

February 2019

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Research Institute

Summary Edition Credit Suisse Global
Investment Returns Yearbook 2019



Elroy Dimson, Paul Marsh, Mike Staunton

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Summary Edition

Credit Suisse Global Investment Returns Yearbook 2019

Coverage of the Summary Edition

This report is a summary version of the full Credit Suisse Global Investment Returns Yearbook 2019, which is available in hardcopy only and contains four deep-dive chapters of analysis leveraging this unique dataset. The first chapter of the printed Yearbook describes the coverage of the DMS database, the industrial transformation that has taken place since 1900, explains why a long-run perspective is important, and summarizes the long-run returns on stocks, bonds, bills, inflation and currencies over the last 119 years. The second chapter of the 256-page volume deals with risk and risk premiums, documenting historical risk premiums around the world and how they have varied over time.

The third chapter of the hardcopy book – which is highlighted in this extract – compares emerging market (EM) and developed market (DM) performance from 1900 to the present, documenting long-run returns, volatilities and risk premiums for today's major EMs. The fourth chapter of the full Yearbook focuses on factor investing: size, value, income, momentum, volatility and other smart-beta factors.

The full 2019 Yearbook concludes with an in-depth historical analysis of the investment performance of 26 global markets – 23 countries and three regions.

To highlight the new and impactful research for the 2019 Yearbook, the opening section of this Summary Edition starts with a review of EM and DM investment returns and risk. The next section turns to a broader view of investing for the long term, with a focus on long-run asset returns, risk and risk premiums, and factor investing – all based on evidence that runs from the beginning of 1900 to the end of 2018. The report concludes with a short review of the investment performance of the most important markets in the world since 1900, including China, Europe, Japan, Switzerland, the United Kingdom, the United States and the World.

To access the full Credit Suisse Global Investment Returns Yearbook or the underlying DMS dataset, please consult page 40.



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CREDIT SUISSE GLOBAL INVESTMENT RETURNS YEARBOOK 2019

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ISBN for full Yearbook 978-3-9524302-8-6

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See page 40 for copyright and acknowledgement instructions, guidance on how to gain access to the underlying data, and for more extensive contact details.

Preface

This publication is a summary version of the full Credit Suisse Global Investment Returns Yearbook 2019 produced by Elroy Dimson, Paul Marsh and Mike Staunton of London Business School, who are recognized as the leading authorities on the analysis of the long-run performance and trends of stocks, bonds, Treasury bills (cash), inflation and currencies. With its 119 years of financial history, this annual study not only remains the most comprehensive of sources for the analysis of historical investment returns, but also a lens through which to gain perspective on the here and now. This is of heightened relevance as volatility has returned to financial markets after a prolonged absence.

2019 Global Investment Returns Yearbook

The 2019 Yearbook comes after the worst year for returns from global equities since the Global Financial Crisis with a decline of 9%. The accommodating monetary environment and conditions of low volatility that provided the comforting backdrop for the extended bull market conditions we have seen for a decade or so have reversed. There are plenty of signs that corporate profitability has passed its cycle peak.

Moreover, the international confrontations over global trade have brought into focus a source of market and economic risk that few investors have had to contemplate before. The economic benefits of permissive global trade had been taken as a given. The Yearbook of course provides us the ability to reflect on historical periods when such conditions were by no means the norm. As 2018 has shown, the irony is often that the countries threatening trade wars are not where stock markets have fared the worst.

Set alongside the specific factors at work, the more challenging conditions investors are encountering do prompt a more realistic assessment of risk and return. Only an analysis of the

genuine “long term” can provide an adequate understanding of these twin variables. Put in the context of the 119 years of history in the Yearbook and an equity risk premium over the period of just over 4%, it underlines how rewarding – and anomalous – the most recent past has been for equity investors. It in turn implicitly challenges any assumption that the most recent recovery in markets and decline in volatility are a resumption of the “normal service” of recent years.

Back to the “real world”

For those trying to judge what “normal service” should look like, the authors continue to stress that investors should assume a more sober view of the likely excess returns equities can generate from here. This is not just judged against the standards of the last decade, but also by comparison with the 4% observed across the life of the Yearbook. A more tempered view is a natural consequence of what by historical standards remains a world of low real interest rates. To this point, in documenting the long-run history of real interest rates in 23 countries since 1900, the study shows that, when real rates are low, future returns on equities and bonds tend to be lower rather than higher.

The Yearbook does highlight that shifts from one real interest rate environment to another can see step changes in returns as investors reset their future expectations. Should a turn in the monetary cycle see an upward reset in real interest rates, the reset in financial assets can be in the opposite direction. While the immediate concerns on interest rates may have abated in this early part of 2019, this is still a scenario to keep foremost in mind. The Credit Suisse House View does not suggest a tightening cycle in the USA is complete nor has it begun in Continental Europe. The working premise that the authors still believe investors should factor into their long-term thinking and modelling is an annualized equity premium relative to cash of around 3½%. This is a consistent view they have held throughout this millennium and has more or less proven to be the case. If this is disappointing based on recent history, it still points to equities historically doubling relative to cash over 20 years.

Emerging markets in a multi-polar world

In other studies from the Credit Suisse Research Institute, and in keeping with the changing mood regarding globalization (“Getting over globalization,” January 2017 and “The end of globalization or a multi-polar world,” September 2015), we have reflected on the likely emergence of a more “multi-polar world” and the significance emerging economies and markets would assume in such an environment. The inclusion of new analysis on emerging and frontier markets in this edition of the Yearbook is a timely added perspective on this theme.

The challenge for investors in analyzing risk premia in emerging markets, particularly versus developed markets, has been the relatively short historical record presented by the index providers. This is a challenge the authors have tackled in prior research (see *Global Investment Returns Yearbook*, 2010) and update here. The perception of premium returns from emerging markets is arguably shaped by the period of measurement available from index providers rather than the period that went before.

The new research on emerging markets in the 2019 Yearbook includes an analysis of returns, risk premiums, volatility and hedging for as long a period as available for the ten largest emerging markets. What is self-evident from the high and wide-ranging volatility and returns in these markets is that diversification is essential across them. Material risk reduction benefits do remain for a developed market investor who diversifies into emerging markets.

The proverbial “elephant in the room” is China in terms of its current and future significance for emerging market investors. With a deep-dive into this market, the authors examine the returns

that both global and domestic investors have seen in China. The role provided by the differing benchmarks is key when judging widely diverging performance by the indices. The authors specifically delve into the reasons behind the underperformance of A-Shares. They do potentially offer a significant diversification opportunity for the global investor given their low correlation with global markets. Interest shown by that investor can also encourage better corporate governance and a more fundamental approach to the market itself.

Factor Investing – style versus substance

Whether driven by an investor’s desire to escape the constraints of a low return world or the asset management industry’s desire to escape the fee compression on its more traditional business, “factor investing” and smart-beta strategies remain very much in vogue. A recent FTSE Russell survey (2018) revealed around three-quarters of respondents had implemented or were actively evaluating smart-beta strategies. Against this backdrop, the 2019 Yearbook refreshes its analysis of factor returns around the world. It is designed to probe more robustly into the stability of a series of specific factors and their premia with the benefit of a long history of data.

The “value” versus “growth” debate of course stirs plenty of passion. Value endured another year of underperformance in 2018, continuing its disappointing run. Sadly for value investors, the Yearbook shows that it is hard to predict or time when value will return to favor in any systematic fashion. In the current environment, mirrored in this style-bias is also the outperformance of technology stocks when looked at through an industry lens. Hence, an investor overweighting a value style would be underweight the technology sector, a major call to make. The lesson from the Yearbook is to diversify portfolios across multiple factors and remain humble as to your predictive abilities where immediate factor performance is concerned.

The 2019 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. For previous editions and other studies published by the Research Institute, please visit: www.credit-suisse.com/researchinstitute.

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Emerging markets

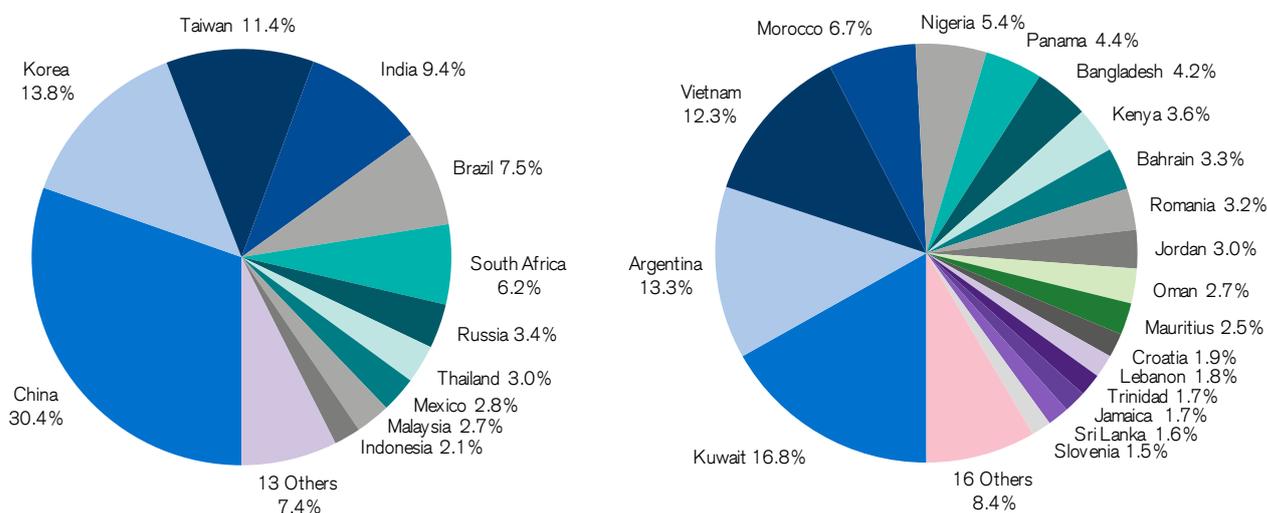
In this extract from the third chapter of the latest Global Investment Returns Yearbook, we compare emerging market (EM) and developed market (DM) performance from 1900 to the present, and look at new evidence on purchasing power parity in a large sample of EMs, drawing conclusions on the case for currency hedging. We contrast and explain the varying returns achieved from Chinese stocks by global and domestic investors, and examine EM index performance over the long run.

Emerging and frontier markets

The left-hand side of **Figure 1** below shows the 24 current constituent countries of the MSCI Emerging Markets index, together with their weightings. The big difference between index providers is that MSCI regards Korea as emerging, while FTSE Russell and S&P deem it developed. In 2018, FTSE Russell promoted Poland to DM, and added Kuwait as an EM.

In 2019, both MSCI and FTSE Russell will add Saudi Arabia, and MSCI will add Argentina. There is less agreement between index providers over what constitutes a frontier market (FM). The right-hand side of **Figure 1** shows a combined list of all markets that are currently deemed to be FMs by at least one of the three index providers, together with their country weightings, based on free-float market capitalization. In total, there are currently 35 FMs around the world.

Figure 1: EMs (left) and FMs (right) at 31 December 2018



Source: MSCI, FTSE Russell, S&P, Elroy Dimson, Paul Marsh, and Mike Staunton. Not to be reproduced without express written permission from the authors.

How emerging markets have evolved

Figure 2 shows how EMs and FMs evolved from 1980. The top panel shows the share of EMs (lightest shading), FMs, DMs and the rest of the world (darkest shading) in world PPP GDP. Over nearly 40 years, today's EM countries have almost doubled their share in world PPP GDP from a quarter to around a half. The DM share has fallen from just over 60% to 37%. Taken together, EMs and FMs today account for 55% of world GDP versus 37% for DMs and 8% from the rest of the world.

Panel b shows GDP share measured at market exchange rates. While the EM share is lower when GDP is measured this way, it still nearly doubled over the period from 18% to 35%. There was a corresponding fall in the DM share. By the end of 2018, EMs and FMs together accounted for nearly 40% of world GDP, versus 57% for DMs and just 4% for the rest of the world.

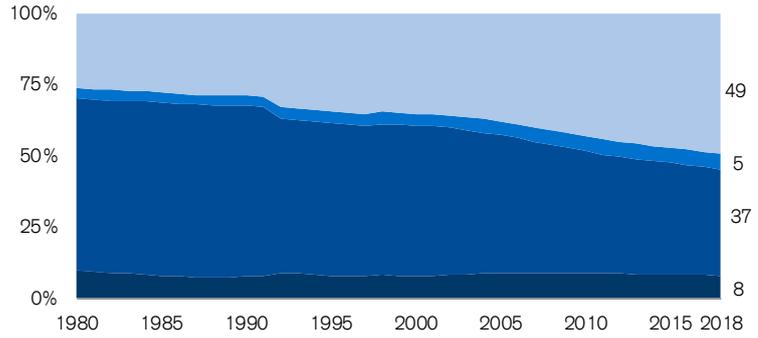
Panel c shows that the share of the world's population living in EMs has declined slightly, from 61% to 59%. DMs started the period with a much lower share of the world's population (17%), and this dropped further to 13% today, a decrease of 22%. Population has grown fastest in FMs and the rest of the world. Currently 9% of the world's population live in FMs, compared with 7% in 1980, representing a 36% increase.

While EMs and FMs together account for 55% of world PPP GDP, some 40% of world GDP at market exchange rates and 68% of the world's population, their combined weighting in global equity indexes is still remarkably small, at around 12%; see panel d. DMs account for virtually all the rest (88%). Although the EM plus FM share has grown from a negligible 2% in 1980 to 12% today, there has been no progress over the last 11 years. In 2007, their combined share was 12.4%, while today it is 12.2%.

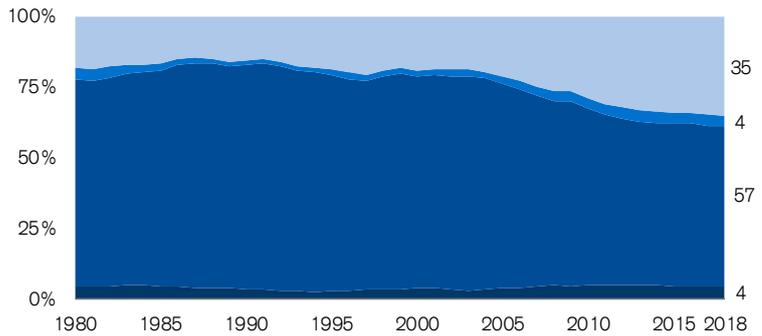
What explains this remarkably low weighting? One possibility could be changes in the composition of the EM population. However, there have been remarkably few EM promotions. Within the MSCI EM index, Portugal achieved DM status in 1997, Greece in 2001 (a decision reversed in 2013), and Israel in 2010. These losses were almost exactly counterbalanced in value by the 2014 additions of Qatar and UAE. Indeed, the period spanned by **Figure 2** has been characterized by the addition of countries, not removal. Stock markets in China, Russia and Eastern Europe re-opened in the early 1990s after long closures and these markets grew rapidly. **Figure 2** includes all these countries throughout the period, but the data for the 1980s includes their GDP and population, while their stock market values remained at zero.

Figure 2: Evolution of EMs and FMs, 1980–2018

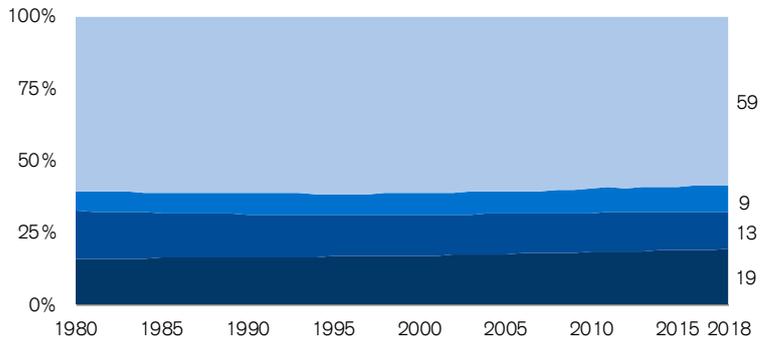
(a) Share of world PPP GDP



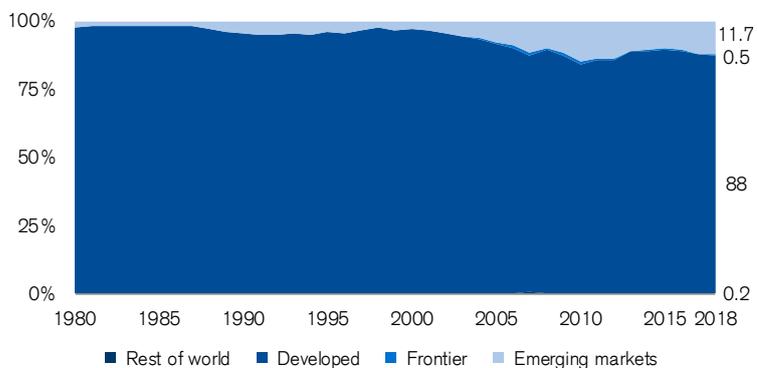
(b) Share of world GDP at market exchange rates



(c) Share of world population



(d) Share of world investable market capitalization



Source: IMF, FTSE Russell, MSCI, Elroy Dimson, Paul Marsh, and Mike Staunton, DMS dataset; Korea is regarded here as an EM, as in the MSCI index series. Not to be reproduced without express written permission from the authors.

Explaining the low index weighting for EMs

The main explanations for the low weighting of EMs in the world index is that the MSCI, FTSE Russell and S&P world indexes are based on the investable universe from the perspective of a global investor. The indexes therefore exclude or underweight market segments that are difficult to access, they apply free-float weighting, and they screen out individual stocks deemed hard to deal in.

As a result, until 2018 the large Chinese A-share market was excluded from the MSCI EM index because of difficulties with gaining access. The year 2018 saw the start of a gradual inclusion of A-shares, but with an initial weighting of just 5% of free-float-adjusted market capitalization.

Free-float weighting also has a larger impact on EM than on DM indexes, as the average level of free-float is lower in EMs. **Figure 3** shows the average free-float weightings for the largest eight EMs and DMs. The EMs plot to the left (low free-float) and the DMs to the right (high free-float), with minimal cross-over. When the markets are weighted by size, the average free-float for EMs (42%) is less than half that for DMs (89%).

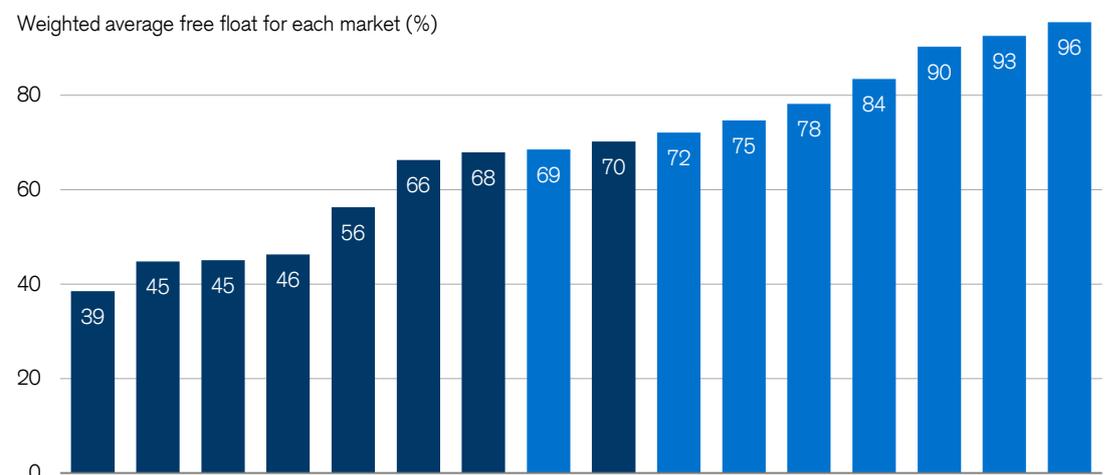
Finally, index providers also screen out individual stocks within markets if they fail to meet minimum liquidity or free-float requirements. This has a proportionately greater impact on EM than DM weightings, as a greater proportion of EM stocks fail the free-float and liquidity hurdles. These factors, taken together, explain the low weight that EMs have in global indexes of just 12%. If there were no exclusions, restrictions or

application of free-float weightings, we estimate that the overall weighting of EMs would be roughly double that shown earlier in **Figure 2**.

The remaining issue raised by that chart is the continued low level of the EM weighting since 2007. This flat-lining is explained by the fact that DMs outperformed EMs by 52% over this period. The greater number of IPOs and seasoned equity offerings within the EM universe was insufficient to overcome this underperformance headwind.

The explanation, then, does not center on emerging markets. The underperformance of EMs was almost entirely driven by the outstanding appreciation of the United States. EMs performed broadly in line with the World on an ex-USA basis.

Figure 3: Average free-float in major EMs and DMs



Source: the BLOOMBERG PROFESSIONAL TM service; Elroy Dimson, Paul Marsh, and Mike Staunton

Exchange rates and inflation

In the 2019 hardcopy edition of the Global Investment Returns Yearbook we report real, inflation-adjusted returns for all the major emerging markets. We report only real, inflation-adjusted returns, and not nominal returns. This is because investors care about the purchasing power resulting from their investments, not the nominal return, especially if the latter has been greatly devalued by inflation.

Three of the countries examined in the full Yearbook experienced extremely high annualized rates of inflation, namely, 71.4% in Brazil, 19.9% in Mexico, and 17.7% in Russia. Brazil suffered the worst, and, for the 22 years from 1974 to 1995, the inflation rate never fell below 20%. In six of these years, it was close to, or above 1000% and over the 64 years for which we have data, Brazilian inflation was 930 trillion percent.

As we report in the Yearbook, changes in countries' exchange rates versus the US dollar have been approximately equal to the inflation differential with the USA over the same period. Put another way, relative purchasing power parity has held to a reasonable approximation.

Figure 4 explores this relationship for a wide variety of countries. For each currency, it plots the annualized exchange rate change versus the US dollar against the country's annualized inflation rate differential relative to the USA.

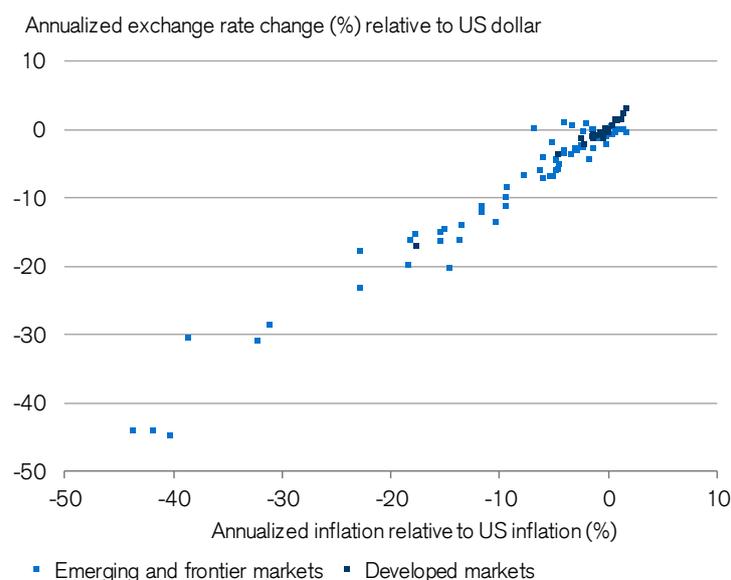
The countries represented in the chart are the 88 countries that we monitor on an ongoing basis. Twenty-four are DMs, shown by the darker-shaded markers. The rest are EMs, FMs or unclassified. **Figure 4** spans the almost 50-year period from 1970, and hence falls mostly within the post-1972 period when floating exchange rates largely replaced the old Bretton Woods regime. For 51 countries, the start date is 1970, while, for others, the period covered is from the date the country became a (truly) independent sovereign state, or once inflation data became available.

There is a very clear relationship between the annualized exchange rate change and the inflation differential. When we fit a regression line, the slope is 1.0. Clearly, purchasing power parity (PPP) holds to a close approximation over the longer run. The relationship is so strong, that the outliers in **Figure 4** – which are clearly EMs and FMs – are more likely to be explained by poorly and perhaps deliberately mismeasured inflation rates, and/or deviations in exchange rates from market-determined values. For example, the largest outlier is Venezuela, where the exact magnitude of the current high inflation rate is just an educated guess, as is the true market exchange rate for the new bolivar soberano.

The fact that PPP holds well for EMs and FMs as well as DMs has important implications for investors. EM currencies are on average much more volatile than their DM counterparts (see the 2012 edition of this Yearbook). This greater volatility can matter a great deal over the short run, and may justify consideration of hedging currency exposure. However, long-horizon investors are already protected to some extent by the PPP relationship.

As we explained in the 2012 Global Investment Returns Yearbook, currency hedging will at best reduce risk by a small margin and, at worst, may prove counterproductive. Investors domiciled in EMs hedge currency exposure less than their DM counterparts, and the strength of PPP lends support to that policy. As in DMs, the better strategy for risk reduction is diversification across EMs, and between EMs and DMs, a topic we study in detail in the 2019 Yearbook.

Figure 4: Exchange rates and inflation for 88 countries, 1970–2018



Source: Elroy Dimson, Paul Marsh, and Mike Staunton, DMS dataset, IMF. Not to be reproduced without express written permission from the authors.

Long-run EM returns

It is natural to ask how EMs have performed over the long run relative to DMs. The first EM index, the S&P/IFCG Emerging Markets Composite, appeared in 1985. MSCI's index started three years later, with FTSE following in 1994. Clearly, the relative recency of these indexes is unhelpful for investors seeking a longer-term performance record. We have therefore constructed a long-run, 119-year EM index starting in 1900.

To do this, we needed a way to classify markets as developed or emerging going back in time. Most of the 23 countries in our dataset are today classified as DMs. However, back in 1900, several countries that we today regard as developed would then have been classified as emerging. Indeed, if we go back far enough in time, even the USA was an EM. As described in the printed Yearbook, we categorize countries as developed according to their historical GDP per capita.

Our long-run, 119-year emerging markets index begins life in 1900 with seven countries. Rather than restricting it to the emerging countries in 1900, we add in further markets once data on returns becomes available. Thus, in 1953, we add India; in 1955, Brazil; in 1963, Korea and Hong Kong (until the latter moved to developed in 1977); in 1964, Malaysia; in 1966, Singapore (until it moved to developed in 1970); in 1968, Taiwan; in 1969, Mexico; in 1976, Argentina, Chile, Greece, Thailand and Zimbabwe; and so on. We then link into the MSCI Emerging Markets index from its inception in 1988.

We also create a developed markets index using the same criterion. This had 16 constituents

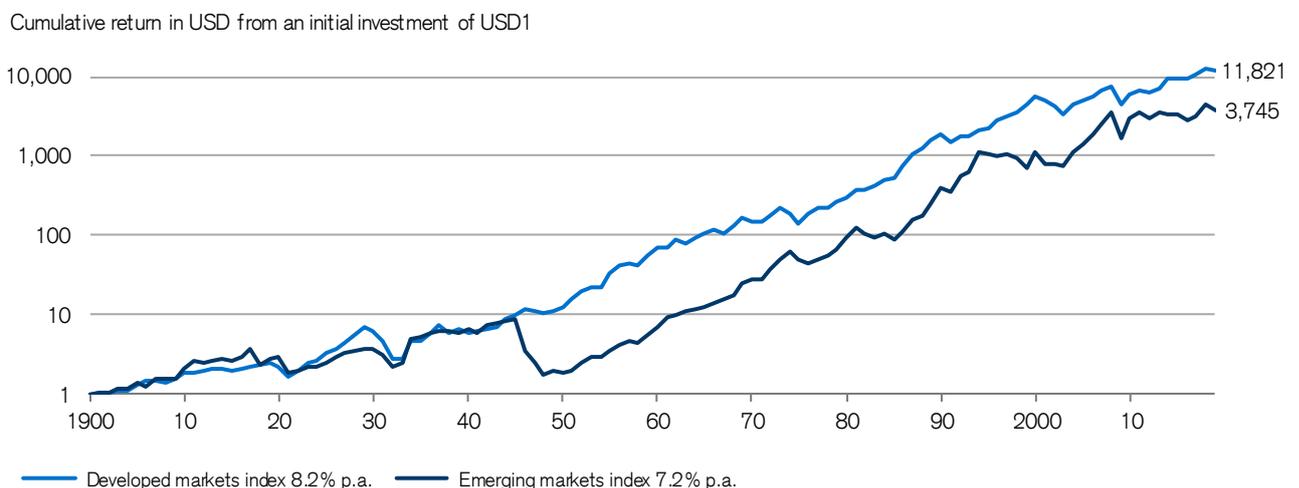
in 1900 and was joined by Finland in 1932 and Japan in 1967. We then link into the MSCI World Index (of DMs) when it started in 1970.

Our indexes are computed in US dollars and include reinvested dividends. Figure 23 shows the long-run performance of emerging versus developed markets. In the early part of the 20th century, emerging markets outperformed, but were hit badly by the October 1917 Revolution in Russia, when investors in Russian stocks lost everything. During the global bull market of the 1920s, emerging markets underperformed, but they were affected less badly than developed markets by the Wall Street Crash. From the mid-1930s until the mid-1940s, EM equities moved in line with DM equities.

From 1945–49, emerging markets collapsed. The largest contributor was Japan, where equities lost 98% of their value in US dollar terms. Another contributor was China, where markets were closed in 1949 following the communist victory, and where investors effectively lost everything. Other markets such as Spain and South Africa also performed poorly in the immediate aftermath of World War II.

From 1950, EMs staged a long fight back, albeit with periodic setbacks. From 1950 to 2018, they achieved an annualized return of 11.7% versus 10.5% from DMs. This was insufficient, however, to make up for their precipitous decline in the 1940s. **Figure 5** shows that the terminal wealth achieved from a 119-year investment in EMs was appreciably less than from DMs. The annualized return from a 119-year investment in EMs was 7.2% compared with 8.2% from DMs, and 8.1% from our overall World index.

Figure 5: Long-run EM and DM returns, 1900–2018



Source: Elroy Dimson, Paul Marsh, and Mike Staunton, *Triumph of the Optimists*, Princeton University Press, 2002, and subsequent research. Not to be reproduced without express written permission from the authors.

China's stock markets

Mainland China is home to two of the world's largest emerging-market stock exchanges in Shanghai and Shenzhen. The original Shanghai Stock Exchange, with origins dating back to 1866, was suspended in 1949. The modern Shanghai Stock Exchange (SSE) started trading in December 1990. It has become the largest exchange within the emerging countries and the fourth-largest in the world. In 1990, eight stocks were listed, but, by the start of 2019, the total stood at 1,450 companies and 14,069 listed securities. SSE companies tend to be large financial and industrial businesses, typically majority state-owned enterprises.

The Shenzhen Stock Exchange (SZSE) started trading in July 1991. It is the second-largest exchange within EMs. With 2,134 listed companies at the start of 2019, it is the eighth-largest stock exchange in the world. Shenzhen is located close to Hong Kong, and its listings are smaller growth companies, often with a high-tech focus. It also has a junior market, ChiNext, which targets innovative businesses and emerging industries. At the start of 2019, ChiNext had 739 firms listed with a value of USD 0.6 trillion.

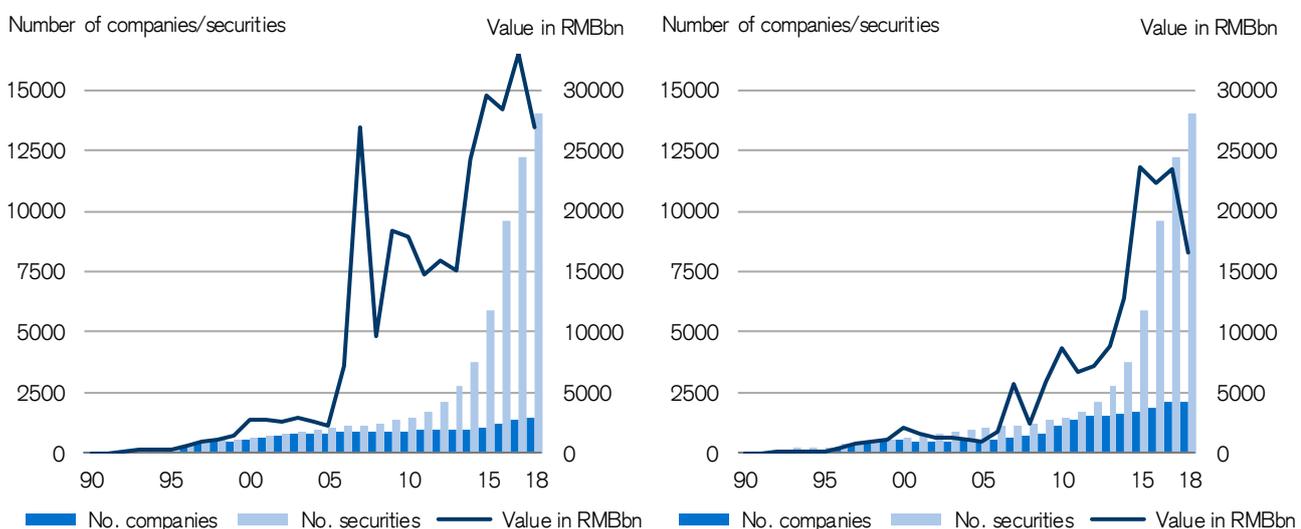
Figure 6 plots the growth in the number and value of listings on the SSE (left-hand side) and SZSE (right-hand side) exchanges. Since inception, the mainland stock markets (SSE and SZSE combined) have grown substantially, with the occasional setback. Since 1998, the five-year increase in the number of company listings has been at least 23% (and on average 79%) and the corresponding rise in the number of listed securities has been at least 38% (and

on average 131%). In terms of market capitalization, the record is more mixed. Since 1998, the five-year growth in combined market capitalization has averaged 285%, but, in two five-year intervals (2001–05 and 2008–12), there was a one-third decline in the value of listed companies. This mostly reflects the volatile trajectory of Chinese security prices rather than companies exiting the market.

Hong Kong is the home of the third major Chinese stock exchange. The UK's 99-year lease of the New Territories expired in 1997, when Hong Kong was handed back to China and became the Hong Kong Special Administrative Region (SAR). Officially it is a part of the People's Republic of China (PRC), but in most respects it operates as though it were an independent country. The only legal currency in the SAR is the Hong Kong dollar (not the Chinese yuan), which is pegged to the US dollar. Hong Kong had established a stock market in 1891 and, after merging with competing markets, a unified Hong Kong Stock Exchange (HKEX) began operations in 1986.

At the start of 2019, 1,925 companies (and 13,055 securities) were listed on the main board of the HKEX, which is the sixth-largest exchange in the world. In addition, a further 389 companies were listed on Hong Kong's junior market, the Growth Enterprise Market (GEM). Half of the companies listed in Hong Kong are mainland enterprises, and these account for over two-thirds (68%) of the value of the HKEX.

Figure 6: Listings by number and value on the Shanghai (left) and Shenzhen (right) markets, 1990–2018



Source: Shanghai Stock Exchange and Shenzhen Stock Exchange Fact Books, 1998–2018

Who owns what in China?

An underperformance by A-shares of 2% sounds innocuous, but, compounded over 2–3 decades, it gives rise to an appreciable loss of wealth. A drag on returns of this magnitude deserves an explanation. We offer six possible explanations: adverse selection, weak regulation, uninformed investors, state-owned enterprises (SOEs), factor returns and market isolation.

From the start, one of the objectives of the Chinese stock market was to enable SOEs to raise funds through privatization issues, which helps explain the heavy weighting, especially on the Shanghai exchange, of SOEs and mature businesses. Each firm admitted to the A-share market has to be approved by the CSRC (China Securities Regulation Commission), which favors firms with strong links to government and regulators. To be selected for flotation, the CSRC has to determine whether the company is representative of the economy, the firm must demonstrate at least three years profitability pre-IPO, and the stock has to meet other financial criteria.

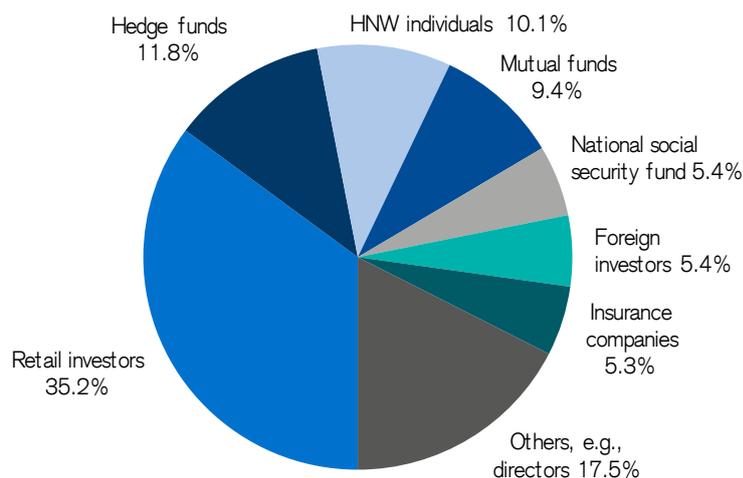
This encourages window dressing practices, in our view, in the run-up to the IPO, and Allen et al. (2018) report that the average return on assets drops from an unsustainable 13% pre-IPO to only 6% post-IPO. Excellent companies may not be selected to IPO on the A-share market. Meanwhile, growth companies may elect to float on offshore exchanges. Technology has been a driving force in equity markets over the last decade, and it is noteworthy that the majority of large Chinese technology companies are listed and traded outside of Mainland China (e.g. Tencent, Alibaba and Baidu). This adverse selection may have contributed to the underperformance of A-shares.

A second contributor is weak regulation. Listed Chinese companies are not universal success stories. During the 2015 market meltdown, the CSRC found it necessary to suspend trading in nearly half of listed firms (Huang, Miao and Wang, 2019). After two consecutive years of losses, stocks are labelled ST (special treatment), but retain their listing. This reinforces the unattractiveness of the A-share market to growth companies, which prefer to list offshore. Multiple studies document unsatisfactory corporate governance, dubious accounting practices, market manipulation, and insider trading in China's stock market, leading to inefficient investment and tunneling. Yet firms are rarely delisted: Allen et al. (2018) report that fewer than ten shares per year are delisted for poor performance, an unusually low proportion of A-share companies. Liu, Stambaugh and Yuan (2019) note that a substantial proportion of small companies sell at prices that reflect the value as shells to be used as a backdoor route to a listing that bypasses certain regulatory barriers.

The third contributor to lower performance may be uninformed investors. In contrast to the USA, domestic retail investors in China dominate the market for A-shares and account for more than 80% of daily turnover. In terms of the ownership, **Figure 7** shows that retail investors own 35.2% of the free-float of A-shares, while high net worth individuals own a further 10.1% and the "other" category includes individual investors in the form of company directors. Public institutional investors like mutual funds, pension investments, and insurance companies are less important than in developed markets.

Retail investors may base buying and selling decisions more on emotion rather than fundamentals, which is likely to elevate herding, momentum and volatility. This is costly for investors, and leads to poor after-costs performance, shorter investment horizons and higher levels of portfolio turnover. It is plausible that investors never "learn" that their portfolio churn is costly because unsuccessful investors exit from the market.

Figure 7: A-share ownership as a percentage of free-float



Source: Farago, R., "China's Local Equity Market: ...How and Where and Who," Aberdeen Standard Investments, 2019

A retail market

Even investment professionals in China are, on average, more enthusiastic and less seasoned than in DMs. In March 2018, UBS reported that there were some 5,000 equity research analysts in China, and around 98% of all covered companies received a buy rating. There were also around 1,600 portfolio managers, with, on average, just three years' experience. However, there is some evidence to suggest that, in China's A-share markets, more informed institutions trade more often and with some justification; see Du, Liao and Sun (2019).

The ownership data in **Figure 7** relates to free-float. The average free-float of A-shares was just 24% with foreign restrictions applied, or 42% without these. One very important participant in the remaining 58% of market capitalization is the Chinese State, with many A-shares being SOEs. This is a potential fourth contributor to underperformance.

China has followed a strategy of partial privatization under which the state maintains state shares in varying amounts, particularly in the so-called economic key sectors. SOEs account for some 24% of the total capitalization of A-shares. While SOEs enjoy some advantages, a number of studies have concluded that political involvement in company decision-making has had a detrimental impact on the performance of SOEs.

A fifth possible contributor to underperformance is factor returns. Both over the long run, and since 2000, value stocks have outperformed growth stocks, high yielders have beaten low- and zero-yielding stocks, and higher risk stocks have underperformed less-risky companies. On balance, these factor effects have not been helpful to Chinese A-shares. In the 2015 Yearbook, we also highlighted an IPO and seasoning factor. There is extensive evidence that, historically, stocks have performed poorly post-IPO, and that performance tends to improve with seasoning, i.e. the time since IPO. The A-share market has grown rapidly through IPOs, and is less seasoned than most other major markets around the world.

A final possible explanation is market isolation. Historically, the Chinese Mainland equity markets have been largely insulated from global markets. Even today, foreign investors hold only 2% of the market or 5.4% on a free-float basis; see **Figure 7**. There were daunting barriers to arbitrage between offshore and onshore securities. The Connect programs, first launched in 2014, enabled two-way flows between these previously segmented markets. **Figure 8** shows what happened next: A-shares leaped to a 30% premium over their H-share equivalents. This continued for several years and, even at end-

2018, still stood at 17%. When Mainland A-shares are more expensive than offshore shares with identical dividend streams and voting rights, their expected return is lower.

We have examined possible reasons for the historical underperformance of A-shares. These should not be interpreted as reasons to avoid A-shares or as predictions for the future. Indeed, the opening up of one of the world's largest equity markets is an exciting opportunity. The negative factors that have contributed to past performance can all be reversed if China continues to open up and to reform its financial system.

The influence of informed foreign investors on China's domestic stock markets is likely to be hugely positive, making the market more fundamentally driven, and impacting corporate governance. For their part, foreign investors stand to gain access to a large, highly liquid pool of stocks, containing many unique and innovative companies. Above all, A-shares provide a potential diversification opportunity, in our opinion, since their returns have historically had a low correlation with other global markets.

Figure 8: The A-share to H-share premium, 2013–18



Source: the BLOOMBERG PROFESSIONAL™ service; Hang Seng Stock Connect China AH Premium Index

Performance of Chinese indexes

To examine the performance of Chinese stocks available to global investors, we look at the MSCI China, the FTSE China and the S&P BMI China indexes. As a comparator, we also plot the MSCI World index. We rebase the indexes to a start value of 100 at end-1992, and plot their total returns in US dollars over the 26-year period, 1993–2018. The data for the FTSE China and S&P BMI index started a little later at end-1993 and end-1994, respectively, so we set their initial values to the then values of the MSCI China index. **Figure 9** shows the cumulative returns.

The chart shows a huge divergence in performance. From an initial investment of USD 100, the terminal value was almost ten times higher from investing in the FTSE China, rather than the MSCI China. The S&P China BMI index was in-between, but the terminal value was still five times higher than for the MSCI China. After 26 years, and the reinvestment of all dividends, the MSCI China ended just 32% above its start value, an annualized return of 1.1%. Global investors tracking this index lost money in real terms. In contrast, the annualized return on the FTSE China was 10.3%, versus 7.4% on the S&P BMI and 7.7% on the MSCI world index.

These three China indexes purport to be measuring the same thing; namely, the performance of Chinese stocks available to foreign investors. The divergences are thus very surprising. Once again, Chinese stock performance seems to be a case of “what answer do you want?”

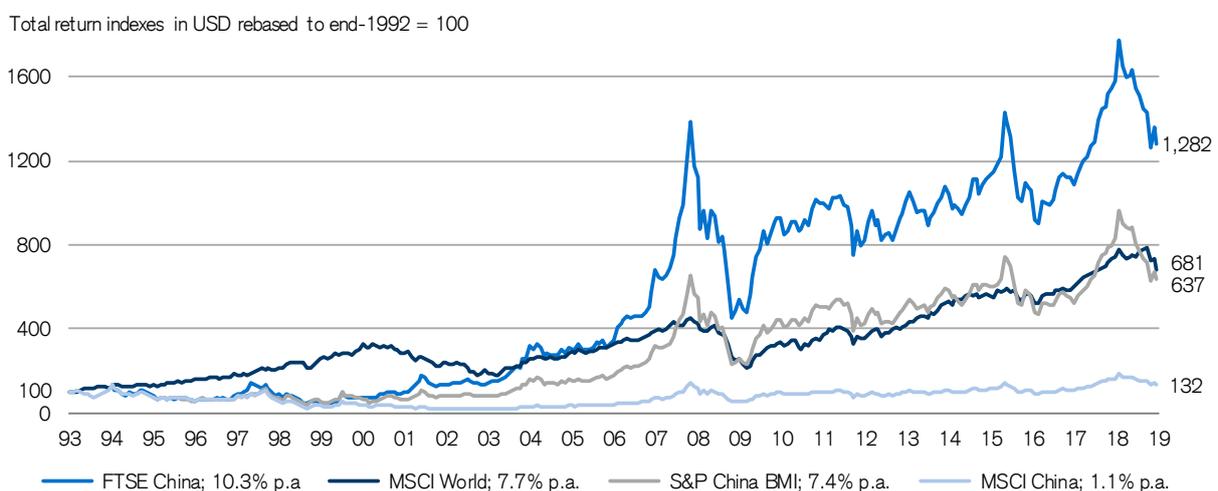
A closer examination reveals good reasons for the divergences, which have arisen from differences in methodology relating to weightings, inclusion

criteria, and nationality tests. Initially, the MSCI China aimed to achieve 65% coverage. In 2002, this increased to 85%, when MSCI started to free-float adjust its index and selection criteria. In contrast, the FTSE China was created in 2000, together with a back-history starting in 1993. Both were free-float adjusted and designed to achieve 90% coverage. Thus free-float and coverage play a key role in explaining divergences up until the early 2000s.

Nationality criteria have also played a role. Until 2013, FTSE considered P-chips to have Hong Kong nationality, and included them in developed-market Hong Kong instead of the FTSE China. Similarly, until 2015, MSCI China did not include N-shares, as it determined a security’s country classification by the location of its incorporation and primary listing. Many N-shares are incorporated in tax havens such as the Cayman Islands or Bermuda, and have their primary listings in the USA, and were therefore previously disqualified. Additionally, until 2017, FTSE excluded N-shares and S-chips. P-chips and N-shares are a large part of the potential universe of Chinese stocks, and their exclusion can also introduce significant sector biases – Tencent is a P-chip, and Baidu and Alibaba are N-shares.

With hindsight, an investor who tracked the FTSE China index was fortunate, while an MSCI China tracker was unlucky. Active managers – again with hindsight – should have avoided FTSE China and chosen MSCI China as their benchmark, as it was easy to beat if they could invest freely across available Chinese stocks. The only problem with this strategy is that no one could track the FTSE China until 2000, as it did not yet exist. The index values we see before then are just a back-history, created after the event.

Figure 9: Longer-run performance of global Chinese indexes, 1992–2018



Source: MSCI, FTSE Russell, S&P, Refinitiv Datastream, Elroy Dimson, Paul Marsh and Mike Staunton. Not to be reproduced without express written permission from the authors.



Investing for the long term

In this section, we review the financial market history that is the backdrop to our study and describe our long-run global returns database, which now covers the main asset categories in 26 markets over the past 119 years. We summarize the returns on stocks, bonds, bills, inflation and currencies since 1900 and present evidence on the historical equity risk premium and maturity premium. Finally, we estimate the long-term risk premiums earned from factor investing. We guide investors to seek premiums supported by robust evidence and to diversify portfolios across multiple factors.

Stock market history

The Great Transformation

At the start 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.

Figure 10 shows the relative sizes of world equity markets at our starting date of end-1899 (left panel), and how they had changed by the start of 2019 (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 (5.5%) in third place. France, Germany, China, Canada and Switzerland each represent around 3% of the global market. Australia occupies ninth position with 2.2%.

In **Figure 10**, nine of the Yearbook countries – all of those accounting for 2% or more of world market capitalization – are shown separately, with 14 smaller markets grouped together as “Smaller Yearbook.” The remaining area of the right-hand pie chart labelled “Not in Yearbook” represents countries comprising 9.7% of world capitalization, for which our data does not go all the way back to 1900. Mostly, they are the emerging markets discussed earlier. Note that the right-hand panel of the pie-chart 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.

The left panel of **Figure 10** shows the equivalent breakdown at the end of 1899 – the start date 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. Countries that are not in our 1900–2018 dataset are again labelled “Not in Yearbook.” In total, the DMS database covered almost 98% of the global equity market at the start of our period in 1900. By the end of 2018, our 23 countries still represented over 90% 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 a danger of overstating world-wide 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-performing bond market of our 21 countries with continuous investment histories. Adding Austria, China, and Russia to our database and the world index was important in eliminating non-survivorship and “unsuccessful” bias. In 2014, we added another “unsuccessful” market, Portugal, to our dataset.

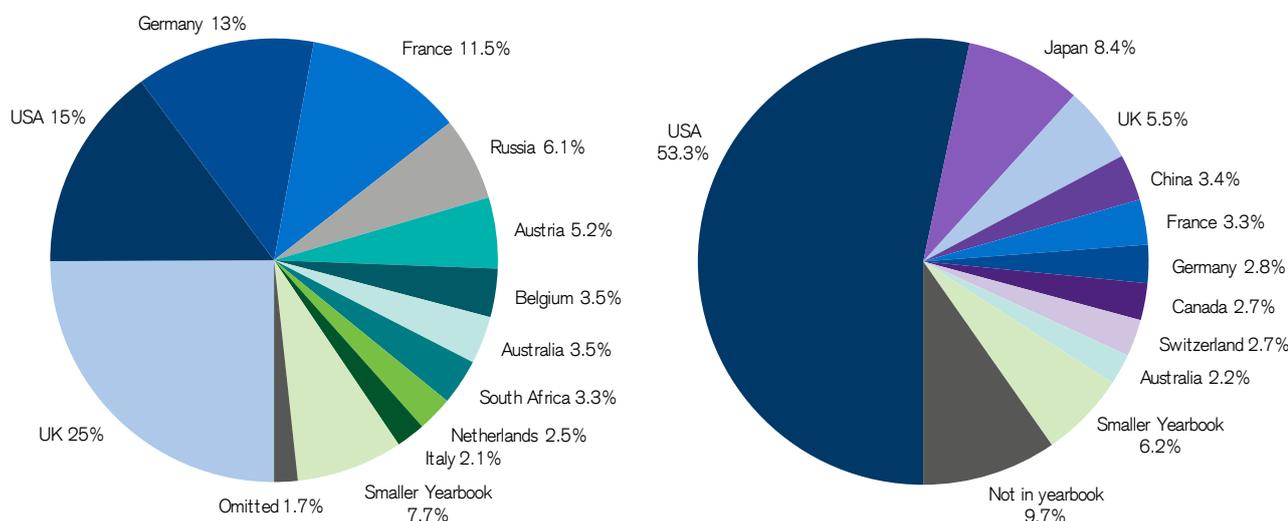
New industries

The changing country composition of the global equity market has been accompanied by evolution in the industrial composition of the market. **Figure 11** shows the composition of listed companies in the USA and the UK. The upper two charts show the position at start-1900, while the lower two show start-2019. 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. Over a century later, railroads declined almost to the point of stock market extinction, representing under 1% of the US market and close to zero in the UK.

Of the US firms listed in 1900, over 80% of their value was in industries that are today small or extinct; the UK figure is 65%. Beside railroads, other industries that have declined precipitously are textiles, iron, coal, and steel. These industries have moved to lower-cost locations in the emerging world. Yet there are also similarities between 1900 and 2019. The banking and insurance sectors continue to be important. Industries such as food, beverages (including alcohol), tobacco, and utilities were present in 1900 and survive today. And, in the UK, quoted mining companies were important in 1900 just as they are in London today.

Even industries that initially seem similar have often altered radically. For example, compare telegraphy in 1900 with smartphones in 2019. 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.

Figure 10: Relative sizes of world stock markets, end-1899 (left) versus start-2019 (right)



Source: MSCI, FTSE Russell, S&P, Elroy Dimson, Paul Marsh, and Mike Staunton. Not to be reproduced without express written permission from the authors.

Another aspect that stands out from **Figure 11** 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 2019 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.

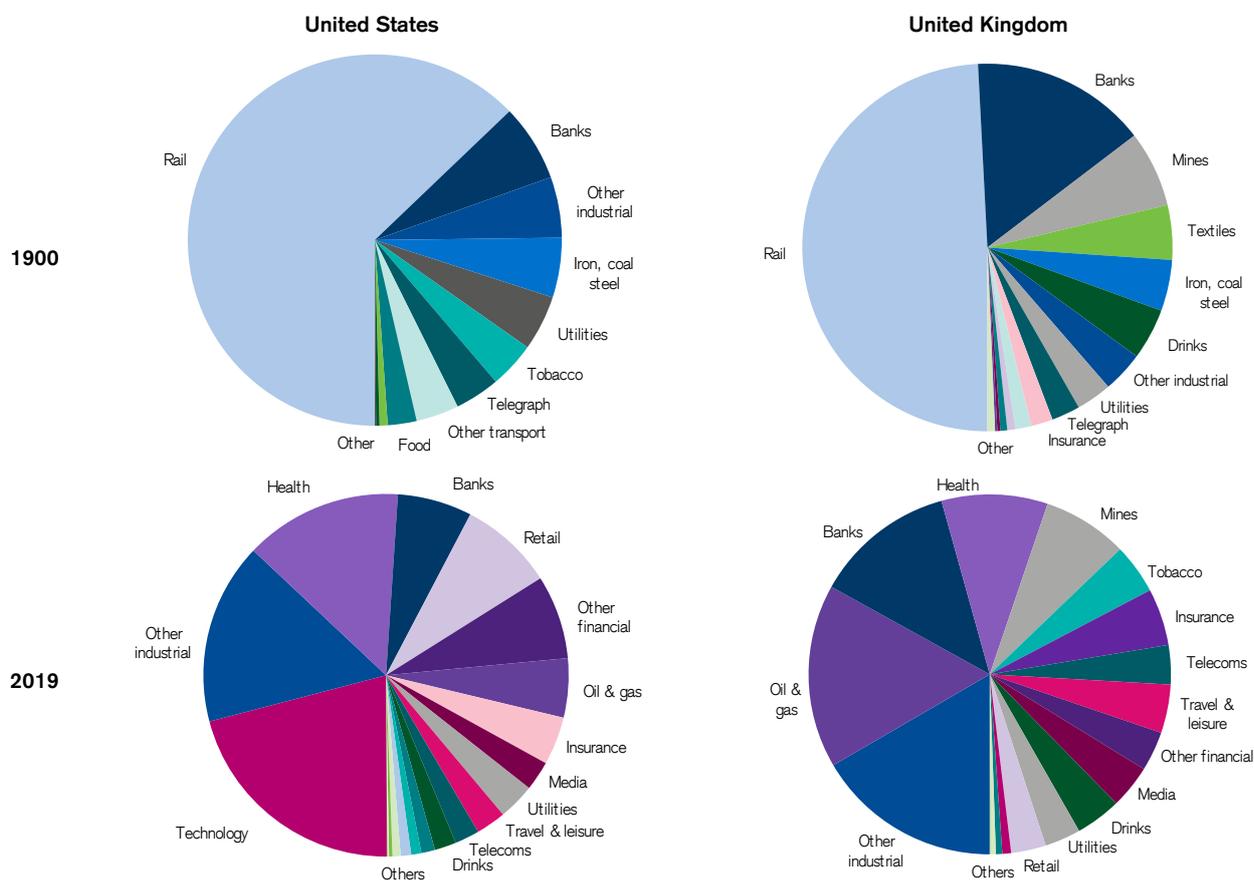
Our analysis relates to exchange-listed businesses. Some industries existed throughout the period, but were not always listed. For example, there were many retailers in 1900, but apart from the major department stores, these were often small, local outlets rather than national and global retail chains like Walmart or Tesco, or on-line global giant, Amazon. Similarly, in 1900, more 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 later. 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 asked whether investors should focus on new industries – the emerging industries – and shun the old, declining sectors. We showed that both new and old industries can reward as well as disappoint. It depends on whether stock prices correctly embed expectations. For example, we noted that, in stock market terms, railroads were the ultimate declining industry in the USA in the period since 1900. Yet, over the last 119 years, railroad stocks beat 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 had generated superior returns.

Figure 11: Industry weightings in the USA (left) and UK (right), 1900 compared with 2019



Sources: Elroy Dimson, Paul Marsh and Mike Staunton, *Triumph of the Optimists*, Princeton University Press, 2002, and *Global Investment Returns Yearbook*, Credit Suisse, 2019; FTSE Russell All-World Index Series Monthly Review, December 2018. Not to be reproduced without express written permission from the authors.

Long-run asset returns

The US experience, 1900-2018

The left-hand side of **Figure 12** shows the cumulative total return from stocks, bonds, bills, and inflation from 1900 to 2018 in the world's leading capital market, the United States. Equities performed best. An initial investment of USD 1 grew to USD 44,663 in nominal terms by end-2018. Long bonds and treasury bills gave lower returns, although they impressively beat inflation. Their respective index levels at the end of 2018 are USD 292 and USD 76, with the inflation index ending at USD 29. The chart legend shows the annualized returns. Equities returned 9.4% per year, versus 4.9% on bonds, 3.7% on bills, and inflation of 2.9% per year.

Since US prices rose 29-fold over this period, it is more helpful to compare returns in real terms. The right-hand side of **Figure 12** shows the real returns on US equities, bonds, and bills. Over the 119 years, an initial investment of USD 1, with dividends reinvested, would have grown in purchasing power by 1,521 times. The corresponding multiples for bonds and bills are 9.9 and 2.6 times the initial investment, respectively. As the legend to the chart shows, these terminal wealth figures correspond to annualized real returns of 6.4% on equities, 1.9% on bonds, and 0.8% on bills.

Figure 12 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

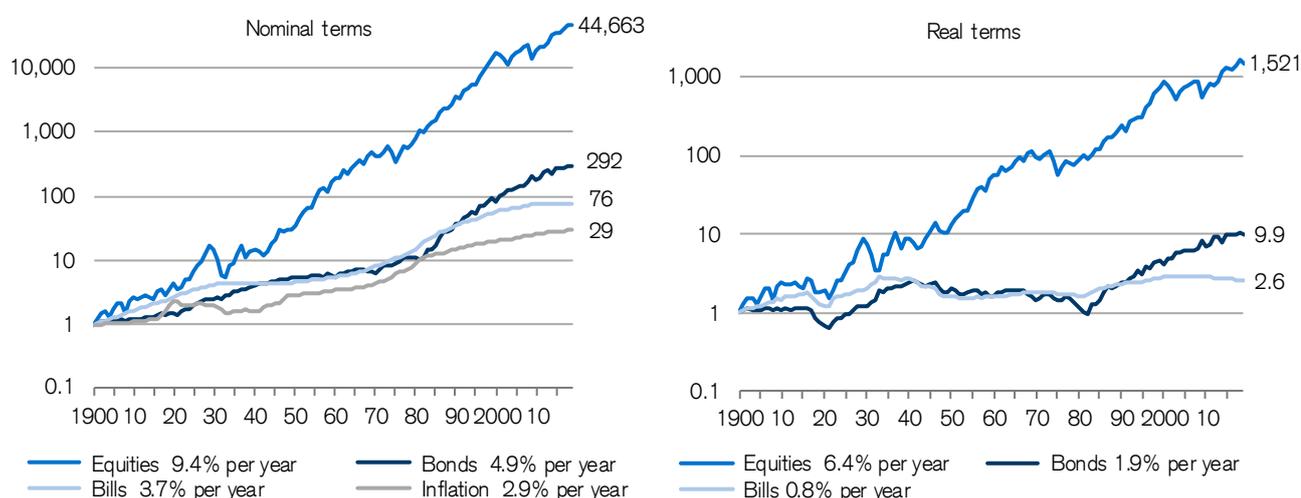
was severe at the time. At the depths of the Wall Street Crash, US equities had fallen by 80% in real terms. Many investors were ruined, especially those who bought stocks with borrowed money. The crash lived on in the memories of investors for at least a generation, and many subsequently chose to shun equity investment.

The chart 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 2009 certainly register, but are placed in context. Besides revealing impressive long-run equity returns, **Figure 12** 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.

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.

Fortunately, the DMS data allow us to examine asset-class comparisons, as in **Figure 12**, for every Yearbook market. The 119-year real equity return was positive in every location, typically at a level of 3% to 6% per year, and equities were the best-performing asset class everywhere.

Figure 12: Cumulative returns on US asset classes in nominal terms (left) and real terms (right), 1900–2018



Sources: Elroy Dimson, Paul Marsh and Mike Staunton, *Triumph of the Optimists*, Princeton University Press, 2002, and *Global Investment Returns Yearbook*, Credit Suisse, 2019. Not to be reproduced without express written permission from the authors.

Long-term stock and bond returns

Table 1 provides statistics on real equity returns from 1900 to 2018. The geometric means in the second column show the 119-year annualized returns achieved by investors. The arithmetic means in the third column show the average of the 119 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 1** which shows the standard deviation of each equity market's returns.

The USA's standard deviation of 19.9% places it among the lower risk markets, ranking sixth after Canada (16.9%), Australia (17.5%), New Zealand (19.2%), Switzerland (19.4%), and the UK (19.7%). (Detailed statistics are available in the Yearbook.) The World index has a standard deviation of just 17.4%, showing the risk reduction obtained from international diversification.

The 119 years from 1900 to 2018 were not especially kind to investors in government bonds. Across the 21 countries, the average annualized real return was 0.9% (1.1% excluding Austria's very low figure). While this exceeds the average return on cash by 1.2%, bonds had much higher risk. As already noted, real bond returns were negative in five countries. German bonds

performed worst, and their volatility was even grimmer than revealed in the table since the statistics exclude the 1922–23 hyperinflation. In the UK, the annualized real bond return was 1.8%, while US bondholders did a little better with a real return of 1.9% per year. These findings suggest that, over the full 119-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.

As reported in the full report, over the entire period, Sweden was the best-performing country in terms of real bond returns, with an annualized return of 2.7%, followed by Switzerland, Canada and New Zealand with annualized returns of 2.3%, 2.2% and 2.2%, respectively. New Zealand bonds had the lowest variability of 8.9%.

The average standard deviation of real bond returns was 13.0% versus 23.4% for equities and 7.6% for bills (these averages exclude Austria). US real equity returns had a standard deviation of 19.9% versus 10.3% 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, except Portugal.

Table 1: Real (inflation-adjusted) equity and bond returns in selected markets, 1900–2018

Country	Geometric mean (%)	Arithmetic mean (%)	Standard error (%)	Standard deviation (%)	Minimum return (%)	Minimum year	Maximum return (%)	Maximum year
Real equity returns								
Europe	4.2	6.0	1.8	19.8	−47.5	2008	75.2	1933
Japan	4.1	8.6	2.7	29.3	−85.5	1946	121.1	1952
Switzerland	4.4	6.2	1.8	19.4	−37.8	1974	59.4	1922
United Kingdom	5.4	7.2	1.8	19.7	−56.6	1974	99.3	1975
United States	6.4	8.3	1.8	19.9	−38.6	1931	55.8	1933
World	5.0	6.5	1.6	17.4	−41.4	2008	67.6	1933
Real bond returns								
Europe	1.2	2.4	1.5	15.8	−52.6	1919	72.2	1933
Japan	−0.8	1.7	1.8	19.4	−77.5	1946	69.8	1954
Switzerland	2.3	2.7	0.9	9.3	−21.4	1918	56.1	1922
United Kingdom	1.8	2.7	1.2	13.5	−29.9	1974	59.4	1921
United States	1.9	2.4	0.9	10.3	−18.1	1917	35.2	1982
World	1.9	2.5	1.0	11.0	−31.6	1919	46.0	1933
World ex-US	1.6	2.6	1.3	14.3	−46.1	1919	75.4	1933

Note: Europe and both World indexes are in common currency (USD). Sources: Elroy Dimson, Paul Marsh and Mike Staunton, *Triumph of the Optimists*, Princeton University Press, 2002, and *Global Investment Returns Yearbook*, Credit Suisse, 2019. Not to be reproduced without express written permission from the authors.

Real returns in local or US currency

To convert nominal returns, we use changes in the nominal exchange rate. Investors, however, focus on real returns in their local currency. To convert real returns in one currency into real returns in another, we simply adjust by the change in the real exchange rate.

We report in the full Yearbook that over the period 1900–2018, the real (inflation-adjusted) Swiss franc was stronger than the US dollar by 0.70% per year. An American who invested in Switzerland had a real return of 4.42% (from Swiss equities) plus 0.70% (from the Swiss franc), giving an overall return of $(1+4.42\%) \times (1+0.70\%) - 1 = 5.15\%$ (all numbers rounded). In contrast, the Swiss investor who invested in America had a real return of 6.35% (from US equities) minus 0.70% (from the US dollar), namely $(1+6.35\%) \times (1-0.70\%) - 1 = 5.61\%$ (again, rounded).

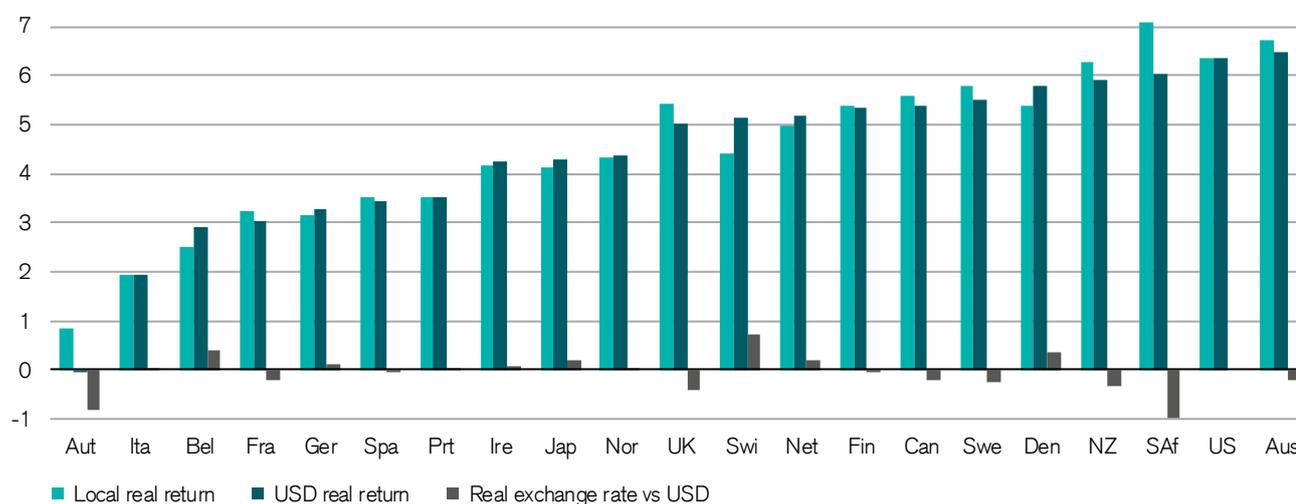
Instead of comparing domestic returns, an alternative way of making cross-country comparisons is thus to translate all countries' returns into real returns in a common currency using the real exchange rate. For equity returns around the world, **Figure 13** shows the results from translating out of local currency and into the US dollar. The bright turquoise bars show the annualized real domestic currency returns from 1900 to 2018. The small gray bars, close to the horizontal axis, show the annualized real exchange rate movement over the same period, with positive values indicating currencies that appreciated against the dollar, and vice versa. The darker bars are common-currency returns, in real US dollars, from the US investor's perspective.

Figure 13 portrays the adjustment from local-currency real returns to dollar-denominated real returns. It simply involves (geometric) addition of the real exchange rate movement. In the case of Switzerland, for example, the domestic real return is 4.42% and the real exchange rate movement is +0.70%. Adding these (geometrically) gives a real dollar return of 5.15% – as in the sample calculation shown above (again, all numbers are rounded). We obtain a similar ranking of equity markets, whether we rank by domestic real returns or real dollar returns.

Here we are seeing that purchasing power parity has held over the very long term (119 years) within a cohort of countries that are predominantly DMs. The power of PPP, illustrated earlier in **Figure 4**, is apparent again because we are adjusting for both exchange-rate changes and relative inflation rates. The annualized returns in each area of the chart are consequently close to each other.

In **Figure 13**, countries are shown in ascending order of the darker bars, which show the annualized real returns to a US investor (returns converted into dollars and adjusted for US inflation). For US investors, their domestic equity market gave a hard-to-beat annualized real return of 6.35%, exceeded in US dollar terms only by Australia. For comparisons like this, we can use any common currency; for example, the annualized real returns denominated in UK inflation-adjusted sterling, are obtained by adjusting by the real sterling-dollar exchange rate movement.

Figure 13: Real annualized equity returns (%) in local currency and US dollars, 1900–2018



Sources: Elroy Dimson, Paul Marsh and Mike Staunton, *Triumph of the Optimists*, Princeton University Press, 2002, and *Global Investment Returns Yearbook*, Credit Suisse, 2019. Not to be reproduced without express written permission from the authors.

Risk and risk premiums

Risk and the equity risk premium

The annualized equity premiums for our 21 countries with continuous investment histories and for the world indexes are summarized in **Figure 14**, where countries are ranked by the equity premium measured relative to bills, displayed as bars. The line-plot shows each country's risk premium measured relative to bonds. Over the entire 119 years, the annualized (geometric) equity risk premium, relative to bills, was 5.5% for the USA and 4.3% for the UK. Averaged across the 21 countries, the risk premium relative to bills was 4.7%, while the risk premium on the world equity index was 4.2%. Relative to long government bonds, the story is similar. The annualized US equity risk premium relative to bonds was 4.3% and the corresponding figure for the UK was 3.5%. Across the 21 markets the risk premium relative to bonds averaged 3.5%, while for the world index, it was 3.0%.

Our global focus also results in rather lower risk premiums than were previously assumed. Prior views have been heavily influenced by the experience of the USA, yet we find that the US risk premium is higher than the average for the other 20 countries in our dataset.

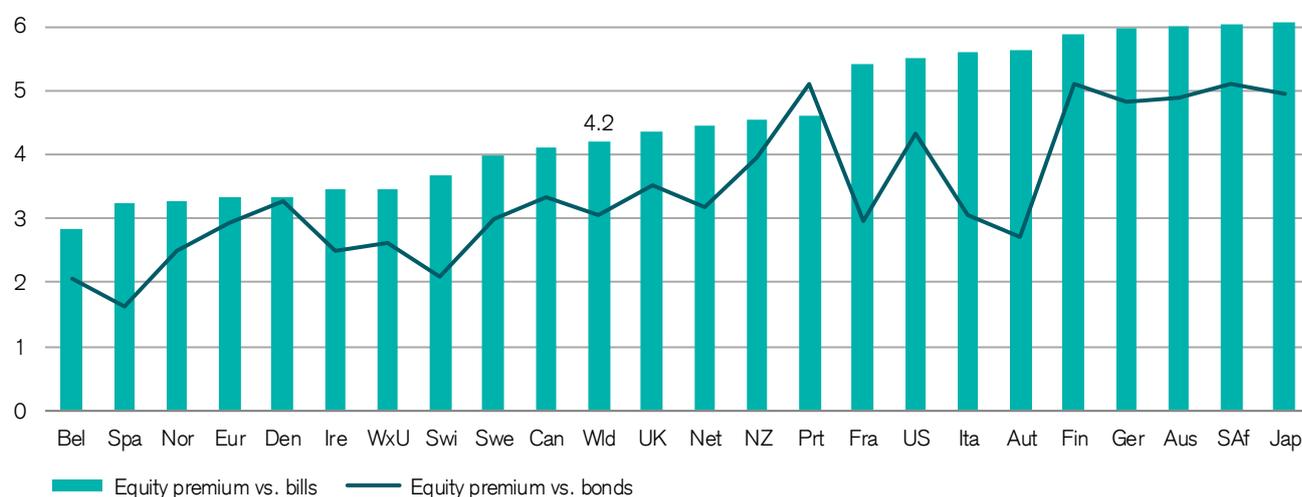
Since the start of the Yearbook project, we have expressed concern about potential survivorship bias in our estimates of the equity risk premium. This concern arose from recognition that, at least until a few years ago, the DMS database accounted for only some 87% of world equity market capitalization in 1900. The other 13% came from markets that existed in 1900, but for

which we as yet had no data. Some of these omitted markets failed to survive and, in some cases such as Russia in 1917 and China in 1949, investors lost all their money. Until six years ago, we had addressed this problem by providing an estimate of the likely magnitude of this bias, based on the assumption that most of the missing 13% of market capitalization became valueless.

Six years ago, we moved away from assumptions and addressed the issue of survivorship bias head-on. Our objective was to establish what had actually happened to the missing 13% of world market capitalization, and to assess the true impact of countries that had performed poorly or failed to survive. The two largest missing markets were Austria-Hungary and Russia, which, at end-1899, accounted for 5% and 6% of world market capitalization, respectively. The two best-known cases of markets that failed to survive were Russia and China. We therefore used new data sources to add these three countries to our database.

In total, our database now contains 23 countries, covering over 98% of world equity market capitalization in 1900. Two countries, Russia and China, have discontinuous histories, but we include them fully in our world index.

Figure 14: Worldwide annualized equity risk premium (%) relative to bills and bonds, 1900–2018



Sources: Elroy Dimson, Paul Marsh and Mike Staunton, *Triumph of the Optimists*, Princeton University Press, 2002, and *Global Investment Returns Yearbook*, Credit Suisse, 2019. Not to be reproduced without express written permission from the authors.

Maturity premiums

A bond maturity premium is required in order to compensate investors for the greater volatility and inflation risk of investing in long bonds. This is borne out by two key observations. First, the yield curve has historically on average been upward sloping; that is, long bonds have typically offered a higher yield to redemption than shorter dated bonds and bills. Second, real bond returns are far more volatile than real bill returns. As was the case with the equity risk premium, we cannot easily measure investors' ex ante requirements or expectations relating to the maturity premium, but we can measure the bond maturity premiums actually achieved. The formula for the bond maturity premium is $1 + \text{Long bond rate of return}$, divided by $1 + \text{Treasury bill rate of return}$, minus 1.

Figure 15 shows the data pictorially, with the bright turquoise bars representing the geometric mean premiums. It shows that over the last 119 years, the bond maturity premium has been positive in every country except Portugal (the premium for Germany excludes 1922–23). The premium for the European index is quite low at just 0.4% as it is measured from the perspective of a US investor, relative to US bills, i.e. US holders would have been only slightly better off holding European bonds rather than US bills. The (unweighted) average maturity premium for the 21 countries is 1.1%, while the maturity premium on the World index (in USD) is also 1.1% per year.

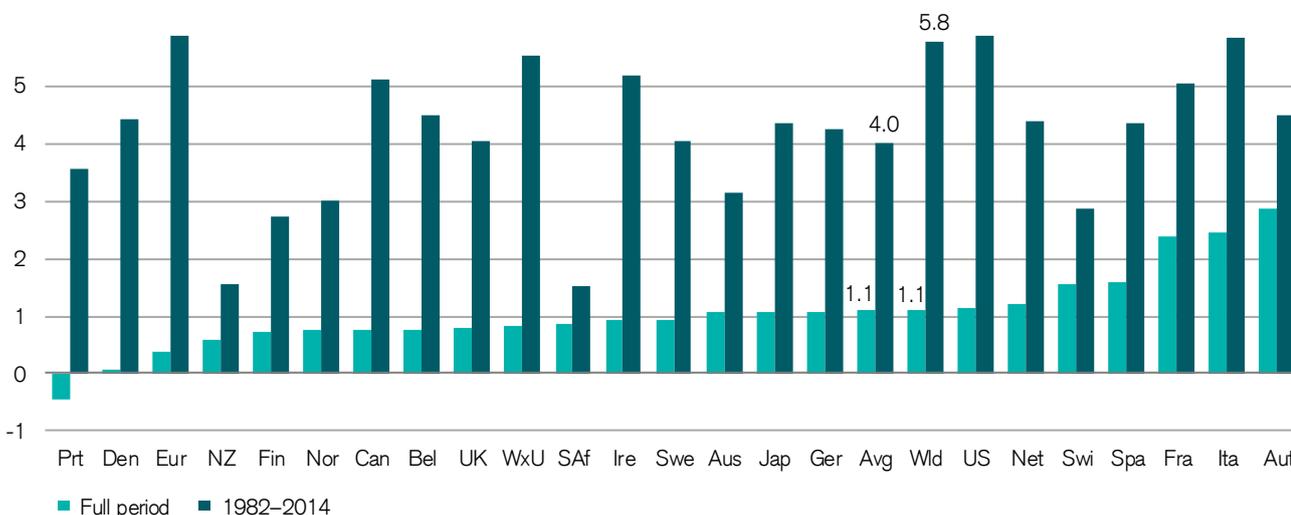
US bond investors could not reasonably have “required” a maturity premium as large as the 27% that they obtained in 2011. Very high realizations such as this must have been pleasant

surprises – typically good news on the inflation front, or a fall in the expected level of real interest rates, plus perhaps a flight to safety. Strictly speaking, therefore, we should refer to the annual maturity premiums simply as “excess returns”, that is, long bond returns in excess of (or under) the Treasury bill rate.

Over long-enough periods, we might expect the pleasant and unpleasant surprises to cancel each other out, providing us with an estimate of investors' ex ante required maturity premium. Once again, however, we need to examine very long periods before we can place confidence in this approach. Furthermore, the 119-year averages conceal a game of two halves. During the first half of the 20th century, when conditions for bond investors were clearly unfavorable, the average maturity premium across the 21 countries was 0.5%. From 1950 to 2018, the average premium was 1.6%. From 1982–2014, a period of 33 years, bonds enjoyed a golden age, with mostly unprecedented favorable conditions. The corresponding maturity premiums over this period were very large indeed.

Extrapolating these recent remarkably high bond returns and maturity premiums into the future would be fantasy. An alternative would be to take the long run, 119-year historical maturity premium on the world bond index of 1.1% per year as our estimate of the future maturity premium (or the equally weighted long-run average premium across the 21 countries which has the same value). For major markets, where there is very low risk of government default, we therefore estimate a forward-looking maturity premium of 1% per year.

Figure 15: Bond maturity premiums – full period (1900–2018) and “golden age” from 1982 to 2014



Over the full period, premiums for Austria and Germany are based on 117 years, excluding 1921–22 for Austria and 1922–23 for Germany. Sources: Elroy Dimson, Paul Marsh and Mike Staunton, *Triumph of the Optimists*, Princeton University Press, 2002, and *Global Investment Returns Yearbook*, Credit Suisse, 2019. Not to be reproduced without express written permission from the authors.

Factor investing

The value premium

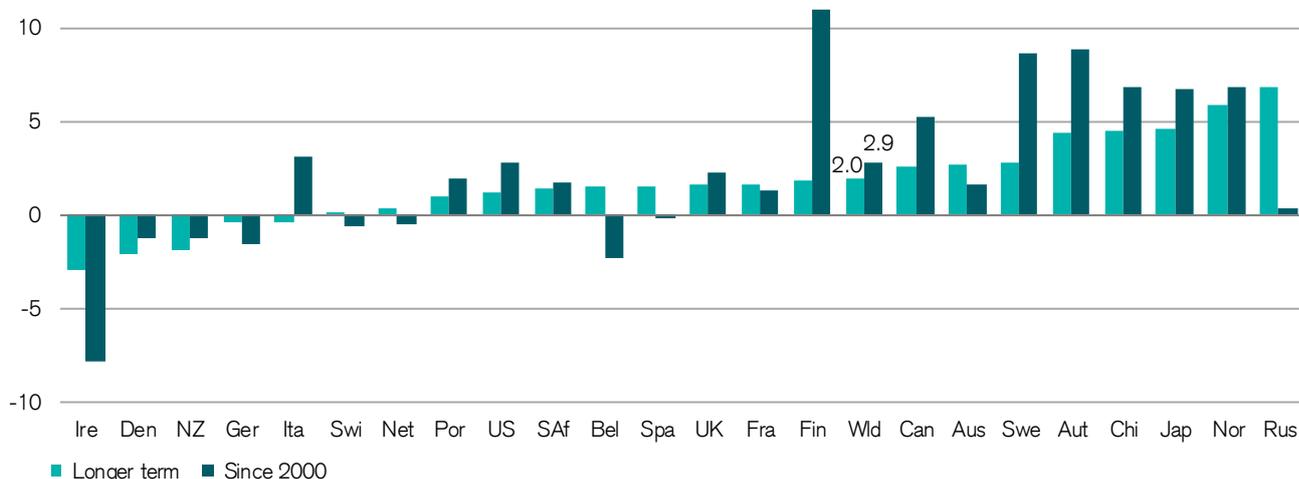
We compute the annualized value premium for each country as the geometric difference between the MSCI Investable Value and Growth indexes from inception (1975 in most countries) to date. MSCI constructs these indexes using eight historical and forward-looking fundamental variables for every security. They define value using a combination of book value-to-price, earnings-to-price, and dividend yield, while they define growth based on a combination of variables measuring short- and long-term growth in EPS and sales per share. They place each security into either the Value or Growth Indexes, or partially allocate it to both.

The lighter bars in **Figure 16** show the value premium for the 23 Yearbook countries over the 44 years from 1975 to 2018 (for seven countries, the MSCI Investable Value and Growth indexes start later, namely Finland and New Zealand in 1988, Ireland in 1991, China and Portugal in 1995, and Russia and South Africa in 1997). They show that, taking a global and long-term perspective, value investing mostly outperformed growth investing. The value premium was positive in 18 countries and negative in five. The value premium on the world index was 2.0% per year.

The superior returns from value stocks arrived erratically, however, with considerable year-to-year variation. Furthermore, as noted above, value tended to perform less well in the periods after researchers first documented the effect. In particular, the 1990s was a poor decade for value stocks. After the tech crash, value stocks returned to favor. The darker bars in **Figure 16** show that, since 2000, there have been positive value premiums in 15 Yearbook countries, and an annualized value premium of 2.9% on the world index. However, no investment style delivers premiums indefinitely, and growth stocks outperformed in most countries from 2007 onwards. Since then, the value investing style has performed poorly.

There is still much controversy over the source of the value premium. Dimson, Marsh, and Staunton (2004) review some of the disputes about the robustness of the premium, and whether it relates to behavioral factors or is simply a reward for greater investment risk, an issue to which we return in the following section. The fundamental issue, of course, is whether value will continue to triumph over the long run and, if so, whether its superiority more than compensates for any higher investment risk.

Figure 16: Annualized value premium in 23 countries, 1975–2018, % per year



Source: Elroy Dimson, Paul Marsh and Mike Staunton, *Triumph of the Optimists*, Princeton University Press, 2002, and *Global Investment Returns Yearbook*, Credit Suisse, 2019; MSCI Value and Growth indexes. Not to be reproduced without express written permission from the authors.

The value premium and value stretch

The observation that individual factors can underperform for many years, combined with the concerns of Arnott et al. (2016) about overcrowding, raises an important question, namely, can factor premiums be “timed”? We explore this issue in the context of value. The value premium in both the USA and UK has been negative since the financial crisis. **Figure 17** illustrates this for the UK, with the shaded area showing the rolling annualized value premium in the UK since 1960. It reveals that the recent run of underperformance is the deepest and longest over this 59-year period. Could this indicate that value is due for a renaissance and that growth investing has become a crowded trade?

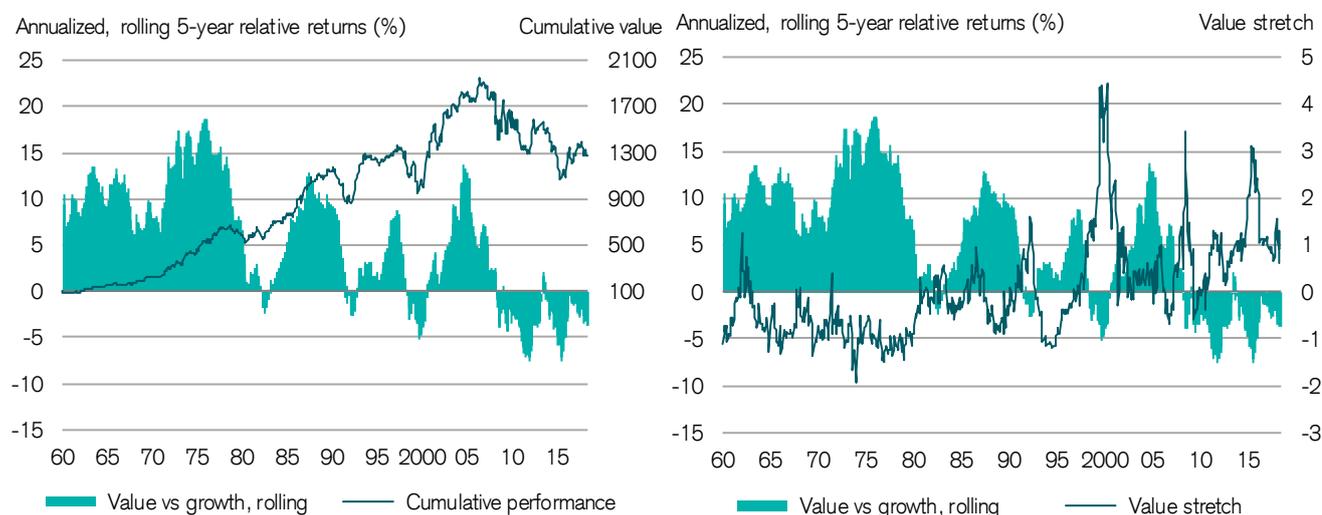
In computing the value premium in **Figure 17**, value stocks are defined as the 40% of stocks in the UK market with the lowest price-to-book ratio, while growth stocks are the 40% with the highest ratios. Clearly, the price-to-book ratio of the growth stock portfolio will be appreciably higher than that of the value stock portfolio. The ratio of the difference is the “value stretch.” It indicates how much more investors are prepared to pay per unit of book value for growth, rather than value stocks. When value stretch is high, this could be an indicator that the value factor is cheap, and this might help us to “time” our investments in value stocks.

In the right-hand chart of **Figure 17**, we plot the value stretch ratio for the UK market since 1960. It is normalized as a zero-mean z-score (see the right-hand scale), so the values can be interpreted as the number of standard deviations from the mean. Unsurprisingly, stretch was highest (i.e. growth was most highly valued relative to

value) with a value of 4.4 in early 2000, while it was lowest in mid-1974, with a value of -1.9 . To examine whether value stretch can be used to time the value factor, we regressed the future value premium on the prior level of stretch. Unfortunately, we found no relationship. No doubt, the value factor will reassert itself at some stage, but our research based on value stretch does not help us predict when.

Despite our own negative results, Arnott et al. maintain, very plausibly, that factors can become expensive, and that there is therefore potential for their timing. This view is contested by Asness, Chandra, Ilmanen and Israel (2017) who argue that factor timing is deceptively difficult. They conclude, “Our own slew of trading simulations ... fails to produce economically meaningful improvement in either gross returns or gross Sharpe ratios, underscoring the difficulty of successfully implementing contrarian factor timing ... Our research supports the approach of sticking to a diversified portfolio of uncorrelated factors that you believe in for the long-term, instead of seeking to tactically time them.” We suspect this debate has further to run.

Figure 17: The rolling value premium and value stretch in the UK, 1960–2018



Source: Elroy Dimson, Paul Marsh and Mike Staunton, *Triumph of the Optimists*, Princeton University Press, 2002, and *Global Investment Returns Yearbook*, Credit Suisse, 2019. Not to be reproduced without express written permission from the authors.

The case for multifactor investing

Smart-beta investing seeks to harvest the long-run factor premiums highlighted by academic researchers. Factors are the security-related characteristics that give rise to common patterns of return among subsets of listed securities. While industry and sector membership have long been a part of how we categorize investments, our focus here goes beyond industry membership.

To identify factors, researchers typically construct long-short portfolios. These portfolios are long the preferred exposure and short the unwanted exposure. In the equity market, for example, an income factor portfolio would contain high-dividend yield stocks accompanied by a short position in lower-yielding stocks. It is far easier to buy stocks you do not own than to sell stocks you do not own. Long-short strategies can therefore be relatively expensive – on occasion impossible – to construct, and they can certainly be difficult to scale up. “Pure play” long-short strategies are sometimes called style strategies.

What are the smart-beta strategies that researchers have highlighted? Fama and French (1993, 2012, 2015) identify four factors in addition to the market: size, value, profitability, and investment; Black (1972) and Frazzini and Pedersen (2014) identify low risk; and Jegadeesh and Titman (1993) and Carhart (1997) identify

momentum. Asness, Iltanen, Israel and Moskowitz (2015) argue that there are four classic style premiums, namely value, momentum, income (or “carry”), and low-volatility (or “defensive”) investing. Ang, Hogan, and Shores (2018) focus on size, value, momentum, volatility, and profitability.

In all, researchers have identified at least 316 factors, most of which are unlikely to be robust in independent testing. Novy-Marx and Velikov (2015) and Green, Hand and Zhang (2017) express complementary doubts about the prospective profits from exploiting factors that appear promising on an in-sample basis. The problem of apparently significant in-sample results being non-robust in out-of-sample tests has been discussed for more than a quarter of a century; see, for example, Dimson and Marsh (1990) and Markowitz and Xu (1994). But seeking genuine out-of-sample evidence would try most investors’ patience. It is important, therefore, to understand risk exposures when evaluating a fund manager’s performance. A factor that is ranked high in performance in a particular year may remain high, may slip to low, or may end up in the middle in the following year. **Figure 18** lists each year’s factor returns since the financial crisis, ranked from highest to lowest. Since the global financial crisis, the ranking of factor returns has not been stable, and earlier years (not shown here) are similar. Because of the inherent unpredictability of risk premiums, perceptive investors diversify their portfolios across risk exposures.

Figure 18: Post-crisis equity factor return premiums in the USA (upper panel) and UK (lower panel)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2008–18	
USA	Highest	Low vol 89.6	Size 28.4	Size 13.6	Low vol 40.1	Value 11.5	Size 5.3	Low vol 10.7	Momentum 42.4	Value 17.0	Momentum 6.2	Low vol 13.8	Low vol 6.4
		Income 20.6	Value -7.9	Momentum 8.5	Income 29.7	Size 7.7	Momentum 4.6	Income 1.6	Low vol 13.1	Income 14.8	Low vol 6.1	Momentum 13.3	Size 2.1
		Momentum -2.5	Income -17.2	Income 7.0	Momentum 1.3	Momentum -0.8	Value 4.4	Value -2.2	Income 1.9	Size 9.7	Size -3.4	Income 3.5	Income 2.0
		Size -4.3	Low vol -32.9	Value -4.6	Size -3.6	Low vol -2.1	Income -8.2	Momentum -5.3	Size -9.4	Low vol -1.8	Value -9.8	Size -8.1	Momentum -3.3
	Lowest	Value -6.3	Momentum 50.6	Low vol -15.5	Value -12.7	Income -7.6	Low vol -9.4	Size -6.7	Value -12.0	Momentum -22.1	Income -13.9	Value -13.8	Value -3.8
UK	Highest	Low vol 127.0	Size 24.9	Size 12.4	Low vol 35.0	Size 17.0	Momentum 32.4	Momentum 7.8	Low vol 23.7	Value 20.2	Momentum 11.0	Low vol 18.2	Momentum 9.2
		Momentum 78.8	Income 1.1	Value 3.2	Income 28.3	Value 14.8	Size 15.5	Income -1.3	Momentum 20.1	Income 15.3	Size 6.1	Momentum 6.6	Low vol 5.1
		Income 15.7	Value -6.9	Momentum 0.7	Momentum 20.6	Momentum -1.7	Low vol 11.5	Size -2.9	Size 11.1	Size -4.9	Value 3.3	Income -2.4	Size 3.3
		Value -11.8	Low vol -20.1	Income -13.7	Size -4.9	Income -8.1	Income 0.0	Low vol -6.2	Income -11.2	Momentum -18.3	Income -0.6	Size -6.8	Income 0.2
	Lowest	Size -17.5	Momentum -25.4	Low vol -22.9	Value -10.7	Low vol -15.7	Value 0.0	Value -10.0	Value -20.9	Low vol -21.2	Low vol -9.6	Value -7.0	Value -3.0

Source: Elroy Dimson, Paul Marsh and Mike Staunton, *Triumph of the Optimists*, Princeton University Press, 2002, and *Global Investment Returns Yearbook*, Credit Suisse, 2019. Not to be reproduced without express written permission from the authors.



Individual markets

The Credit Suisse Global Investment Returns Yearbook covers 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 Europe index.

Our 23 countries represent 98% of world equity market capitalization at the start of 1900 and 90% of the investable universe in 2019. The list of countries included in the Yearbook database has expanded over time, but has been stable since 2015. The underlying annual returns are distributed as the DMS data module by Morningstar Inc.

Guide to countries and regions

Countries are listed alphabetically, followed by three regional groups. There are six pages per market (only three for China and Russia). Each market opens with a short historical overview and economic snapshot. We summarize the evolution of securities exchanges in each individual country, and spotlight a few financial descriptors of the economy in more recent times. We compare the local stock market with other markets around the world, identify industry sectors that are dominant in the country's stock exchange, and identify particular listed companies that are prominent in the national stock market.

The first page for each market includes an overview of long-term investment performance, encapsulated in two charts. The left-hand chart reports the annualized real returns on equities, bonds and bills over this century, the last 50 years, and since 1900. For the latter two periods,

the right-hand chart reports the annualized premiums achieved by equities relative to bonds and bills, by bonds relative to bills, and by the real exchange rate relative to the US dollar (the periods covered differ for China and Russia, which have breaks in their market histories).

On the second page for each market, we list our data sources, covering equities, bonds, bills, currencies, and inflation. The primary data sources are cited in the Reference list at the rear of the full Yearbook. Additional bibliographic references may be found in *Triumph of the Optimists* and in our chapter in *The Handbook of the Equity Risk Premium*, which is listed in the references as Dimson, Marsh, and Staunton (2007).

Our data series are comprehensive. We cover five assets in each of 23 countries. For all 115 asset/market combinations, we estimate total returns for 119 years from the start of 1900 to the end of 2018 (with a gap for each of China and Russia).

Where possible, we use high-quality contemporary return indexes with broad coverage. We link these to data from peer-reviewed academic research or, alternatively, highly rated professional studies. Often we link together a sequence of indexes. We choose the best available indexes for each

period, switching when feasible to superior alternatives, as these become available. The criteria for judging superiority are, first, index methodology (such as weighting scheme and free-float adjustment) and, second, the breadth of coverage of the index. All indexes incorporate reinvested income. Exchange rates are not described separately; where there is a choice of exchange rates, we use market rather than official rates.

A summary table follows the data description. This provides an overview of the asset returns and risk premiums for that market. For both nominal and real (inflation-adjusted) asset returns and for three risk-premium series, we show the geometric and arithmetic mean return, the standard error of the arithmetic mean, the standard deviation and serial correlation of annual returns and the lowest and highest annual return, together with the dates in which these extremes occurred. We also show the lowest and highest ten-year returns, together with the end-year for those returns, as well as the rank of the most recent year's returns (where the highest return has rank 1, and the lowest, for a country with a complete history, has rank 119). These statistics are based on the entire period spanned by our study.

The third page for each market shows a graph of the real (inflation-adjusted) returns achieved on equities, bonds, and bills, together with the real exchange rate against the US dollar, all based at the start of 1900 to a value of one. The real exchange rate is defined as the nominal exchange rate against the dollar, adjusted by the inflation rate of the country relative to that of the USA. The vertical axis for these indexes is on the left-hand side of the graph; the scale is logarithmic. The lower part of this chart displays the individual yearly percentage returns on equities and on bonds. Returns are measured in real (inflation-adjusted) terms. The vertical axis for these year-by-year returns is on the right-hand side of the graph; it is an arithmetic scale. For countries with an unbroken history from 1900 to date, there are three further pages, which we describe next.

The fourth page for each market provides "return triangles" of the annualized real returns on each of the principal asset categories, the three premiums relating to equities, bonds, and bills, real and nominal exchange rates against the dollar, plus the annualized inflation rate. These returns span all multiples of a decade from one to twelve decades, including the (incomplete) decade we are in at present.

The "triangles" table presents returns over individual decades, and returns to date from an initial investment made at the start of 1900, 1910, and so on to the end of 2018. The triangles are divided into two groups of five.

The five lower triangular tables on the left (the unshaded triangles) are read from top to bottom; for instance, the annualized real return for Australian equities from the start of 1910 to the start of 1930 was 8.6%. The five (shaded) upper triangular tables on the right are read from left to right; for instance, the annualized equity premium versus bonds for Australia during 1910–70 was 6.9%.

The penultimate page illustrates the dispersion of real returns. The upper chart displays the dispersion of real equity returns, and the lower chart, real bond returns. The vertical axis measures the real return, annualized over intervals of all possible length from 10 to 119 years. We depict the range of real returns that could be computed if data were used as at any year-end between 1909 and 2018.

The horizontal axis shows the number of years used to compute the real return. For instance, at the left-hand side of the chart, located against a holding period of ten years, is the range of ten-year real returns. This part of the chart is based on 110 estimates of the historical real return. The estimates comprise performance statistics over the following decade-long intervals: (1) 1900–09, (2) 1901–10, ..., (109) 2008–17, and (110) 2009–18. Similarly, with a holding period of 20 years, the chart is based on 100 estimates of the real return over intervals with a duration of two decades.

In the following pages we provide a short review of the investment performance of the most important markets in the world since 1900, including China, Japan, Switzerland, the United Kingdom, the United States and the World.

To access the full Credit Suisse Global Investment Returns Yearbook or the underlying DMS dataset, please consult page 40.



The biggest economy

Despite the occasional wobble, China's economic expansion has had a huge cumulative impact. Measured using PPP exchange rates, China now has the world's largest GDP according to the International Monetary Fund. 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.

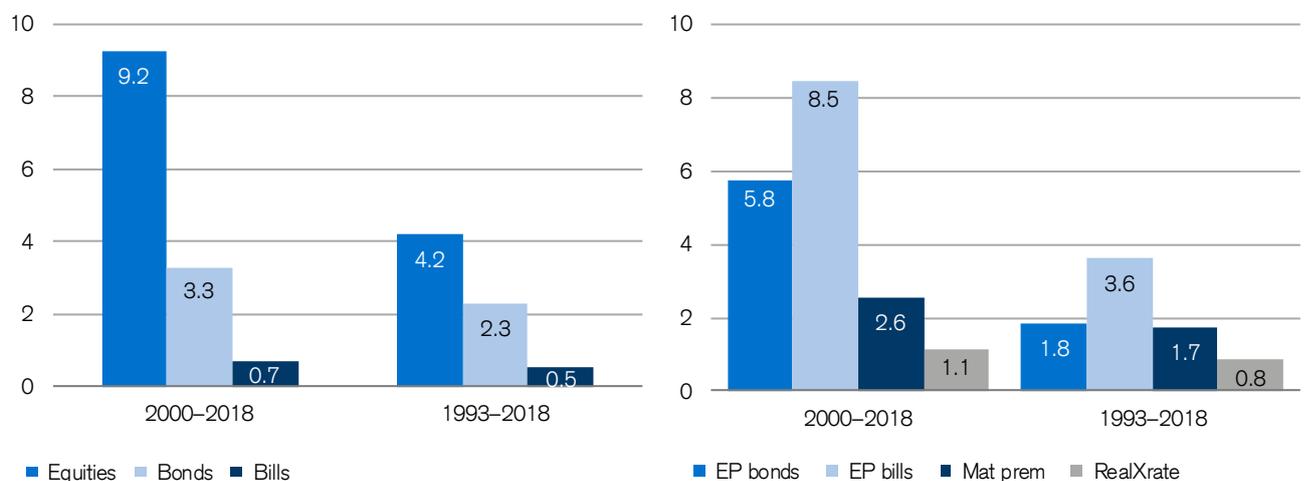
The People's Republic of China (PRC) has been a single-party state since then. We therefore distinguish between (1) the Qing period and the ROC, (2) the PRC until economic reforms were introduced, and (3) the modern period following

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 indexes, including the total losses in the late 1940s.

China's GDP growth was not accompanied by superior investment returns. Nearly one-third (30%) of the Chinese market's free-float investable capitalization is represented by financials, mainly banks and insurers. Tencent Holdings is the biggest holding in the FTSE World China index, followed by Alibaba Group, China Construction Bank, the Industrial and Commercial Bank of China, and then China Mobile.

Figure 19: Annualized real returns on asset classes and risk premiums for China, 1993–2018 (%)



Note: The three asset classes are equities, long-term government bonds, and Treasury bills. All returns include reinvested income, are adjusted for inflation, and are expressed as geometric mean returns.

Note: EP bonds and EP bills denote the equity premium relative to bonds and to bills; Mat prem denotes the maturity premium for bonds relative to bills; RealXRate denotes the inflation-adjusted change in the exchange rate against the US dollar.

Sources: Elroy Dimson, Paul Marsh and Mike Staunton, *Triumph of the Optimists*, Princeton University Press, 2002, and *Global Investment Returns Yearbook*, Credit Suisse, 2019. Not to be reproduced without express written permission from the authors.



The Old World

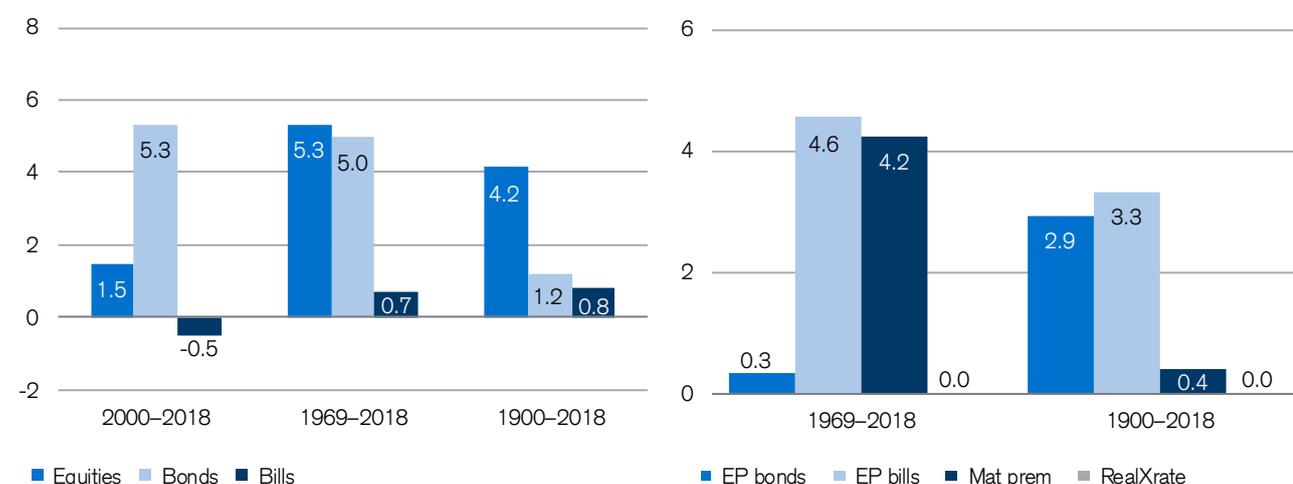
The Yearbook documents investment returns for 16 European countries, most (but not all) of which are in the European Union. They comprise ten EU states in the Eurozone (Austria, Belgium, Finland, France, Germany, Ireland, Italy, the Netherlands, Portugal, and Spain), three EU states outside the Eurozone (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 5.0% for the world index, indicating that the Old World countries have underperformed. This may relate to some nations' loss of imperial powers and colonial territories, the destruction from the two world wars (where Europe was at the epicenter), the fact that many New World countries were resource-rich, or perhaps to the greater vibrancy of New World economies.

We follow a policy of continuous improvement with our data sources, introducing new countries when feasible, and switching to superior index series as they become available. As we noted above, we recently added three new European countries: Austria, Portugal and Russia. Two of them have a continuous history, but Russia does not; however, all of them are fully included in the Europe 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.

Figure 20: Annualized real returns on asset classes and risk premiums for Europe, 1900–2018 (%)



Note: The three asset classes are equities, long-term government bonds, and Treasury bills. All returns include reinvested income, are adjusted for inflation, and are expressed as geometric mean returns.

Note: EP bonds and EP bills denote the equity premium relative to bonds and to bills; Mat prem denotes the maturity premium for bonds relative to bills; RealXRate denotes the inflation-adjusted change in the exchange rate against the US dollar.

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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% over this period. With one or two setbacks, equities kept rising for another 30 years.

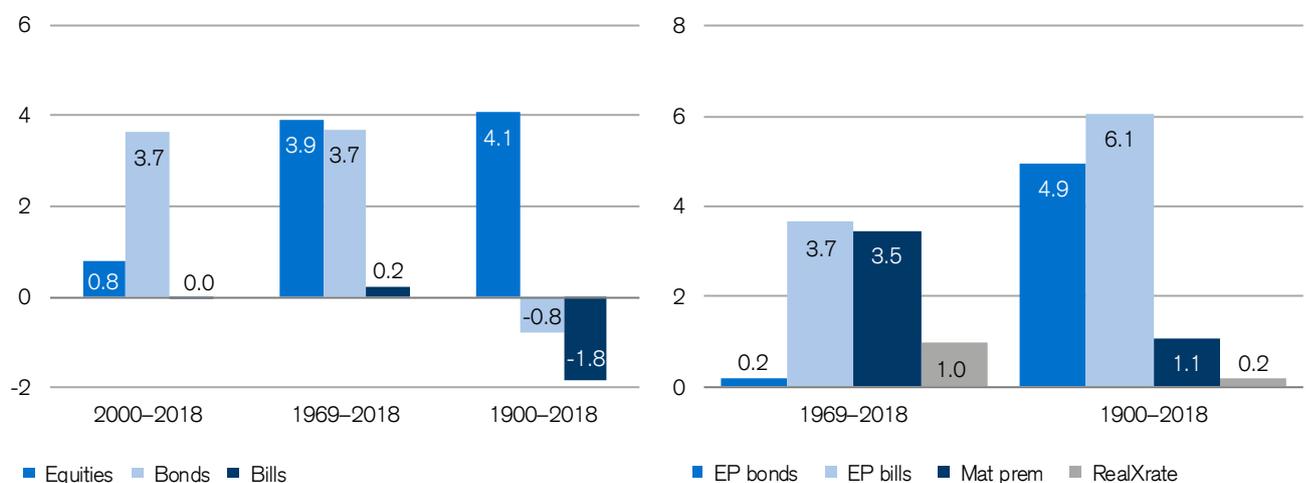
By the start of the 1990s, the Japanese equity market was the largest in the world, with a 41% weighting in the world index compared to 30% for the USA. Real estate values were also riding high: a 1993 article in the Journal of Economic

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 2019, Japan was the worst-performing stock market. At the start of 2019, 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.

Figure 21: Annualized real returns on asset classes and risk premiums for Japan, 1900–2018 (%)



Note: The three asset classes are equities, long-term government bonds, and Treasury bills. All returns include reinvested income, are adjusted for inflation, and are expressed as geometric mean returns.

Note: EP bonds and EP bills denote the equity premium relative to bonds and to bills; Mat prem denotes the maturity premium for bonds relative to bills; RealXRate denotes the inflation-adjusted change in the exchange rate against the US dollar.

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Traditional safe haven

For a small country with just 0.1% of the world's population and less than 0.01% of its land mass, Switzerland punches well above its weight financially, in our view, and wins several gold medals in the global financial stakes.

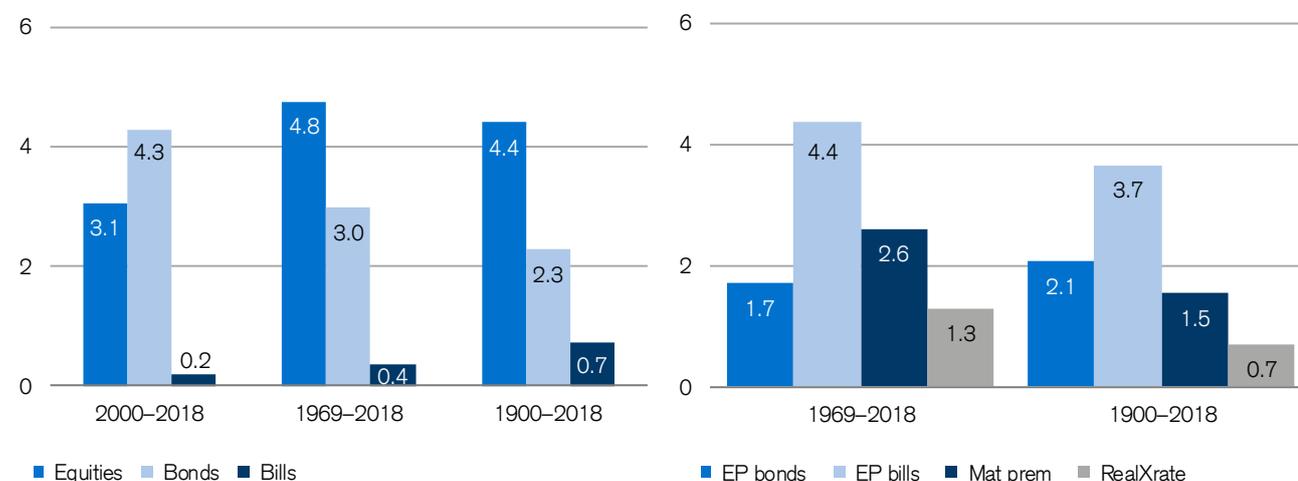
The Swiss stock market traces its origins to exchanges in Geneva (1850), Zurich (1873), and Basel (1876). It is now the world's eighth-largest equity market, accounting for 2.7% of total world value. Since 1900, Swiss equities have achieved a real return of 4.4% (equal to the median across our countries). Meanwhile, Switzerland has been the world's second best-performing government bond market, with an annualized real return of 2.3%. The country also had the world's lowest 119-year inflation rate of just 2.1%.

Switzerland is one of the world's most important banking centers, and private banking has been a major Swiss competence for over 300 years. Swiss neutrality, sound economic policy, low inflation and a strong currency have bolstered the country's reputation as a safe haven.

A large proportion of all cross-border private assets invested worldwide is still managed in Switzerland.

Switzerland's pharmaceutical sector accounts for a third (35%) of the value of the FTSE Switzerland index. Nestle (22%), Novartis (17%), and Roche (16%) together account for over half of the index's value.

Figure 22: Annualized real returns on asset classes and risk premiums for Switzerland, 1900–2018 (%)



Note: The three asset classes are equities, long-term government bonds, and Treasury bills. All returns include reinvested income, are adjusted for inflation, and are expressed as geometric mean returns.

Note: EP bonds and EP bills denote the equity premium relative to bonds and to bills; Mat prem denotes the maturity premium for bonds relative to bills; RealXRate denotes the inflation-adjusted change in the exchange rate against the US dollar.

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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.

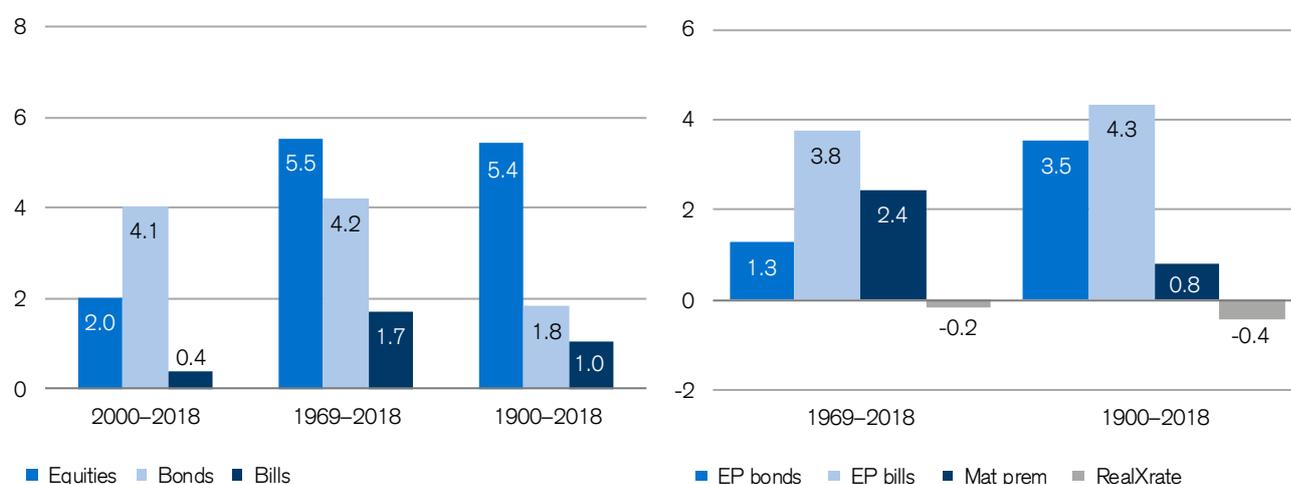
Today, London is ranked as the top financial center in the Global Financial Centers Index, Worldwide Centers of Commerce Index, and Forbes' ranking of powerful cities. It is the world's banking center, with 550 international banks and 170 global securities firms having offices in London. The UK's foreign 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.

Royal Dutch Shell is the largest UK stock by market capitalization. Other major companies include HSBC Holdings, BP, Astra Zeneca, Glaxo SmithKline, Diageo, and British American Tobacco.

Figure 23: Annualized real returns on asset classes and risk premiums for the UK, 1900–2018 (%)



Note: The three asset classes are equities, long-term government bonds, and Treasury bills. All returns include reinvested income, are adjusted for inflation, and are expressed as geometric mean returns.

Note: EP bonds and EP bills denote the equity premium relative to bonds and to bills; Mat prem denotes the maturity premium for bonds relative to bills; RealXRate denotes the inflation-adjusted change in the exchange rate against the US dollar.

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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 that the USA could pass Saudi Arabia in 2018 to become the world's number one oil producer.

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, investable basis), which is six times as large as Japan, its closest rival. The USA also has the world's largest bond market.

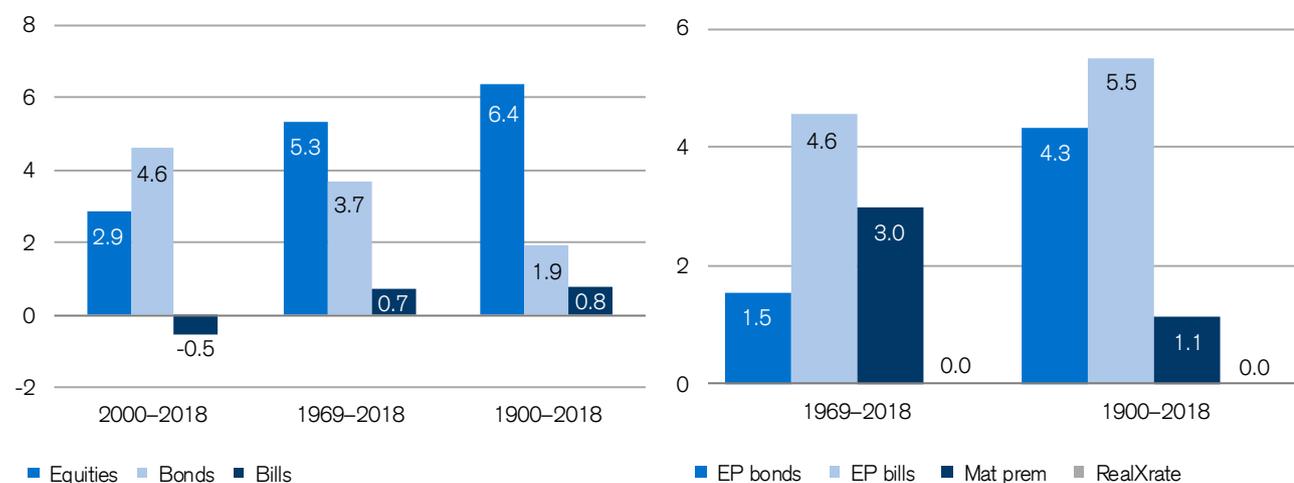
US financial markets are by far the best-documented in the world and, until recently, most of the long-run evidence cited on historical investment performance drew almost exclusively on the US experience. Since 1900, equities

and government bonds in the USA have given annualized real returns of 6.4% and 1.9%, respectively.

There is an obvious danger of placing too much reliance on the impressive 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.

Figure 24: Annualized real returns on asset classes and risk premiums for the USA, 1900–2018 (%)



Note: The three asset classes are equities, long-term government bonds, and Treasury bills. All returns include reinvested income, are adjusted for inflation, and are expressed as geometric mean returns.

Note: EP bonds and EP bills denote the equity premium relative to bonds and to bills; Mat prem denotes the maturity premium for bonds relative to bills; RealXrate denotes the inflation-adjusted change in the exchange rate against the US dollar.

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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 start-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.

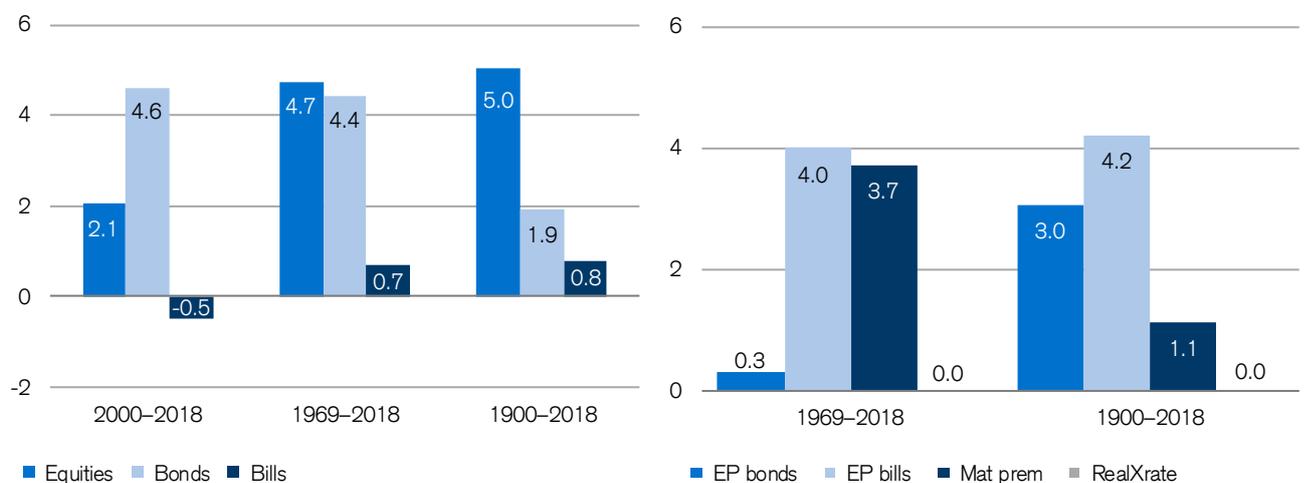
Over the 119 years from 1900 to 2018, the left-hand chart shows that the real return on the

world index was 5.0% per year for equities and 1.9% per year for bonds. The right-hand chart shows that the world equity index had an annualized equity risk premium, relative to Treasury bills, of 4.2% over the last 119 years, and a similar premium of 4.0% 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. Most recently, 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.

Figure 25: Annualized real returns on asset classes and risk premiums for the World index, 1900–2018 (%)



Note: The three asset classes are equities, long-term government bonds, and Treasury bills. All returns include reinvested income, are adjusted for inflation, and are expressed as geometric mean returns.

Note: EP bonds and EP bills denote the equity premium relative to bonds and to bills; Mat prem denotes the maturity premium for bonds relative to bills; RealXRate denotes the inflation-adjusted change in the exchange rate against the US dollar.

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Data sources for the underlying database

The DMS database draws on the efforts of many researchers around the world. The reader's attention is drawn to the comprehensive list of studies catalogued at the end of the *Credit Suisse Global Investment Returns Yearbook 2019*.

Imprint

Publisher

Credit Suisse Research Institute
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ISBN for full Yearbook:

978-3-9524302-8-6

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