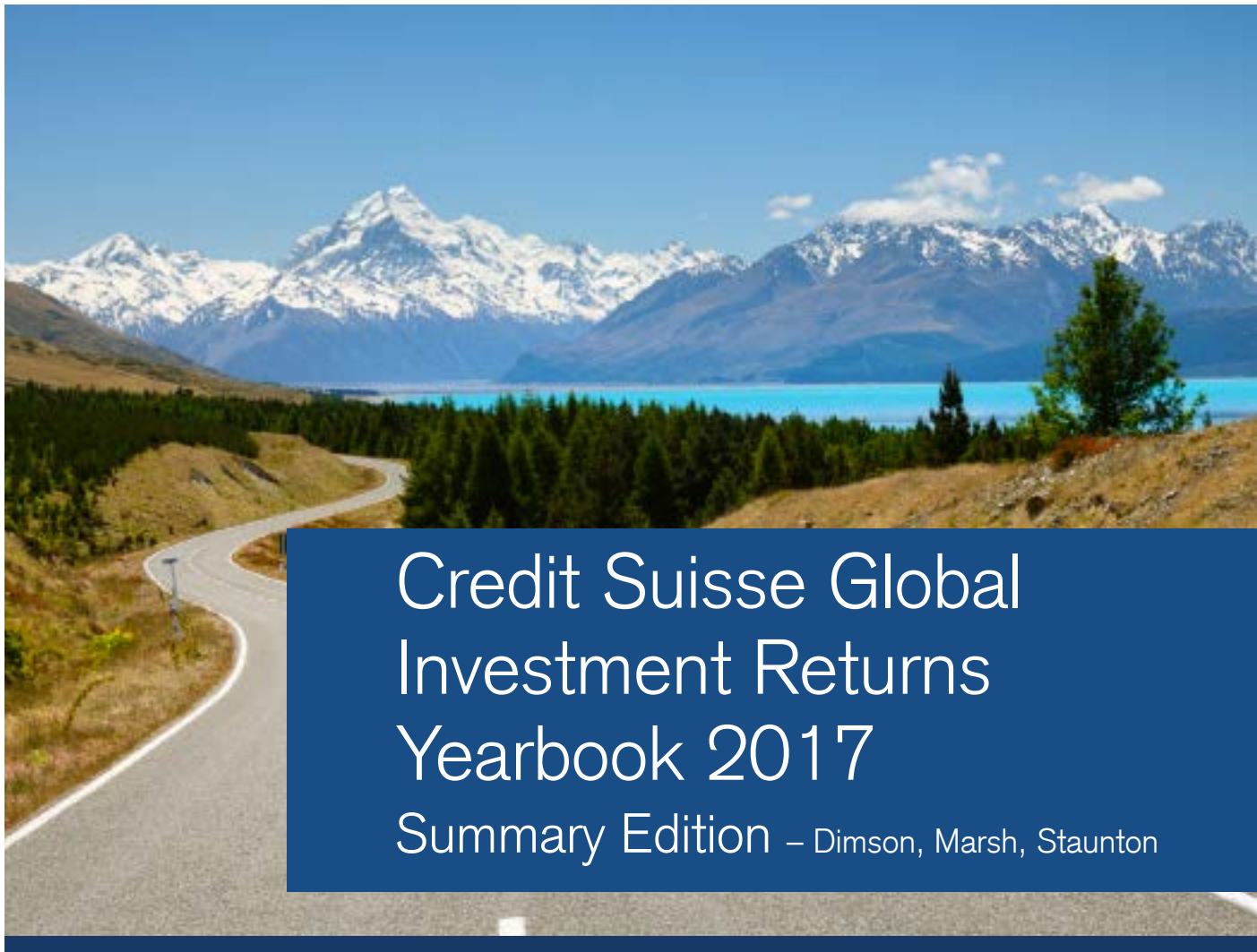


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## Credit Suisse Global Investment Returns Yearbook 2017

Summary Edition – Dimson, Marsh, Staunton

# Contents

## THE CREDIT SUISSE GLOBAL INVESTMENT RETURNS YEARBOOK 2017 SUMMARY EDITION

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# Preface

## The 2017 Global Investment Returns Yearbook – Summary Edition

*This publication is a summary version of the full Credit Suisse Global Investment Returns Yearbook 2017, available in hardcopy only. Please contact your Credit Suisse representative for further details.*

Credit Suisse is proud to publish the 2017 edition of the Global Investment Returns Yearbook, now incorporating the Global Investment Returns Sourcebook in a single publication. The Yearbook is produced in conjunction with Elroy Dimson, Paul Marsh and Mike Staunton, recognized as the leading authorities on the analysis of the long-run performance and trends of stocks, bonds, Treasury bills (cash), inflation and currencies.

The core of the Credit Suisse Global Investment Returns Yearbook project provides an analysis of investment returns stretching back 117 years, spanning all five asset categories in 23 countries across North America, Asia, Europe and Africa coupled with an overall global aggregate. For those grappling with suitable parameters to judge relative valuation among the respective asset classes and also for specific company valuation, long-run series of equity risk premiums and real dividend growth provide valuable guidance.

### Looking backward to look forward

Far from simply looking backward, we believe the long-term analysis in the Yearbook helps provide a context in which to put nearer-term market movements and the economic environment that influences them. Indeed, as we reflect on the here and now, and some momentous economic and political events in 2016, the study offers invaluable perspectives for what have felt to be extraordinary times. Twelve months ago, investors were scouring history for a guide as to how to invest in times of deflation as interest rates on long-dated government bonds fell toward, and in some countries, below zero. Now, the political backdrop has altered dramatically, and so has the investment discussion.

Fears of the limits of monetary policy have become hopes for the opportunity afforded by fiscal policy; fears of deflation have been replaced by discussion of resurgent inflation; and perhaps most important of all, the debate is now not can bond yields spiral ever lower, but rather might this be the beginning of the end for the most extraordinary bull run of the last 30 years, and mark a reversal of the persistent underperformance of equities versus bonds we have seen this millennium?

Perhaps one of the most significant charts of recent decades, underpinning the political upheaval with which investors are now wrestling, has been that of the wage and corporate profit share of US Gross Domestic Product (GDP). These two series tend to move almost perfectly inversely with one another: when the corporate share of national income climbs, that of labor declines. The recovery from the financial crisis saw the corporate share of GDP climb to a record level of 12.6% of GDP in 2012, the highest share seen since 1950. This was driven by a combination of borrowing costs falling sharply, commodity prices rebounding and high unemployment and the forces of globalization reducing labor bargaining power significantly.

It is this final point, the decline in the labor share of national income in developed economies, which has done the most to fuel populist political forces – and reversing this decline represents their goal. Their policy prescriptions go against the conventional wisdom of recent decades: rolling back globalization via protectionism, repatriating jobs, and boosting fiscal spending. The recent Credit Suisse Research Institute report, “Getting over Globalization” from January 2017 provides valuable insights on this topic. Understanding the impact of this policy mix on corporate profits, inflation and growth in a US economy already apparently operating close to full capacity is a key challenge for investors over the coming years. The Yearbook reminds us of course that the reinvestment of the dividends companies distribute is, in the long term, the principal driver of total equity returns. Should labor regain its pricing power with its associated pressure on corporate profitability,

consequences for the dividend-paying capacity of companies will arise. It should be noted that the long-term real growth in dividends in the US stock market has been 1.7%. In 2016, it was 5.5%.

A few potential conclusions do suggest themselves. First, the possible return of inflation as an investment theme. As noted above, the US labor market already appears tight at a time when labor force growth is slow (and a permanent tightening of migration laws could slow it further), and wage growth is tentatively moving higher. Repatriating jobs into such an environment could be a combustible mix for corporate profitability.

Second, populist politics create challenges for bonds. Not only is the inflation conversation changing, but increased fiscal spending will need to be financed and monetary policy may prove tighter than expected if nominal GDP growth quickens. With bond yields peaking in the mid-1980s, a dataset of this historical breadth offers investors a reminder of the periods in which bond prices used to go down as well as up. This is the regime our investment strategists at Credit Suisse believe we are now heading toward.

Finally, as for equities, they arguably offer a degree of insulation from some of these challenges. Their earnings and dividend streams have by their nature an inflation linking. Moreover, in a historical context, the yield comparisons of equities relative to bonds are not stretched, at a time when investors have seemingly spent the best part of a decade focusing on deflation or disinflationary hedges. There is precedent for moves from disinflation to mild inflation providing a favorable environment for equities that would justify a long overdue asset allocation switch in favor of equities versus bonds. However, a full examination of inflationary periods in the Yearbook provides a reminder that the term "inflation hedge" can be something of a misnomer. If the term "hedge" is used to portray a price moving in the opposite direction to another, equities do not necessarily fit this bill in a progressively higher inflation world. The asset allocation decision becomes a relative not an absolute game.

### **Factor-investing strategies**

Away from asset allocation, the Yearbook examines the role of factor or "style" investing within equity portfolios, but through a historical lens. "Smart-beta" strategies and the exchange-traded funds and products designed to replicate them for investors are of course very much in vogue. A survey from FTSE Russell has suggested that almost three-quarters of asset owners are either using or actively evaluating smart beta. Against such a backdrop, a key question is "are smart-beta strategies smart?" Are factor risk premiums simply transitory anomalies in stock-market behavior that, no sooner have they been identified, swiftly disappear? Only long-term data can genuinely test such a proposition. While a myriad of factors are being examined by investors and academics, the Yearbook revisits five factors where the longevity of data provides a basis for more formal analysis; size, value, volatility, income and momentum.

All can be seen to have an effect on portfolio performance over time and merit attention. However, whether an "effect" or co-movement of companies of a type translates into a consistent premium in investment returns is a more complex matter. While the year 2016 may have been a year when "value" as a style returned to the stage, its re-emergence only served to highlight how painful for performance such strategies had been for several years before.

### **The Yearbook project**

The 2017 Yearbook is published by the Credit Suisse Research Institute with the aim of delivering the insights of world-class experts to complement the research of our own investment analysts. It marks the ninth collaboration with Elroy Dimson, Paul Marsh and Mike Staunton. For previous editions and articles, please contact your Credit Suisse sales representative.

We hope you enjoy the 2017 edition.

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# The Yearbook Project

The core of the Credit Suisse [Yearbook](#) is a long-run study covering 117 years of investment returns since 1900 in all the main asset categories in 23 countries and the world. With the unrivalled quality and breadth of its database, the [Yearbook](#) is the global authority on the long-run performance of stocks, bonds, Treasury bills, inflation and currencies.

The [Yearbook](#) provides a summary and overview of our research on long-run asset returns, together with detailed country and region chapters. It extends and brings up to date the key findings from our book [Triumph of the Optimists](#). The entire [Yearbook](#) draws on our long-run database of asset returns, the DMS database (Dimson, Marsh, and Staunton, 2017).

We provide below summary highlights from the full hardcopy report. The [Yearbook](#) itself contains three deep-dive chapters of analysis leveraging this unique dataset.

The first chapter describes the coverage of the DMS database (section 1.1) and the industrial transformation that has taken place since our start date of 1900 (Section 1.2), explains why a long-run perspective is important (section 1.3), and summarizes the long-run returns on stocks, bonds, bills, inflation and currencies over the last 117 years (sections 1.4 to 1.6). The second chapter deals with risk and risk premiums. We document the historical risk premiums around the world, discuss how these vary over time, and provide long-run predictions.

The third chapter focuses on factor investing: size, value, income, momentum, volatility and other factors. We emphasize the difference between factor [effects](#), for example, the tendency of small-caps to perform differently from large-caps, and factor [premiums](#), for example, the tendency for small-caps to outperform large-caps. We discuss the theories put forward to explain factor premiums, and discuss whether the premiums are likely to persist. Chapters 4–30 of the full hardcopy version present detailed historical analysis of the performance of 23 countries and three regions.

## 1.1 Yearbook coverage

The global database that underpins the [Yearbook](#) contains annual returns on stocks, bonds, bills, inflation, and currencies for 23 countries from 1900 to 2016. The countries comprise the United States and Canada, ten countries from what is now the euro currency area (Austria, Belgium, Finland, France, Germany, Ireland, Italy, the Netherlands, Portugal, and Spain), six non-Eurozone markets in Europe (Denmark, Norway, Russia, Sweden, Switzerland, and the United Kingdom), four Asia-Pacific markets (Australia, China, Japan, and New Zealand) and one African market (South Africa). Together, at the start of 2017, these countries make up 91% of the investable universe for a global investor, based on free float market capitalizations.

The DMS database also includes three regional indexes for equities and bonds denominated in a common currency, here taken as USD. These are a 23-country World index, a 22-country World ex-USA index and a 16-country Europe index. The equity indexes are weighted by each country's market capitalization, while the bond indexes are weighted by GDP.

All 23 countries experienced market closures at some point, mostly during wartime. In almost all cases, it is possible to bridge these closures and construct a returns history that reflects the experience of investors over the closure period. Russia and China are exceptions. Their markets were interrupted by revolutions, followed by long periods of communist rule. Markets were closed, not just temporarily, but with no intention of reopening, and assets were expropriated.

For 21 countries, we thus have a continuous 117-year history of investment returns, for which we present summary statistics in this and the next chapter, and more detailed information in the country chapters. For Russia and China, we have returns for the pre-communist era, and then

for the period since these markets reopened in the early 1990s. We include these countries in the world and regional indexes, including the total losses, in order to avoid survivorship bias.

The expropriation of Russian assets after 1917 and Chinese assets after 1949 could be seen as wealth redistribution, rather than wealth loss. But investors at the time would not have warmed to this view. Shareholders in firms with substantial overseas assets may also have salvaged some equity value, for example Chinese companies with assets in Hong Kong and Formosa (now Taiwan). Despite this, when incorporating these countries into our world/regional indexes, we assume that shareholders and domestic bondholders in Russia and China suffered total losses in 1917 and 1949, respectively. We then re-include these countries in the index after their markets re-opened in the early 1990s and once reliable market indexes were initiated.

The DMS series all commence in 1900, and this common start date aids international comparisons. Data availability and quality dictated this choice of start date, and for practical purposes, 1900 was the earliest plausible start date for a comparative international database with broad coverage (see Dimson, Marsh, and Staunton, 2007). Chart 1 shows the relative sizes of world equity markets at our starting date of end-1899 (left panel), and how they had changed by end-2016 (right panel). The right panel shows that the US market dominates its closest rival and today accounts for over 53% of total world equity market value. Japan (8.4%) is in second place, ahead of the UK (6.2%) in third place. France, Germany, Canada and Switzerland each represent around 3% of the global market. Australia and China occupy positions eight and nine, respectively, each with around 2–2½%.

In Chart 1, nine of the [Yearbook](#) countries – all of those accounting for 1% or more of world market capitalization – are shown separately, with 14 smaller markets grouped together as the “Smaller [Yearbook](#).” The remaining area of the right-hand pie chart, labelled “Not in [Yearbook](#),” represents countries, comprising 8.6% of world capitalization, for which our data does not go all the way back to 1900. Mostly, they are emerging markets. Note that the right-hand panel of Chart 1 is based on the free-float market capitalizations of the countries in the FTSE All-World index, which spans the investable universe for a global investor. Emerging markets represent a higher proportion of the world total when measured using full-float weights, when investability criteria are relaxed, or if indexes are GDP-weighted (see the 2014 [Yearbook](#)).

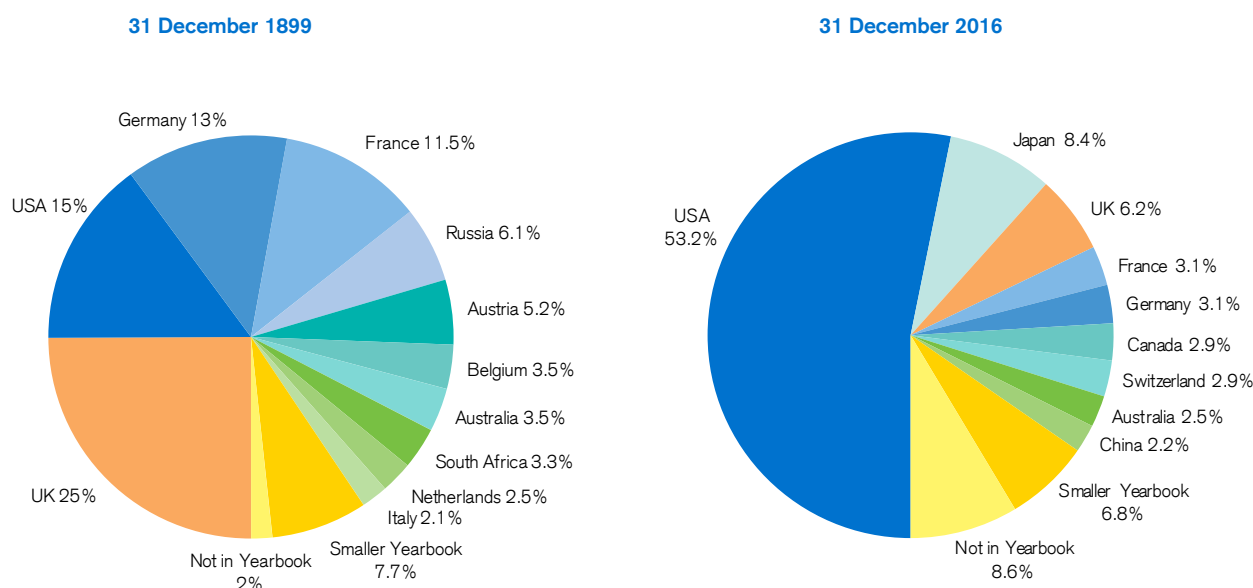
The left panel of Chart 1 shows the equivalent breakdown at the end-1899 start of the DMS database. The chart shows that at the start of the 20th century, the UK equity market was the largest in the world, accounting for a quarter of world capitalization, and dominating even the US market (15%). Germany (13%) ranked in third place, followed by France, Russia, and Austria-Hungary. Non-[Yearbook](#) countries are again labelled “Not in [Yearbook](#).” In total, the DMS database covers almost 98% of the global equity market at the start of our period.

Early in the 20th century, the US equity market overtook the UK and has since then been the world’s dominant stock market, although at the end of the 1980s Japan was very briefly the world’s largest market. At its peak, at start-1990, Japan accounted for almost 45% of the world index, compared with around 30% for the USA. Subsequently, as the right panel of Chart 1 attests, Japan’s weighting fell to just 8.4%, reflecting its extremely poor stock market performance since then. Our 23 countries accounted for 98% of world equity market capitalization at the start of 1900, and today they still represent some 91% of the investable universe. But the changing fortunes of individual countries raise two important questions.

The first relates to survivorship bias. Investors in some countries were lucky, but others suffered financial disaster or dreadful returns. If countries in the latter group are omitted, there is clearly a danger of overstating worldwide equity returns. In 2013, we added Russia and China to our database – the two best known cases of markets that failed to survive. China was a small market in 1900 and even in 1949, but Russia accounted for some 6% of world market capitalization at end-1899. Similarly, we also added Austria-Hungary, which had a 5% weighting in the end-1899 world index. While Austria-Hungary was not a total investment disaster, it was the worst-performing equity market and the second worst bond market among our 21 countries with continuous investment histories. The addition of Austria, China, and Russia to our database and the world index was important in eliminating non-survivorship and “unsuccess” bias. In 2014, we added another “unsuccessful” market, Portugal, to our dataset (see pages 172–178).



**Chart 1: Relative sizes of world stock markets, end-1899 versus end-2016**



Source: Elroy Dimson, Paul Marsh, and Mike Staunton, *Triumph of the Optimists*, Princeton University Press 2002, and FTSE Analytics FTSE All-World Index Series, December 2016.

The second and opposite source of bias, namely success bias, is even more serious. The USA is by far the world’s best-documented capital market. Prior to assembly of the DMS database, the evidence cited on long-run asset returns was almost invariably taken from US markets, and was typically treated as being universally applicable. Yet organized trading in marketable securities began in Amsterdam in 1602 and London in 1698, but did not commence in New York until 1792. Since then, the US share of the global stock market has risen from zero to 53% (Chart 1). This reflects the superior performance of the US economy, the large volume of IPOs, and the substantial returns from US stocks. No other market can rival this long-term accomplishment. But this makes it dangerous to generalize from US asset returns since they exhibit “success bias.” This is why our focus in the *Yearbook* project is on global returns.

## 1.2 The Great Transformation

At the beginning of 1900 – the start date of our global returns database – virtually no one had driven a car, made a phone call, used an electric light, heard recorded music, or seen a movie; no one had flown in an aircraft, listened to the radio, watched TV, used a computer, sent an e-mail, or used a smartphone. There were no x-rays, body scans, DNA tests, or transplants, and no one had taken an antibiotic; as a result, many would die young.

Mankind has enjoyed a wave of transformative innovation dating from the Industrial Revolution, continuing through the Golden Age of Invention in the late 19th century, and extending into today’s information revolution. This has given rise to entire new industries: electricity and power generation, automobiles, aerospace, airlines, telecommunications, oil and gas, pharmaceuticals and biotechnology, computers, information technology, and media and entertainment. Meanwhile, makers of horse-drawn carriages and wagons, canal boats, steam locomotives, candles, and matches have seen their industries decline. There have been profound changes in what is produced, how it is made, and the way in which people live and work.

These changes can be seen in the shifting composition of the firms listed on world stock markets. Chart 2 shows the industrial composition of listed companies in the USA and the UK. The upper two pie charts show the position at the beginning of 1900, while the lower two show the beginning of 2017. Markets at the start of the 20th century were dominated by railroads, which accounted for 63% of US stock market value and almost 50% of UK value. More than a century later, railroads declined almost to the point of stock market extinction, representing less than 1% of the US market and close to zero in the UK market.

Of the US firms listed in 1900, more than 80% of their value was in industries that are today small or extinct; the UK figure is 65%. Besides railroads, other industries that have declined precipitously are textiles, iron, coal, and steel. These industries still exist, but have moved to lower-cost locations in the emerging world. Yet similarities between 1900 and 2017 are also apparent. The banking and insurance industries continue to be important. Similarly, such industries as food, beverages (including alcohol), tobacco, and utilities were present in 1900 just as they are today. And, in the UK, quoted mining companies were important in 1900 just as they are in London today.

But even industries that initially seem similar have often altered radically. For example, compare telegraphy in 1900 with smartphones in 2016. Both were high-tech at the time. Or contrast other transport in 1900 – shipping lines, trams, and docks – with their modern counterparts, airlines, buses, and trucking. Similarly, within industrials, the 1900 list of companies includes the world's then-largest candle maker and the world's largest manufacturer of matches.

Another statistic that stands out from Chart 2 is the high proportion of today's companies that come from industries that were small or non-existent in 1900, 62% by value for the USA and 47% for the UK. The largest industries in 2017 are technology (in the USA, but not the UK), oil and gas, banking, healthcare, the catch-all group of other industrials, mining (for the UK, but not the USA), telecommunications, insurance, and retail. Of these, oil and gas, technology, and healthcare (including pharmaceuticals and biotechnology) were almost totally absent in 1900. Telecoms and media, at least as we know them now, are also new industries.

Our analysis relates only to exchange-listed businesses. Some industries existed throughout the period, but were not always listed. For example, there were many retailers in 1900, but apart from the major department stores, these were often small, local outlets rather than national and global retail chains like Walmart or Tesco. Similarly, in 1900, a higher proportion of manufacturing firms were family owned and unlisted. In the UK and other countries, nationalization has also caused entire industries – railroads, utilities, telecoms, steel, airlines, and airports – to be delisted, often to be re-privatized at a later date. We included listed railroads, for example, while omitting highways that remain largely state-owned. The evolving composition of the corporate sector highlights the importance of avoiding survivorship bias within a stock market index, as well as across indexes (see Dimson, Marsh and Staunton, 2002).

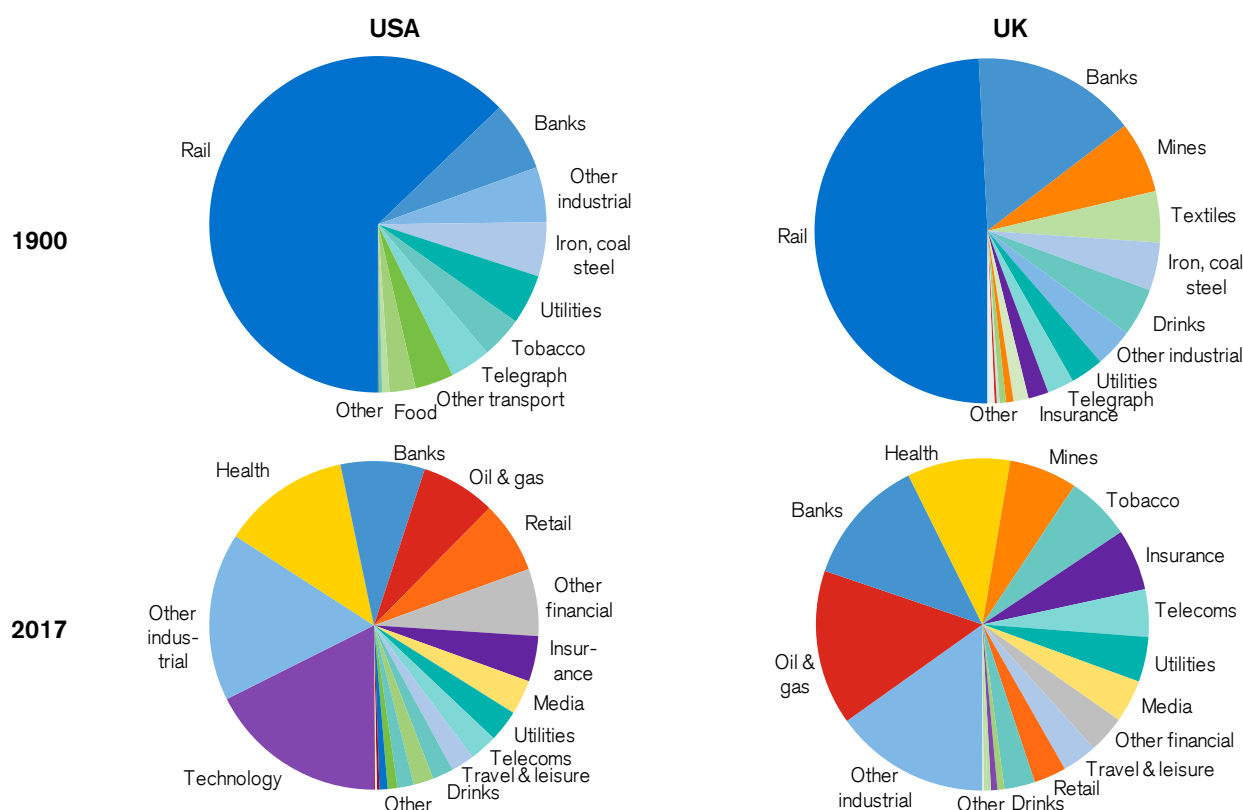
In the 2015 [Yearbook](#), we looked at long-run industry returns in the USA and UK since 1900, and asked whether investors should focus on new industries and shun the old, declining sectors. We showed that both new and old industries can reward as well as disappoint. It all depends on whether stock prices correctly embed expectations. For example, we noted above that, in stock market terms, railroads were the ultimate declining industry in the USA in the period since 1900. Yet, over the last 117 years, railroad stocks have beaten the US market, and outperformed both trucking stocks and airlines since these industries emerged in the 1920s and 1930s. Indeed, the research in the 2015 [Yearbook](#) indicated that, if anything, investors may have placed too high an initial value on new technologies, overvaluing the new, and undervaluing the old. We showed that an industry value rotation strategy helped lean against this tendency, and historically had generated superior returns.

### 1.3 Why a long-term perspective is needed

To understand risk and return, we must examine long periods of history. This is because asset returns, and especially equity returns, are very volatile. Even over periods as long as 20 years or more, we can still observe “unusual” returns. This is readily illustrated by recent history. The 21st century began with one of the most savage bear markets in history. The damage inflicted on global equities began in 2000, and by March 2003, US stocks had fallen 45%, UK equity prices had halved, and German stocks had fallen by two-thirds. Markets then staged a remarkable recovery, with substantial gains that reduced, and in many countries eliminated, the bear market losses. World markets hit new highs at the end of October 2007, only to plunge again in another epic bear market fueled by the Global Financial Crisis. Markets bottomed in March 2009 and then staged another impressive recovery. Yet, in real terms, it took until 2013 for many of the world's largest markets to regain their start-2000 levels.



**Chart 2: Industry weightings in the USA and UK, 1900 compared with 2017**



Source: Elroy Dimson, Paul Marsh, and Mike Staunton, *Triumph of the Optimists*, Princeton University Press, 2002, and subsequent research

Table 1 covers the 21 countries with a continuous 117-year history. For each country, the top row shows the annualized real return over 2000–16 and highlights the mediocre returns from equities. Equities gave negative real returns in Finland, Italy and Portugal, and a zero return in the Netherlands. The annualized real return was 0.8% in Japan, 1.7% in France, 2.2% in Germany, 2.4% in the UK, and 2.7% in the USA. Resource-oriented markets such as Australia, Canada, New Zealand, Norway and South Africa fared better. The real USD return on the world index from the perspective of a US investor was an underwhelming 1.9% per year.

Over 2000–16, Table 1 shows that bonds were the best asset class in 16 of the 21 countries. The five countries where equities did best were small, with low weightings in the world index.

The demons of chance are meant to be more generous. Investors who hold equities require a reward for taking risk. At the end of 1999, investors cannot have expected, let alone required, a negative risk premium from equities relative to bonds, otherwise they would have avoided them. Looking in isolation at the 17 years that followed tells us little about the future expected risk premium from equities. It was simply the case that investors were unlucky and returns were attenuated by two deep bear markets. This was a brutal reminder that the very nature of the risk for which they sought a reward means that events can turn out poorly, even over multiple years.

In contrast, Table 1 shows that the previous 20 years – the 1980s and 1990s – were a golden age (see the second row for each country). Inflation fell from its highs in the 1970s and early 1980s, which lowered interest rates and bond yields. Profit growth accelerated. This led to strong performance from both equities and bonds. The average real return on the world equity index was a staggering 10.6% versus just 1.9% over the 2000–16 period. While the world bond index did very well over 2000–16 with a return of 4.8% p.a., world bonds did even better in the 1980s and 1990s with a 6.6% annualized return. Real cash/bill returns were also higher in every country.

**Table 1: Real return on equities, bonds and bills: 2000–2016 in perspective**

Countries	Period	Annualized real return (% per year)				Best
		Equities	Bonds	Bills	Inflation	
Australia	2000 – 2016	5.1	4.6	1.7	2.8	Equities
	1980 – 1999	8.8	5.9	5.1	5.3	Equities
	1900 – 2016	6.8	1.7	0.7	3.8	Equities
Austria	2000 – 2016	4.9	6.5	0.1	1.9	Bonds
	1980 – 1999	5.8	5.9	3.9	3.1	Bonds
	1900 – 2016	0.8	-3.7	-7.9	12.6	Equities
Belgium	2000 – 2016	2.9	5.5	-0.2	2.0	Bonds
	1980 – 1999	12.4	7.4	4.7	3.4	Equities
	1900 – 2016	2.7	0.5	-0.3	5.0	Equities
Canada	2000 – 2016	4.2	5.3	0.3	1.9	Bonds
	1980 – 1999	6.9	7.7	4.9	4.1	Bonds
	1900 – 2016	5.7	2.2	1.5	3.0	Equities
Denmark	2000 – 2016	8.0	6.0	0.3	1.7	Equities
	1980 – 1999	12.2	9.8	5.7	4.2	Equities
	1900 – 2016	5.4	3.3	2.1	3.7	Equities
Finland	2000 – 2016	-0.6	6.5	0.7	1.6	Bonds
	1980 – 1999	20.6	5.2	5.5	4.5	Equities
	1900 – 2016	5.4	0.3	-0.5	7.0	Equities
France	2000 – 2016	1.7	6.2	0.3	1.4	Bonds
	1980 – 1999	13.5	8.7	2.6	4.4	Equities
	1900 – 2016	3.3	0.3	-2.7	6.9	Equities
Germany*	2000 – 2016	2.2	7.1	0.3	1.5	Bonds
	1980 – 1999	11.0	4.8	3.5	2.6	Equities
	1900 – 2016	3.3	-1.3	-2.4	4.6	Equities
Ireland	2000 – 2016	2.0	5.6	0.4	1.9	Bonds
	1980 – 1999	12.9	8.9	4.8	5.5	Equities
	1900 – 2016	4.4	1.6	0.7	4.1	Equities
Italy	2000 – 2016	-2.0	5.7	0.2	1.8	Bonds
	1980 – 1999	10.3	6.0	1.1	7.5	Equities
	1900 – 2016	2.0	-1.1	-3.5	8.1	Equities
Japan	2000 – 2016	0.8	4.0	0.1	0.1	Bonds
	1980 – 1999	5.8	7.1	2.2	1.7	Bonds
	1900 – 2016	4.2	-0.8	-1.9	6.7	Equities
Netherlands	2000 – 2016	0.0	6.1	-0.1	1.9	Bonds
	1980 – 1999	17.3	5.8	4.0	2.6	Equities
	1900 – 2016	5.0	1.8	0.6	2.9	Equities
New Zealand	2000 – 2016	6.4	4.4	2.4	2.2	Equities
	1980 – 1999	8.9	6.8	5.4	6.1	Equities
	1900 – 2016	6.2	2.1	1.7	3.6	Equities
Norway	2000 – 2016	6.7	4.3	1.1	2.0	Equities
	1980 – 1999	7.9	6.0	4.6	5.3	Equities
	1900 – 2016	4.3	1.8	1.1	3.6	Equities
Portugal	2000 – 2016	-2.4	3.8	-0.1	2.0	Bonds
	1980 – 1999	15.2	3.3	2.5	11.4	Equities
	1900 – 2016	3.5	0.7	-1.1	7.3	Equities
South Africa	2000 – 2016	8.2	5.1	2.2	5.8	Equities
	1980 – 1999	6.7	1.9	3.2	11.9	Equities
	1900 – 2016	7.2	1.8	1.0	5.0	Equities
Spain	2000 – 2016	2.3	5.1	-0.2	2.2	Bonds
	1980 – 1999	15.3	7.4	4.3	6.9	Equities
	1900 – 2016	3.6	1.8	0.3	5.6	Equities
Sweden	2000 – 2016	5.0	5.7	0.7	1.2	Bonds
	1980 – 1999	19.1	7.0	4.8	5.3	Equities
	1900 – 2016	5.9	2.7	1.8	3.4	Equities
Switzerland	2000 – 2016	3.0	4.9	0.4	0.4	Bonds
	1980 – 1999	10.4	2.7	1.6	2.7	Equities
	1900 – 2016	4.4	2.3	0.8	2.2	Equities
United Kingdom	2000 – 2016	2.4	4.6	0.7	2.0	Bonds
	1980 – 1999	13.7	8.8	5.0	4.8	Equities
	1900 – 2016	5.5	1.8	1.0	3.7	Equities
United States	2000 – 2016	2.7	5.1	-0.5	2.1	Bonds
	1980 – 1999	12.4	6.4	2.8	4.0	Equities
	1900 – 2016	6.4	2.0	0.8	2.9	Equities
World (USD)	2000 – 2016	1.9	4.8	-0.5	2.1	Bonds
	1980 – 1999	10.6	6.6	2.8	4.0	Equities
	1900 – 2016	5.1	1.8	0.8	2.9	Equities

\* German bonds, bills and inflation over 1900–2016 exclude 1922–23. Source: Elroy Dimson, Paul Marsh, and Mike Staunton

The opening 17 years of the 21st century were unusual. Yet looking back at the previous 20 years confuses the picture, as golden ages, by definition, occur infrequently. To understand risk and return in capital markets – a key objective of the *Yearbook* – we must examine periods much longer than 20 years because stocks are volatile, with major variation in year-to-year returns. We need long time series to support inferences about stock returns.

The final rows for each country in Table 1 show returns over our full 117 years and provide an insight into the perspective that longer periods of history can bring. The long-term equity returns are less favorable than the performance over 1980–99, but equally, they contrast sharply with the generally much poorer returns over 2000–16. Equities were the best-performing asset in every country, confirming that, over the long run, there has been a reward for their higher risk.

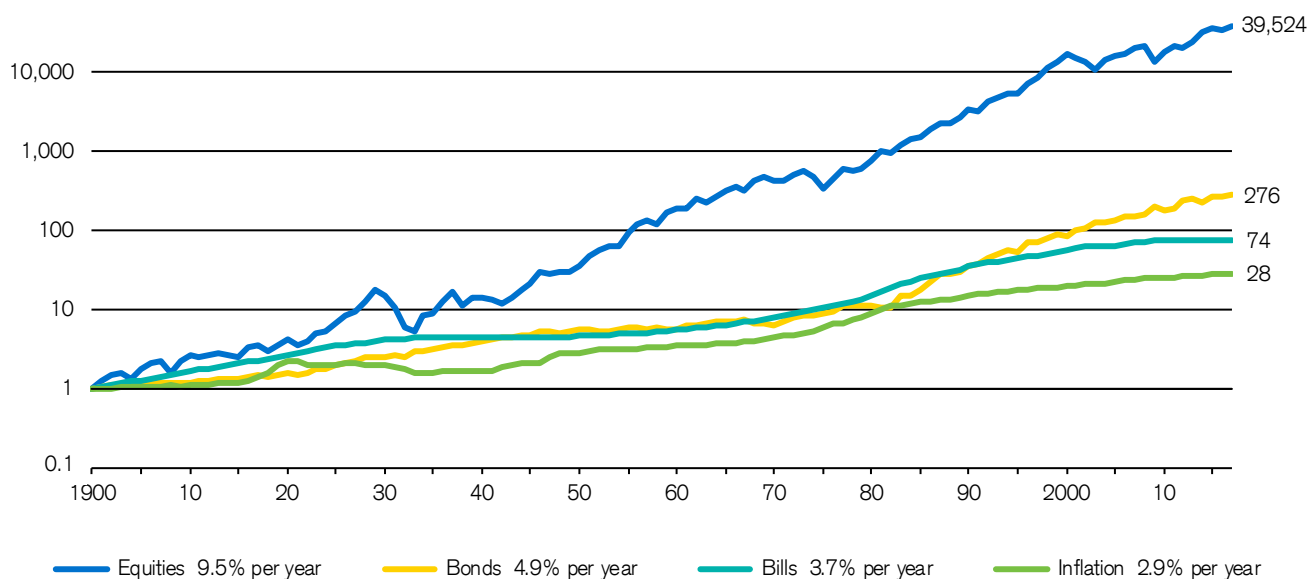
### 1.4 Long-run equity returns and bond returns

Chart 3 shows the cumulative total return from stocks, bonds, bills, and inflation from 1900 to 2016 in the world’s leading capital market, the United States. Equities performed best, with an initial investment of USD 1 growing to USD 39,524 in nominal terms by end-2016. Long bonds and treasury bills gave lower returns, although they handsomely beat inflation. Their respective index levels at the end of 2016 are USD 276 and USD 74, with the inflation index ending at USD 28. The legend to Chart 3 shows the annualized returns. Equities returned 9.5% per year, versus 4.9% on bonds, 3.7% on bills, and inflation of 2.9% per year.

Since US prices rose 28-fold over this period, it is more helpful to compare returns in real terms. Chart 4 shows the real returns on US equities, bonds, and bills. Over the 117 years, an initial investment of USD 1, with dividends reinvested, would have grown in purchasing power by 1,402 times. The corresponding multiples for bonds and bills are 9.8 and 2.6 times the initial investment, respectively. As the legend for Chart 4 shows, these terminal wealth figures correspond to annualized real returns of 6.4% on equities, 2.0% on bonds, and 0.8% on bills.

Chart 4 shows that US equities totally dominated bonds and bills. There were severe setbacks of course, most notably during World War I; the Wall Street Crash and its aftermath, including the Great Depression; the OPEC oil shock of the 1970s after the 1973 October War in the Middle East; and the two bear markets in the first decade of the 21st century. Each shock was severe at the time. At the depths of the Wall Street Crash, US equities had fallen by 80% in real terms (see section 2.2 in the next chapter). Many investors were ruined, especially those who

**Chart 3: Cumulative returns on US asset classes in nominal terms, 1900–2016**



Source: Elroy Dimson, Paul Marsh, and Mike Staunton, *Triumph of the Optimists*, Princeton University Press, 2002, and subsequent research

bought stocks with borrowed money. The crash lived on in the memories of investors – and indeed those who subsequently chose to shun equities – for at least a generation.

Chart 4 sets the Wall Street Crash in its long-run context by showing that equities eventually recovered and gained new highs. Other dramatic episodes, such as the October 1987 crash hardly register, while the bursting of the technology bubble in 2000 and the financial crisis of 2007–09 certainly register, but are placed in context. Besides revealing impressive long-run equity returns, Chart 4 thus helps to set the bear markets of the past in perspective. Events that were traumatic at the time now just appear as setbacks within a longer-term secular rise.

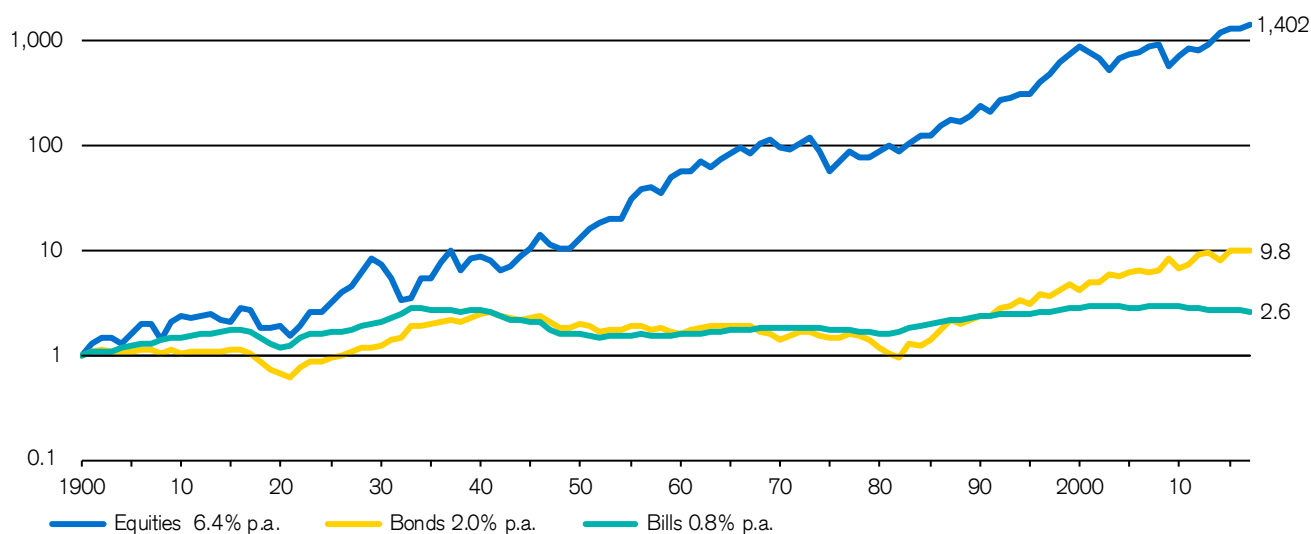
As noted above, we should be cautious about generalizing from the USA which, over the 20th century, rapidly emerged as the world’s foremost political, military, and economic power. By focusing on the world’s most successful economy, investors could gain a misleading impression of equity returns elsewhere, or of future equity returns for the USA itself. For a more complete view, we also need to look at investment returns in other countries.

**Long-run returns around the world**

The *Yearbook* allows us to make global comparisons. Chart 5 shows annualized real equity, bond, and bill returns over the last 117 years for the 21 *Yearbook* countries with continuous investment histories plus the world index, the world ex-USA, and Europe, ranked in ascending order of equity market performance. The real equity return was positive in every location, typically at a level of 3% to 6% per year. Equities were the best-performing asset class everywhere. Furthermore, bonds beat bills in every country. This overall pattern, of equities beating bonds and bonds beating bills, is precisely what we would expect over the long haul, since equities are riskier than bonds, while bonds are riskier than cash.

Chart 5 shows that, while in most countries bonds gave a positive real return, four countries experienced negative returns. Most of these countries were also among the worst equity performers. Their poor performance dates back to the first half of the 20th century, and these were the countries that suffered most from the ravages of war, and from periods of high or hyperinflation, typically associated with wars and their aftermath. Chart 5 shows that the USA performed well, ranking third for equity performance (6.4% per year) and sixth for bonds (2.0% per year). This confirms our earlier conjecture, namely, that US returns would be high since the US economy has been such an obvious success story, and that it was unwise for investors

**Chart 4: Cumulative returns on US asset classes in real terms, 1900–2016**



Source: Elroy Dimson, Paul Marsh, and Mike Staunton, *Triumph of the Optimists*, Princeton University Press, 2002, and subsequent research

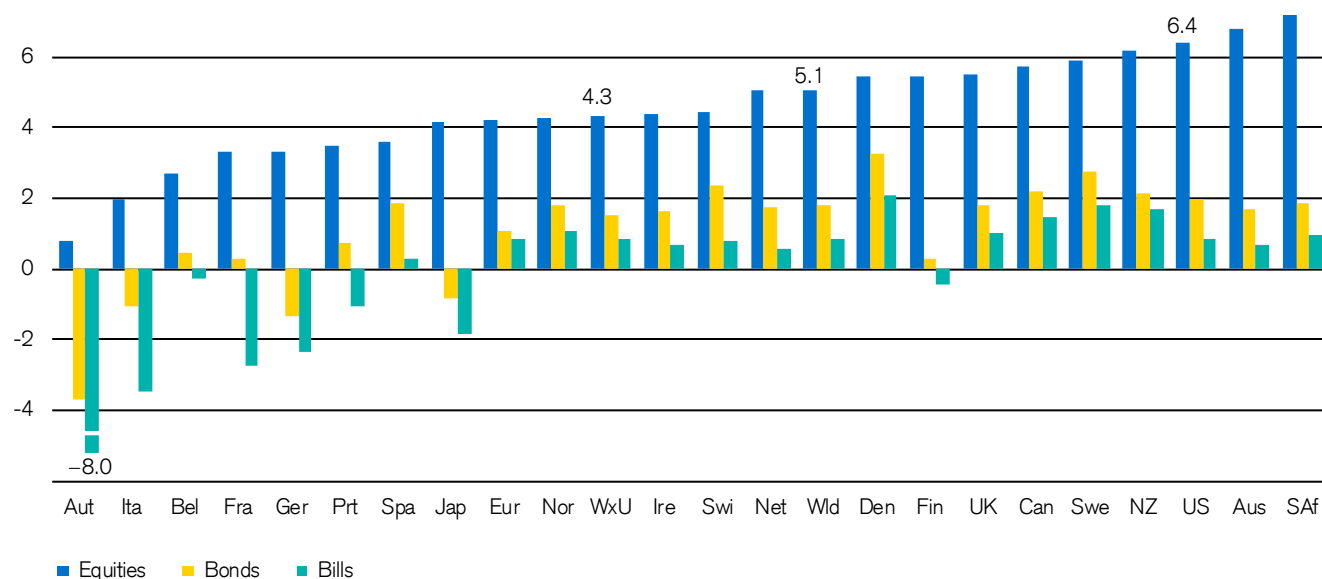
around the world to base their future projections solely on US evidence. However, Chart 5 helps set this debate in context by showing that, while US stocks did well, the USA was not the top performer, nor were its returns especially high relative to the world averages. The real return on US equities of 6.4% contrasts with the real USD return of 4.3% on the World-ex USA index. A common factor among the best-performing equity markets over the last 117 years is that they tended to be resource-rich and/or New World countries.

Table 2 provides statistics on real equity returns from 1900 to 2016. The geometric means in the second column show the 117-year annualized returns achieved by investors, and these are the figures that were plotted in Chart 5. The arithmetic means in the third column show the average of the 117 annual returns for each country/region. The arithmetic mean of a sequence of different returns is always larger than the geometric mean. For example, if stocks double one year (+100%) and halve the next (-50%), the investor is back where he/she started, and the annualized, or geometric mean, return is zero. However, the arithmetic mean is one-half of +100 - 50, which is +25%. The more volatile the sequence of returns, the greater will be the amount by which the arithmetic mean exceeds the geometric mean. This is verified by the fifth column of Table 2 which shows the standard deviation of each equity market's returns.

The USA's standard deviation of 20.0% places it among the lower risk markets, ranking sixth after Canada (17.0%), Australia (17.6%), New Zealand (19.3%), Switzerland (19.4%), and the UK (19.6%). The World index has a standard deviation of just 17.4%, showing the risk reduction obtained from international diversification. The most volatile markets were Portugal (34.3%), Germany (31.6%), Austria (29.9%), Finland (29.8%), Japan (29.4%), and Italy (28.5%), which were the countries most seriously affected by the depredations of war, civil strife, and inflation, and in Finland's case, also reflecting its concentrated stock market during more recent periods. Table 2 also shows that, as one would expect, the countries with the highest standard deviations experienced the greatest range of returns; in other words, they had the lowest minima and the highest maxima.

Bear markets underline the risk of equities. Even in a lower volatility market such as the USA, losses can be huge. Table 2 shows that the worst calendar year for US equities was 1931 with a real return of -38%. However, during the 1929-31 Wall Street Crash period, US equities fell from peak to trough by 80% in real terms. The worst period for UK equities was the 1973-74 bear market, with stocks falling 71% in real terms, and by 57% in a single year, 1974. For nearly half of the 21 countries in the table, 2008 was the worst year on record for stocks.

**Chart 5: Real annualized returns (%) on equities versus bonds and bills internationally, 1900-2016**



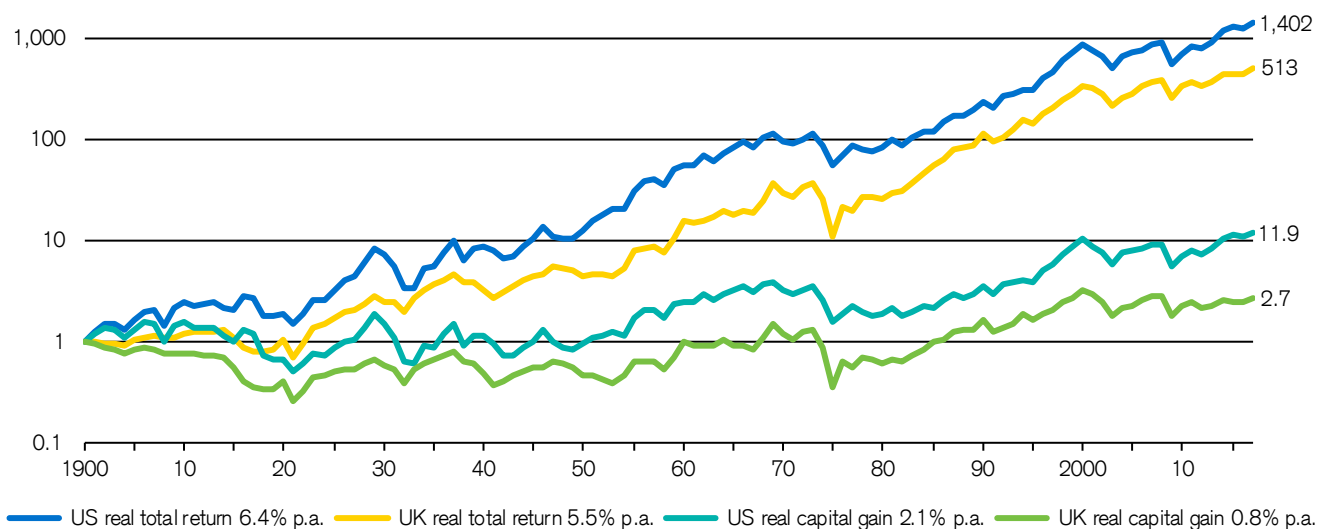
Source: Elroy Dimson, Paul Marsh, and Mike Staunton, *Triumph of the Optimists*, Princeton University Press, 2002, and subsequent research

**Table 2: Real (inflation-adjusted) equity returns around the world, 1900–2016**

Country	Geometric mean%	Arithmetic mean%	Standard error%	Standard dev. %	Minimum return%	Min year	Maximum return%	Max year
Australia	6.8	8.3	1.6	17.6	-42.5	2008	51.5	1983
Austria	0.8	4.8	2.8	29.9	-59.4	2008	127.1	1985
Belgium	2.7	5.3	2.2	23.5	-48.9	2008	105.1	1919
Canada	5.7	7.1	1.6	17.0	-33.8	2008	55.2	1933
Denmark	5.4	7.3	1.9	20.8	-49.2	2008	107.8	1983
Finland	5.4	9.3	2.8	29.8	-60.8	1918	161.7	1999
France	3.3	5.8	2.1	23.0	-41.5	2008	66.1	1954
Germany	3.3	8.1	2.9	31.6	-90.8	1948	154.6	1949
Ireland	4.4	7.0	2.1	22.9	-65.4	2008	68.4	1977
Italy	2.0	5.9	2.6	28.5	-72.9	1945	120.7	1946
Japan	4.2	8.7	2.7	29.4	-85.5	1946	121.1	1952
Netherlands	5.0	7.1	2.0	21.3	-50.4	2008	101.6	1940
New Zealand	6.2	7.9	1.8	19.3	-54.7	1987	105.3	1983
Norway	4.3	7.2	2.5	26.8	-53.6	2008	166.9	1979
Portugal	3.5	8.4	3.2	34.3	-76.6	1978	151.8	1986
South Africa	7.2	9.3	2.0	22.1	-52.2	1920	102.9	1933
Spain	3.6	5.8	2.0	21.9	-43.3	1977	99.4	1986
Sweden	5.9	8.0	2.0	21.1	-42.5	1918	67.5	1999
Switzerland	4.4	6.2	1.8	19.4	-37.8	1974	59.4	1922
United Kingdom	5.5	7.3	1.8	19.6	-57.1	1974	96.7	1975
United States	6.4	8.4	1.9	20.0	-38.4	1931	56.2	1933
Europe	4.2	6.0	1.8	19.8	-47.5	2008	75.7	1933
World ex-US	4.3	6.0	1.7	18.9	-44.2	2008	80.0	1933
World	5.1	6.5	1.6	17.4	-41.4	2008	68.0	1933

Source: Elroy Dimson, Paul Marsh, and Mike Staunton, *Triumph of the Optimists*, Princeton University Press, 2002, and subsequent research.

**Chart 6: Impact of reinvested dividends on cumulative US and UK equity local-currency returns, 1900–2016**



Source: Elroy Dimson, Paul Marsh, and Mike Staunton, *Triumph of the Optimists*, Princeton University Press, 2002, and subsequent research.



## 1.5 Inflation, bills and bonds over the long run

### Inflation

Inflation was a major force over the 20th century, and we clearly need to adjust investment returns for changes in purchasing power. Table 3 shows inflation rates around the world from 1900 to 2016. In the USA, annualized inflation was 2.9% per year, versus 3.7% in the UK.

Thanks to the power of compounding, this apparently small difference meant that, while US consumer prices rose by a factor of 28, UK consumer prices rose 70-fold. Prices did not rise steadily throughout the 117 years, and all countries experienced deflation at some stage in the 1920s and early 1930s. In the USA, consumer prices fell almost a third in the years after 1920, and did not regain their 1920 level until 1947. In 77% of the years since 1995, at least one, and in some years several of the 21 countries shown in Table 3 experienced (generally mild) deflation. On average, in each of the years from 2008 to 2015, over half of the 21 countries experienced an inflation rate that was no more than 2%. Indeed, during 2016, 17 of the 21 countries had inflation rates below 2%. While inflation rates are very low by historical standards, inflation rose in 17 of the 21 countries during 2016, and deflationary worries are abating.

Table 3 shows that over the last 117 years, there were seven high-inflation countries, Germany, Austria, Portugal, Finland, France, Japan, and Spain. There were two runners-up, Belgium and South Africa, and one low-inflation country, Switzerland. The other countries fall in between, with inflation of around 3% to 4% per year. Note that the true 117-year mean and standard deviation for Germany are far higher than Table 3 shows, as the hyperinflationary years of 1922–23 are omitted. Including these years, the 117-year arithmetic mean inflation rate would exceed 2 billion percent. However, even this massive German figure is dwarfed by Hungarian inflation in July 1946 which reached 42 quintillion percent per month.

After experiencing the highest inflation of any *Yearbook* country in the first half of the 20th century, Germany had the second-lowest inflation rate out of the 21 countries from 1950 onward (Switzerland had the lowest). Several other countries, including the UK, moved in the opposite direction, from having comparatively low inflation to becoming relatively high inflation

**Table 3: Inflation rates around the world, 1900–2016**

Country	Geometric mean%	Arithmetic mean%	Standard error%	Standard dev. %	Minimum return%	Min year	Maximum return%	Max year
Australia	3.8	3.9	0.5	5.1	-12.6	1921	19.3	1951
Austria	12.6	31.8	16.6	179.3	-5.0	1931	1748.1	1922
Belgium	5.0	6.0	1.5	16.4	-37.9	1919	96.3	1917
Canada	3.0	3.1	0.4	4.5	-15.8	1921	15.1	1917
Denmark	3.7	3.9	0.6	6.0	-15.1	1926	24.4	1940
Finland	7.0	8.7	2.4	26.1	-11.3	1919	241.4	1918
France	6.9	7.5	1.1	12.1	-18.4	1921	65.1	1946
Germany*	4.6	5.4	1.4	14.7	-9.5	1932	209 bn	1923
Ireland	4.1	4.3	0.6	6.8	-26.0	1921	23.3	1981
Italy	8.1	10.3	3.2	34.1	-9.7	1931	344.4	1944
Japan	6.7	9.9	3.8	40.7	-18.7	1930	361.1	1946
Netherlands	2.9	3.0	0.4	4.6	-13.4	1921	18.7	1918
New Zealand	3.6	3.7	0.4	4.6	-12.0	1932	14.7	1980
Norway	3.6	3.9	0.7	7.2	-19.5	1921	40.3	1918
Portugal	7.3	8.1	1.4	14.6	-17.6	1948	80.9	1918
South Africa	5.0	5.2	0.7	7.3	-17.2	1921	47.5	1920
Spain	5.6	5.8	0.6	6.8	-6.7	1928	36.5	1946
Sweden	3.4	3.6	0.6	6.6	-25.2	1921	39.4	1918
Switzerland	2.2	2.3	0.5	5.1	-17.7	1922	25.7	1918
United Kingdom	3.7	3.9	0.6	6.4	-26.0	1921	24.9	1975
United States	2.9	3.0	0.4	4.7	-10.7	1921	20.5	1918

\* For Germany, the means, standard deviation, and standard error are based on 115 years, excluding 1922–23. Source: Elroy Dimson, Paul Marsh, and Mike Staunton, *Triumph of the Optimists*, Princeton University Press, 2002, and subsequent research.

countries in the second half of the 20th century. US inflation was also higher from 1950 on, but was below the average of other countries in both periods. In many countries, inflation peaked during the 1970s, and was gradually brought under control thereafter.

## Bill returns

Treasury bills are an important asset class since they tell us the return on cash, and provide a benchmark for the risk-free rate of interest. Table 4 shows the annualized real returns on treasury bills – the realized short-term rate of interest, adjusted for inflation – in the 21 countries from 1900 to 2016. American and British investors earned annualized real returns of 0.8% and 1.0%, respectively). Investors in eight countries – Austria, Belgium, Finland, France, Germany, Italy, Japan, and Portugal – earned negative real returns on bills. For Germany, Table 4 excludes 1922–23, and its full 117-year record is thus far worse than recorded in the table since, in 1923, German bill (and bond) investors lost virtually everything. This provides a reminder that, although we can generally regard short-dated government bills as risk-free, this ceases to be true in cases of hyperinflation and bills become riskier than equities. More recently, we have learned that even sovereign bills of developed countries carry credit risk.

In the first half of the 20th century, there was no discernible relationship between interest rates and inflation in the USA or the other 20 countries. From the 1950s onward, however, there is generally a close relationship. In every country, there was a breakpoint in the real rate of interest at the end of the 1970s, with real rates thereafter being appreciably higher than from 1900 to 1979. There was then a second breakpoint in 2008, when rates fell sharply (see the 2013 [Yearbook](#)). In the USA, for example, the annualized real interest rate was 0.6% from 1900 to 1979, compared with 2.1% from 1980 to 2008, and –1.6% since then; in the UK, the pre-1980 annualized real rate was 0.1%, compared with 4.4% from 1980 to 2008, and –1.7% since then.

**Table 4: Real interest rates around the world, 1900–2016**

Country	Geometric mean%	Arithmetic mean%	Standard error%	Standard dev.%	Minimum return%	Min year	Maximum return%	Max year
Australia	0.7	0.8	0.5	5.3	–15.5	1951	18.5	1921
Austria	–7.9	–3.8	1.7	18.5	–94.2	1922	12.6	1931
Belgium	–0.3	0.6	1.2	12.6	–46.6	1941	69.0	1919
Canada	1.5	1.6	0.4	4.8	–12.5	1947	27.1	1921
Denmark	2.1	2.2	0.5	5.9	–15.8	1940	25.1	1921
Finland	–0.5	0.5	1.1	11.6	–69.2	1918	19.9	1919
France	–2.7	–2.2	0.9	9.3	–38.5	1946	29.7	1921
Germany*	–2.4	–0.4	1.2	13.0	–100.0	1923	38.8	1924
Ireland	0.7	0.9	0.6	6.5	–15.5	1915	42.2	1921
Italy	–3.5	–2.5	1.0	11.2	–76.6	1944	14.2	1931
Japan	–1.9	–0.3	1.3	13.6	–77.5	1946	29.8	1930
Netherlands	0.6	0.7	0.4	4.9	–12.7	1918	19.6	1921
New Zealand	1.7	1.8	0.4	4.6	–8.1	1951	21.1	1932
Norway	1.1	1.3	0.6	7.0	–25.4	1918	31.2	1921
Portugal	–1.1	–0.5	0.9	9.7	–41.6	1918	23.8	1948
South Africa	1.0	1.2	0.6	6.1	–27.8	1920	27.3	1921
Spain	0.3	0.4	0.5	5.7	–23.8	1946	12.6	1928
Sweden	1.8	2.0	0.6	6.4	–23.2	1918	42.7	1921
Switzerland	0.8	0.9	0.4	4.9	–16.5	1918	25.8	1922
United Kingdom	1.0	1.2	0.6	6.3	–15.7	1915	43.0	1921
United States	0.8	0.9	0.4	4.6	–15.1	1946	20.0	1921

\* For Germany, the means, standard deviation, and standard error are based on 115 years, excluding 1922–23. Source: Elroy Dimson, Paul Marsh, and Mike Staunton, [Triumph of the Optimists](#), Princeton University Press, 2002, and subsequent research.

## Bond returns

Table 5 shows that the 117 years from 1900 to 2016 were not especially kind to investors in government bonds. Across the 21 countries, the average annualized real return was 1.0% (1.3% excluding Austria's very low figure). While this exceeds the average return on cash by 1.3%, bonds had much higher risk. As already noted, real bond returns were negative in four countries. German bonds performed worst, and their volatility was even grimmer than revealed in Table 5 since the statistics exclude 1922–23. In 1923, hyperinflation resulted in an almost total real loss for German bond investors. In the UK, the annualized real bond return was 1.8%, while US bondholders did a little better with a real return of 2.0% per year. These findings suggest that, over the full 117-year period, real bond returns in many countries were below investors' prior expectations, with the largest differences occurring in the highest-inflation countries.

Particularly in the first half of the 20th century, several countries experienced extreme and disappointingly low returns arising from the ravages of war and extreme inflation. This was followed by a degree of reversal, with the countries experiencing the lowest returns in the first half of the 20th century being among the best performers thereafter. Over the full period, Denmark, Sweden, Switzerland, and Canada had the highest real bond returns of 3.3%, 2.7%, 2.3%, and 2.2%, respectively. However, in contrast to the government bonds of other countries, Danish bond returns are estimated from mortgage bonds over part of their history (see Chapter 10), and thus incorporate some element of return for credit risk. The best-performing country in terms of pure government bonds was therefore Sweden, with an annualized real return of 2.7%. Table 5 shows that New Zealand bonds had the lowest variability of 9.0%, followed by Swiss (9.4%) and Dutch (9.8%) bonds.

The average standard deviation of real bond returns was 13.0% versus 23.5% for equities and 7.7% for bills (these averages exclude Austria). US real equity returns had a standard deviation of 20.0% versus 10.4% for bonds and 4.6% for bills. Clearly stocks are the riskiest asset class, and we saw above that they have beaten bonds in every country. Similarly, bonds, which are less risky than equities, but riskier than bills, have beaten bills in every country. Our long-run findings thus provide strong support for one of the lasting laws of finance – the law of risk and return, and the notion that risk-bearing should carry an expected reward.

**Table 5: Real bond returns around the world, 1900–2016**

Country	Geometric mean%	Arithmetic mean%	Standard error%	Standard dev.%	Minimum return%	Min year	Maximum return%	Max year
Australia	1.7	2.5	1.2	13.1	-26.6	1951	62.2	1932
Austria	-3.7	4.9	4.7	51.0	-94.4	1945	441.6	1926
Belgium	0.5	1.6	1.4	15.0	-45.6	1917	62.3	1919
Canada	2.2	2.7	1.0	10.3	-25.9	1915	41.7	1921
Denmark	3.3	3.9	1.1	11.8	-18.2	1919	50.1	1983
Finland	0.3	1.5	1.3	13.7	-69.5	1918	30.2	1921
France	0.3	1.2	1.2	13.0	-43.5	1947	35.9	1927
Germany*	-1.3	1.3	1.5	15.7	-100.0	1923	62.5	1932
Ireland	1.6	2.7	1.4	15.0	-34.1	1915	61.2	1921
Italy	-1.1	0.3	1.4	14.7	-64.3	1944	35.5	1993
Japan	-0.8	1.8	1.8	19.6	-77.5	1946	69.8	1954
Netherlands	1.8	2.2	0.9	9.8	-18.1	1915	32.8	1932
New Zealand	2.1	2.5	0.8	9.0	-23.7	1984	34.1	1991
Norway	1.8	2.5	1.1	12.0	-48.0	1918	62.1	1921
Portugal	0.7	2.5	1.7	18.7	-49.7	1994	82.4	1922
South Africa	1.8	2.4	1.0	10.5	-32.6	1920	37.1	1921
Spain	1.8	2.6	1.2	12.5	-30.2	1920	53.2	1942
Sweden	2.7	3.5	1.2	12.7	-37.0	1939	68.2	1921
Switzerland	2.3	2.7	0.9	9.4	-21.4	1918	56.1	1922
United Kingdom	1.8	2.7	1.3	13.7	-30.7	1974	59.4	1921
United States	2.0	2.5	1.0	10.4	-18.4	1917	35.1	1982
Europe	1.1	2.4	1.5	16.2	-52.4	1919	72.8	1933
World ex-USA	1.5	2.5	1.4	14.6	-45.5	1919	76.1	1933
World	1.8	2.4	1.0	11.2	-32.0	1919	46.7	1933

\* For Germany, the means, standard deviation, and standard error are based on 115 years, excluding 1922–23. Source: Elroy Dimson, Paul Marsh, and Mike Staunton, *Triumph of the Optimists*, Princeton University Press, 2002, and subsequent research

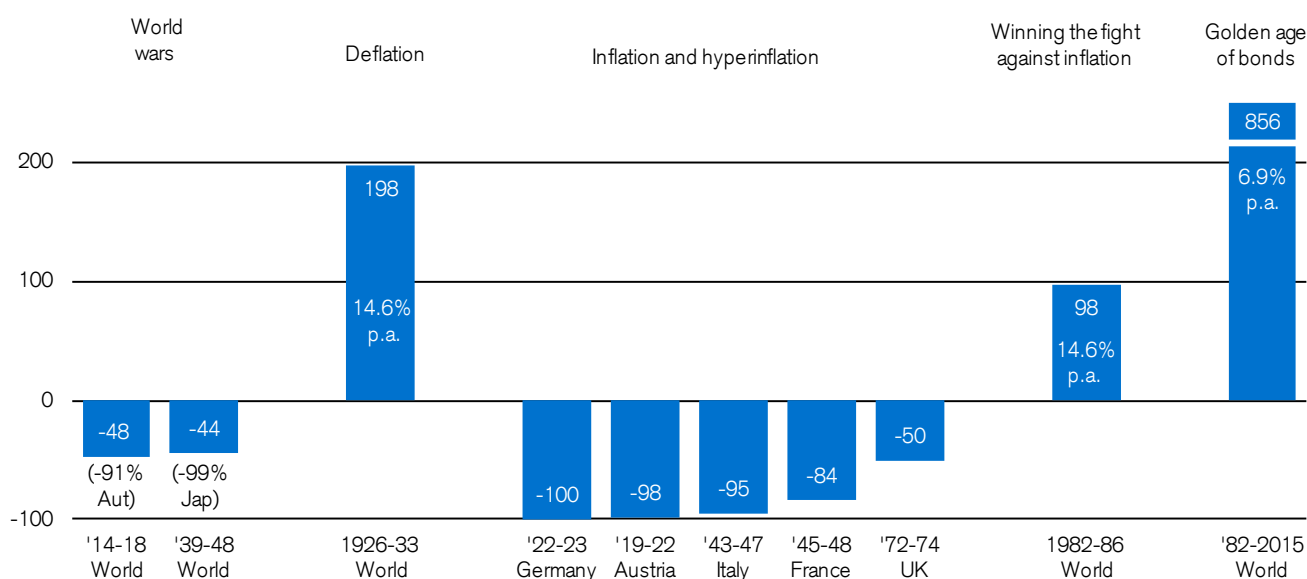
While bonds have generally been much less volatile than equities, they have sometimes experienced protracted intervals of very low or very high returns. Chart 7 shows the real returns on bonds over a selection of extreme periods. The two bars on the left-hand side show that wars have generally proved very bad for bonds. Investors in the world bond index lost 48% of their real wealth during World War I, while, from 1939 to 1948 in World War II and its immediate aftermath, the world bond index fell by 44% in real terms. While wars are bad, deflation has proved good news for bond investors. In fact, Chart 7 shows that during the deflationary period from 1926 to 1933, the real return on the world bond index was 198%, equivalent to 14.6% per annum.

Predictably, Chart 7 shows that the worst periods for bond investors were episodes of very high inflation or hyperinflation. The extreme case was German hyperinflation in 1922–23, but Austria also experienced hyperinflation after World War I, while bond investors in France, Italy, and Japan suffered disastrous returns during the extremes of inflation following World War II. More recently, Chart 7 shows that UK bond investors lost half their wealth in real terms in the inflationary period from 1972 to 1974. During the 1970s, many other countries suffered strong inflationary pressures.

From the late 1970s, governments tackled inflation using short-term interest rates as a policy instrument. This initially hurt bond returns, but, by 1982, inflation, inflationary expectations, and the risk premium bond investors require for inflation risk were all declining, giving a strong boost to bond prices. Chart 7 shows that, from 1982 to 1986, the world bond index rose by 98% in real terms, equivalent to an annualized return of 14.6%. The final bar of the chart shows that this was the start of a golden age that has lasted for more than three decades. From 1982 until the end of 2015, the world bond index gave a real return of 856% per annum. There were obviously setbacks, but world bonds gave positive real returns in 26 of the 34 years. The average real return averaged 6.5% across the 21 countries, and was 7.1% in the USA and 7.2% in the UK. Switzerland, which has enjoyed excellent bond returns over the full period since 1900, had the lowest return of 4.1%. Swiss bonds failed to benefit on the same scale, as Switzerland had no material inflationary problem to solve. Annualized real returns were 5% or more in every other market except for the most recently added country, Portugal.

These high returns partly reflect the higher real interest rates on offer since 1980 (see above). However, over this period, bonds beat bills in every country – the average difference between the annualized bond and bill returns was 4.1% – so there were clearly other factors at work.

**Chart 7: Real returns on bonds (%) during extreme periods, 1900–2016**



Source: Elroy Dimson, Paul Marsh, and Mike Staunton

The bull market began with the successful fight back by governments against inflation. Then, over time, real interest rates fell from their high levels in the early and mid-1980s, giving a further boost to bond prices. During the two major bear markets of the early 21st century and the Eurozone crisis, bonds – especially those issued by countries that have maintained the highest credit ratings – benefited from their safe-haven status and from policy interest rates being kept low to support national economies.

The lengthy period of strong bond returns contrasts sharply with the 117-year record shown in Table 5. Over the period since 1900, the average annualized real bond return across the 21 countries was just 1.0% per year, with disappointing returns in many countries. Yet, by the end of 2015, world bonds were level-pegging with world equities over the previous 34 years, giving the same annualized real return of 6.9%.

Bonds have thus been stellar performers throughout the working lives of most individuals. They have produced equity-like performance, yet with much lower volatility in an apparent violation of the law of risk and return. We argued in our 2013 [Yearbook](#) that extrapolating these high returns into the future would be fantasy. They have arisen from non-repeatable factors, and future returns are likely to be far lower.

More generally, this is a further example of the importance of looking at very long periods of history in order to understand markets. Even periods as long as three or four decades can be quite misleading if naively extrapolated. In the 2013 [Yearbook](#), we suggested a simple way of forecasting likely long-run real bond returns.

## 1.6 Factor investing – highlights

*We show below a short extract from the Yearbook's chapter analyzing factor investing. We refer readers to the full hardcopy version or the [Global Investment Returns Yearbook 2017](#) for a detailed analysis of factor investing which includes extensive additional information.*

Factor investing and smart-beta strategies are in vogue. A recent survey of major investors reports that almost three-quarters of asset owners are already using or are actively evaluating smart beta (FTSE Russell, 2016). Of those with an allocation to smart beta, nearly two-thirds are evaluating additional allocations, and the proportion of asset owners using at least five smart-beta indexes has risen tenfold from 2% in 2014 to over 20% in 2016. These market participants, with over USD 2 trillion in assets, include corporations, governments, pension plans and non-profit organizations, and they have adopted factor investing as an integral part of their strategy.

Exchange traded funds (ETFs) and exchange traded products (ETPs) have opened up further opportunities for investors to target asset exposures selectively. By the end of 2016, there were over 6,000 ETFs and ETPs, with over 12,000 listings and assets totaling USD 3.5 trillion; see Furr (2017). There were over 1,000 smart-beta equity products, with over 2,000 listings and assets totaling over USD 0.5 trillion. There were 145 smart-beta equity providers in 32 different countries. Smart-beta investing seeks to harvest the long-run factor premiums highlighted by academic researchers.

We have discussed five aspects of factor-based investing that are of great importance to investors. They are important because investment professionals cite strong evidence that they contribute to long-term returns. There is a size effect, in that smaller companies behave differently from large ones. There is a value effect, whereby value stocks perform differently from growth stocks. There is an income effect, with high-yielders performing differently from low- and zero-yielders, although this may also be regarded as a subset of the value effect.

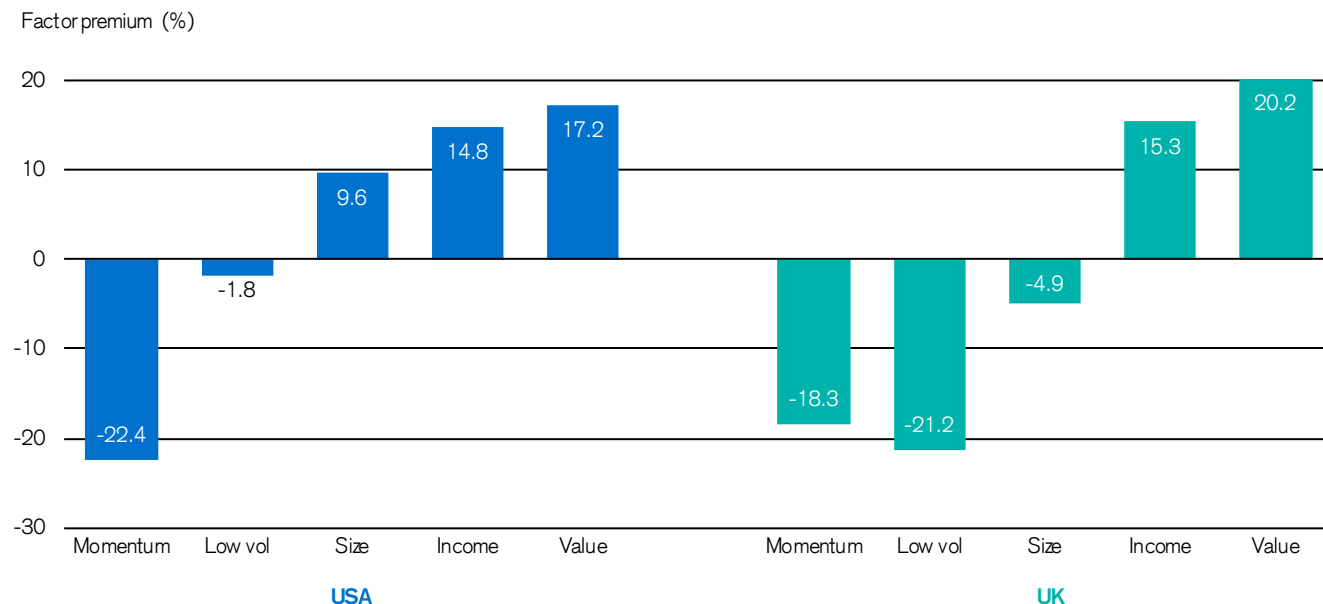
There is a momentum effect, whereby stocks with relative strength generate different returns from stocks with relative weakness. These effects are well substantiated. In addition, there is a low-volatility effect that is apparent in some markets. These effects cannot be ignored.

By an “effect,” we mean a tendency for stocks with certain attributes to co-move with one another. For example, value stocks move together, and in a different direction to growth stocks.

The reason these effects cannot be ignored is that they are likely to have an impact on portfolio performance. In addition to co-movement, there may also be a premium in expected returns for exposure to these factors. However, the evidence on premiums is not conclusive.

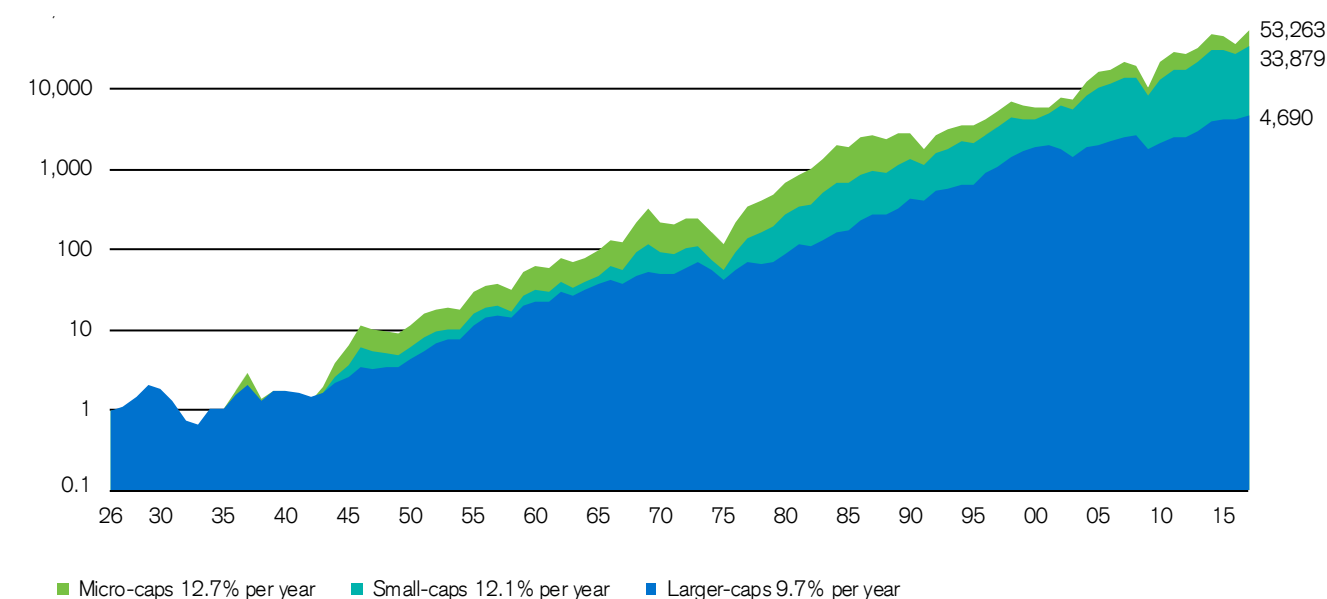
**Key selected charts**

**Chart 8: Equity factor premiums in the USA (LHS) and UK (RHS) over 2016**



Source: Elroy Dimson, Paul Marsh, and Mike Staunton, *Triumph of the Optimists*, Princeton University Press, 2002, and subsequent research. Note: size is small-caps relative to large, value is high book-to-market relative to low, income is high-yielding stocks relative to low-yielders, low risk is low idiosyncratic volatility relative to high, momentum is winner stocks relative to losers.

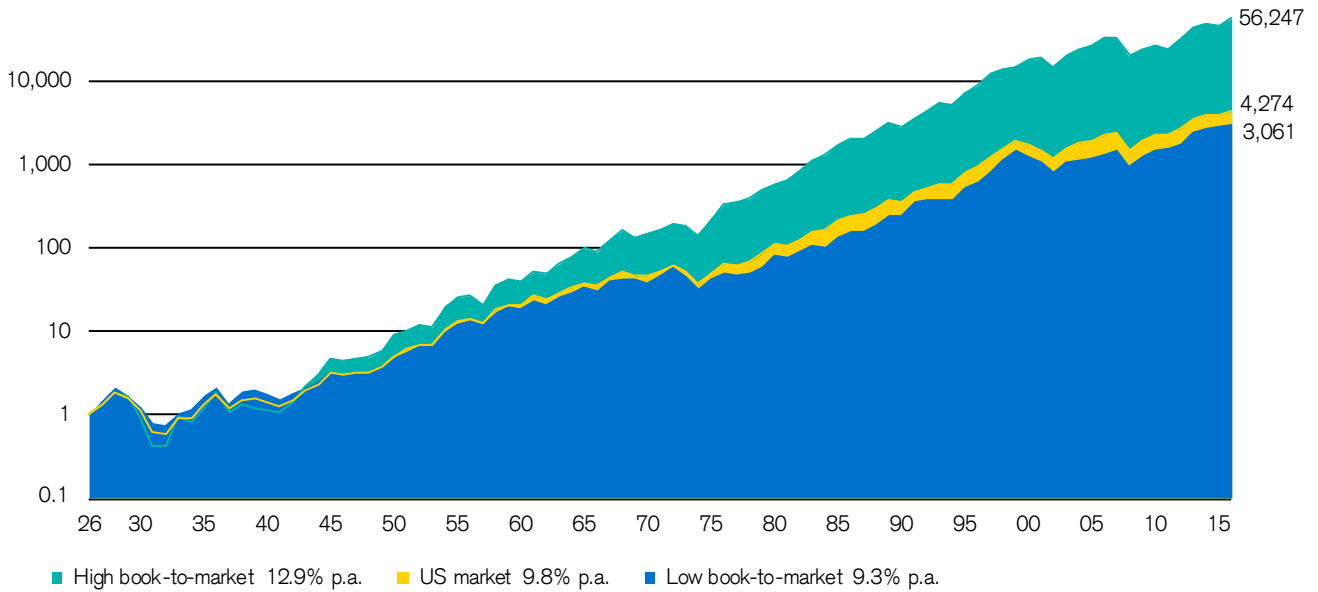
**Chart 9: Cumulative performance of US micro-caps, small-caps and large-caps, 1926–2016**



Source: Elroy Dimson, Paul Marsh, and Mike Staunton, *Triumph of the Optimists*, Princeton University Press, 2002, and subsequent research. US CRSP capitalization decile returns are from Morningstar.

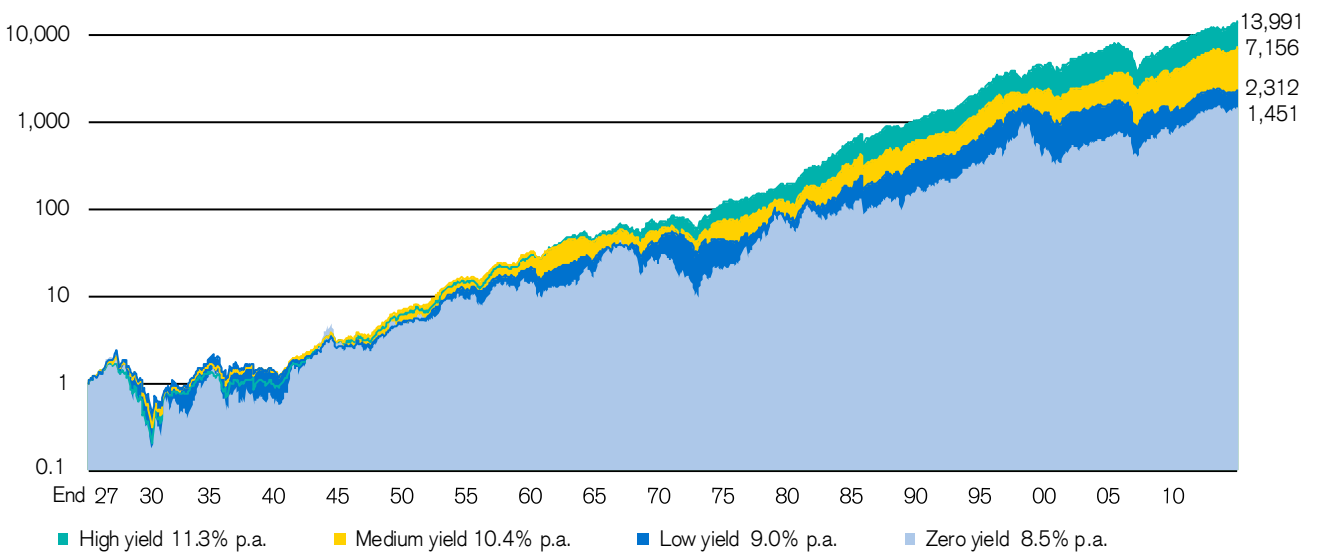


**Chart 10: Cumulative return from high book-to-market versus low book-to-market US stocks, 1926–2016**



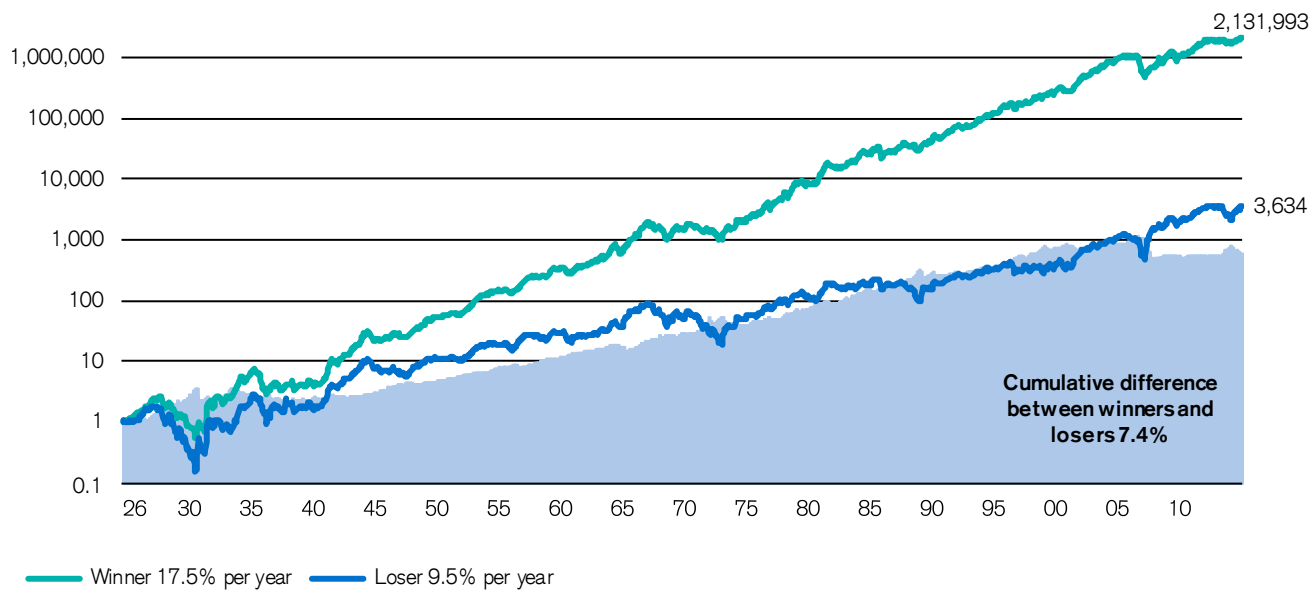
Source: Professor Kenneth French, Tuck School of Business, Dartmouth (website).

**Chart 11: Cumulative return from US zero, low, medium, and high-yielders, June 1927 to end-2016**



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

**Chart 12: Cumulative return from 6/1/6 momentum strategy based on US stocks, 1926–2016**



Source: Griffin, Ji, and Martin (2003) to end-2000; updated to end-2016 by Elroy Dimson, Paul Marsh, and Mike Staunton

## CHAPTER 2

# Individual markets

## Overview of country analysis

The coverage of the [Credit Suisse Global Investment Returns Yearbook](#) comprises 23 countries and three regions, all with index series that start in 1900. The markets 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). In addition, there is a 23-country world index, a 22-country world ex-US index, and a 16-country European index. For each region, there are stock and bond indices measured in US dollars and weighted by equity market capitalization and gross domestic product (GDP), respectively.

Our 23 countries represent 98% of world equity market capitalization at the start of 1900 and 91% of the investable universe in 2017. More details on the global coverage of the [Yearbook](#) and the sizes of each national market are provided in section 1.1 (starting on page 6). The list of countries included in the [Yearbook](#) database has expanded over time, but has been stable since 2015. The most recent additions are Portugal (added in 2014) and Austria (added in 2013), both with a full 117-year record, plus China and Russia (also added in 2013) with a record from 1900 to date apart from a gap in their financial histories from the start of their communist régimes until securities trading recommenced.

The underlying annual returns data are redistributed by Morningstar Inc.

**We show below summary profiles of the country analysis listed alphabetically, followed by three regional groups. Extensive additional information is included in the full hardcopy version of the Global Investment Returns Yearbook 2017.**

# Australia

## The lucky country



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

A large part of the Australian economy is made up of services, which represent three-quarters of GDP. With a strong banking system, the country was relatively untouched by the Global Financial Crisis, and was supported by strong demand for resources from China and other Asian nations. From 2011 onward, Australia had to confront the implications of falling global commodity prices, although 2016 saw a welcome recovery.

Whether it is down to economic management, a resource advantage or a generous spirit, Australia has in real terms been the second-best performing equity market over the past 117 years. Since 1900, the Australian stock market has achieved an annualized real return of 6.8% per year.

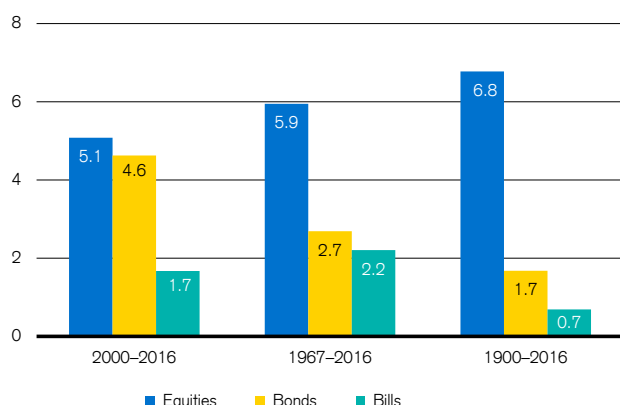
The Australian Securities Exchange (ASX) has its origins in six separate exchanges, established as early as 1861 in Melbourne and 1871 in Sydney, well before the federation of the Australian colonies formed the Commonwealth of Australia in 1901.

Among all the countries covered by the FTSE World index, Australia has the eighth-largest capitalization. Almost half the FTSE Australia index is represented by banks (33%) and basic materials (14%, predominantly mining). The largest stocks at the start of 2017 were Commonwealth Bank of Australia (11% of the index) and Westpac Banking Corporation (8%). They are followed by Australia & New Zealand Banking Group, National Australia Bank, BHP Billiton, CSL and Wesfarmers.

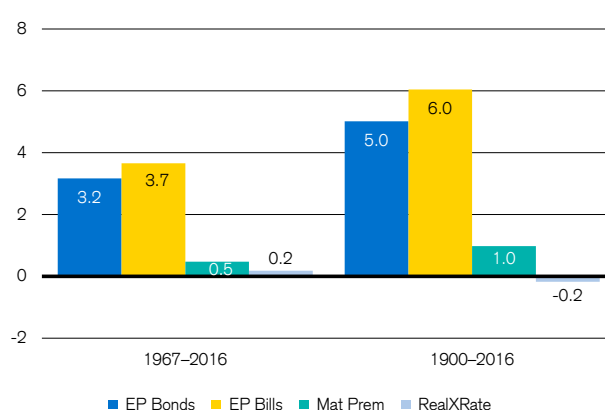
Australia also has a significant government and corporate bond market, and is home to the largest financial futures and options exchange in the Asia-Pacific region.

In the two exhibits below, we report (in the left-hand chart) the annualized real returns on equities, bonds and bills over this century, the last 50 years, and since 1900; and (in the right-hand chart) the annualized premiums achieved over the latter two periods by equities relative to bonds and bills, by bonds relative to bills, and by the real exchange rate relative to the US dollar.

**Annualized real returns on asset classes (l.h.s.) and risk premiums (r.h.s.) for Australia, 1900–2016 (%)**



Note: Equities denotes the total return, including reinvested dividend income, on the equity market. Bonds denotes the total return, including reinvested coupons, on long-term government bonds. Bills denotes the total return, including income, from Treasury bills. All returns are adjusted for inflation and are expressed as geometric mean returns.

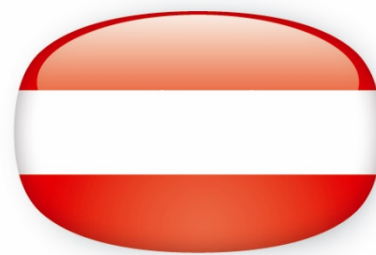


Note: EP Bonds denotes the equity premium relative to long-term government bonds; EP Bills denotes the equity premium relative to Treasury bills; Mat Prem denotes the maturity premium for government bond returns relative to bill returns; and RealXRate denotes the real (inflation-adjusted) change in the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

Source: Elroy Dimson, Paul Marsh and Mike Staunton, *Triumph of the Optimists*, Princeton University Press, 2002, and subsequent research.

# Austria

## Fallen empire



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

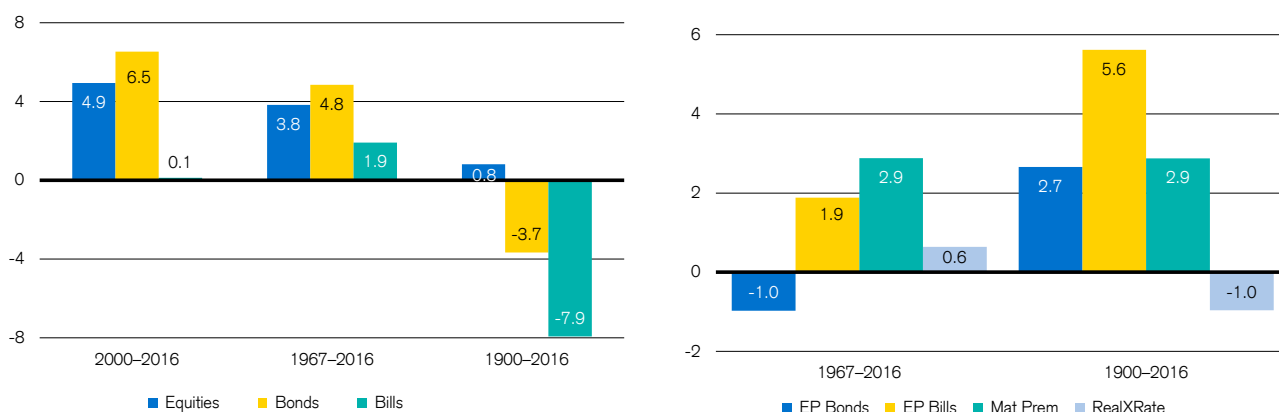
The Austrian Empire was reformed in the 19th century into Austria-Hungary, which, by 1900, was the second-largest country in Europe. It comprised modern-day Austria, Bosnia-Herzegovina, Croatia, Czech Republic, Hungary, Slovakia, Slovenia, large parts of Romania and Serbia, and small parts of Italy,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

Bonds were traded on the Wiener Börse from 1771 and shares from 1818 onward. Trading was interrupted by the world wars and, after the stock exchange reopened in 1948, share trading was sluggish and there was not a single IPO in the 1960s or 1970s. The Exchange’s activity expanded from the mid-1980s onward, building on Austria’s gateway to Eastern Europe. Still, over the last 117 years, real stock-market returns (0.8% per year) have been lower for Austria than for any other country with a continuous record from 1900 to date.

Financials represent almost half (45%) of the FTSE Austria index. At the start of 2017, the largest Austrian company was Erste Group Bank (33% of the index), followed by OMV, Voestalpine, and Andritz.

In the two exhibits below, we report (in the left-hand chart) the annualized real returns on equities, bonds and bills over this century, the last 50 years, and since 1900; and (in the right-hand chart) the annualized premiums achieved over the latter two periods by equities relative to bonds and bills, by bonds relative to bills, and by the real exchange rate relative to the US dollar. These premiums exclude the hyperinflationary years 1921–22.

**Annualized real returns on asset classes (l.h.s.) and risk premiums (r.h.s.) for Austria, 1900–2016 (%)**



Note: Equities denotes the total return, including reinvested dividend income, on the equity market. Bonds denotes the total return, including reinvested coupons, on long-term government bonds. Bills denotes the total return, including income, from Treasury bills. All returns are adjusted for inflation and are expressed as geometric mean returns.

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, *Triumph of the Optimists*, Princeton University Press, 2002, and subsequent research.

# Belgium

## At the heart of Europe



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

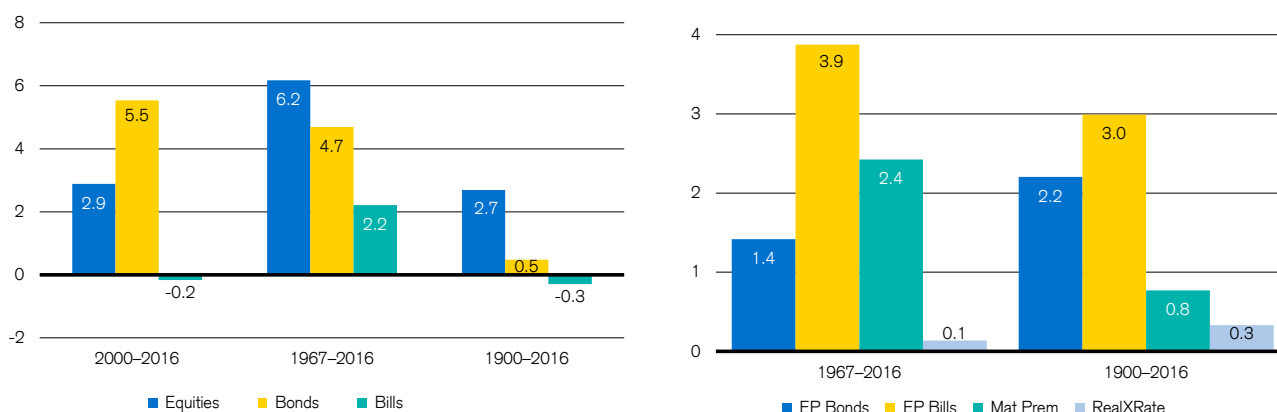
Belgium's strategic location has been a mixed blessing, making it a major battleground in international wars, including the Battle of Waterloo, 200 years ago, and the two world wars of the 20th century. The ravages of war and attendant high inflation rates are an important contributory factor to its poor long-run investment returns – Belgium has been one of the three worst-performing equity markets and the seventh worst-performing bond market out of all those with a complete history. Its equity risk premium over 117 years was the lowest of the *Yearbook* countries when measured relative to bills, and fourth-lowest measured relative to bonds.

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

Its importance has gradually declined, and what became Euronext Brussels suffered badly during the banking crisis. Three large banks made up a majority of its market capitalization at the start of 2008, but the banking sector now represents less than 11% of the FTSE Belgium index. By the start of 2017, 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 the two exhibits below, we report (in the left-hand chart) the annualized real returns on equities, bonds and bills over this century, the last 50 years, and since 1900; and (in the right-hand chart) the annualized premiums achieved over the latter two periods by equities relative to bonds and bills, by bonds relative to bills, and by the real exchange rate relative to the US dollar.

**Annualized real returns on asset classes (l.h.s.) and risk premiums (r.h.s.) for Belgium, 1900–2016 (%)**



Note: Equities denotes the total return, including reinvested dividend income, on the equity market. Bonds denotes the total return, including reinvested coupons, on long-term government bonds. Bills denotes the total return, including income, from Treasury bills. All returns are adjusted for inflation and are expressed as geometric mean returns.

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, *Triumph of the Optimists*, Princeton University Press, 2002, and subsequent research.



# Canada

## Resourceful country



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

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

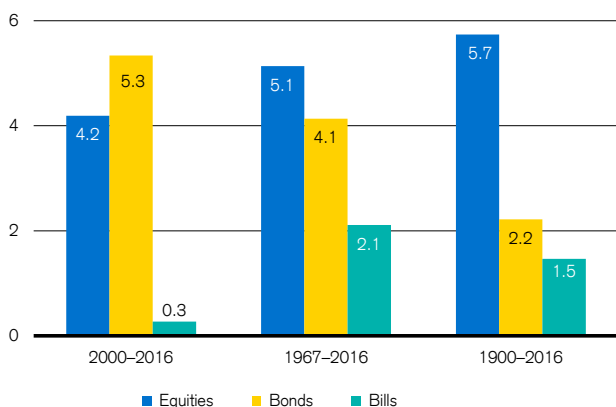
The Canadian equity market dates back to the opening of the Toronto Stock Exchange in 1861 and – as can be seen in the pie chart on the first page of the country profiles section of this report – it is now the world's sixth-largest stock market by capitalization. Canada's bond market also ranks among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

Nearly half (45%) of the market capitalization of the FTSE Canada index is accounted for by financials, predominantly banks (32%). Given Canada's natural resource endowment, it is no surprise that oil and gas has a 21% weighting, with a further 5% in mining stocks. The largest stocks are currently Royal Bank of Canada, Toronto-Dominion Bank, Bank of Nova Scotia, Suncor Energy and Canadian National Railway.

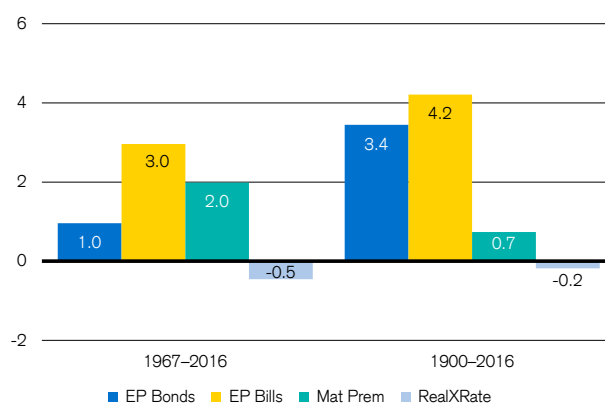
Canadian equities have performed well over the long run, with a real return of 5.7% per year. The real return on bonds has been 2.2% per year. These figures are close to those we report for the USA.

In the two exhibits below, we report (in the left-hand chart) the annualized real returns on equities, bonds and bills over this century, the last 50 years, and since 1900; and (in the right-hand chart) the annualized premiums achieved over the latter two periods by equities relative to bonds and bills, by bonds relative to bills, and by the real exchange rate relative to the US dollar.

**Annualized real returns on asset classes (l.h.s.) and risk premiums (r.h.s.) for Canada, 1900–2016 (%)**



Note: Equities denotes the total return, including reinvested dividend income, on the equity market. Bonds denotes the total return, including reinvested coupons, on long-term government bonds. Bills denotes the total return, including income, from Treasury bills. All returns are adjusted for inflation and are expressed as geometric mean returns.

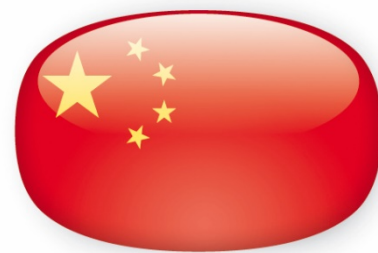


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Source: Elroy Dimson, Paul Marsh and Mike Staunton, *Triumph of the Optimists*, Princeton University Press, 2002, and subsequent research.

# China

## The biggest economy



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

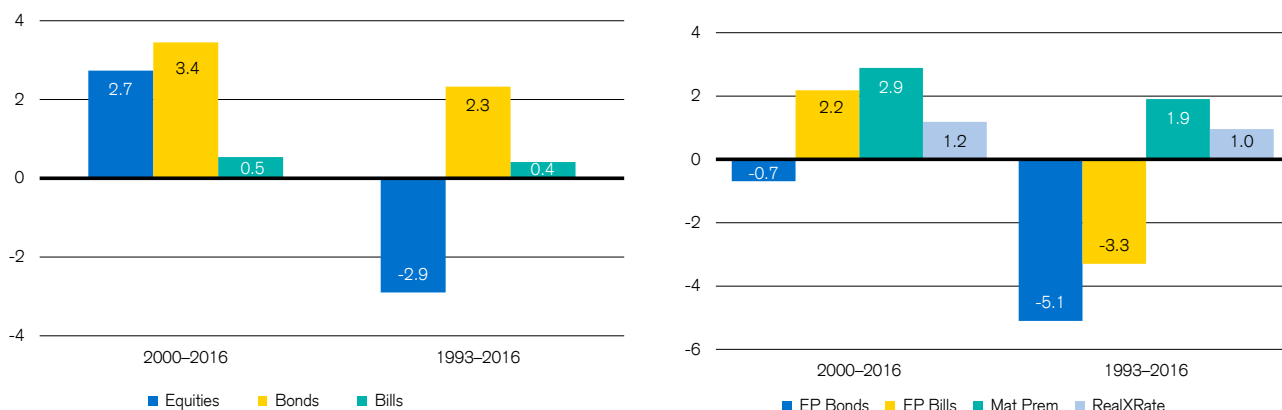
After the Qing Dynasty, it became the Republic of China (ROC) in 1911. The ROC nationalists lost control of the mainland at the end of the 1946–49 civil war, after which their jurisdiction was limited to Taiwan and a few islands. Following the communist victory in 1949, privately owned assets were expropriated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

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

As discussed in the 2014 [Yearbook](#), China's GDP growth was not accompanied by superior investment returns. Nearly half (40%) of the Chinese market's free-float investible capitalization is represented by financials, mainly banks and insurers. Tencent Holdings is the biggest holding in the FTSE World China index, followed by China Construction Bank, China Mobile, and then the Industrial and Commercial Bank of China.

In the two exhibits below, we report (in the left-hand chart) the annualized real returns on equities, bonds and bills over this century, and over the period since 1993; and (in the right-hand chart) the annualized premiums achieved over the same two periods by equities relative to bonds and bills, by bonds relative to bills, and by the real exchange rate relative to the US dollar.

**Annualized real returns on asset classes (l.h.s.) and risk premiums (r.h.s.) for China, 1993–2016 (%)**



Note: Equities denotes the total return, including reinvested dividend income, on the equity market. Bonds denotes the total return, including reinvested coupons, on long-term government bonds. Bills denotes the total return, including income, from Treasury bills. All returns are adjusted for inflation and are expressed as geometric mean returns.

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, [Triumph of the Optimists](#), Princeton University Press, 2002, and subsequent research.

# Denmark

## Nation of peace



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

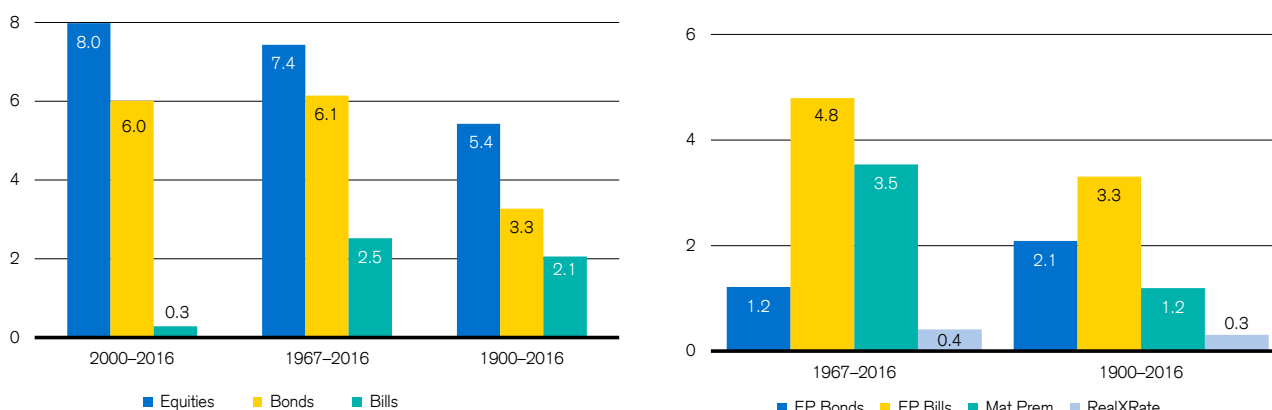
The unified kingdom of Denmark had emerged in the eighth century, and an absolute monarchy that had begun in 1660 came to an end in 1849 when the country's constitution was signed. In the early 20th century, Denmark adopted a welfare state model. It became a member of the European Union in 1973, but retained its own currency. Whatever the source of Denmark's contentment, it does not appear to spring from outstanding equity returns. Since 1900, Danish equities have given an annualized real return of 5.4%, which is close to the performance of the world index.

In contrast, Danish bonds gave an annualized real return of 3.3%, 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 research by Claus Parum (see Parum 1999a,b, 2001 and 2002) who felt it was more appropriate to use mortgage bonds, rather than more thinly traded government bonds.

The Copenhagen Stock Exchange was formally established in 1808, but traces its roots back to the late 17th century. The Danish equity market is relatively small. The FTSE Denmark index has a very high weighting in healthcare (49%). Nearly one-third (33%) of the Danish equity market is represented by one company, Novo-Nordisk. Other large companies include Danske Bank and AP Møller-Mærsk.

In the two exhibits below, we report (in the left-hand chart) the annualized real returns on equities, bonds and bills over this century, the last 50 years, and since 1900; and (in the right-hand chart) the annualized premiums achieved over the latter two periods by equities relative to bonds and bills, by bonds relative to bills, and by the real exchange rate relative to the US dollar.

**Annualized real returns on asset classes (l.h.s.) and risk premiums (r.h.s.) for Denmark, 1900–2016 (%)**



Note: Equities denotes the total return, including reinvested dividend income, on the equity market. Bonds denotes the total return, including reinvested coupons, on long-term government bonds. Bills denotes the total return, including income, from Treasury bills. All returns are adjusted for inflation and are expressed as geometric mean returns.

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Source: Elroy Dimson, Paul Marsh and Mike Staunton, [Triumph of the Optimists](#), Princeton University Press, 2002, and subsequent research.

# Finland

## East meets West



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

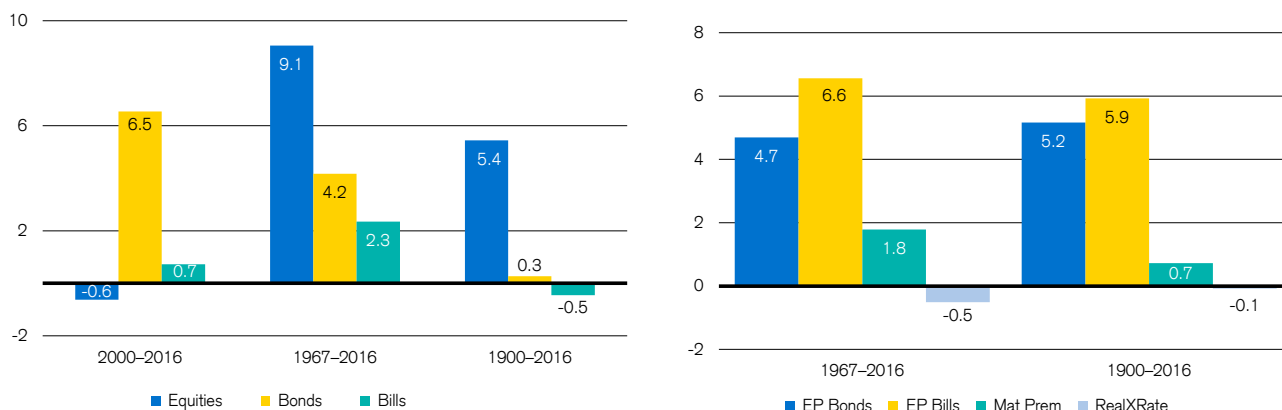
With its proximity to the Baltics and Russia, Finland is a meeting place for Eastern and Western European cultures. This country of snow, swamps and forests – one of Europe’s most sparsely populated nations – was part of the Kingdom of Sweden until sovereignty transferred in 1809 to the Russian Empire.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

Finnish securities were initially traded over-the-counter or overseas. Trading began at the Helsinki Stock Exchange in 1912. Since 2003, the Helsinki exchange has been part of the OMX family of Nordic markets. At its peak, Nokia represented 72% of the value-weighted HEX All Shares Index, and Finland was a particularly concentrated stock market. Today, the largest Finnish companies are Nokia (21% of the FTSE Finland index), Sampo (16%) and Kone (13%).

We have made enhancements to our Finnish equity series, drawing on work by Nyberg and Vaihekoski (2014).

In the two exhibits below, we report (in the left-hand chart) the annualized real returns on equities, bonds and bills over this century, the last 50 years, and since 1900; and (in the right-hand chart) the annualized premiums achieved over the latter two periods by equities relative to bonds and bills, by bonds relative to bills, and by the real exchange rate relative to the US dollar.

**Annualized real returns on asset classes (l.h.s.) and risk premiums (r.h.s.) for Finland, 1900–2016 (%)**



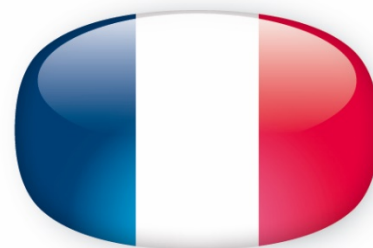
Note: Equities denotes the total return, including reinvested dividend income, on the equity market. Bonds denotes the total return, including reinvested coupons, on long-term government bonds. Bills denotes the total return, including income, from Treasury bills. All returns are adjusted for inflation and are expressed as geometric mean returns.

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, *Triumph of the Optimists*, Princeton University Press, 2002, and subsequent research.

# France

## European center



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

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

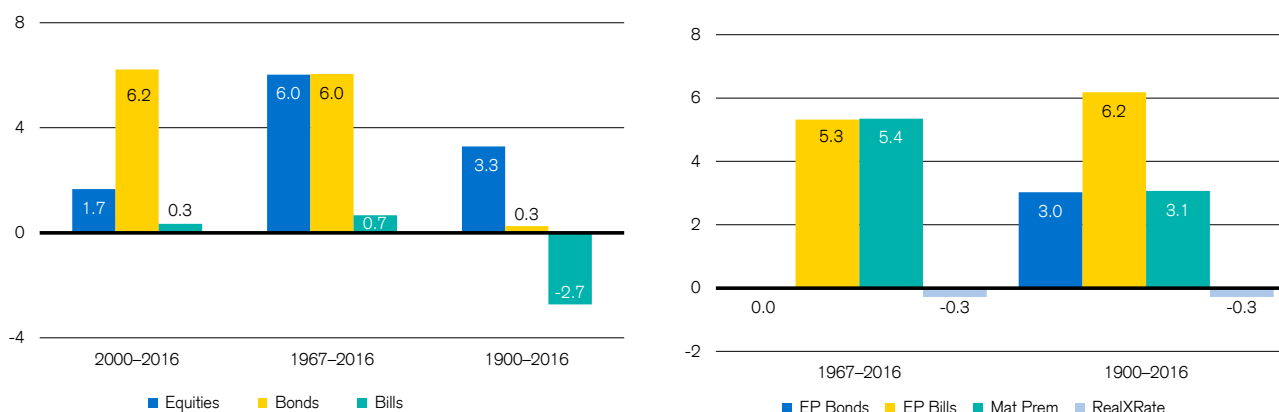
Paris has continued to be an important financial center, while France remains at the center of Europe, being a founder of the European Union and the Eurozone. France is the second most populous country in the European Union and is ranked third by GDP. It has the largest equity market in Continental Europe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

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

At the start of 2017, France's largest listed companies were Total, Sanofi, and BNP Paribas.

In the two exhibits below, we report (in the left-hand chart) the annualized real returns on equities, bonds and bills over this century, the last 50 years, and since 1900; and (in the right-hand chart) the annualized premiums achieved over the latter two periods by equities relative to bonds and bills, by bonds relative to bills, and by the real exchange rate relative to the US dollar.

**Annualized real returns on asset classes (l.h.s.) and risk premiums (r.h.s.) for France, 1900–2016 (%)**



Note: Equities denotes the total return, including reinvested dividend income, on the equity market. Bonds denotes the total return, including reinvested coupons, on long-term government bonds. Bills denotes the total return, including income, from Treasury bills. All returns are adjusted for inflation and are expressed as geometric mean returns.

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Source: Elroy Dimson, Paul Marsh and Mike Staunton, *Triumph of the Optimists*, Princeton University Press, 2002, and subsequent research.

# Germany

## Locomotive of Europe



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

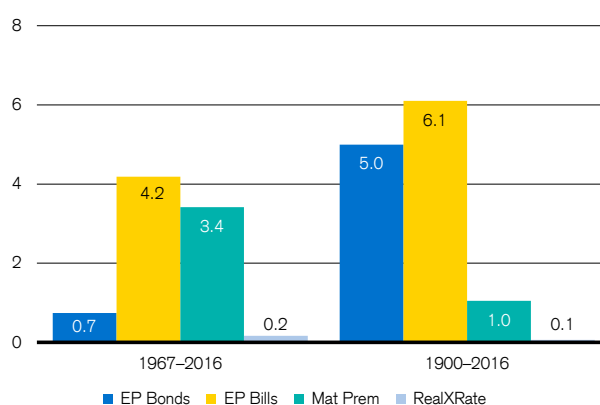
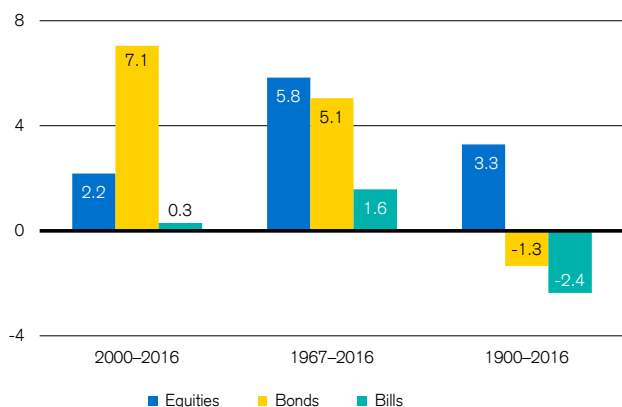
In the first half of the 20th century, German equities lost two-thirds of their value in World War I and, during 1922–23, inflation hit 209 billion percent. In World War II and its immediate aftermath, equities fell by 88% in real terms, while bonds fell by 91%. After World War II, there was a remarkable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

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

The German stock market retains its bias toward manufacturing, with weightings of 22% in consumer goods, 21% in basic materials, and 16% in industrials. The largest stocks are Siemens, Bayer, BASF, SAP, Daimler, Allianz, and Deutsche Telekom. Small and medium enterprises are also important.

In the two exhibits below, we report (in the left-hand chart) the annualized real returns on equities, bonds and bills over this century, the last 50 years, and since 1900; and (in the right-hand chart) the annualized premiums achieved over the latter two periods by equities relative to bonds and bills, by bonds relative to bills, and by the real exchange rate relative to the US dollar. We omit the 1922–23 hyperinflation for every series except real equity returns and the real exchange rate.

**Annualized real returns on asset classes (l.h.s.) and risk premiums (r.h.s.) for Germany, 1900–2016 (%)**



Note: Equities denotes the total return, including reinvested dividend income, on the equity market. Bonds denotes the total return, including reinvested coupons, on long-term government bonds. Bills denotes the total return, including income, from Treasury bills. All returns are adjusted for inflation and are expressed as geometric mean returns.

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Source: Elroy Dimson, Paul Marsh and Mike Staunton, *Triumph of the Optimists*, Princeton University Press, 2002, and subsequent research.

# Ireland

## Born free



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

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

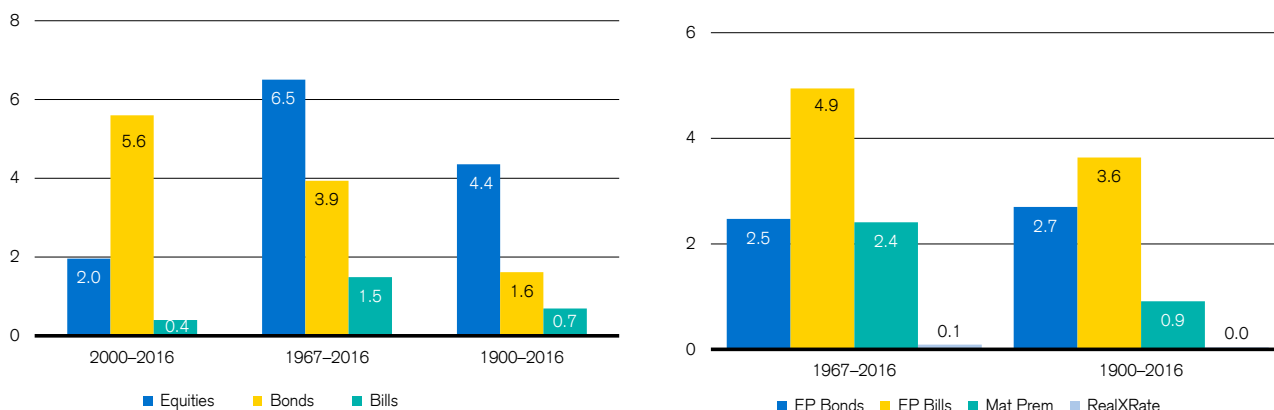
By the 1990s and early 2000s, Ireland experienced great economic success and became known as the Celtic Tiger. By 2007, it had become the world’s fifth-richest country in terms of GDP per capita, the second-richest in the European Union, and was experiencing net immigration. Over the period 1987–2006,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

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

There have been stock exchanges in Dublin and Cork since 1793. To monitor Irish stocks from 1900, we constructed an index based on stocks traded on these two exchanges. Currently, Ireland’s largest index constituents are Kerry Group (45% of the FTSE Ireland index), Bank of Ireland (29%) and Ryanair (14%).

In the two exhibits below, we report (in the left-hand chart) the annualized real returns on equities, bonds and bills over this century, the last 50 years, and since 1900; and (in the right-hand chart) the annualized premiums achieved over the latter two periods by equities relative to bonds and bills, by bonds relative to bills, and by the real exchange rate relative to the US dollar.

**Annualized real returns on asset classes (l.h.s.) and risk premiums (r.h.s.) for Ireland, 1900–2016 (%)**



Note: Equities denotes the total return, including reinvested dividend income, on the equity market. Bonds denotes the total return, including reinvested coupons, on long-term government bonds. Bills denotes the total return, including income, from Treasury bills. All returns are adjusted for inflation and are expressed as geometric mean returns.

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# Italy

## Banking innovators



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

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

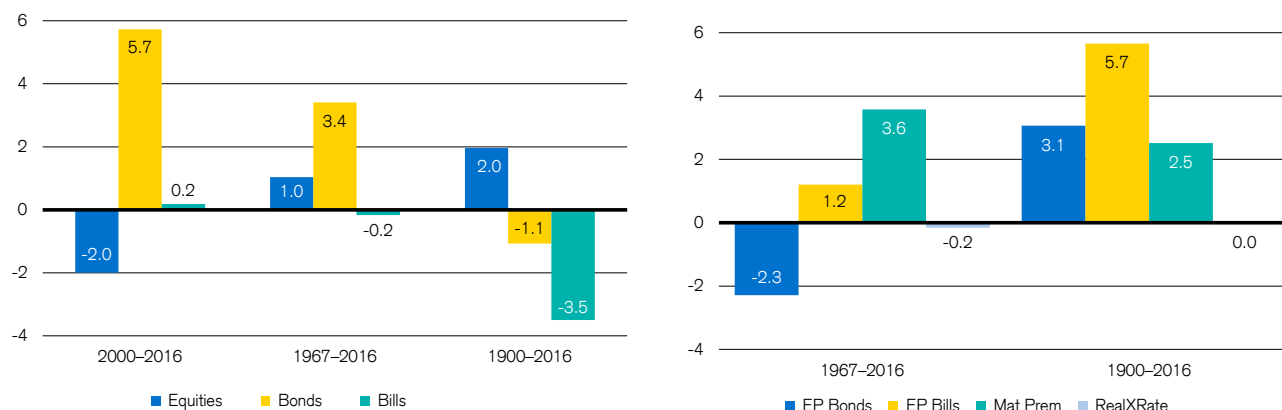
Despite the setbacks, banking is still important in Italy. While banking can trace its roots back to Biblical times, Italy can claim a key role in its development. In the Middle Ages, North Italian bankers, including the Medici family, dominated lending and trade financing throughout Europe. These bankers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

Italy retains a large banking sector to this day, with banks still accounting for under a quarter (21%) of the FTSE Italy index, and insurance for a further 9%. Oil and gas accounts for 16%. The largest stocks traded on the Milan Stock Exchange are Eni (15%), Enel (12%), Intesa Sanpaolo, Generali, and Unicredit.

Italy has experienced some of the lowest asset returns of any *Yearbook* country. Since 1900, the annualized real equity return has been 2.0%, the second lowest among all *Yearbook* countries with a 117-year history. Alongside Germany and Austria, which suffered severe hyperinflations, Italy had real bond and real bill returns that were among the very worst of the *Yearbook* countries, as well as high inflation and a weak currency.

In the two exhibits below, we report (in the left-hand chart) the annualized real returns on equities, bonds and bills over this century, the last 50 years, and since 1900; and (in the right-hand chart) the annualized premiums achieved over the latter two periods by equities relative to bonds and bills, by bonds relative to bills, and by the real exchange rate relative to the US dollar.

**Annualized real returns on asset classes (l.h.s.) and risk premiums (r.h.s.) for Italy, 1900–2016 (%)**



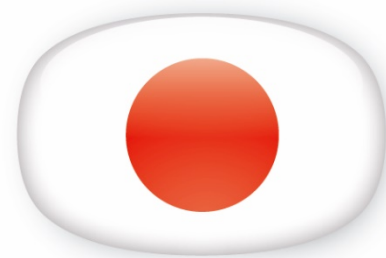
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Source: Elroy Dimson, Paul Marsh and Mike Staunton, *Triumph of the Optimists*, Princeton University Press, 2002, and subsequent research.

# Japan

## Birthplace of futures



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

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

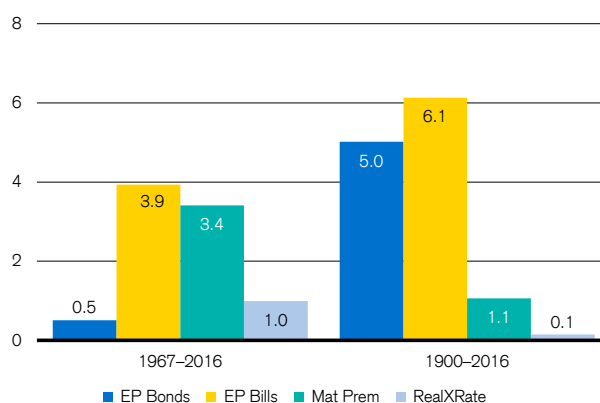
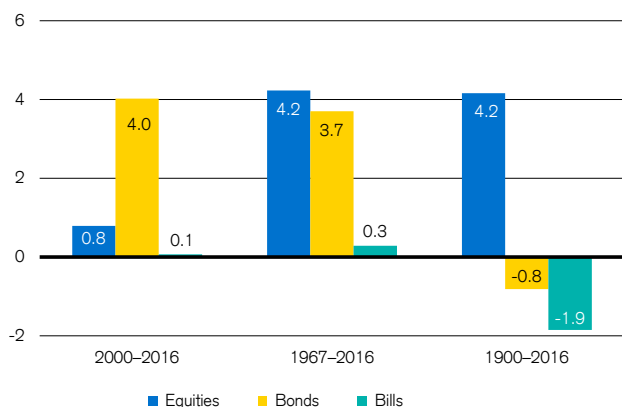
By the start of the 1990s, the Japanese equity market was the largest in the world, with a 41% weighting in the world index compared to 30% for the USA. Real estate values were also riding high: a 1993 article in the Journal of Economic Perspectives reported that, in late 1991, the land under the Emperor's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

Then the bubble burst. From 1990 to the start of 2009, Japan was the worst-performing stock market. At the start of 2017, its capital value is still close to one-third of its value at the beginning of the 1990s. Its weighting in the world index fell from 41% to 9%. Meanwhile, Japan has suffered a prolonged period of stagnation, banking crises and deflation. Hopefully, this will not form the blueprint for other countries.

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

In the two exhibits below, we report (in the left-hand chart) the annualized real returns on equities, bonds and bills over this century, the last 50 years, and since 1900; and (in the right-hand chart) the annualized premiums achieved over the latter two periods by equities relative to bonds and bills, by bonds relative to bills, and by the real exchange rate relative to the US dollar.

**Annualized real returns on asset classes (l.h.s.) and risk premiums (r.h.s.) for Japan, 1900–2016 (%)**



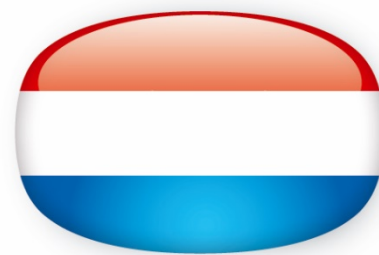
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Source: Elroy Dimson, Paul Marsh and Mike Staunton, *Triumph of the Optimists*, Princeton University Press, 2002, and subsequent research.

# Netherlands

## Exchange pioneer



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

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

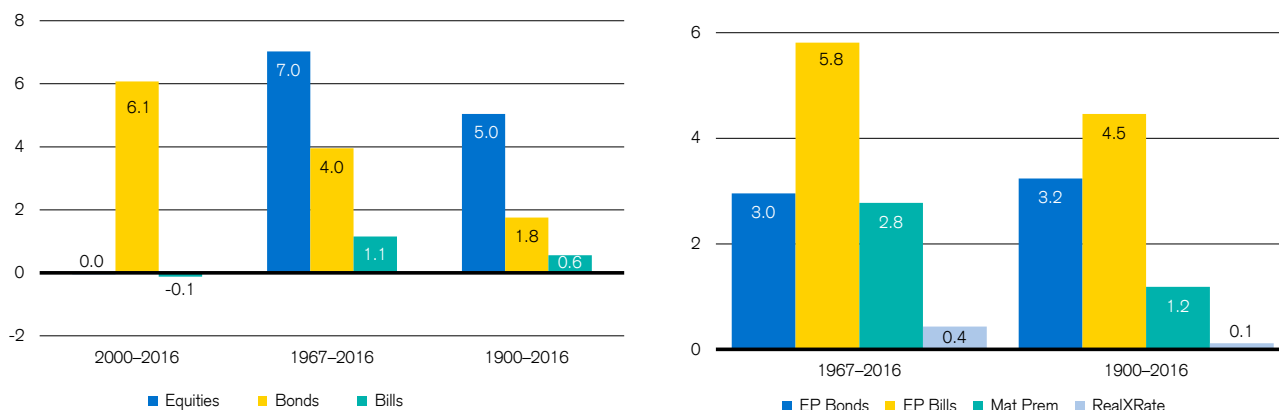
A book written in 1688 by a Spaniard living in Amsterdam (appropriately entitled *Confusion de Confusiones*) describes the amazingly diverse tactics used by investors. Even though only one stock was traded – the Dutch East India Company – they had bulls, bears, panics, bubbles and other features of modern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

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

The Netherlands has a heavy exposure to financials (27% of the stock market's capitalization), consumer goods (23%), and consumer services (14%). Although Royal Dutch Shell now has its primary listing in London, and a secondary listing in Amsterdam, the Amsterdam exchange still hosts more than its share of major multinationals, including Unilever, ING Group, ASML Holding, Koninklijke Philips, Ahold, Heineken, and Akzo Nobel.

In the two exhibits below, we report (in the left-hand chart) the annualized real returns on equities, bonds and bills over this century, the last 50 years, and since 1900; and (in the right-hand chart) the annualized premiums achieved over the latter two periods by equities relative to bonds and bills, by bonds relative to bills, and by the real exchange rate relative to the US dollar.

**Annualized real returns on asset classes (l.h.s.) and risk premiums (r.h.s.) for The Netherlands, 1900–2016 (%)**



Note: Equities denotes the total return, including reinvested dividend income, on the equity market. Bonds denotes the total return, including reinvested coupons, on long-term government bonds. Bills denotes the total return, including income, from Treasury bills. All returns are adjusted for inflation and are expressed as geometric mean returns.

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Source: Elroy Dimson, Paul Marsh and Mike Staunton, *Triumph of the Optimists*, Princeton University Press, 2002, and subsequent research.

# New Zealand

## Purity and integrity



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

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

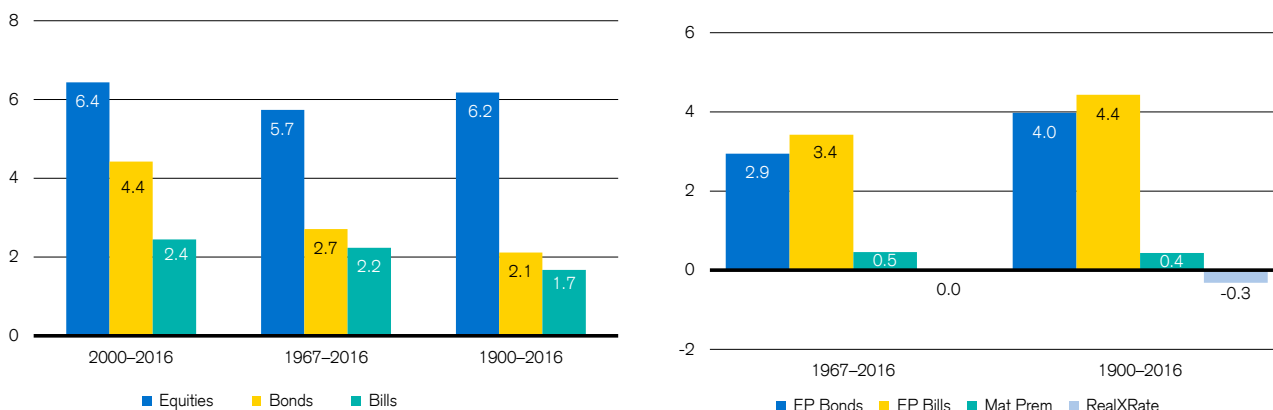
Over the last three decades, New Zealand has evolved into a more industrialized, free market economy. It competes globally as an export-led nation through efficient ports, airline services, and submarine fiber-optic communications. New Zealand took up a non-permanent seat on the UN Security Council for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

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

The largest firms traded on the exchange are Fletcher Building (16% of the market capitalization of the FTSE New Zealand index), plus Spark New Zealand (14%), Auckland International Airport (12%), and F&P Healthcare (11%).

In the two exhibits below, we report (in the left-hand chart) the annualized real returns on equities, bonds and bills over this century, the last 50 years, and since 1900; and (in the right-hand chart) the annualized premiums achieved over the latter two periods by equities relative to bonds and bills, by bonds relative to bills, and by the real exchange rate relative to the US dollar.

**Annualized real returns on asset classes (l.h.s.) and risk premiums (r.h.s.) for New Zealand, 1900–2016 (%)**



Note: Equities denotes the total return, including reinvested dividend income, on the equity market. Bonds denotes the total return, including reinvested coupons, on long-term government bonds. Bills denotes the total return, including income, from Treasury bills. All returns are adjusted for inflation and are expressed as geometric mean returns.

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Source: Elroy Dimson, Paul Marsh and Mike Staunton, *Triumph of the Optimists*, Princeton University Press, 2002, and subsequent research.

# Norway

## Nordic oil kingdom



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

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

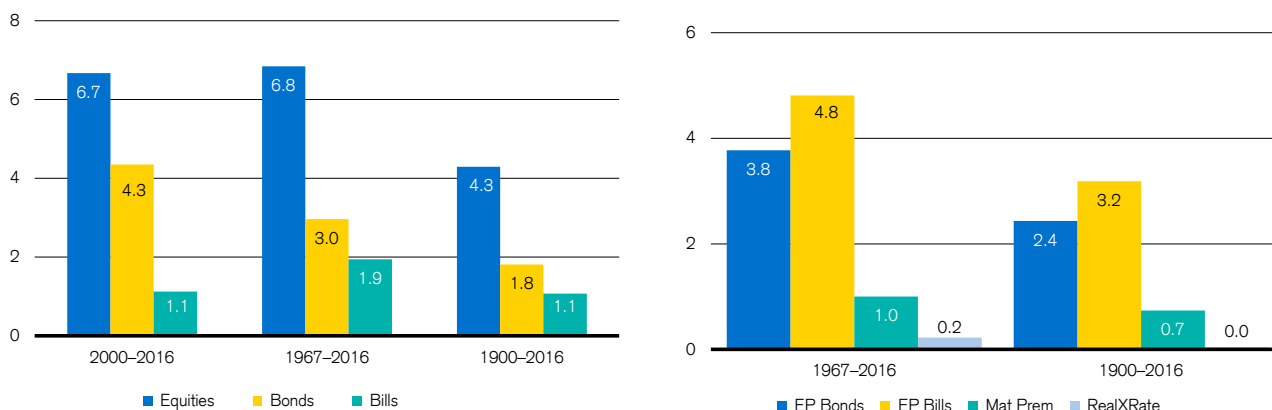
The Oslo Stock Exchange was founded as Christiania Bors in 1819 for auctioning ships, commodities, and currencies. Later, this extended to trading in stocks and shares. The exchange now forms part of the OMX grouping of Scandinavian exchanges.

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

The largest Oslo Stock Exchange stocks are Statoil (23% of the index), DNB (21%), and Telenor (13%).

In the two exhibits below, we report (in the left-hand chart) the annualized real returns on equities, bonds and bills over this century, the last 50 years, and since 1900; and (in the right-hand chart) the annualized premiums achieved over the latter two periods by equities relative to bonds and bills, by bonds relative to bills, and by the real exchange rate relative to the US dollar.

**Annualized real returns on asset classes (l.h.s.) and risk premiums (r.h.s.) for Norway, 1900–2016 (%)**



Note: Equities denotes the total return, including reinvested dividend income, on the equity market. Bonds denotes the total return, including reinvested coupons, on long-term government bonds. Bills denotes the total return, including income, from Treasury bills. All returns are adjusted for inflation and are expressed as geometric mean returns.

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Source: Elroy Dimson, Paul Marsh and Mike Staunton, [Triumph of the Optimists](#), Princeton University Press, 2002, and subsequent research.

# Portugal

## Land of discoverers



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

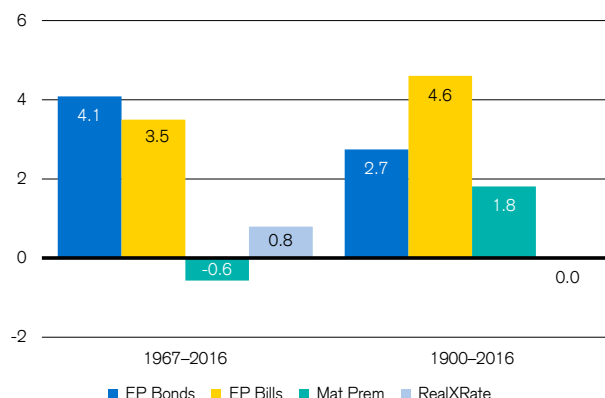
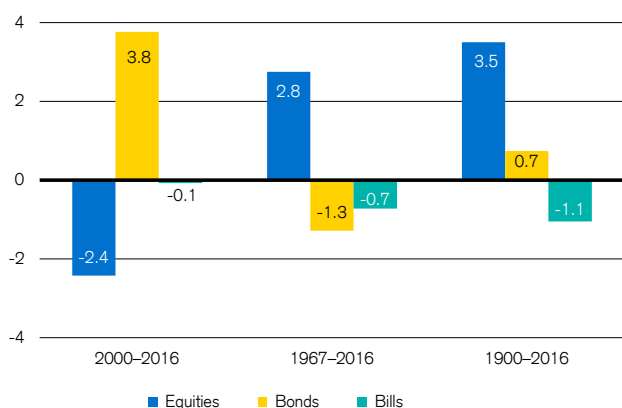
The Portuguese monarchy was deposed in 1910 and the country was then run by repressive governments for some six decades. Modern Portugal emerged in 1974 from the Carnation Revolution, a military coup that overthrew the former regime. The following year, Portugal granted independence to all its African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

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

The Euronext Lisbon stock exchange (a part of the NYSE Euronext) trades a range of major Portuguese corporations. The FTSE Portugal index comprises 41% in oil & gas, and 38% in utilities. The biggest companies traded in Lisbon are Galp Energia, EDP, and Jeronimo Martins.

In the two exhibits below, we report (in the left-hand chart) the annualized real returns on equities, bonds and bills over this century, the last 50 years, and since 1900; and (in the right-hand chart) the annualized premiums achieved over the latter two periods by equities relative to bonds and bills, by bonds relative to bills, and by the real exchange rate relative to the US dollar.

**Annualized real returns on asset classes (l.h.s.) and risk premiums (r.h.s.) for Portugal, 1900–2016 (%)**



Note: Equities denotes the total return, including reinvested dividend income, on the equity market. Bonds denotes the total return, including reinvested coupons, on long-term government bonds. Bills denotes the total return, including income, from Treasury bills. All returns are adjusted for inflation and are expressed as geometric mean returns.

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# Russia

## Wealth of resources



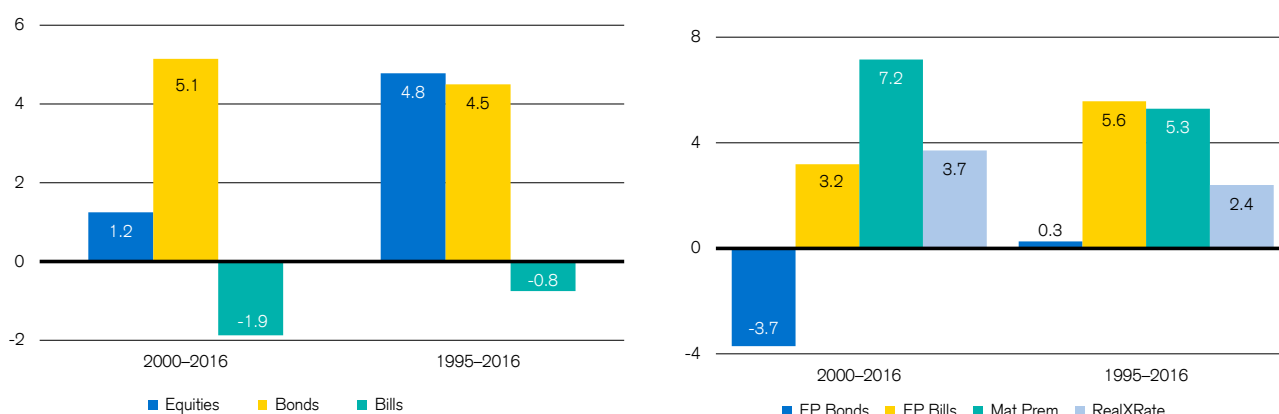
Russia is the world's largest country, covering more than one-eighth of the Earth's inhabited land area, spanning nine time zones, and located in both Europe and Asia. Formerly, it even owned one-sixth of what is now the USA. It is the world's leading oil producer, second-largest natural gas producer,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

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

In 1998, Russia experienced a severe financial crisis, with government debt default, currency devaluation, hyperinflation and an economic meltdown. However, there was a surprisingly swift recovery and, in the decade after the 1998 crisis, the economy averaged 7% annual growth. In 2008–09, there was a major reaction to global setbacks and commodity price swings. Fueled by a persistently volatile political situation, Russian stock market performance has likewise been volatile. By the beginning of 2017, over half (54%) of the Russian stock market comprised oil and gas companies, the largest being Gazprom and Lukoil. Adding in basic materials, resources represent almost two-thirds of Russia's market capitalization.

Russia, like China, does not have a continuous investment history because of the long interval of Soviet communism that lasted for more than 70 years following the October 1917 Revolution. In 1917, domestic investors in Russian stocks and bonds effectively lost everything. While Russian bonds held overseas were still traded in centers such as London and Paris long after 1917, no interest was paid. Although the Russian government eventually reached agreement with the UK (1986) and France (1996) to pay a small amount of compensation, investors in aggregate still lost more than 99% in present value terms. In the two exhibits below, we report (in the left-hand chart) the annualized real returns on equities, bonds and bills over this century, and over the period since 1995; and (in the right-hand chart) the annualized premiums achieved over the same two periods by equities relative to bonds and bills, by bonds relative to bills, and by the real exchange rate relative to the US dollar.

**Annualized real returns on asset classes (l.h.s.) and risk premiums (r.h.s.) for Russia, 1995–2016 (%)**



Note: Equities denotes the total return, including reinvested dividend income, on the equity market. Bonds denotes the total return, including reinvested coupons, on long-term government bonds. Bills denotes the total return, including income, from Treasury bills. All returns are adjusted for inflation and are expressed as geometric mean returns.

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, *Triumph of the Optimists*, Princeton University Press, 2002, and subsequent research.



# South Africa

## Golden opportunity



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

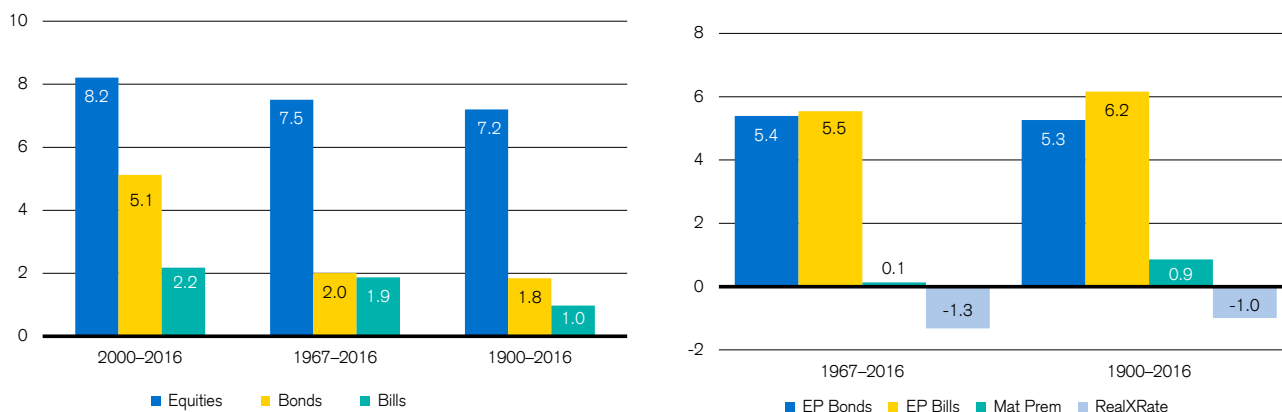
The 1886 gold rush led to many mining and financing companies opening up. To cater to their needs, the Johannesburg Stock Exchange (JSE) opened in 1887. Over the years since 1900, the South African equity market has been one of the world's most successful, generating a real equity return of 7.2% per year, which is the highest return among the [Yearbook](#) countries.

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

In 1900, South Africa, together with several other [Yearbook](#) countries, would have been deemed an emerging market. According to index compilers, it has not yet emerged and today ranks as the seventh-largest emerging market, well below China, Korea, and Taiwan. Gold, once key to South Africa's wealth, has declined in importance as the economy has diversified. Financials account for 27%, while basic materials lag behind with only 13% of the market capitalization. Taken together, media and mobile telecoms account for 28% of the market index. The largest JSE stocks are Naspers (21% of the index), and Sasol and MTN (each 5%).

In the two exhibits below, we report (in the left-hand chart) the annualized real returns on equities, bonds and bills over this century, the last 50 years, and since 1900; and (in the right-hand chart) the annualized premiums achieved over the latter two periods by equities relative to bonds and bills, by bonds relative to bills, and by the real exchange rate relative to the US dollar.

**Annualized real returns on asset classes (l.h.s.) and risk premiums (r.h.s.) for South Africa, 1900–2016 (%)**



Note: Equities denotes the total return, including reinvested dividend income, on the equity market. Bonds denotes the total return, including reinvested coupons, on long-term government bonds. Bills denotes the total return, including income, from Treasury bills. All returns are adjusted for inflation and are expressed as geometric mean returns.

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Source: Elroy Dimson, Paul Marsh and Mike Staunton, [Triumph of the Optimists](#), Princeton University Press, 2002, and subsequent research.

# Spain

## Key to Latin America



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

While the 1960s and 1980s saw Spanish real equity returns enjoying a bull market and ranked second in the world, the 1930s and 1970s witnessed the very worst returns among our countries. Over the entire 117 years covered by the *Yearbook*, Spain's long-term equity premium (measured relative to bonds) was 1.7%, which is lower than for any other country that we cover over the same period.

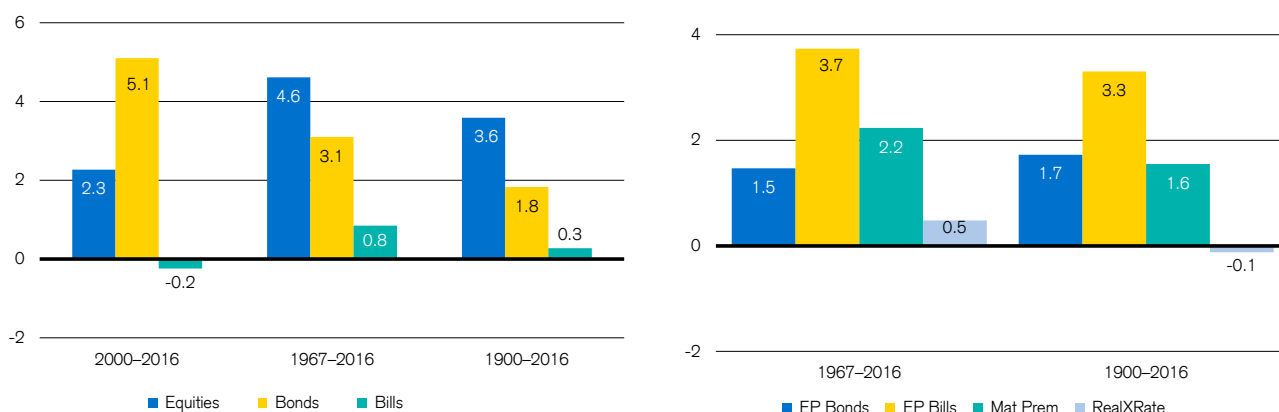
Although Spain stayed on the sidelines during the two world wars, Spanish stocks lost much of their real value over the period of the civil war during 1936–39, while the return to democracy in the 1970s coincided with the quadrupling of oil prices, heightened by Spain's dependence on imports for 70%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

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

The Madrid Stock Exchange was founded in 1831 and is now the fourteenth-largest in the world, helped by strong economic growth since the 1980s. The major Spanish companies retain a strong presence in Latin America combined with increasing strength in banking and infrastructure across Europe. The largest stocks are Banco Santander (20% of the FTSE Spain index), BBVA (11%), Telefonica (10%), and Iberdrola and Inditex (both 9%).

In the two exhibits below, we report (in the left-hand chart) the annualized real returns on equities, bonds and bills over this century, the last 50 years, and since 1900; and (in the right-hand chart) the annualized premiums achieved over the latter two periods by equities relative to bonds and bills, by bonds relative to bills, and by the real exchange rate relative to the US dollar.

**Annualized real returns on asset classes (l.h.s.) and risk premiums (r.h.s.) for Spain, 1900–2016 (%)**



Note: Equities denotes the total return, including reinvested dividend income, on the equity market. Bonds denotes the total return, including reinvested coupons, on long-term government bonds. Bills denotes the total return, including income, from Treasury bills. All returns are adjusted for inflation and are expressed as geometric mean returns.

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Source: Elroy Dimson, Paul Marsh and Mike Staunton, *Triumph of the Optimists*, Princeton University Press, 2002, and subsequent research.

# Sweden

## Nobel prize returns



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

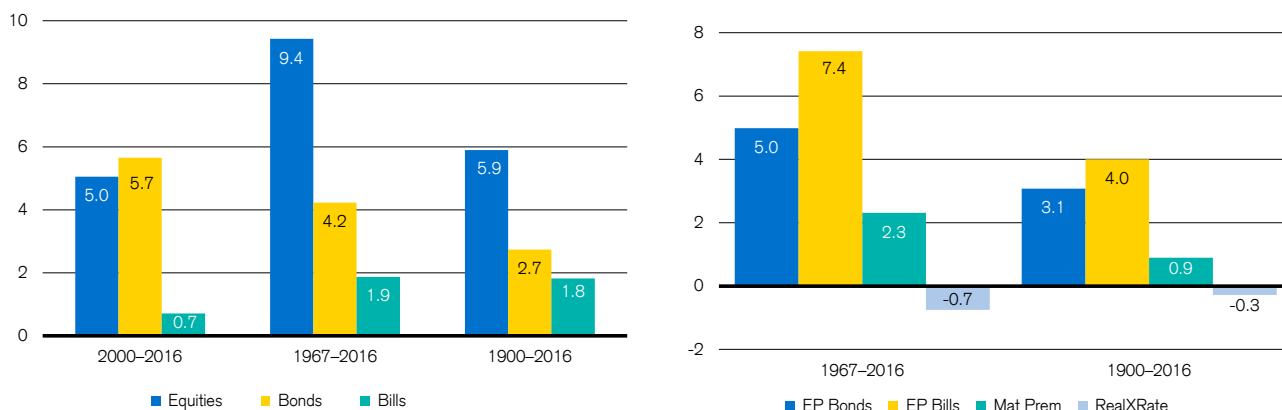
Alfred Nobel had instructed that the prize fund be invested in safe securities. Were a Nobel prize to be awarded for investment returns, it would be given to Sweden for its achievement as the only country to have real returns for equities, bonds and bills all ranked in the top five.

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

In Sweden, the financial sector accounts for a third (37%) of the market capitalization of the FTSE Sweden index, while industrials account for almost as much (31%). The largest single companies are Nordea Bank, Hennes & Mauritz (each 10% of the index), followed by Atlas Copco (8%). In 2014, we made enhancements to our series for Swedish equities, drawing on work by Daniel Waldenström (2014).

In the two exhibits below, we report (in the left-hand chart) the annualized real returns on equities, bonds and bills over this century, the last 50 years, and since 1900; and (in the right-hand chart) the annualized premiums achieved over the latter two periods by equities relative to bonds and bills, by bonds relative to bills, and by the real exchange rate relative to the US dollar.

**Annualized real returns on asset classes (l.h.s.) and risk premiums (r.h.s.) for Sweden, 1900–2016 (%)**



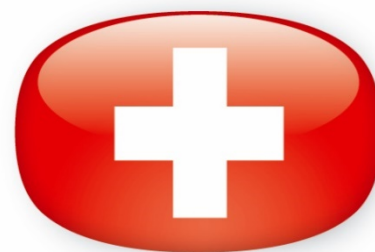
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Source: Elroy Dimson, Paul Marsh and Mike Staunton, *Triumph of the Optimists*, Princeton University Press, 2002, and subsequent research.

# Switzerland

## Traditional safe haven



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

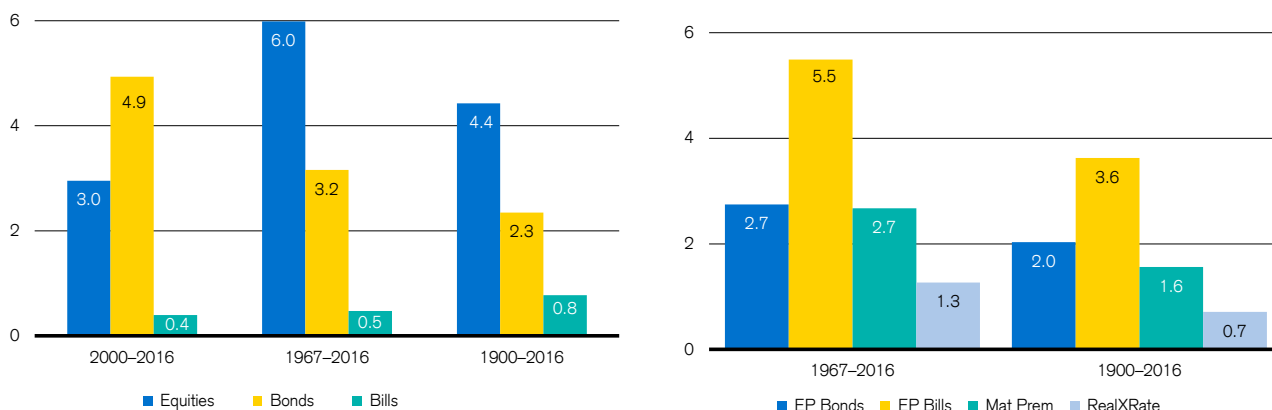
For a small country with just 0.1% of the world's population and less than 0.01% of its land mass, Switzerland punches well above its weight financially and wins several gold medals in the global financial stakes. The Swiss stock market traces its origins to exchanges in Geneva (1850), Zurich (1873), and Basel (1876). It is now the world's seventh-largest equity market, accounting for 3.3% of total world value. Since 1900, Swiss equities have achieved a real return of 4.4% (equal to the median across our countries). Meanwhile, Switzerland has been one of the world's three best-performing government bond markets, with an annualized real return of 2.4%. The country also had the world's lowest 117-year inflation rate of just 2.2%.

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

Switzerland's pharmaceutical sector accounts for a third (34%) of the value of the FTSE Switzerland index. Nestle, Novartis, and Roche together account for over half of the index's value.

In the two exhibits below, we report (in the left-hand chart) the annualized real returns on equities, bonds and bills over this century, the last 50 years, and since 1900; and (in the right-hand chart) the annualized premiums achieved over the latter two periods by equities relative to bonds and bills, by bonds relative to bills, and by the real exchange rate relative to the US dollar.

**Annualized real returns on asset classes (l.h.s.) and risk premiums (r.h.s.) for Switzerland, 1900–2016 (%)**



Note: Equities denotes the total return, including reinvested dividend income, on the equity market. Bonds denotes the total return, including reinvested coupons, on long-term government bonds. Bills denotes the total return, including income, from Treasury bills. All returns are adjusted for inflation and are expressed as geometric mean returns.

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Source: Elroy Dimson, Paul Marsh and Mike Staunton, *Triumph of the Optimists*, Princeton University Press, 2002, and subsequent research.

# United Kingdom

## Global center for finance



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

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

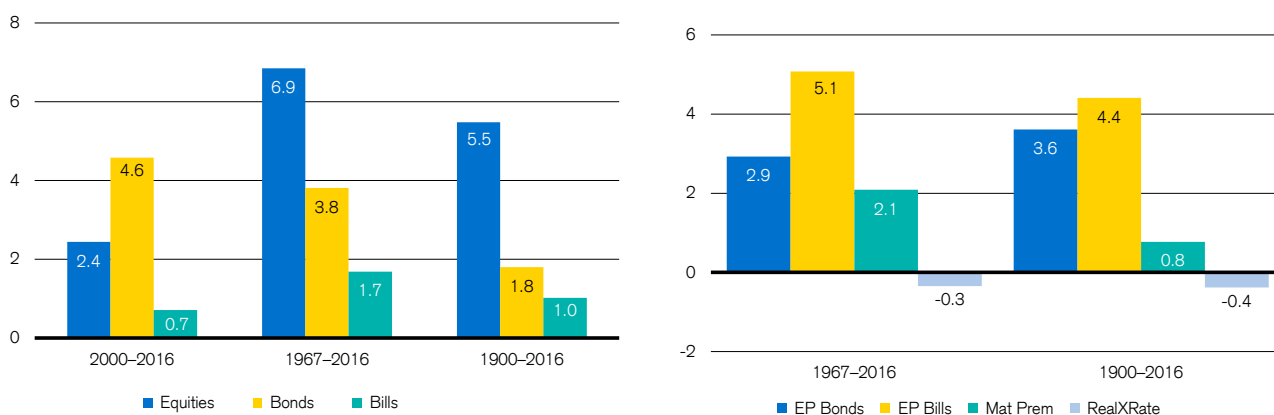
London is the world's largest fund management center, managing almost half of Europe's institutional equity capital and three-quarters of Europe's hedge fund assets. More than three-quarters of Eurobond deals are originated and executed there. More than a third of the world's swap transactions and more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

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

Royal Dutch Shell has its primary listing in the UK and is the largest UK stock by market capitalization. Other major companies include HSBC, BP, British American Tobacco, Glaxo SmithKline, and Astra Zeneca.

In the two exhibits below, we report (in the left-hand chart) the annualized real returns on equities, bonds and bills over this century, the last 50 years, and since 1900; and (in the right-hand chart) the annualized premiums achieved over the latter two periods by equities relative to bonds and bills, by bonds relative to bills, and by the real exchange rate relative to the US dollar.

**Annualized real returns on asset classes (l.h.s.) and risk premiums (r.h.s.) for the UK, 1900–2016 (%)**



Note: Equities denotes the total return, including reinvested dividend income, on the equity market. Bonds denotes the total return, including reinvested coupons, on long-term government bonds. Bills denotes the total return, including income, from Treasury bills. All returns are adjusted for inflation and are expressed as geometric mean returns.

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, *Triumph of the Optimists*, Princeton University Press, 2002, and subsequent research.

# United States

## Financial superpower



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

The USA is also a financial superpower. It has the world's largest economy, and the dollar is the world's reserve currency. Its stock market accounts for 53% of total world value (on a free-float, investible basis), which is more than six times as large as Japan, its closest rival. The USA also has the world's largest bond market.

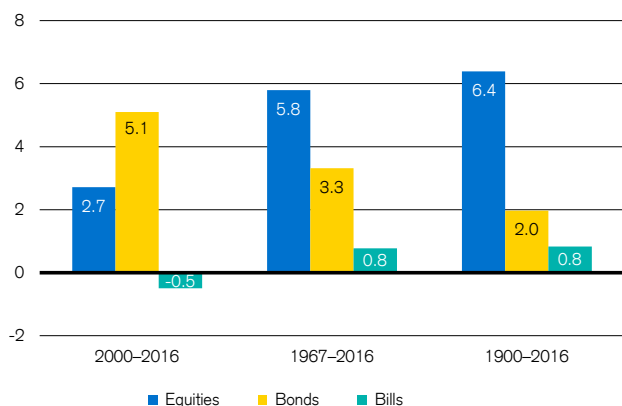
US financial markets are by far the best-documented in the world and, until recently, most of the long-run evidence cited on historical investment performance drew almost exclusively on the US experience. Since 1900, equities and government bonds in the USA have given annualized real returns of 6.4%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

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

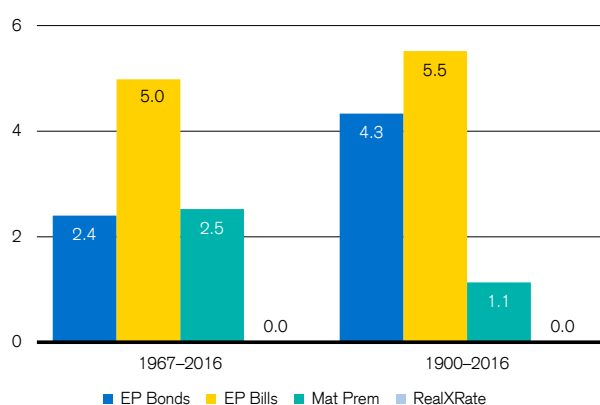
Extrapolating from such a successful market can lead to "success" bias. Investors can gain a misleading view of equity returns elsewhere, or of future equity returns for the USA itself. That is why this [Yearbook](#) focuses on global investment returns, rather than just US returns.

In the two exhibits below, we report (in the left-hand chart) the annualized real returns on equities, bonds and bills over this century, the last 50 years, and since 1900; and (in the right-hand chart) the annualized premiums achieved over the latter two periods by equities relative to bonds and bills, by bonds relative to bills, and by the real exchange rate relative to the US dollar.

**Annualized real returns on asset classes (l.h.s.) and risk premiums (r.h.s.) for the USA, 1900–2016 (%)**



Note: Equities denotes the total return, including reinvested dividend income, on the equity market. Bonds denotes the total return, including reinvested coupons, on long-term government bonds. Bills denotes the total return, including income, from Treasury bills. All returns are adjusted for inflation and are expressed as geometric mean returns.



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, [Triumph of the Optimists](#), Princeton University Press, 2002, and subsequent research.

# World

## Globally diversified



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

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

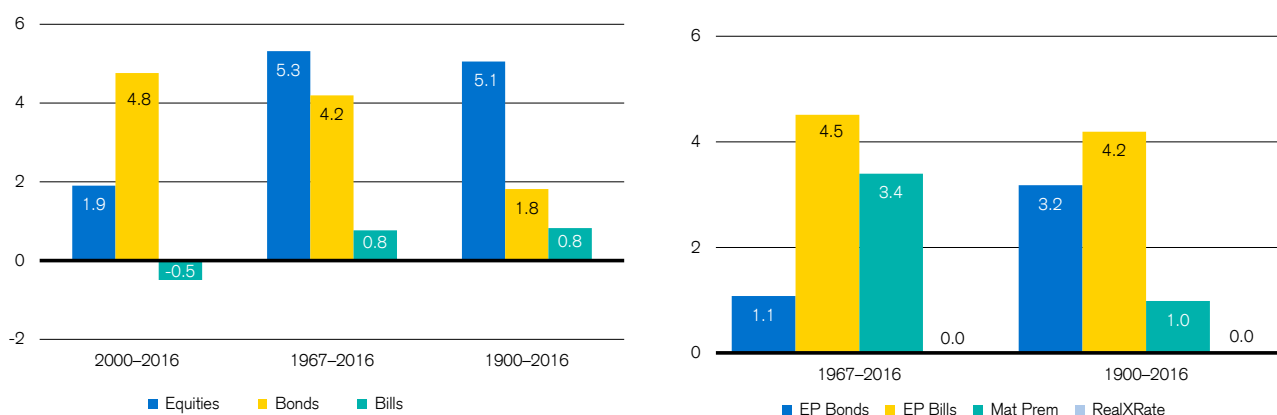
Over the 117 years from 1900 to 2016, the left-hand chart shows that the real return on the world index was 5.1% per year for equities and 1.8% per year for bonds. The right-hand chart also shows that the world equity index had an annualized equity risk premium, relative to Treasury bills, of 4.2% over the last 117 years, and a similar premium of 4.5% per year over the most recent 50 years.

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

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

In the two exhibits below, we report (in the left-hand chart) the annualized real returns on equities, bonds and bills over this century, the last 50 years, and since 1900; and (in the right-hand chart) the annualized premiums achieved over the latter two periods by equities relative to bonds and bills, by bonds relative to bills, and by the real exchange rate relative to the US dollar.

**Annualized real returns on asset classes (l.h.s.) and risk premiums (r.h.s.) for the World index, 1900–2016 (%)**



Note: Equities denotes the total return, including reinvested dividend income, on the equity market. Bonds denotes the total return, including reinvested coupons, on long-term government bonds. Bills denotes the total return, including income, from Treasury bills. All returns are adjusted for inflation and are expressed as geometric mean returns.

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, [Triumph of the Optimists](#), Princeton University Press, 2002, and subsequent research.



# World ex-USA

## Beyond America



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

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

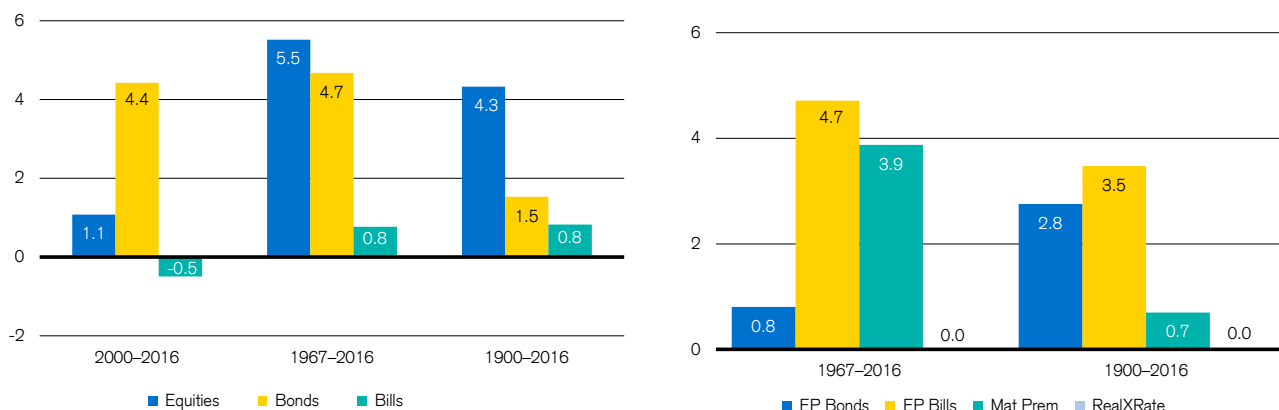
The charts below confirm this concern. They show that, from the perspective of a US-based international investor, the real return on the world ex-US equity index was 4.3% per year, which is 2.1% per year below that for the USA. This suggests that, although the USA has not been the most extreme of outliers,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

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

To avoid survivorship bias, the additional countries are fully included in the world indexes 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 indexes after their markets reopened in the 1990s.

In the two exhibits below, we report (in the left-hand chart) the annualized real returns on equities, bonds and bills over this century, the last 50 years, and since 1900; and (in the right-hand chart) the annualized premiums achieved over the latter two periods by equities relative to bonds and bills, by bonds relative to bills, and by the real exchange rate relative to the US dollar.

**Annualized real returns on asset classes (l.h.s.) and risk premiums (r.h.s.) for World ex-US, 1900–2016 (%)**



Note: Equities denotes the total return, including reinvested dividend income, on the equity market. Bonds denotes the total return, including reinvested coupons, on long-term government bonds. Bills denotes the total return, including income, from Treasury bills. All returns are adjusted for inflation and are expressed as geometric mean returns.

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, *Triumph of the Optimists*, Princeton University Press, 2002, and subsequent research.

# 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 ten 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 countries represent the Old World.

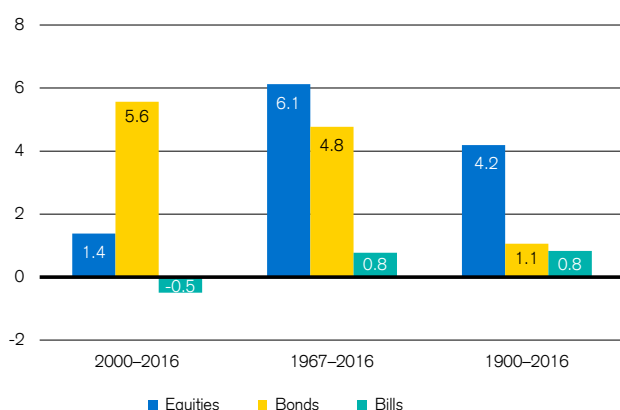
It is interesting to assess how well European countries as a group have performed, compared with our world index. We have therefore constructed a 16-country European index using the same methodology as for the world index. As with the latter, this European index can be designated in any desired common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

The left-hand chart below shows that the real equity return on European equities was 4.2%. This compares with 5.1% for the world index, indicating that the Old World countries have underperformed. This may relate to some nations' loss of imperial powers and colonial territories, the destruction from the two world wars (where Europe was at the epicenter), the fact that many New World countries were resource-rich, or perhaps to the greater vibrancy of New World economies.

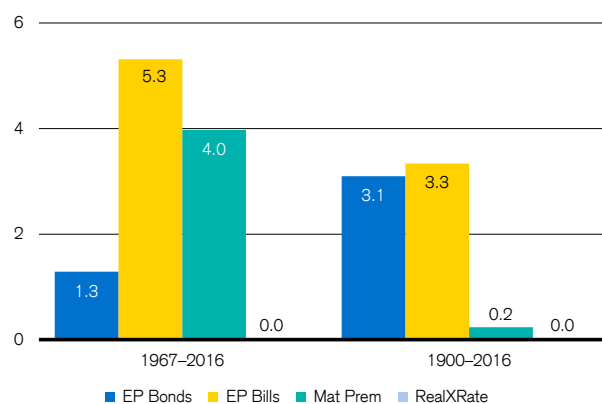
We follow a policy of continuous improvement with our data sources, introducing new countries when feasible, and switching to superior index series as they become available. As we noted above, we recently added three new European countries, Austria, Portugal and Russia. Two of them have a continuous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

In the two exhibits below, we report (in the left-hand chart) the annualized real returns on equities, bonds and bills over this century, the last 50 years, and since 1900; and (in the right-hand chart) the annualized premiums achieved over the latter two periods by equities relative to bonds and bills, by bonds relative to bills, and by the real exchange rate relative to the US dollar.

**Annualized real returns on asset classes (l.h.s.) and risk premiums (r.h.s.) for Europe, 1900–2016 (%)**



Note: Equities denotes the total return, including reinvested dividend income, on the equity market. Bonds denotes the total return, including reinvested coupons, on long-term government bonds. Bills denotes the total return, including income, from Treasury bills. All returns are adjusted for inflation and are expressed as geometric mean returns.



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, [Triumph of the Optimists](#), Princeton University Press, 2002, and subsequent research.

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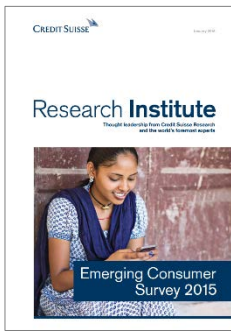
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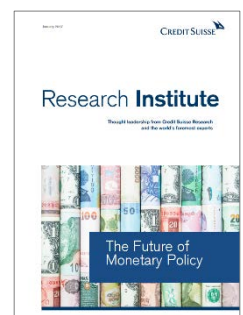
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