also be expansion in the size of the stock market as a result of initial public offerings, privatizations, and seasoned offerings by listed companies. Existing stockholders cannot benefit financially from such expansion, unless they invest in the new shares that are created.

Whatever the explanation, the absence of a clear-cut relationship between economic growth and stock returns should give investors pause for thought. But at the same time, this finding should emphatically not be interpreted as evidence that economic growth is irrelevant. The prosperity of companies, and the investors who own them, must depend on the state of both national economies and the global economy.

To summarize, economic growth is not a panacea for investors, since its benefits are offset by the dilution arising from the need for capital. New investors who create or buy into the new businesses that accompany economic growth will increase growing countries' market capitalizations. But those new stocks do not represent wealth creation that can be shared with current investors.

Conclusion

Many investors and commentators have misunderstood the evidence on economic growth and equity performance. Though difficult for investors to capture in portfolio returns, stronger GDP growth is generally good for investors.

Why, then, has it been so difficult to make money by buying the stocks of countries that are improving their economic position? The first explanation is of course that stock prices impound anticipated business conditions. As we showed in our 2010 paper, although past economic growth does not predict subsequent equity market movements, stock prices do predict future economic growth. Markets anticipate the macro-economy. To use public information to try to predict the market is to bet against the consensus view set by a multitude of other smart and informed global investors.

Secondly, a strategy of buying the shares of countries that are advancing economically is a

strategy of buying companies that are on average becoming less risky, and hence offer a lower expected return. It is more risky to invest in companies in distressed economies. Other things held constant, the expected return on equities in successful, growing economies should therefore be lower than the expected return in declining economies.

Third, there may be limits to arbitraging global mispricing. There is extensive evidence that investors bid up the prices of growth assets, to the point that their long-run return is below the performance of distressed assets (sometimes referred to as 'value' investments). Some observers regard this as mispricing, and contend that it offers opportunities for arbitrageurs. The strategy would be to buy equities in distressed markets and to short-sell securities in fast-growing markets. However, short-selling can be costly and risky, thereby allowing 'hot' markets to remain overpriced, and to yield disappointing long-run returns.

Last, there is the question of luck. Some countries have resources – agricultural, extractive, capital, or intellectual – that may confer an advantage compared to other nations. If that advantage is appreciated and already priced in by investors, there can be no expectation of superior investment returns. But if the consensus undervalues those resources, then an astute or lucky investor may outperform. In the 20th century, resource-rich countries like the US, Canada, Sweden, or Australia prospered. In the opening decade of the 21st century, commodity-rich and low-labor-cost emerging markets prospered. Some of the successes and disappointments may be attributable to Fortuna – the goddess of luck.



A behavioral take on investor returns

One behavior of investors that is well documented is the tendency to buy after the market has risen and to sell following a drop. As a consequence of this pattern, the asset-weighted returns investors earn tend to be less than the time-weighted returns of the funds in which they invest. Investors can counterbalance this tendency by making predictions that place more weight on past results and less on recent outcomes.

Michael J. Mauboussin, Head of Global Financial Strategies, Credit Suisse Investment Banking

The interpreter made me do it

There is a part of your brain, in the left hemisphere, that neuroscientists have dubbed “the interpreter.” The apparent role of the interpreter is to assign a cause to every effect it sees. Generally, it associates good results with lots of skill and poor results with a lack of skill (Gazzaniga, 2011). The interpreter is very effective at sorting cause and effect most of the time, and this ability is what allows us to understand the world around us. But the interpreter stumbles when confronted with randomness. The interpreter construes positive results that come from favorable luck as something good. Bad outcomes are to be avoided. This is our natural mode and presents a problem to us as investors.

Perhaps the most dismal numbers in investing relate to the difference between three investment returns: those of the market, those of active investment managers, and those of investors. For example, the annual total shareholder returns were 9.3% for the S&P 500 Index over the past 20 years ended 31 December 2013. The annual return for the average actively managed mutual fund

was 1.0–1.5 percentage points less, reflecting expense ratios and transaction costs. This makes sense because the returns for passive and active funds are the same before costs, on average, but are lower for active funds after costs (Sharpe, 1991).

But the average return that investors earned was another 1–2 percentage points less than that of the average actively managed fund. This means that the investor return was roughly 60%–80% that of the market. At first glance, it does not make sense that investors who own actively managed funds could earn returns lower than the funds themselves. The root of the problem is bad timing.

Spurred on by the interpreter, investors tend to extrapolate recent results. This pattern of investor behavior is so consistent that academics have a name for it: the “dumb money effect” (Frazzini and Lamont, 2008). When markets are down investors are fearful and withdraw their cash. When markets are up they are greedy and add more cash. Figure 1 shows the net new investor cash flow and returns for the MSCI World Index since 1992. While the general pattern of new cash flow following returns is clear, note that investors have been reticent to

Figure 1

Equity funds flow and market results

Source: Investment Company Institute and MSCI.

Note: MSCI World Index results are based on total returns including gross dividends.

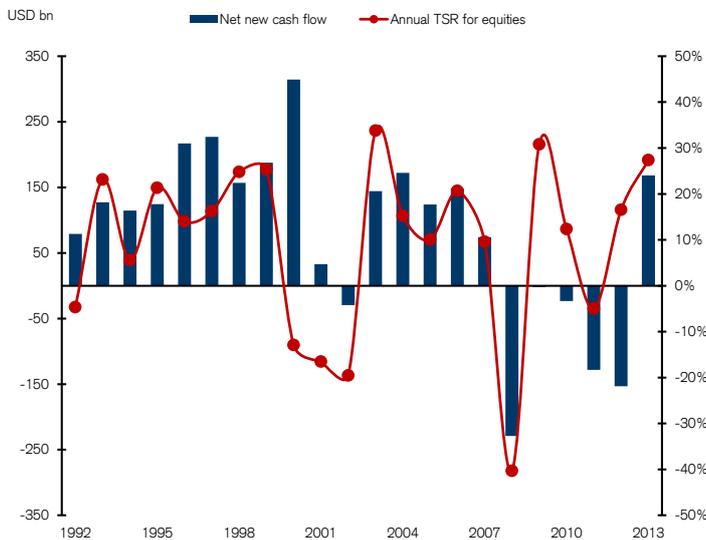
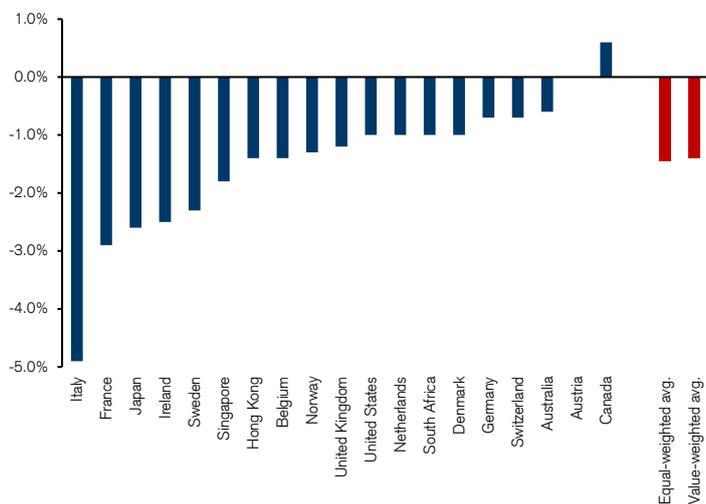


Figure 2

Buy-and-hold returns less asset-weighted returns in 19 markets

Source: Iliia D. Dichev, "What Are Investors' Actual Historical Returns? Evidence from Dollar-Weighted Returns," American Economic Review, Vol. 97, No. 1, March 2007, 386-401. Data are 20 years ended 2004.



commit to equities in recent years. Aggregate outflows in the past five years are negative, despite good market results.

The key to understanding the dumb money effect is the distinction between time-weighted and asset-weighted returns. Let's use a mutual fund as an example. The time-weighted return measures the performance of the fund over time based on net asset value. The asset-weighted return incorporates not only the performance, but also the money going in and out of the fund.

Time-weighted versus asset-weighted returns

Here's a simple illustration (Dichev, 2007). Let us say an investor buys 100 shares of a fund that starts a year with a net asset value of USD 10, representing an outlay of USD 1,000. In the next year, the fund's net asset value rises to USD 20, doubling the investor's money. Excited, the investor buys an additional 100 shares, spending another USD 2,000. In the second year, the net asset value of the fund declines to USD 10, back where it started. How did the fund and our investor fare over the two years?

The time-weighted return for the fund is zero, of course, as the fund ended at the same price as it started (note that this is the fund's geometric return and not its arithmetic return.) But the asset-weighted return for the investor is -27%, calculated as the internal rate of return based on the timing and magnitude of the investor's cash flows. The return would have been zero had our investor used a simple buy-and-hold strategy, and there would have been no nominal gain or loss. But in the scenario we outlined, our investor lost USD 1,000 of the USD 3,000 total investment because of the purchase after the fund rose.

This basic example reflects the experience of one investor over two years, but we can apply the same methodology to many investors over multiple years. Because of investor behavior, returns for major indices substantially overstate the returns that investors actually earn. Figure 2 shows the difference between the buy-and-hold return and the asset-weighted return for 19 countries around the world. On average, investors earn 1.5 percentage points less per year than a buy-and-hold strategy as a result of the dumb money effect.

So our minds encourage us to act at extremes and buy when the market is up and sell when the market is down. As per the 2013 Yearbook discussion of mean reversion, for long-term investors "it is helpful to adopt a framework that offsets the temptation to follow the herd." The question is: How do we sidestep this behavioral bias of buying high and selling low?

Kahneman's favorite paper

Daniel Kahneman is a psychologist who is renowned for his work in judgment and decision-

making and who won the Nobel Prize in economics in 2002. Shortly after he won the Nobel Prize, he was asked to name the favorite paper he had written. He replied with "On the Psychology of Prediction," which he wrote with Amos Tversky in 1973. The paper is rich with insight, but, for our purpose, the main lesson is how to make a thoughtful prediction. They argued that three types of information are relevant.

First is the base rate, or the outcome of an appropriate reference class. In the case of the stock market, for instance, this would reflect the historical record of returns that the Global Investment Returns Yearbook series documents. The Yearbook provides a remarkably robust database from which to consider long-term returns. Second is the specific information about the case that you are examining. For markets, that would represent some sense of valuation and what that valuation implies about future returns. The final element is how to weight the base rate and the specific information at hand in order to create a sensible prediction. In some cases, most of the weight should be accorded to the base rate. In other instances, the specific information should carry the most weight. Kahneman and Tversky suggested that we tend to underweight the base rate in many of our predictions.

Here is one way to think about the problem of how to weight the information. If you are dealing with an activity where luck is the main factor in determining outcomes, you should place almost all of the weight on the base rate. For example, think of the spin of a roulette wheel or the roll of a die. The best estimate is some measure of the average, with an appropriate variance. If, by contrast, you are dealing with an activity where luck plays almost no role, you should place almost all of the weight on the specific information. For example, if you line up five people off the street against a

world class sprinter, you know the sprinter is going to win.

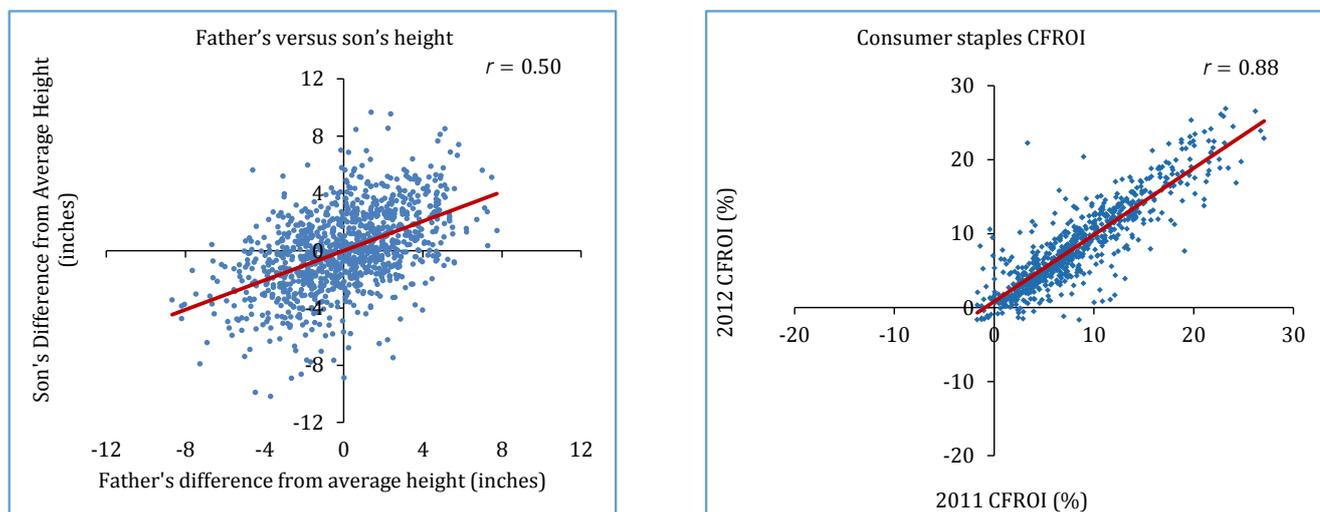
We can quantify the role of luck through the correlation coefficient, which statisticians denote by the letter r . The correlation coefficient measures the degree of linear relationship between variables in a pair of distributions. When the correlation coefficient is zero, what happens next is unrelated to what happened before. Results are random. When the correlation is 1.0, what happened before tells you what will happen next. The correlation coefficient takes a value from -1.0 (perfect negative correlation) to 1.0 (perfect positive correlation).

The main point, for our purpose, is that r gives you an indication of how to weight the base rate and specific information. If r is close to zero, rely on the base rate. If r is 1.0, the specific information is all you need. The correlation coefficient gives you an indication of the rate of reversion to the mean.

Let us consider a couple of examples to make this concrete. Take a look at Figure 3. On the left is the correlation between the heights of fathers and sons, which is 0.50. Part of a son's height is hereditary and part is environmental. Say a father is 76 inches tall and the average height of all men is 70 inches. To predict the son's height, you would equally weight the father's height of 76 inches (specific information) and the average height of 70 inches (base rate) for a prediction of 73 inches. Naturally, this prediction does not hold for any particular son, but it is the best prediction for a population of fathers of that height.

Figure 3
Correlation of father-son heights and consumer staples CFROIs

Source: Credit Suisse



Now examine the picture on the right of Figure 3, which shows the correlation between 2011 and 2012 cash flow return on investment (CFROI®) for more than 1,000 consumer staples companies around the world. Here, r approaches 0.90, which tells us that what happened last year is a very good indicator of what will happen this year. Assume a company has a CFROI of 13.5% and the average for the sector is 9.2%. The expected CFROI for the subsequent year is about 13%, as most of the weighting in the forecast goes to the specific information. There is some reversion to the mean, but overall the results are very persistent from year to year.

Now we turn our attention back to markets. Figure 4 shows the correlation coefficient for year-to-year total shareholder returns for the S&P 500 from 1928 to 2013 as well as the MSCI World Index from 1970 to 2013. In both cases, the r is very close to zero. In practical terms, this means that the best prediction of next year's return is something consistent with the base rate. For the S&P 500 from 1928 to 2013, for instance, the base rate is a nominal arithmetic return of 11.3% with a standard deviation of about 20%.

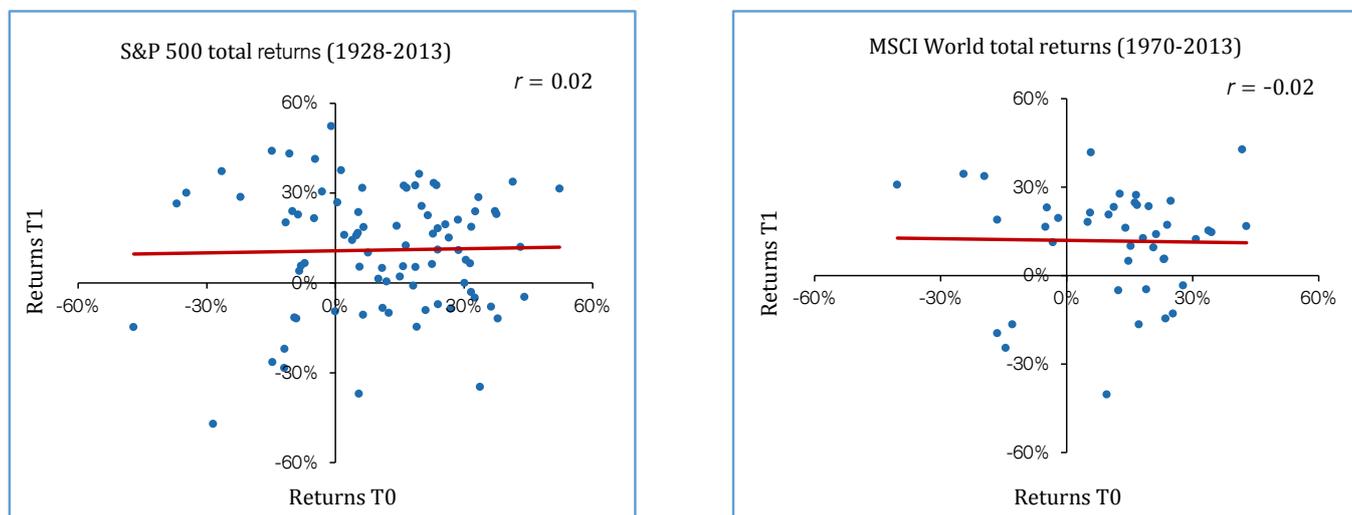
In 2013, most developed markets realized total shareholder returns above historical averages, led by Japan's gain of more than 50% and the greater than 30% rise in the United States. The MSCI World Index gained 27.4%. Emerging markets fared poorer, with the MSCI Emerging Market Index down 2%.

Andrew Garthwaite, Global Equity Strategist at Credit Suisse, forecasts total shareholder returns in the range of 9% for the United States equity market and 13% for global equities for 2014. The basis for this short-term forecast is that Credit Suisse's strategy team continues to believe that equity valuations remain attractive relative to bonds and that flows into equities have more to go. Naturally, a long-term forecast should appeal to the accumulation of data in the Yearbook. Since 1900, the return for US equities has exceeded that of ex-US equities by 1.9 percentage points per annum.

The lesson should be clear. Since year-to-year results for the stock market are very difficult to predict, investors should not be lured by last year's good results any more than they should be repelled by poor outcomes. It is better to focus on long-term averages and avoid being too swayed by recent outcomes. Avoiding the dumb money effect boils down to maintaining consistent exposure.

Figure 4
Correlation of year-to-year returns for S&P 500 and MSCI World Index

Source: Credit Suisse

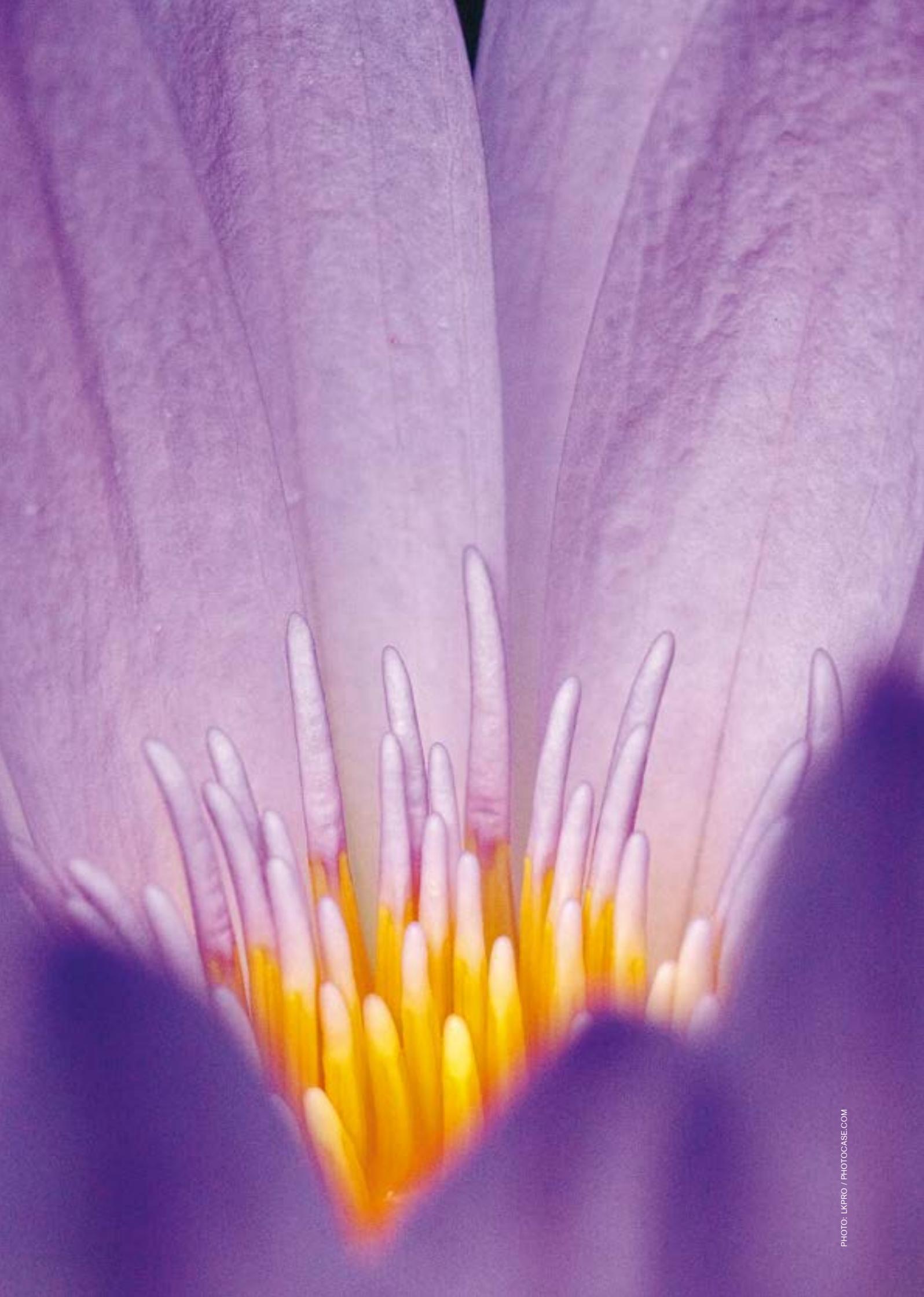


Summary

Equity investors earn, on average, returns that are well below those of the index. One of the determinants of this performance drag is the tendency to buy after the market has risen and to sell after the market has declined. This drives asset-weighted returns below time-weighted returns. We can trace this behavioral bias to the part of our brain that links cause and effect.

More than 40 years ago, Daniel Kahneman and Amos Tversky suggested an approach to making predictions that can help counterbalance this tendency. In cases where the correlation coefficient is close to zero, as it is for year-to-year equity market returns, a prediction that relies predominantly on the base rate is likely to outperform predictions derived from other approaches.

This suggests that investors should avoid getting too caught up in short-term results and rather focus on an asset allocation strategy that takes a long view. The Yearbook provides well-researched, long-term data that serve as the foundation for such a long-term strategy.





All markets

Country profiles

The coverage of the [Credit Suisse Global Investment Returns Yearbook](#) has expanded to 23 countries and three regions, all with index series that start in 1900. The three countries added in 2013 are Austria (with a 114-year record), Russia, and China, which have a gap in their financial market histories from the start of their communist régimes until securities trading recommenced. New for 2014 is Portugal (with a 114-year record). There is a 23-country world region, a 22-country world ex-US region, and a 16-country European region. For each region, there are stock and bond indices, measured in USD and weighted by equity market capitalization and GDP, respectively

Figure 1 shows the relative market capitalizations of world equity markets at our base date of end-1899. Figure 2 shows how they had changed by end-2013. Markets that are not included in the [Yearbook](#) dataset are colored black. As these pie charts show, the [Yearbook](#) covered 98% of the world equity market in 1900 and 91% at end-2013.

In the country pages that follow, there are three charts for each country or region with an unbroken history. The upper chart reports the cumulative real value of an initial investment in equities, long-term government bonds, and Treasury bills, with income reinvested for the last 114 years. The middle chart reports the annualized real returns on equities, bonds, and bills over this century, the last 50 years, and since 1900. The bottom chart reports the annualized premia achieved by equities relative to bonds and bills, by bonds relative to bills, and by the real exchange rate relative to the US dollar for the latter two periods.

Countries are listed alphabetically, starting on the next page, and followed by three regional groups. Extensive additional information is available in the [Credit Suisse Global Investment Returns Sourcebook 2014](#). This hard-copy reference book of over 220 pages, which is available through London Business School, also contains bibliographic information on the data sources for each country. The underlying annual returns data are redistributed by Morningstar Inc.

The Yearbook's global coverage

The [Yearbook](#) contains annual returns on stocks, bonds, bills, inflation, and currencies for 23 countries from 1900 to 2013. The countries comprise two North American nations (Canada and the USA), ten Eurozone states (Austria, Belgium, Finland, France, Germany, Ireland, Italy, the Netherlands, Portugal, and Spain), six European markets that are outside the euro area (Denmark, Norway, Russia, Sweden, Switzerland, and the UK), four Asia-Pacific countries (Australia, China, Japan and New Zealand), and one African market (South Africa). These countries covered 98% of the global stock market in 1900, and over 90% of its market capitalization by the start of 2014.

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

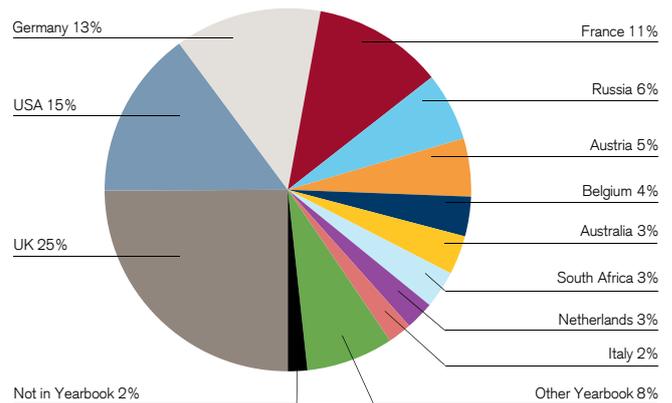
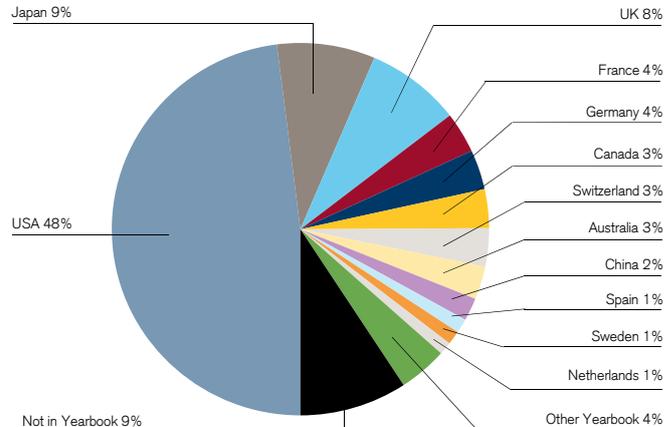


Figure 2
Relative sizes of world stock markets, end-2013



Source: Elroy Dimson, Paul Marsh, and Mike Staunton, [Credit Suisse Global Investment Returns Sourcebook 2014](#).

Data sources

1. Dimson, E., P. R. Marsh and M. Staunton, 2002, [Triumph of the Optimists](#), NJ: Princeton University Press
2. Dimson, E., P. R. Marsh and M. Staunton, 2007, The worldwide equity premium: a smaller puzzle, R Mehra (Ed.) [The Handbook of the Equity Risk Premium](#), Amsterdam: Elsevier
3. Dimson, E., P. R. Marsh and M. Staunton, 2014, [Credit Suisse Global Investment Returns Sourcebook 2014](#), Zurich: Credit Suisse Research Institute
4. Dimson, E., P. R. Marsh and M. Staunton, 2014, [The Dimson-Marsh-Staunton \(DMS\) Global Investment Returns Database](#), Morningstar Inc.

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



Australia

The lucky country

Australia is often described as “The Lucky Country” with reference to its natural resources, prosperity, weather, and distance from problems elsewhere in the world. But maybe Australians make their own luck. The Heritage Foundation ranked Australia as the *Yearbook* country with the highest economic freedom, while the Charities Aid Foundation study of World Giving ranked Australia as the most generous out of 146 countries in the world.

Whether it is down to luck, economic management or a generous spirit, Australia has been one of the two best-performing equity markets over the 114 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 ranks among the world’s top ten stock exchanges by value and turnover. Half the index is represented by banks (35%) and mining (14%), while the largest stocks at the start of 2014 are BHP Billiton, Commonwealth Bank of Australia, National Australia Bank, and Westpac Banking Corporation.

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 114 years, the real value of equities, with income reinvested, grew by a factor of 3332.5 as compared to 5.7 for bonds and 2.2 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 7.4%, bonds 1.5%, and bills 0.7%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 6.6%. For additional explanations of these figures, see page 37.

Figure 1 Cumulative real returns from 1900 to 2013

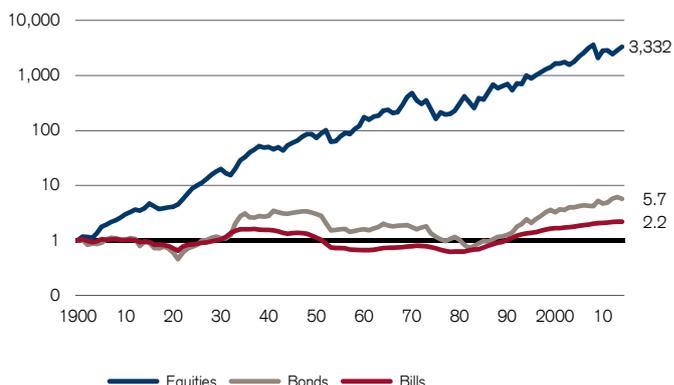


Figure 2 Annualized real returns on major asset classes (%)

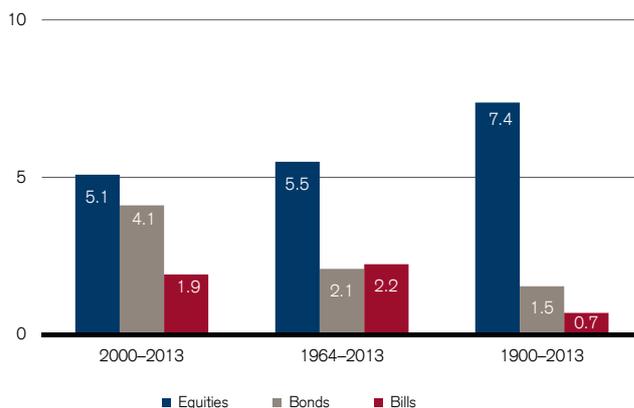
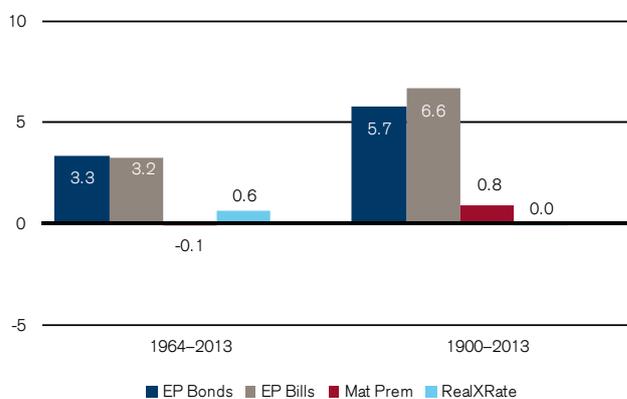


Figure 3 Annualized equity, bond, and currency premia (%)



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

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, *Credit Suisse Global Investment Returns Sourcebook 2014*.



Austria

Lost empire

The Austrian Empire was re-formed in the 19th century into Austria-Hungary, which, by 1900, was the second-largest country in Europe. It comprised modern-day Austria, Bosnia-Herzegovina, Croatia, Czech Republic, Hungary, Slovakia, Slovenia; large parts of Romania and Serbia; and small parts of Italy, Montenegro, Poland, and Ukraine. At the end of World War I and the break-up of the Habsburg Empire, the first Austrian republic was established.

Although Austria did not pay reparations after World War I, the country suffered hyperinflation during 1921–22 similar to that of Germany. In 1938, there was a union with Germany, and Austria ceased to exist as an independent country until after World War II. In 1955, Austria became an independent sovereign state again, becoming a member of the European Union in 1995, and a member of the Eurozone in 1999. Today, Austria is prosperous, enjoying the highest per capita GDP out of all countries in the EU.

Bonds were traded on the Wiener Börse from 1771 and shares from 1818 onward. Trading was interrupted by the world wars and, after the stock exchange reopened in 1948, share trading was sluggish – there was not a single IPO in the 1960s or 1970s. From the mid-1980s, building on Austria’s gateway to Eastern Europe, the Exchange’s activity expanded. Still, over the last 114 years, real stock market returns (0.7% per year) have been lower for Austria than for any other country with unbroken records from 1900 to date.

At the start of 2014, the largest Austrian company is Erste Group Bank (26% of the market), followed by OMV, Voestalpine, Andritz, and Immofinanz.

Capital market returns for Austria

Figure 1 shows that, over the last 114 years, the real value of equities, with income reinvested, grew by a factor of 2.1 as compared to 0.0088 for bonds and 0.0001 for bills. Figure 2 shows the long-term real index levels as annualized returns, with equities giving 0.7%, bonds –4.1%, and bills –8.1%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 5.6%. For additional explanations of these figures, see page 37.

Figure 1
Cumulative real returns from 1900 to 2013

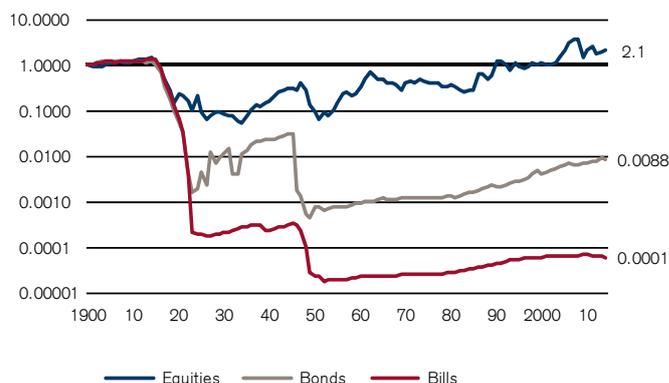


Figure 2
Annualized real returns on major asset classes (%)

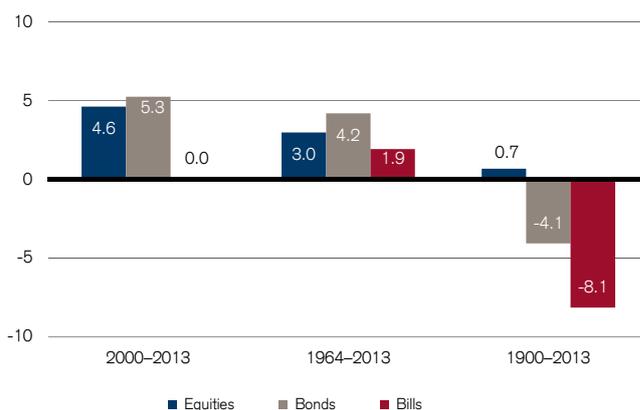
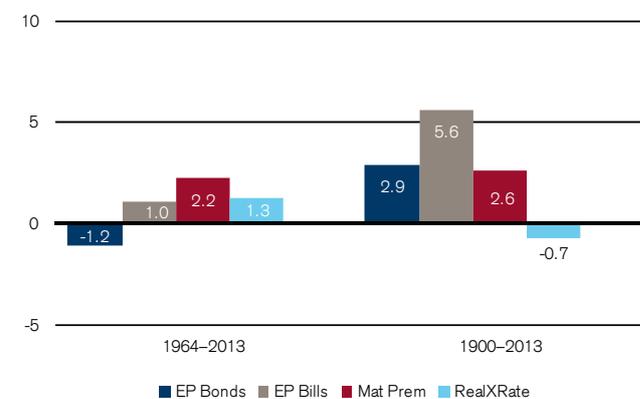


Figure 3
Annualized equity, bond, and currency premia (%)



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

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, *Credit Suisse Global Investment Returns Sourcebook 2014*.



Belgium

At the heart of Europe

Belgium lies at the crossroads of Europe's economic backbone and its key transport and trade corridors, and is the headquarters of the European Union. Belgium has been ranked the most global of the 208 nations that are scored in 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 three worst-performing equity markets and the seventh worst-performing bond market out of all those with a complete history.

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 banking crisis. Three large banks made up a majority of its market capitalization at the start of 2008, but the banking sector now represents only 10% of the index. By the start of 2014, most of the index (54%) was invested in just one company, Anheuser-Busch InBev, the leading global brewer and one of the world's top five consumer products companies.

In 2013, we made enhancements to our Belgian data series, drawing on work by Annaert, Buelens, and Deloof (2012), whom we acknowledge in the [Credit Suisse Global Investment Returns Sourcebook 2014](#).

Capital market returns for Belgium

Figure 1 shows that, over the last 114 years, the real value of equities, with income reinvested, grew by a factor of 19.3 as compared to 1.3 for bonds and 0.7 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 2.6%, bonds 0.2%, and bills -0.3%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 2.9%. For additional explanations of these figures, see page 37.

Figure 1
Cumulative real returns from 1900 to 2013



Figure 2
Annualized real returns on major asset classes (%)

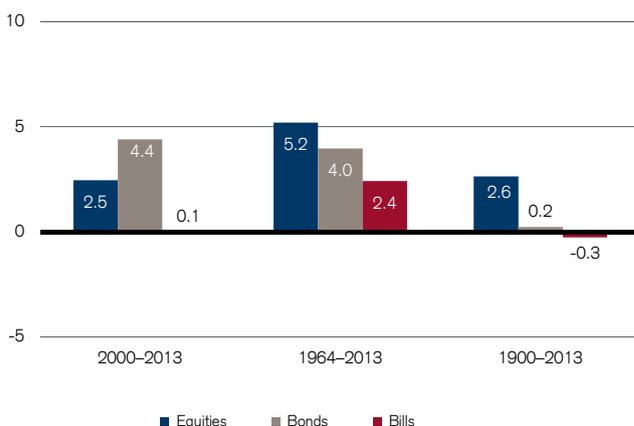
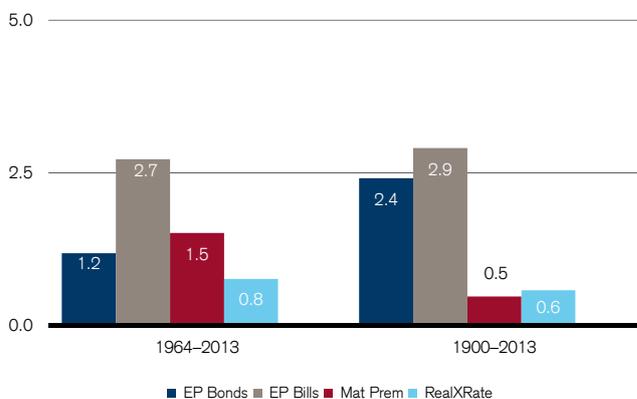


Figure 3
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Note: EP Bonds denotes the equity premium relative to long-term government bonds; EP Bills denotes the equity premium relative to Treasury bills; Mat Prem denotes the maturity premium for government bond returns relative to bill returns; and RealXRate denotes the real (inflation adjusted) change in the exchange rate against the US dollar.

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, [Credit Suisse Global Investment Returns Sourcebook 2014](#).



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 two out of all the countries monitored in the Country Brand Index. It is blessed with natural resources, having the world's second-largest oil reserves, while its mines are leading producers of nickel, gold, diamonds, uranium and lead. It is also a major exporter of soft commodities, especially grains and wheat, as well as lumber, pulp and paper.

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

Given Canada's natural endowment, it is no surprise that oil and gas has a 22% weighting, with a further 5% in mining stocks. Banks comprise 27% of the Canadian market. The largest stocks are currently Royal Bank of Canada, Toronto-Dominion Bank, Bank of Nova Scotia, and Suncor Energy.

Canadian equities have performed well over the long run, with a real return of 5.7% 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 114 years, the real value of equities, with income reinvested, grew by a factor of 583.3 as compared to 11.1 for bonds and 5.6 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 5.7%, bonds 2.1%, and bills 1.5%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 4.2%. For additional explanations of these figures, see page 37.

Figure 1
Cumulative real returns from 1900 to 2013

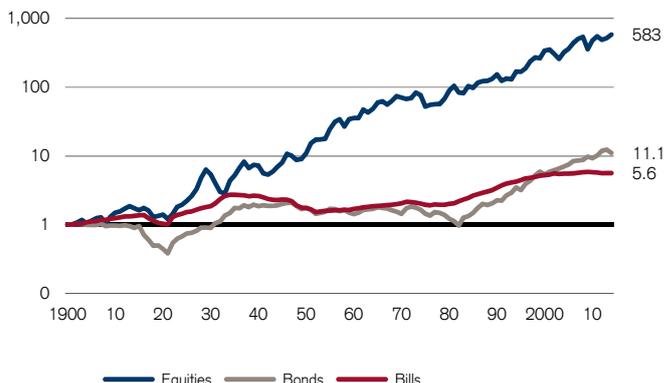


Figure 2
Annualized real returns on major asset classes (%)

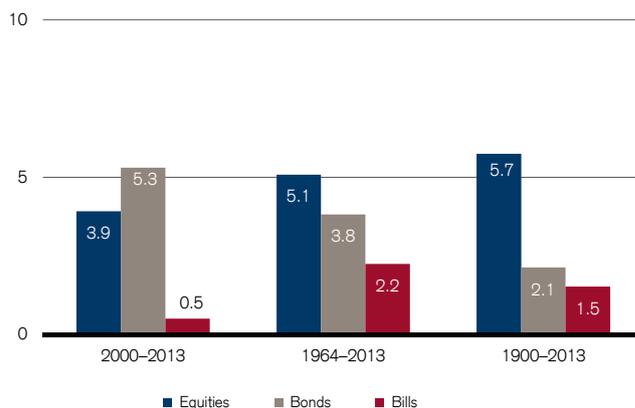
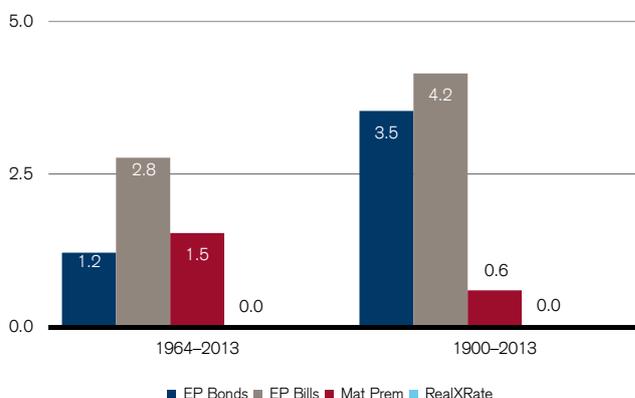


Figure 3
Annualized equity, bond, and currency premia (%)



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

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2014.



China

Emerging powerhouse

The world's most heavily populated country, China has over 1.3 billion inhabitants. After the Qing Dynasty, it became the Republic of China (ROC) in 1911. The ROC nationalists lost control of the mainland at the end of the 1946–49 civil war, after which their jurisdiction was limited to Taiwan and a few islands.

After the communist victory in 1949, privately owned assets were expropriated and government debt was repudiated, and the People's Republic of China (PRC) has been a single-party state. We therefore distinguish between three periods. First, the Qing period and the ROC. Second, the PRC until economic reforms were introduced. Third, the modern period following the second stage of China's economic reforms of the late 1980s and early 1990s.

Though a tiny proportion of assets held outside the mainland may have retained value, and some UK bondholders received a small settlement in 1987 for outstanding claims, we assume the communist takeover generated total losses for domestic investors. After 1940, we hold the nominal value of assets constant until 1949. This gives rise to a collapse in real values during the early 1940s. Chinese returns from 1900 are incorporated into the world and world ex-US indices.

China's economic growth since the reforms has been rapid, and it is now seen as an engine for the global economy. Intriguingly, China's fast GDP growth has not been accompanied by superior investment returns. Nearly half (41%) of the Chinese stock market's free-float capitalization is represented by financials, mainly banks and insurers. The largest companies are Tencent Holdings and China Mobile (each being 8% of the index), followed by China Construction Bank, the Industrial and Commercial Bank of China, and CNOOC.

Capital market returns for China

In addition to the performance from 1900 to the 1940s, Figure 1 shows that, over 1993–2013, the real value of equities, with income reinvested, grew by a factor of 0.4 as compared to 1.4 for bonds and 1.1 for bills. Figure 2 displays the 1993–2013 real index levels as annualized returns, with equities giving –3.8%, bonds 1.6%, and bills 0.5%. Figure 3 expresses the annualized real returns as premia. Since 1993, the annualized equity risk premium relative to bills has been –5.2%. For additional explanations of these figures, see page 37.

Figure 1 Cumulative real returns from 1900 to 2013

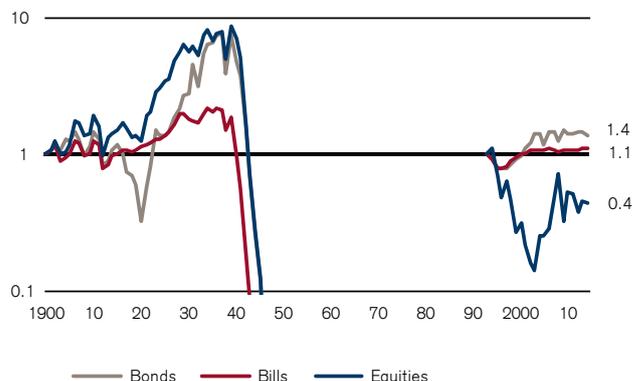


Figure 2 Annualized real returns on major asset classes (%)

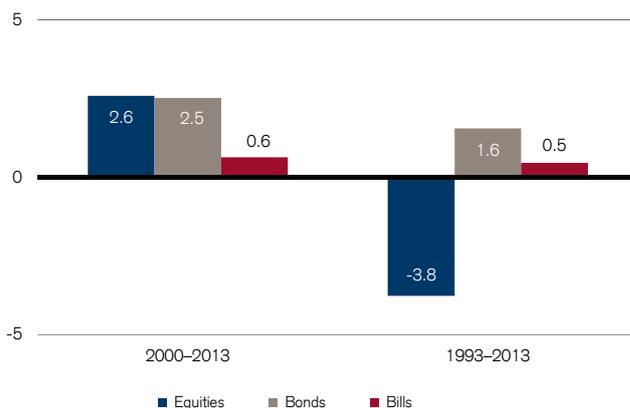
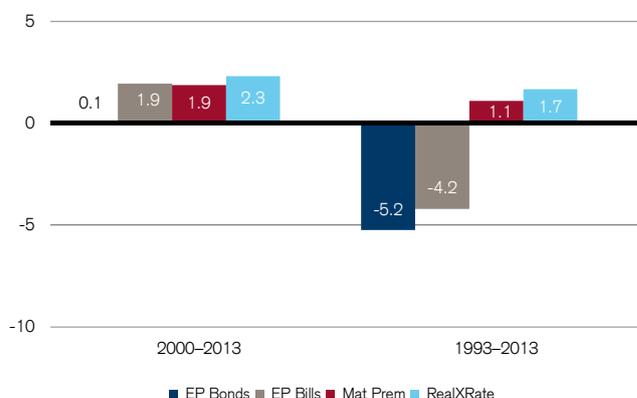


Figure 3 Annualized equity, bond, and currency premia (%)



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

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2014.



Denmark

Happiest nation

The United Nations World Happiness Report, published by Columbia University's Earth Institute, ranked Denmark the happiest nation on earth, ahead of Finland, Norway and the Netherlands. The Global Peace Index rates the country as the second most peaceful in the world (jointly with New Zealand). And, according to Transparency International, Denmark also ranked joint top with Finland and New Zealand as the least corrupt country in the world.

Whatever the source of Danish happiness and tranquility, it does not appear to spring from outstanding equity returns. Since 1900, Danish equities have given an annualized real return of 5.2%, which is close to the performance of the world equity index.

In contrast, Danish bonds gave an annualized real return of 3.1%, the highest among the *Yearbook* countries. This is because our Danish bond returns, unlike those for other *Yearbook* countries, include an element of credit risk. The returns are taken from a study by Claus Parum, who felt it was more appropriate to use mortgage bonds, rather than more thinly traded government bonds.

The Copenhagen Stock Exchange was formally established in 1808, but traces its roots back to the late 17th century. The Danish equity market is relatively small. It has a high weighting in healthcare (57%) and industrials (19%). Nearly one half (43%) of the Danish equity market is represented by one company, Novo-Nordisk. Other large companies include Danske Bank and AP Møller-Mærsk.

Capital market returns for Denmark

Figure 1 shows that, over the last 114 years, the real value of equities, with income reinvested, grew by a factor of 325.4 as compared to 32.1 for bonds and 11.1 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 5.2%, bonds 3.1%, and bills 2.1%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 3.0%. For additional explanations of these figures, see page 37.

Figure 1
Cumulative real returns from 1900 to 2013

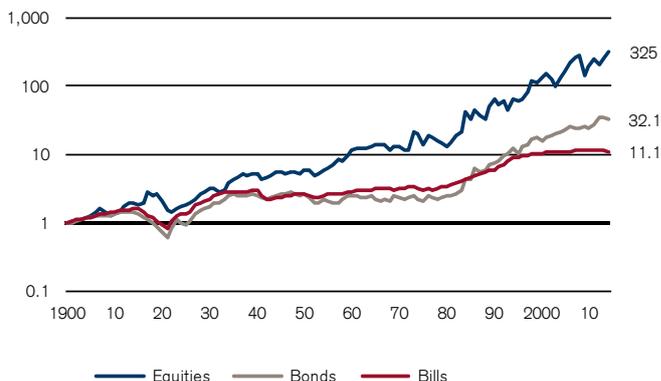


Figure 2
Annualized real returns on major asset classes (%)

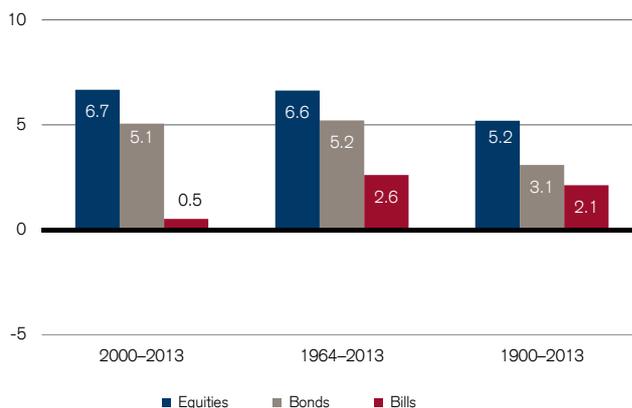
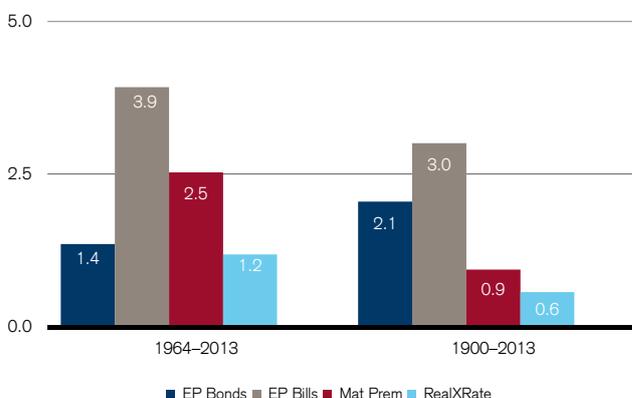


Figure 3
Annualized equity, bond, and currency premia (%)



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

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, *Credit Suisse Global Investment Returns Sourcebook 2014*.



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.

Recently, the Fund for Peace ranked Finland as the most stable country, while The Economist Intelligence Unit ranked the Finnish educational system as the world’s best. According to Transparency International, Finland ranked joint top with Denmark and New Zealand as the least corrupt country. A member of the European Union since 1995, Finland is the only Nordic state in the Eurozone. The Finns have transformed their country from a farm and forest-based community to a diversified industrial economy. 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 until 2012. 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 was a particularly concentrated stock market. Today, the largest Finnish companies are currently Nokia (25% of the market), Sampo (19% of the market), and Kone (14%).

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

Capital market returns for Finland

Figure 1 shows that, over the last 114 years, the real value of equities, with income reinvested, grew by a factor of 364.2 as compared to 1.0 for bonds and 0.6 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 5.3%, bonds 0.0%, and bills –0.5%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 5.9%. For additional explanations of these figures, see page 37.

Figure 1
Cumulative real returns from 1900 to 2013

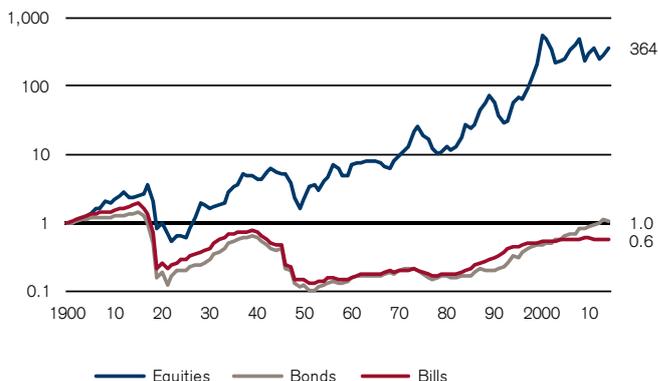


Figure 2
Annualized real returns on major asset classes (%)

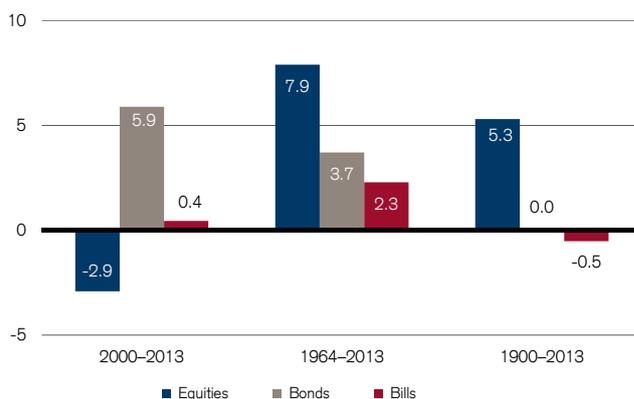
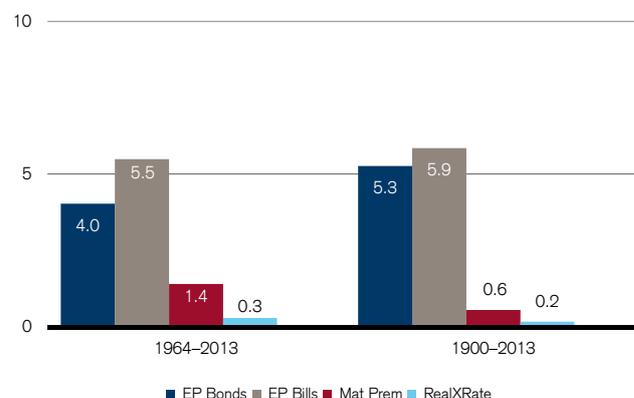


Figure 3
Annualized equity, bond, and currency premia (%)



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Source: Elroy Dimson, Paul Marsh, and Mike Staunton, [Credit Suisse Global Investment Returns Sourcebook 2014](#).



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 fourth in the world, and one of the largest bond markets in the world. At the start of 2014, France's largest listed companies were Sanofi, Total, LVMH, and BNP Paribas.

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

Capital market returns for France

Figure 1 shows that, over the last 114 years, the real value of equities, with income reinvested, grew by a factor of 34.9 as compared to 1.0 for bonds and 0.04 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 3.2%, bonds 0.0%, and bills –2.8%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 6.1%. For additional explanations of these figures, see page 37.

Figure 1 Cumulative real returns from 1900 to 2013

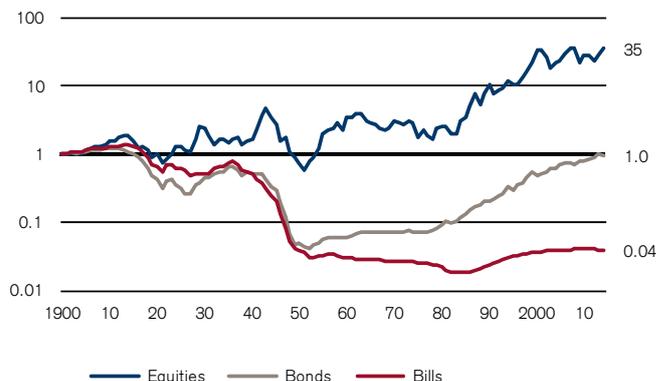


Figure 2 Annualized real returns on major asset classes (%)

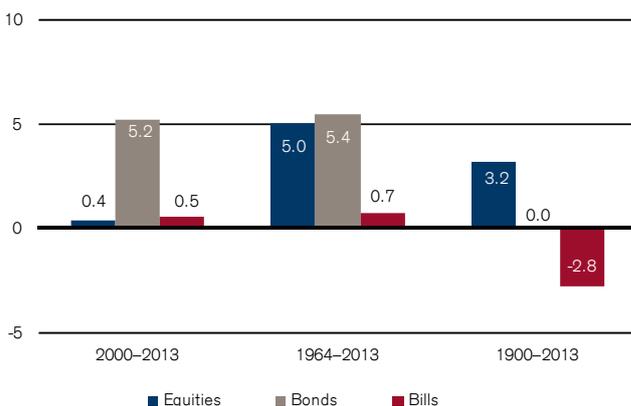
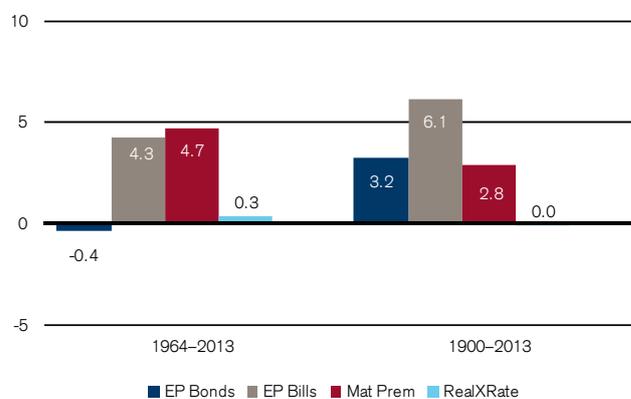


Figure 3 Annualized equity, bond, and currency premia (%)



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

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2014.



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 second-lowest inflation rate, its strongest currency (now the euro), and an especially strong bond market.

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

The German stock market retains its bias toward manufacturing, with weightings of 23% in basic materials, 23% in consumer goods, and 15% in industrials. The largest stocks are Siemens, BASF, Beyer, SAP, and Allianz.

Capital market returns for Germany

Figure 1 shows that, over the last 114 years, the real value of equities, with income reinvested, grew by a factor of 37.6 as compared to 0.2 for bonds and 0.1 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 3.2%, bonds –1.6%, and bills –2.4%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 6.1%. For additional explanations of these figures, see page 37.

Figure 1 Cumulative real returns from 1900 to 2013

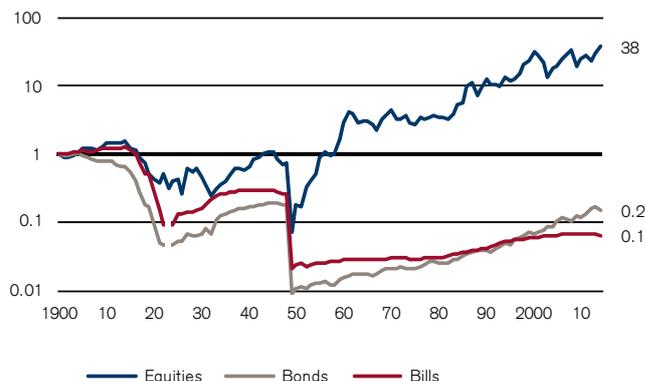


Figure 2 Annualized real returns on major asset classes (%)

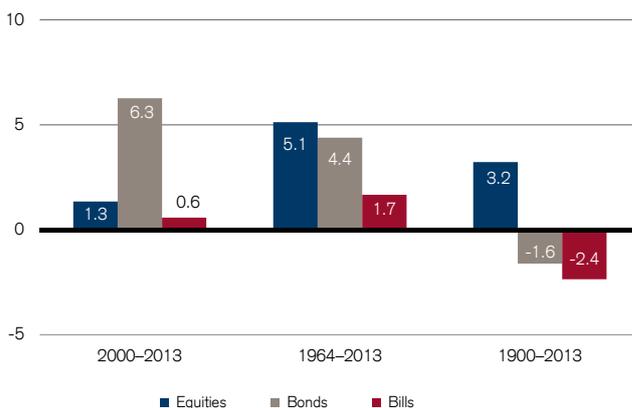
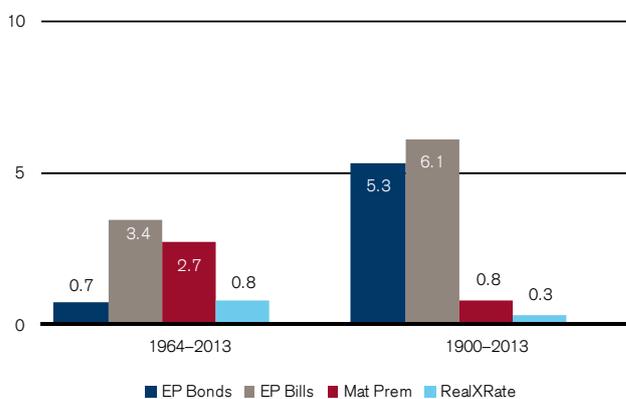


Figure 3 Annualized equity, bond, and currency premia (%)



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

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2014.



Ireland

Born free

Ireland was born as an independent country in 1922 as the Irish Free State, released from 700 years of Norman and later British 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 still faces hardship. Just as the Born Free Foundation aims to free tigers from being held captive, 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 boom was based on real estate, financials and leverage, and Irish stocks are now worth less than half 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 2014, they were no longer represented. The captive tiger now has a smaller bite.

Stock exchanges had existed from 1793 in Dublin and Cork. 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 adopted the euro from the outset of the Eurozone.

Capital market returns for Ireland

Figure 1 shows that, over the last 114 years, the real value of equities, with income reinvested, grew by a factor of 96.6 as compared to 4.9 for bonds and 2.1 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 4.1%, bonds 1.4%, and bills 0.7%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 3.4%. For additional explanations of these figures, see page 37.

Figure 1
Cumulative real returns from 1900 to 2013



Figure 2
Annualized real returns on major asset classes (%)

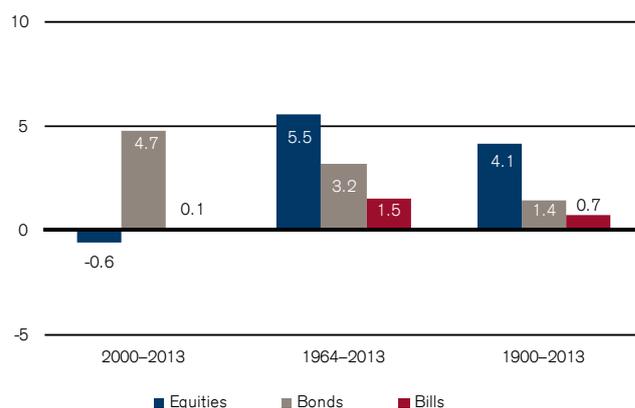
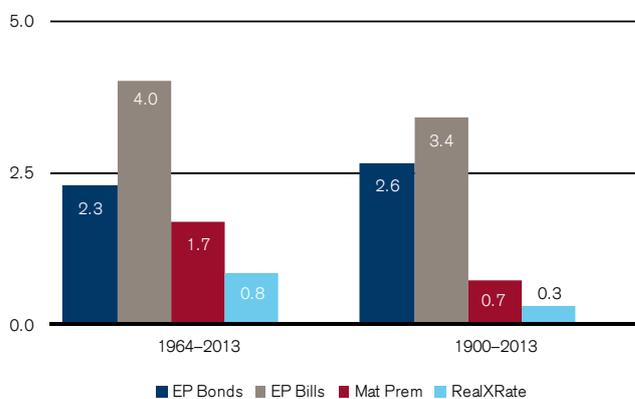


Figure 3
Annualized equity, bond, and currency premia (%)



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

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, *Credit Suisse Global Investment Returns Sourcebook 2014*.



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. Reflecting its international heritage, Italy was ranked by the KOF Index as the most politically globalized country in the world.

Italy retains a large banking sector to this day, with banks still accounting for a quarter (24%) of the Italian equity market, and insurance a further 10%. Oil and gas accounts for 21%, and the largest stocks traded on the Milan Stock Exchange are Eni, Enel, Unicredit, and Generali.

Sadly, Italy has experienced some of the poorest asset returns of any Yearbook country. Since 1900, the annualized real return from equities has been 1.9%, which is one of the three lowest returns out of the Yearbook countries. After Germany and Austria, which experienced especially severe hyperinflations, Italy has suffered the poorest real bond and real bill returns of any Yearbook country, the highest inflation rate, and the weakest currency.

Today, Italy's stock market is just in the world's largest 20, but its highly developed bond market is the world's third largest.

Capital market returns for Italy

Figure 1 shows that, over the last 114 years, the real value of equities, with income reinvested, grew by a factor of 8.6 as compared to 0.2 for bonds and 0.02 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 1.9%, bonds -1.5%, and bills -3.6%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 5.7%. For additional explanations of these figures, see page 37.

Figure 1 Cumulative real returns from 1900 to 2013

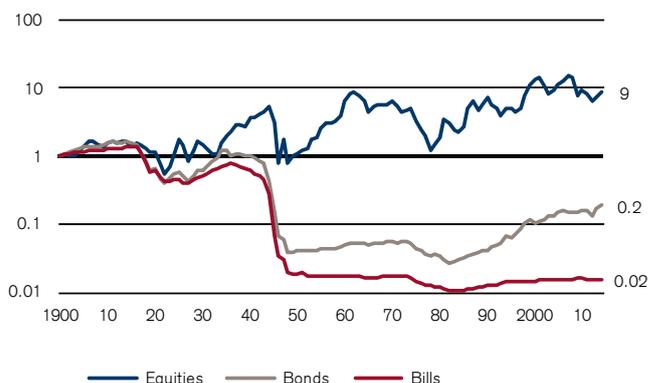


Figure 2 Annualized real returns on major asset classes (%)

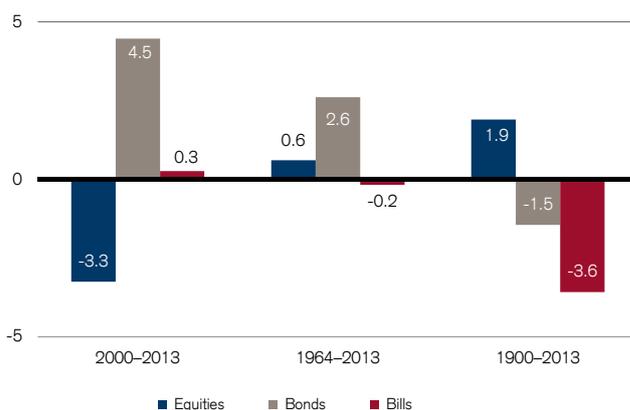
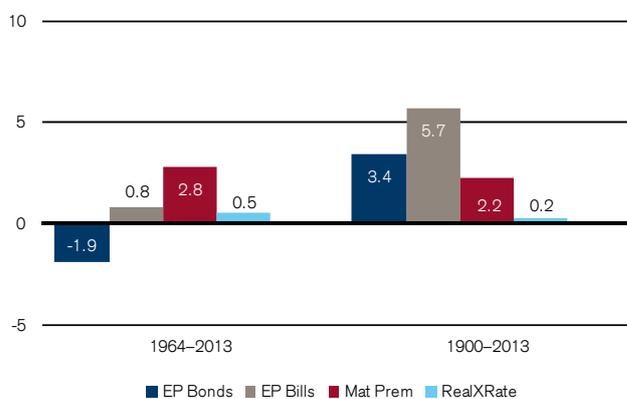
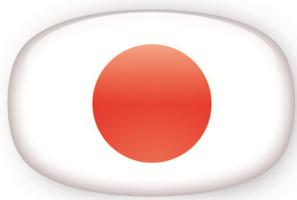


Figure 3 Annualized equity, bond, and currency premia (%)



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

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2014.



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 41% weighting in the world index, as compared to 30% for the USA. Real estate values were also riding high and it was asserted 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 2014, its capital value is still close to one third of its value at the beginning of the 1990s. Its weighting in the world index fell from 41% to 8%. Meanwhile, Japan suffered a prolonged period of stagnation, banking crises and deflation. Hopefully, this will not form the blueprint for other countries facing a financial crisis.

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

Capital market returns for Japan

Figure 1 shows that, over the last 114 years, the real value of equities, with income reinvested, grew by a factor of 98.2 as compared to 0.3 for bonds and 0.1 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 4.1%, bonds -1.0%, and bills -1.9%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 6.1%. For additional explanations of these figures, see page 37.

Figure 1 Cumulative real returns from 1900 to 2013

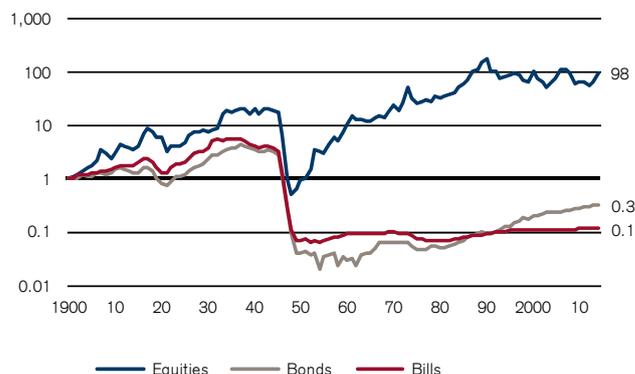


Figure 2 Annualized real returns on major asset classes

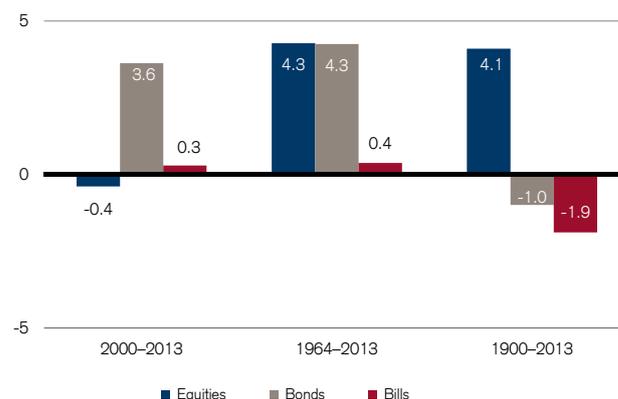
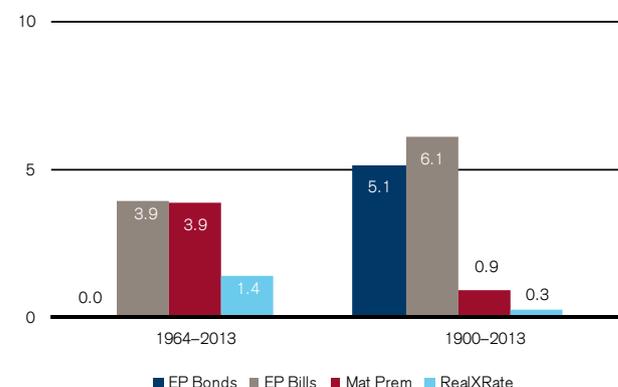


Figure 3 Annualized equity, bond, and currency premia



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

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2014.



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 4.9% per year. The Netherlands has traditionally been a low inflation country and, since 1900, has enjoyed the lowest inflation rate among the EU countries and the second lowest (after Switzerland) from among all the countries covered in the *Yearbook*.

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, Koninklijke Philips, ArcelorMittal, ING Group, Akzo Nobel, and ASML Holding.

Capital market returns for the Netherlands

Figure 1 shows that, over the last 114 years, the real value of equities, with income reinvested, grew by a factor of 246.4 as compared to 5.5 for bonds and 2.0 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 4.9%, bonds 1.5%, and bills 0.6%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 4.3%. For additional explanations of these figures, see page 37.

Figure 1
Cumulative real returns from 1900 to 2013

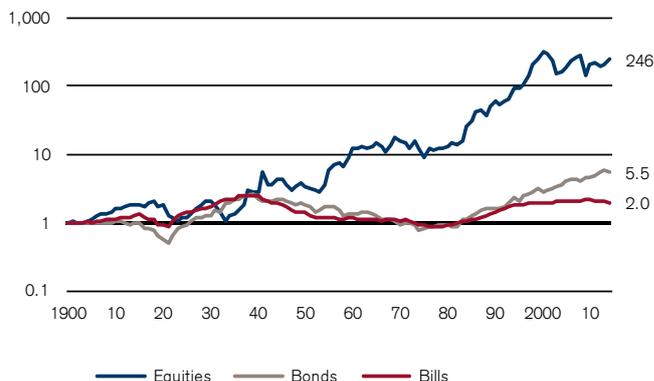


Figure 2
Annualized real returns on major asset classes (%)

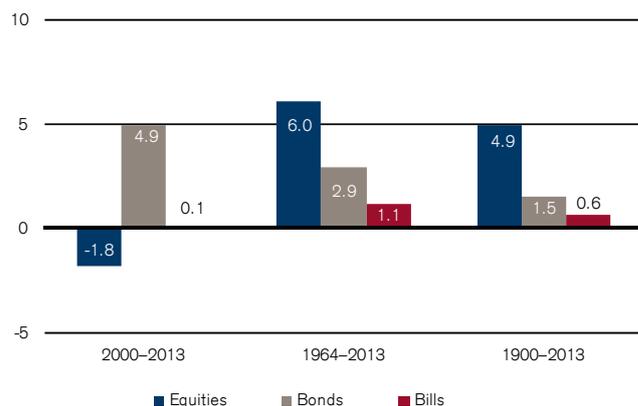
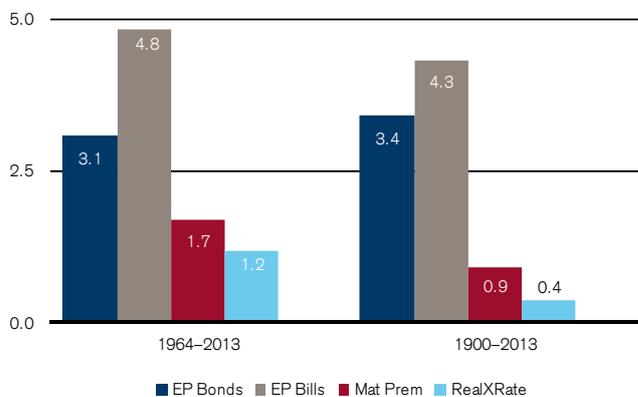


Figure 3
Annualized equity, bond, and currency premia (%)



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

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, *Credit Suisse Global Investment Returns Sourcebook 2014*.



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, New Zealand ranked joint top in 2013 with Denmark and Finland 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 rates the country as the second most peaceful in the world (with Denmark).

The British colony of New Zealand became an independent dominion in 1907. Traditionally, New Zealand’s economy was built upon a few primary products, notably wool, meat and dairy products. It was dependent on concessionary access to British markets until 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 (23% of the index), Telecom Corporation of New Zealand (17%), and Auckland International Airport.

Capital market returns for New Zealand

Figure 1 shows that, over the last 114 years, the real value of equities, with income reinvested, grew by a factor of 778.5 as compared to 10.0 for bonds and 6.5 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 6.0%, bonds 2.0%, and bills 1.7%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 4.3%. For additional explanations of these figures, see page 37.

Figure 1
Cumulative real returns from 1900 to 2013

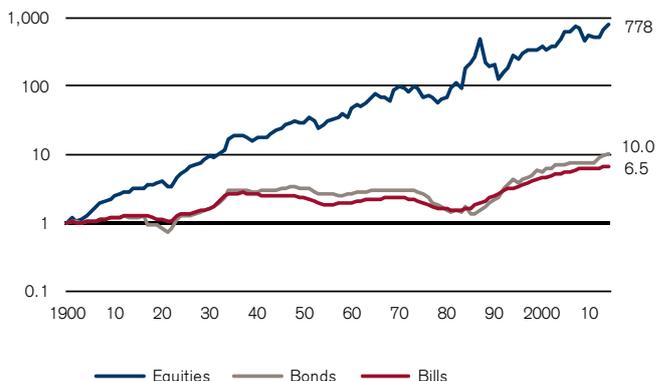


Figure 2
Annualized real returns on major asset classes (%)

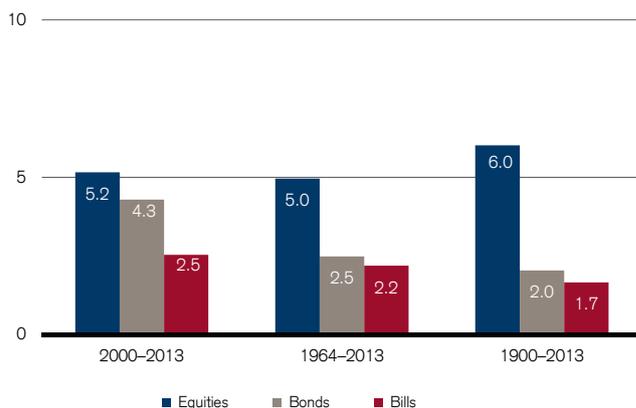
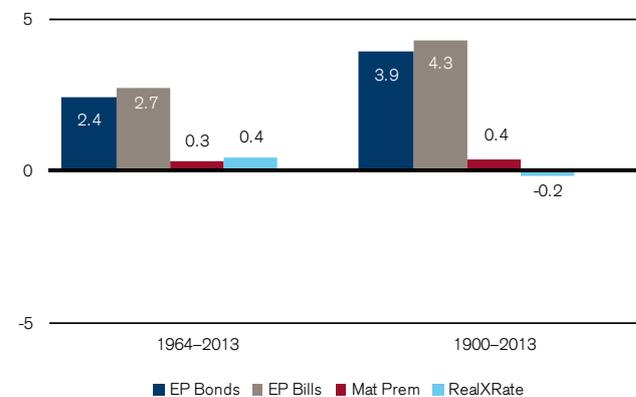


Figure 3
Annualized equity, bond, and currency premia (%)



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

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2014.



Norway

Nordic oil kingdom

Norway is a very small country (ranked 115th by population and 61st by land area) surrounded by large natural resources. It is the only country that is self sufficient in electricity production (through hydro power) and it is one of the world's largest exporters of oil. Norway is the second-largest exporter of fish.

The population of 4.9 million enjoys the largest GDP per capita in the world, beaten only by a few city states. Norwegians live under a constitutional monarchy outside the eurozone. Prices are high: The Economist's Big Mac Index recently reported that a burger in Norway was more expensive than any other country. 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 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 of over 0.8 trillion US dollars. The fund invests predominantly in equities and, on average, it owns more than 1% of every listed company in the world.

The largest Oslo Stock Exchange stocks are Statoil, DNB, Telenor, and SeaDrill.

Capital market returns for Norway

Figure 1 shows that, over the last 114 years, the real value of equities, with income reinvested, grew by a factor of 116.3 as compared to 7.4 for bonds and 3.6 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 4.3%, bonds 1.8%, and bills 1.1%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 3.1%. For additional explanations of these figures, see page 37.

Figure 1
Cumulative real returns from 1900 to 2013

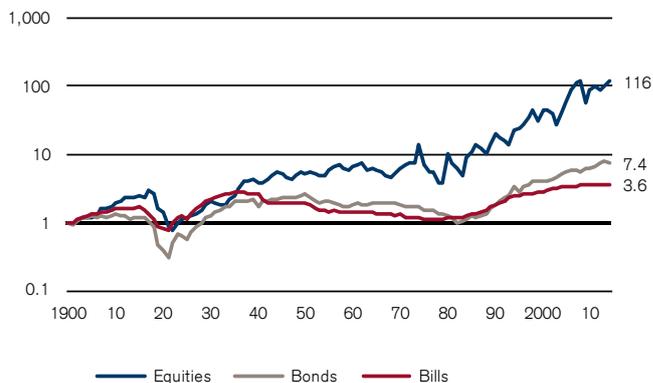


Figure 2
Annualized real returns on major asset classes (%)

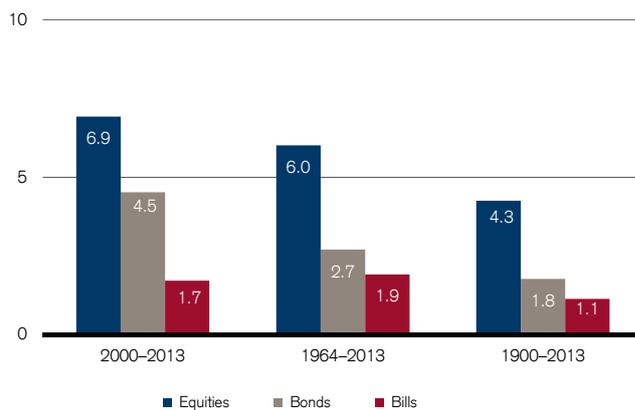
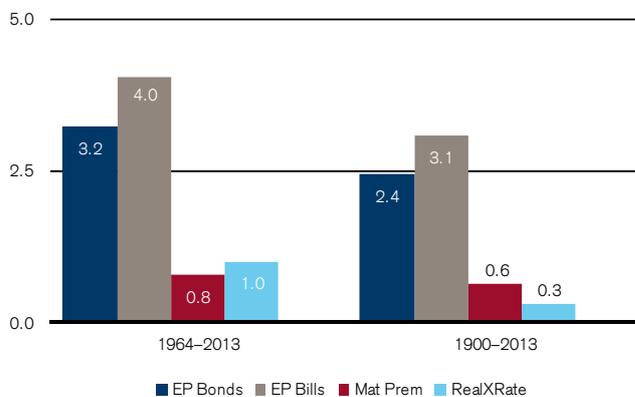


Figure 3
Annualized equity, bond, and currency premia (%)



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

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2014.



Portugal

Land of discoverors

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

Modern Portugal emerged in 1974 from the Carnation Revolution, a bloodless military coup which overthrew the former regime. The country joined the European Union in 1986 and was among the first to adopt the euro. In the second decade of the 21st century the Portuguese economy suffered its most severe recession since the 1970s, and unemployment still remains high.

Over the long haul, since 1900, Portuguese shares have given an inflation-adjusted return of 3.7%. Government bonds provided an annualized real return of 0.6%, so the equity premium relative to bonds was 3.0%.

The companies with the largest market capitalizations are in the energy and utility sectors – comprising 22% in oil and gas plus 32% in electric utilities. The largest companies traded in Lisbon, each comprising more than one fifth of index value, are Galp Energia, Jeronimo Martins, and EDP.

The data for Portuguese equities come from a newly completed study by da Costa and Mata (2014), whose research is cited in full in the [Credit Suisse Global Investment Returns Sourcebook 2014](#).

Capital market returns for Portugal

Figure 1 shows that, over the last 114 years, the real value of equities, with income reinvested, grew by a factor of 60.2 as compared to 2.0 for bonds and 0.3 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 3.7%, bonds 0.6%, and bills -1.1%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 4.8%. For additional explanations of these figures, see page 37.

Figure 1 Cumulative real returns from 1900 to 2013

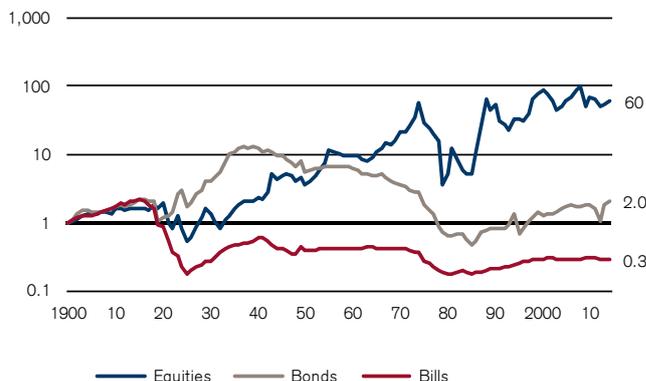


Figure 2 Annualized real returns on major asset classes (%)

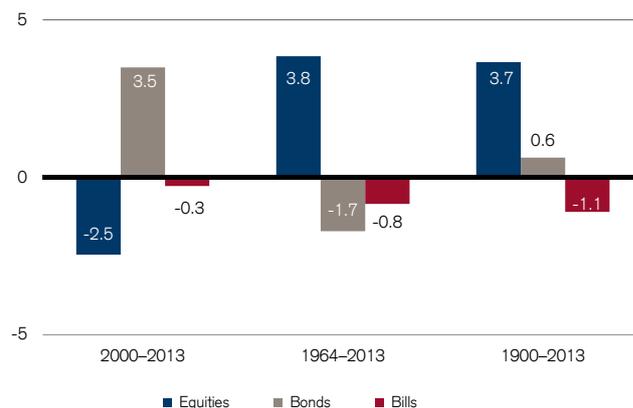
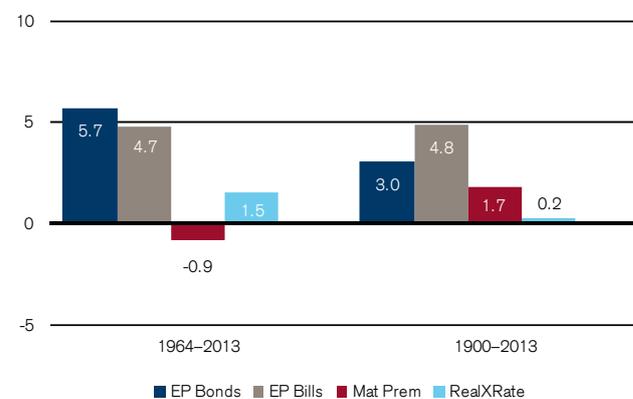


Figure 3 Annualized equity, bond, and currency premia (%)



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

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, [Credit Suisse Global Investment Returns Sourcebook 2014](#).



Russia

Wealth of resources

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

After the 1917 revolution, Russia ceased to be a market economy. We therefore distinguish between three periods. First, the Russian Empire up to 1917. Second, the long interlude following Soviet expropriation of private assets and the repudiation of Russia's government debt. Third, the Russian Federation, following the dissolution of the Soviet Union in 1991.

Very limited compensation was eventually paid to British and French bondholders in the 1980s and 1990s, respectively, but investors in aggregate still lost more than 99% in present value terms. The 1917 revolution is deemed to have resulted in complete losses for domestic stock- and bondholders. Russian returns are incorporated into the world, world ex-US, and Europe indices.

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

By the beginning of 2014, over half (51%) of the Russian stock market comprised oil and gas companies, the largest being Gazprom and Lukoil. Adding in basic materials, resources are close to two-thirds of market capitalization. The next largest stock is Sberbank.

Capital market returns for Russia

In addition to performance from 1900 to 1917, Figure 1 shows that, over 1995–2013, the real value of equities, with income reinvested, grew by a factor of 2.9 as compared to 3.1 for bonds and 0.7 for bills. Figure 2 displays the 1995–2013 real index levels as annualized returns, with equities giving 5.8%, bonds 6.1%, and bills –2.2%. Figure 3 expresses these annualized real returns as premia. Since 1995, the annualized equity risk premium relative to bills has been 8.2%. For additional explanations of these figures, see page 37.

Figure 1 Cumulative real returns from 1900 to 2013

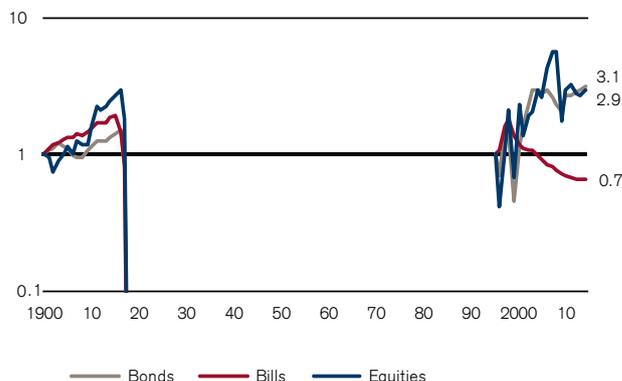


Figure 2 Annualized real returns on major asset classes (%)

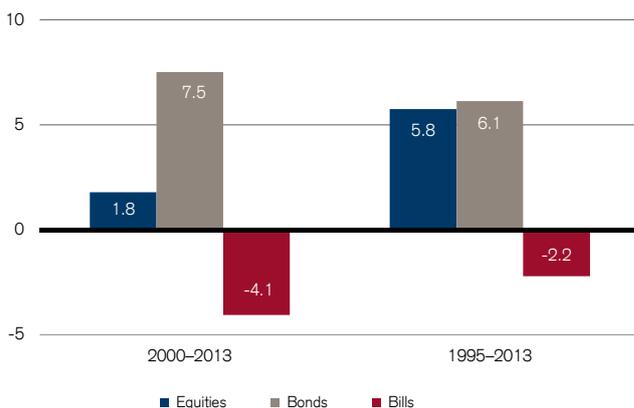
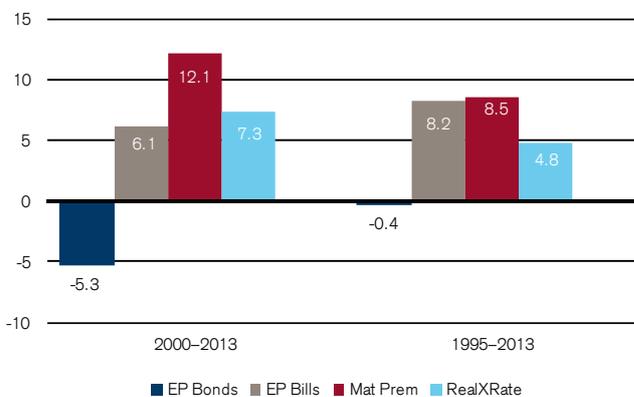


Figure 3 Annualized equity, bond, and currency premia (%)



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

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2014.



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 7.4% per year, which is the 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 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. Financials account for 23%, while basic minerals lag behind with only 11% of the market capitalization. The largest JSE stocks are MTN, Naspers, Sasol, and Standard Bank.

Capital market returns for South Africa

Figure 1 shows that, over the last 114 years, the real value of equities, with income reinvested, grew by a factor of 3372.4 as compared to 8.1 for bonds and 3.0 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 7.4%, bonds 1.8%, and bills 1.0%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 6.3%. For additional explanations of these figures, see page 37.

Figure 1
Cumulative real returns from 1900 to 2013

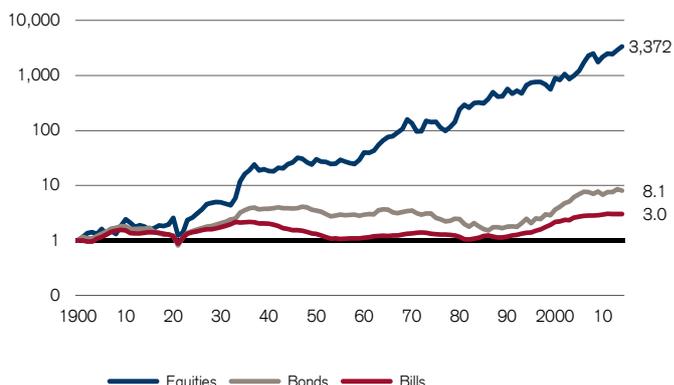


Figure 2
Annualized real returns on major asset classes (%)

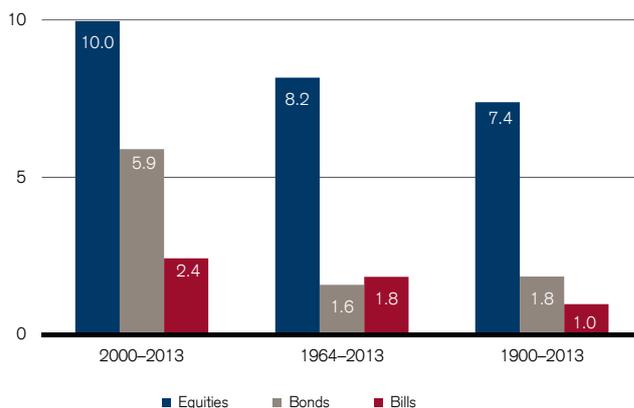
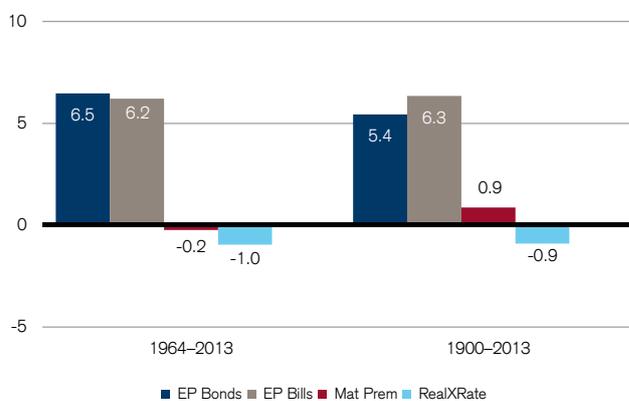


Figure 3
Annualized equity, bond, and currency premia (%)



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

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, [Credit Suisse Global Investment Returns Sourcebook 2014](#).



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.

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 is now the fourteenth-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 Banco Santander, Telefonica, BBVA, and Inditex.

Capital market returns for Spain

Figure 1 shows that, over the last 114 years, the real value of equities, with income reinvested, grew by a factor of 57.3 as compared to 5.1 for bonds and 1.4 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 3.6%, bonds 1.4%, and bills 0.3%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 3.3%. For additional explanations of these figures, see page 37.

Figure 1 Cumulative real returns from 1900 to 2013

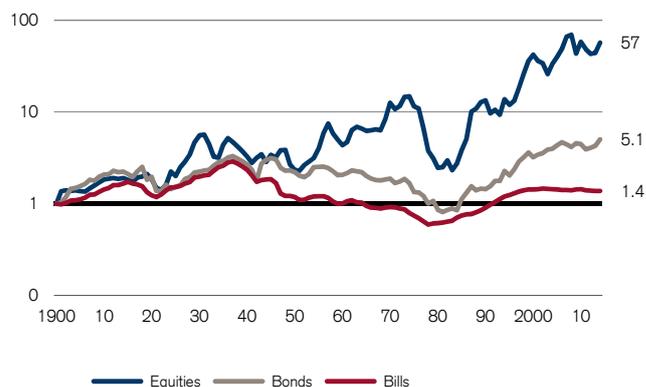


Figure 2 Annualized real returns on major asset classes (%)

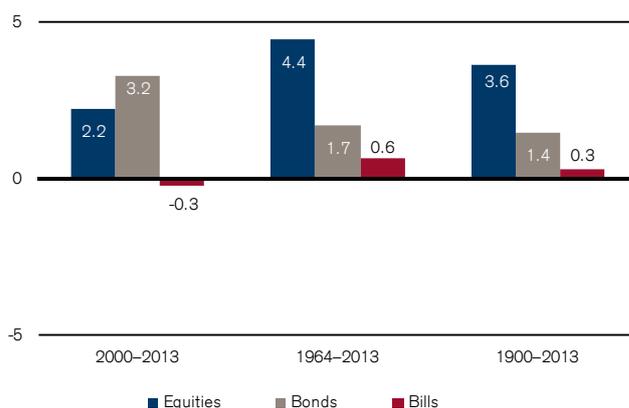
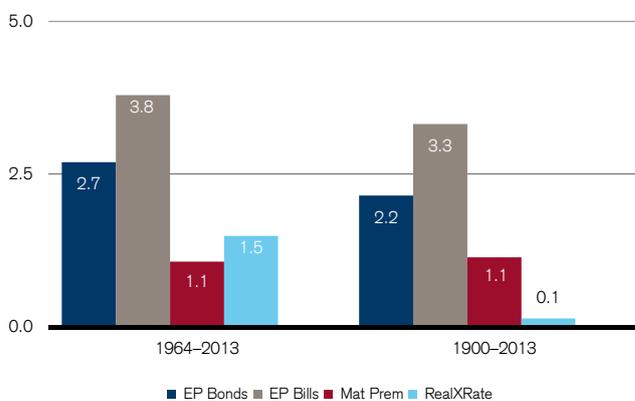


Figure 3 Annualized equity, bond, and currency premia (%)



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

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2014.



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 six.

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 of industrial holding companies in the 1980s. Overall, they have returned 5.8% per year. Details on our Swedish index data and sources are provided in the [Credit Suisse Global Investment Returns Sourcebook 2014](#).

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

Despite the high rankings for real bond and bill returns, Nobel prize winners would rue the instruction to invest in safe securities as the real return on bonds was only 2.6% per year, and that on bills only 1.9% per year. With the capital invested in domestic equities, the winners would have maximized their fortunes as well as their fame.

In Sweden, the financial sector accounts for a third (34%) of equity market capitalization. The largest single company is Hennes and Mauritz, followed by Nordea Bank and Ericsson.

In 2013, we made enhancements to our series for Swedish equities, drawing on work by Gernandt, Palm, and Waldenström (2012), whom we acknowledge in the [Credit Suisse Global Investment Returns Sourcebook 2014](#).

Capital market returns for Sweden

Figure 1 shows that, over the last 114 years, the real value of equities, with income reinvested, grew by a factor of 600.7 as compared to 17.7 for bonds and 8.4 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 5.8%, bonds 2.6%, and bills 1.9%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 3.8%. For additional explanations of these figures, see page 37.

Figure 1
Cumulative real returns from 1900 to 2013

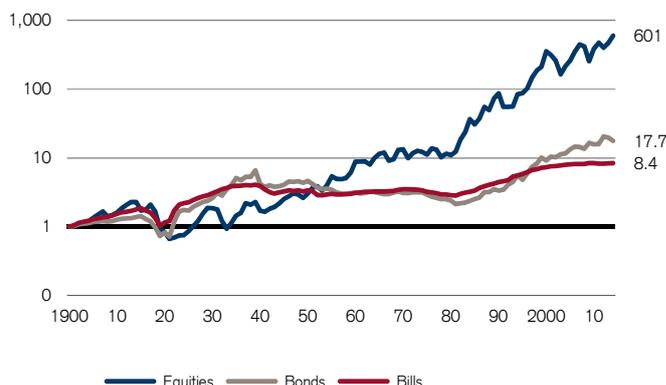


Figure 2
Annualized real returns on major asset classes (%)

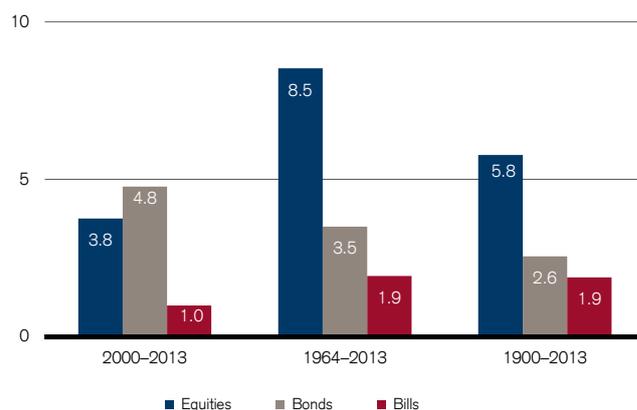
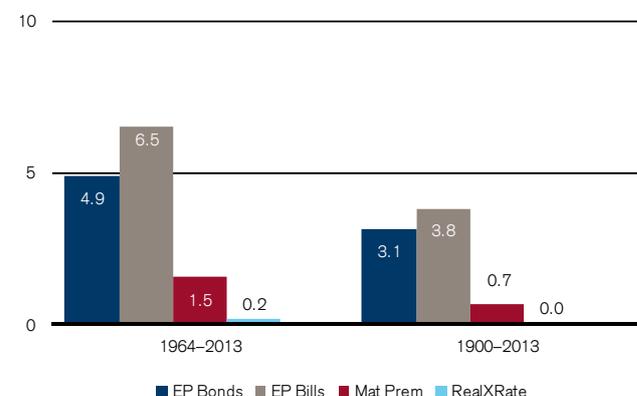
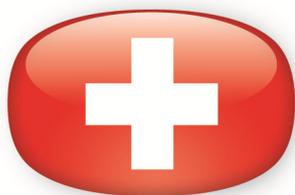


Figure 3
Annualized equity, bond, and currency premia (%)



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

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, [Credit Suisse Global Investment Returns Sourcebook 2014](#).



Switzerland

Traditional safe haven

For a small country with just 0.1% of the world's population and less than 0.01% of its land mass, Switzerland punches well above its weight financially and wins several gold medals in the global financial stakes. In the Global Competitiveness Report 2012–2013, Switzerland is top ranked in the world. It also moved up one place in 2013 to be ranked by Future Brand Index as the world's number one country brand.

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 3.2% of total world value.

Since 1900, Swiss equities have achieved an acceptable real return of 4.4%, while Switzerland has been one of the world's four best-performing government bond markets, with an annualized real return of 2.2%. Switzerland has also enjoyed the world's lowest inflation rate: just 2.2% 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 pharmaceutical sector accounts for a third (33%) of the equity market. Listed companies include world leaders such as Nestle, Novartis, and Roche, which together comprise more than half of the equity market capitalization of Switzerland.

Capital market returns for Switzerland

Figure 1 shows that, over the last 114 years, the real value of equities, with income reinvested, grew by a factor of 137.1 as compared to 12.3 for bonds and 2.5 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 4.4%, bonds 2.2%, and bills 0.8%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 3.6%. For additional explanations of these figures, see page 37.

Figure 1 Cumulative real returns from 1900 to 2013



Figure 2 Annualized real returns on major asset classes (%)

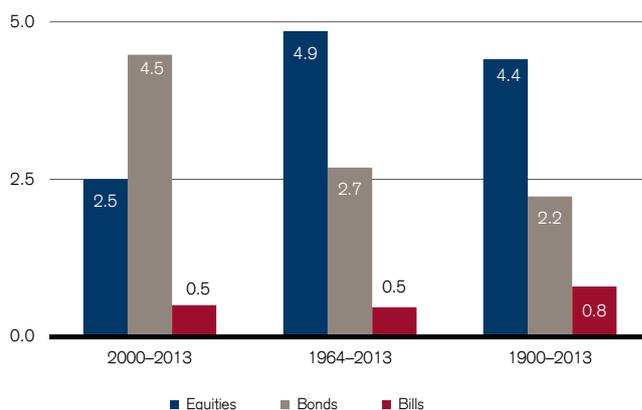
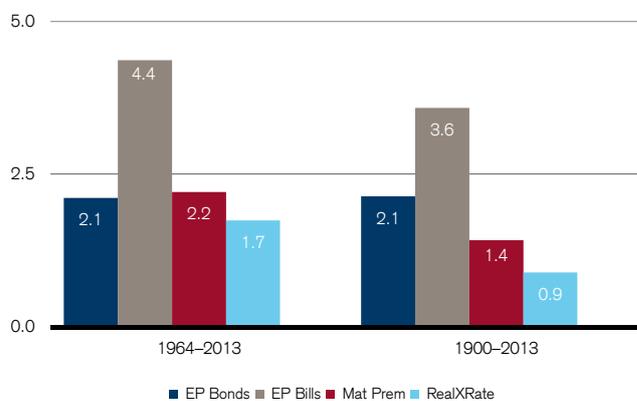


Figure 3 Annualized equity, bond, and currency premia (%)



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

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2014.



United Kingdom

Global center

Organized stock trading in the United Kingdom dates from 1698, and the London Stock Exchange was formally established in 1801. By 1900, the UK equity market was the largest in the world, and London was the world's leading financial center, specializing in global and cross-border finance.

Early in the 20th century, the US equity market overtook the UK and, nowadays, New York is a larger financial center than London. What continues to set London apart, and justifies its claim to be the world's leading international financial center, is the global, cross-border nature of much of its business.

Today, London is ranked as the top financial center in the Global Financial 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 seventh-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.

London is now the location at which Royal Dutch Shell is listed. Other major UK companies include HSBC, BP, Vodafone, and GlaxoSmithKline.

Capital market returns for the United Kingdom

Figure 1 shows that, over the last 114 years, the real value of equities, with income reinvested, grew by a factor of 372.4 as compared to 4.9 for bonds and 2.8 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 5.3%, bonds 1.4%, and bills 0.9%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 4.4%. For additional explanations of these figures, see page 37.

Figure 1
Cumulative real returns from 1900 to 2013

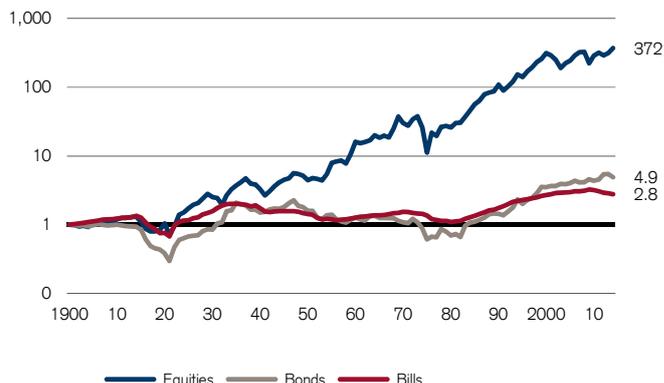


Figure 2
Annualized real returns on major asset classes (%)

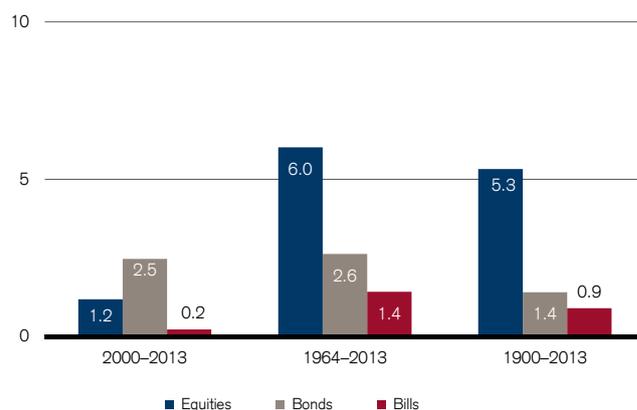
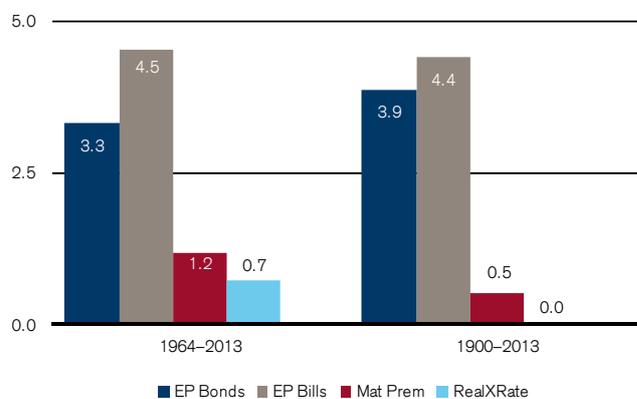


Figure 3
Annualized equity, bond, and currency premia (%)



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

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2014.



United States

Financial superpower

In the 20th century, the United States rapidly became the world's foremost political, military, and economic power. After the fall of communism, it became the world's sole superpower. The International Energy Agency predicts that the USA will be the world's largest oil producer by 2017

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 48% of total world value, which is more than five times as large as Japan, its closest rival. The USA also has the world's largest bond market.

US financial markets are 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 6.5% and 1.9%, 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 almost a one-half 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 114 years, the real value of equities, with income reinvested, grew by a factor of 1247.6 as compared to 8.2 for bonds and 2.7 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 6.5%, bonds 1.9%, and bills 0.9%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 5.5%. For additional explanations of these figures, see page 37.

Figure 1 Cumulative real returns from 1900 to 2013

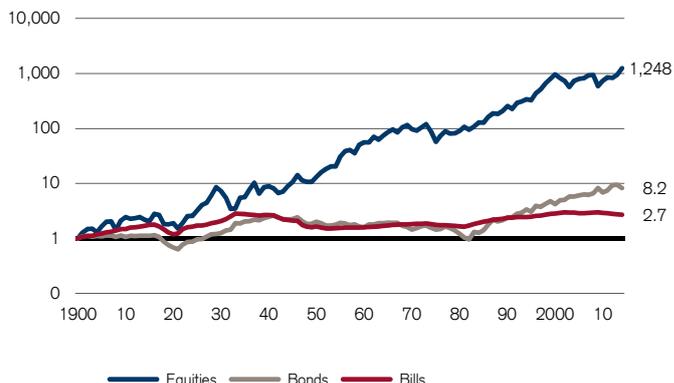


Figure 2 Annualized real returns on major asset classes (%)

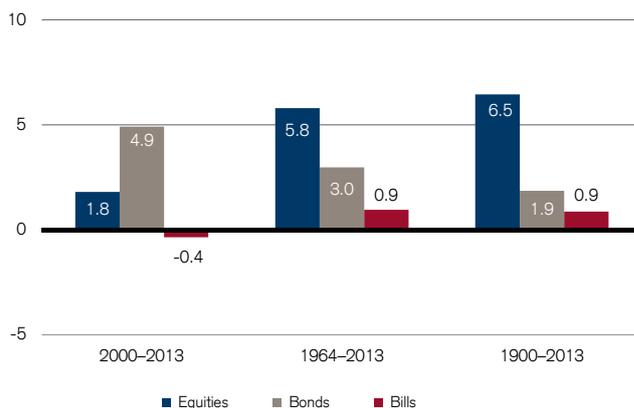
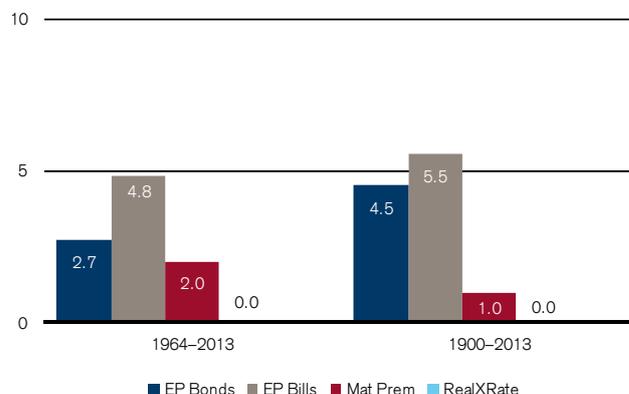


Figure 3 Annualized equity, bond, and currency premia (%)



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

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2014.



World

Globally diversified

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

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

Over the 114 years from 1900 to 2013, the middle chart shows that the real return on the world index was 5.2% per year for equities, and 1.8% per year for bonds. The bottom chart also shows that the world equity index had an annualized equity risk premium, relative to Treasury bills, of 4.3% over the last 114 years, and a very similar 4.4% over the most recent 50 years.

We follow a policy of continuous improvement with our data sources, introducing new countries when feasible, and switching to superior index series as they become available. In 2013, we added Austria, China and Russia; and in 2014, Portugal. Austria and Portugal have a continuous history, but China and Russia do not. To avoid survivorship bias, all these countries are fully included in the world indices from 1900 onward. Two markets register a total loss – Russia in 1917 and China in 1949. These countries then re-enter the world indices after their markets reopened in the 1990s.

Capital market returns for World (in USD)

Figure 1 shows that, over the last 114 years, the real value of equities, with income reinvested, grew by a factor of 313.5 as compared to 7.6 for bonds and 2.7 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 5.2%, bonds 1.8%, and bills 0.9%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 4.3%. For additional explanations of these figures, see page 37.

Figure 1
Cumulative real returns from 1900 to 2013



Figure 2
Annualized real returns on major asset classes (%)

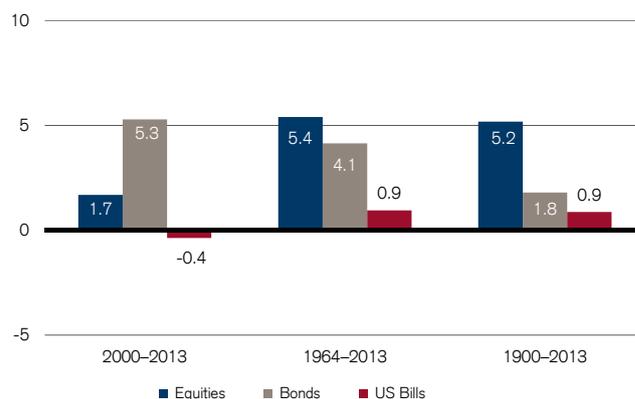
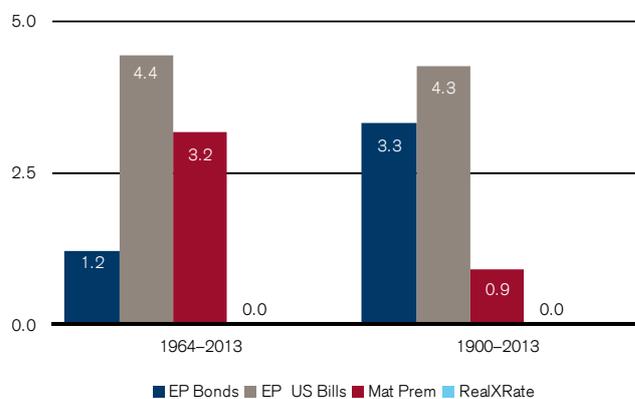


Figure 3
Annualized equity, bond, and currency premia (%)



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

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2014.



World ex-USA

Beyond America

In addition to the two world indices, we also construct two world indices that exclude the USA, using exactly the same principles. Although we are excluding just one out of 23 countries, the USA accounts for roughly half the total stock market capitalization of the *Yearbook* countries, so that the 22-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 4.5% per year, which is 2.0% per year below that for the USA. This suggests that, although the USA has not been the most extreme of outliers, it is nevertheless important to look at global returns, rather than just focusing on the USA.

We follow a policy of continuous improvement with our data sources, introducing new countries when feasible, and switching to superior index series as they become available. In 2013 and 2014, we added Portugal, Austria, China and Russia. Portugal and Austria have a continuous history, but China and Russia do not. To avoid survivorship bias, the additional countries are fully included in the world indices from 1900 onward. Two markets register a total loss: Russia in 1917 and China in 1949. These countries then re-enter the world and world ex-USA indices after their markets reopened in the 1990s.

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

Figure 1 shows that, over the last 114 years, the real value of equities, with income reinvested, grew by a factor of 156.6 as compared to 5.8 for bonds and 2.7 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 4.5%, bonds 1.6%, and bills 0.9%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 3.6%. For additional explanations of these figures, see page 37.

Figure 1
Cumulative real returns from 1900 to 2013



Figure 2
Annualized real returns on major asset classes (%)

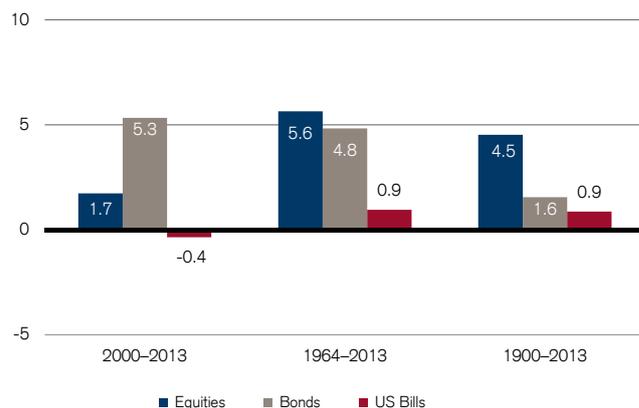
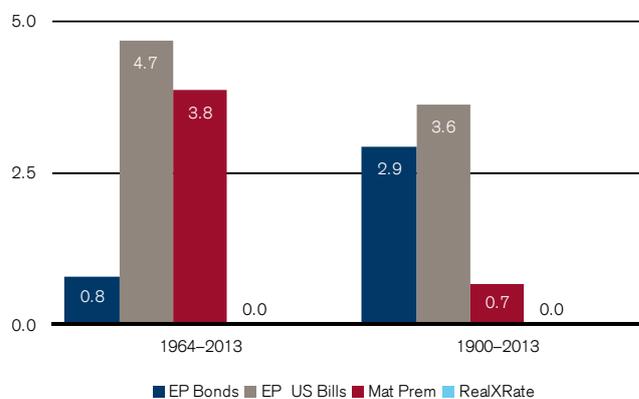


Figure 3
Annualized equity, bond, and currency premia (%)



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

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, *Credit Suisse Global Investment Returns Sourcebook 2014*.



Europe

The Old World

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

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

The middle chart opposite shows that the real equity return on European equities was 4.4%. This compares with 5.2% 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.

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

Capital market returns for Europe (in USD)

Figure 1 shows that, over the last 114 years, the real value of equities, with income reinvested, grew by a factor of 136.8 as compared to 3.5 for bonds and 2.7 for bills. Figure 2 displays the long-term real index levels as annualized returns, with equities giving 4.4%, bonds 1.1%, and bills 0.9%. Figure 3 expresses the annualized long-term real returns as premia. Since 1900, the annualized equity risk premium relative to bills has been 3.5%. For additional explanations of these figures, see page 37.

Figure 1
Cumulative real returns from 1900 to 2013

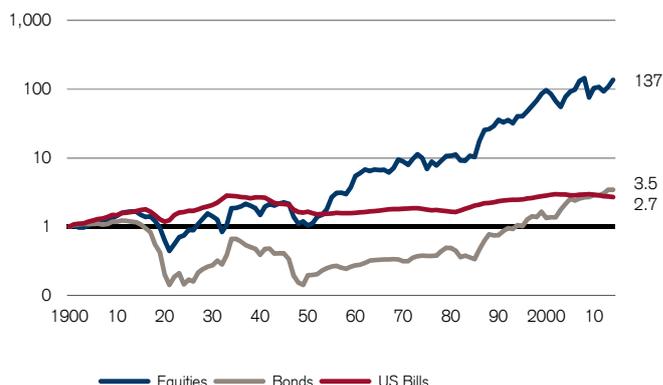


Figure 2
Annualized real returns on major asset classes (%)

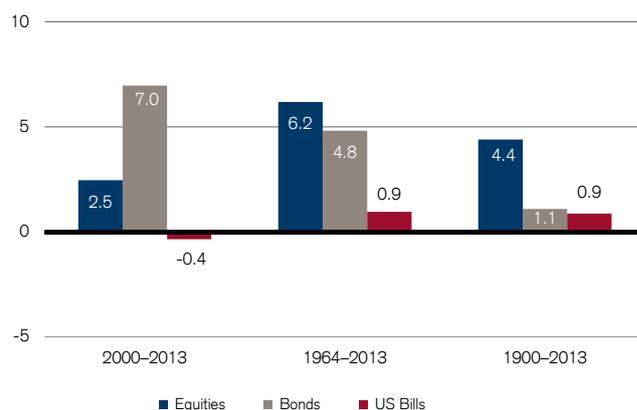
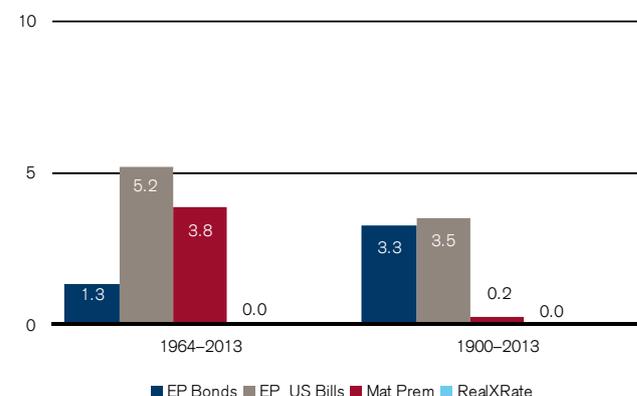


Figure 3
Annualized equity, bond, and currency premia (%)



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

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, Credit Suisse Global Investment Returns Sourcebook 2014.

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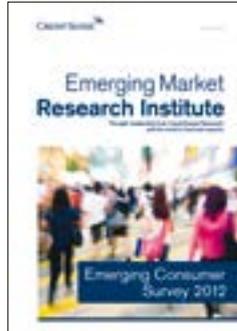
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