New evidence puts risk premium in context

By Elroy Dimson, Paul Marsh **and** Mike Staunton**, London Business School** explain why their research is important for investors and companies alike.

One of the most important contemporary issues in corporate finance is the magnitude of the equity risk premium, the incremental return that investors require from holding risky equities rather than risk-free securities. This article sheds light on this issue by addressing two key questions: What has the size of the equity risk premium been historically? And what can we expect for the future? In answering these questions we reviewed evidence for 16 different countries over the 102-year period from 1900-2001. Although equities gave the highest return in every country, they also proved to be the riskiest asset class and the margin over bills and bonds is smaller than many investors have perceived.

THE LONG TERM

To understand the risk premium we need to examine very long periods of time, as stock markets are volatile with much variation in year-to-year returns. Our research spans over a century of returns on equities, government bonds, treasury bills, inflation and exchange rates. It covers sixteen countries, including two North American markets, the UK and three other non-Euro markets in Europe, seven markets from what is now the Euro currency area, two Asia-Pacific markets, and one African stock market. They are illustrated below.

The long-term record for equities is summarised by the yellow bars in Figure 1, which show real returns over the 102-year period from 1900-2001. Clearly, these 102-year returns are much less favourable than the returns during the 1990s, but equally, they contrast sharply with the disappointing returns of 2000-01.

Investors need to examine the full extent of financial market history, and by looking not just at the United States, but at other countries as well. Both practitioners and researchers have grown increasingly uneasy about many of the current estimates of the risk premium, largely because they seem so high. Apart from biases in construction, these other studies often suffer from a lack of international evidence and long-term data. Our study helps fill this gap by providing a 102-year history for sixteen different markets.

NEW DATABASE

The new evidence on long-run risk premia we present is derived from a unique database, compiled with the support of ABN AMRO. The database comprises annual returns on stocks, bonds, bills, inflation and currencies for sixteen countries from 1900-2001. Together, these countries made up 95 per cent of the free float market capitalization of all world equities at start-2002, and we estimate that they comprised over 90 per cent by value at the start of our period in 1900. The data is distributed by Ibbotson Associates of Chicago.

The annualized equity risk premia are plotted in Figure 2. Here, countries are ranked by the equity risk premium relative to bonds, displayed as bars. The line-plot presents each country's risk premium relative to bills.

There are material differences between the premia reported in our study and those put forward by other major studies in both the United States and the United Kingdom. We have estimated the premia to be around 1.5 per cent lower than reported in other major studies. The differences arise from previous biases in index construction for the United Kingdom and, for both countries, from the choice of time frame, which in our case goes back for a longer period of time.

Clearly, the 102-year historical estimates of equity premia reported here are lower than was previously thought and other studies suggest. Even then, however, the historical record may overstate expectations. First, even if we have been successful in avoiding survivor bias within each index, we sti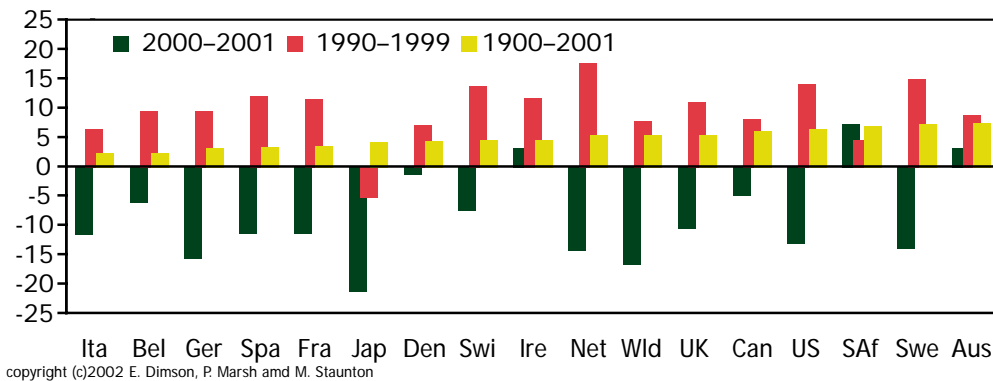ll focus on markets that survived, omitting countries such as Poland, Russia or China whose compound rate of return was −100 per cent. Second, our premia are estimated relative to bills and bonds, which in a number of countries gave markedly negative real returns. Since these so-called risk-free returns likely fell below investors' expectations, the corresponding equity premia are probably still overstated.

LOOKING FORWARD

For discounting future cash flows, we need the expected future risk premium, i.e., the arithmetic mean of the possible premia that may occur. If future returns are drawn from the same distribution as those that occurred in the past then the
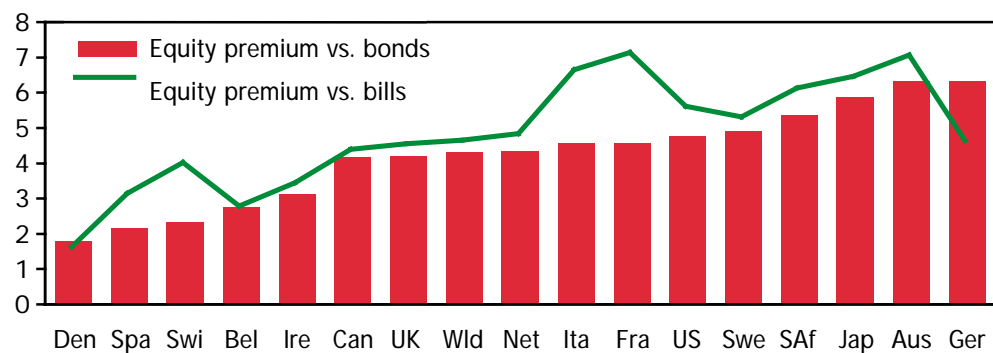

The equity premium around the world:
16 markets with a history since 1900

Canada
USA
UK
Ireland
France
Spain
Netherlands
Belgium

Switzerland
Germany
Italy
Denmark
Sweden
South Africa
Japan
Australia

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Fig.1: Short-trem and long-run real returns on equities around the world (%)

Legend: 2000–2001, 1990–1999, 1900–2001

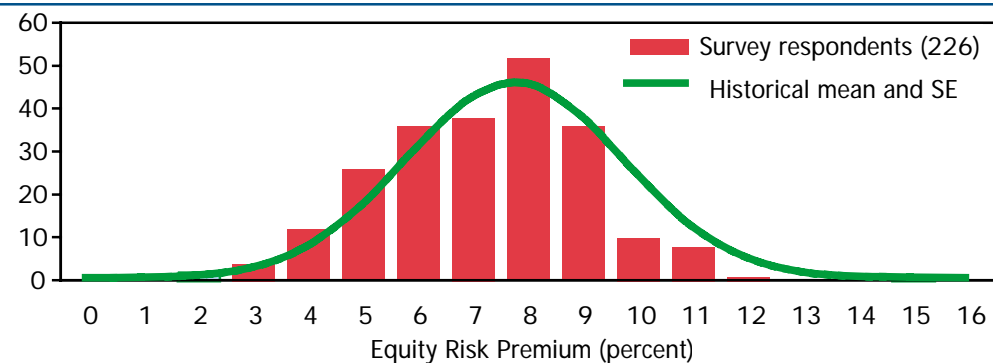Countries (x-axis): Ita Bel Ger Spa Fra Jap Den Swi Ire Net Wld UK Can US SAf Swe Aus

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Fig.2: Worldwide annualized equity risk premia 1900-2001 (%)

Legend: Equity premium vs. bonds / Equity premium vs. bills

Countries (x-axis): Den Spa Swi Bel Ire Can UK Wld Net Ita Fra US Swe SAf Jap Aus Ger

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Fig.3: Financial economists' risk premium forecasts and market history

Legend: Survey respondents (226) / Historical mean and SE

x-axis: Equity Risk Premium (percent) 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

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expected risk premium is the arithmetic mean (or simple average) of the one-year historical premia. However, we must do more than simply extrapolate from the past.

In late 1998 Ivo Welch studied the opinions of 226 financial economists who were asked to forecast the thirty-year arithmetic mean equity risk premium. The bars in Figure 3 show the distribution of the responses. The average forecast was 7 per cent and the range ran from 1 to 15 per cent.

While the bars in Figure 3 show the distribution of survey responses, the curved line represents the normal distribution based on the mean over approximately a century and the associated standard error for the US equity risk premium. The spread in both distributions indicates that the uncertainty across financial experts about the risk premium is as large as the uncertainty that arises from statistical analysis of historical returns.

In August 2001, Welch updated the survey and found that respondents had revised downward their estimates of the long-term arithmetic mean risk premium by an average of 1.6 per cent. Over a thirty-year horizon they now estimated an equity risk premium averaging 5.5 per cent, and over a one-year horizon, an equity premium of 3.4 per cent. The mean premia were the same for those who had previously participated in the earlier survey and those who were taking part for the first time.

Although respondents to the earlier survey had indicated that a bear market would raise their equity premium forecast, Welch reports that: "This is in contrast with the observed findings: it appears as if the recent bear market correlates with lower equity premium forecasts, not higher equity premium forecasts".
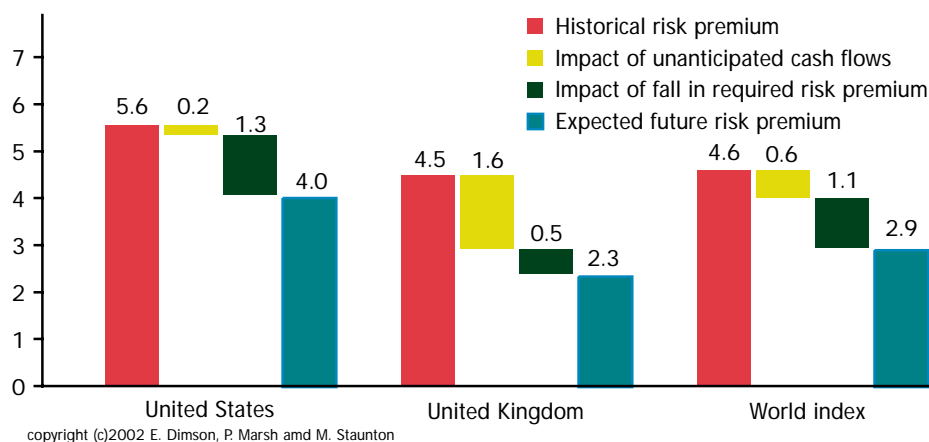
Predictions of the long-term equity premium should not be so sensitive to short-term stock market fluctuations. While it is possible that one-year required rates of return fluctuate markedly, it is unlikely that thirty-year expectations can be so volatile. Thus, the changing consensus may reflect new approaches to estimating the premium and/or new facts about long-term market performance, such as evidence that other countries have typically had historical premia that were lower than the United States.

REVISITING HISTORY

The wide dispersion of estimates, together with the dramatic decline in the consensus premium between 1998 and 2001, reinforces the need to better understand the historical record. A comparison between the first and second half of our 102-year period makes an interesting point. Over the first half of the century, the arithmetic average world equity risk premium relative to bills was 4.1 per cent, whereas over the period 1950-2001, it was 7.7 per cent. The large risk premia achieved during the second half of the

Fig.4: Inferring expectations from the historical premium (%)

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Legend:
- Historical risk premium
- Impact of unanticipated cash flows
- Impact of fall in required risk premium
- Expected future risk premium

United States: 5.6, 0.2, 1.3, 4.0
United Kingdom: 4.5, 1.6, 0.5, 2.3
World index: 4.6, 0.6, 1.1, 2.9

century are attributable to three factors. First, there was unprecedented growth in productivity and efficiency. Second, there was a fall in the required rate of return due to diminished business and investment risk. Finally, transaction and monitoring costs are now lower than a century ago. Factors such as these, which led to a reduction in the required risk premium, have contributed further to the upward re-rating of stock prices.

To convert from a pure historical estimate for the risk premium into a forwarding-looking projection, we need to reverse-engineer the factors that drove up stocks over the last 102 years. The simplest idea would be to infer the impact on returns of the historical changes in the dividend yield. But we can go beyond this as shown in Figure 4 which we illustrate with the US, UK and world markets.

Within each panel, the first bar portrays the historical annualized risk premium of the equity market. This includes the contribution from unanticipated growth in cash flows and the gain from falls in the required risk premium. We therefore deduct the impact of these two factors. What remains in the right-hand bar is an estimate of the prospective risk premium. We explain in our book, Triumph of the Optimists, how we quantify the deductions in the two centre bars of each panel, but the key point is that the prospective risk premium is lower than the raw historical premium.

The other critical issue when assessing the equity risk premium is the investment time horizon. When making asset allocation decisions some investors define the long term to be an arbitrary period such as twenty years, and assume that equity returns are expected to outperform over this period. However, our data shows that this is not always the case.

Taking The Netherlands as an example, over a twenty-year interval, close to half of all premia are below zero. In Holland, it is only when we look back at intervals of at least forty years that we can say the risk premium has always been positive. While forty years is a very long time, several countries have even longer periods until their historical premium is consistently above zero. Stocks may indeed have been attractive investments over the long term but short term underperformance can be severe and persist for decades.

EXPECTED RISK PREMIA

While there are obviously differences in risk between markets, this is unlikely to account for cross-sectional differences in historical premia, which are more likely attributable to country-specific events that will not recur. When making future projections, there is a strong case, particularly given the increasingly international nature of capital markets, for taking a global rather than a country-by-country approach to determining the prospective equity risk premium.

Just as there must be some true differences across countries in their riskiness, there must also be variation over time in the levels of stock market risk. However, apart from extreme situations such as the days following the terrorist attacks on September 11 2001, it may be better to use a normal equity premium most of the time. One would deviate from this prediction only when there are compelling economic reasons to suppose the expected premia are unusually high or low.

CONCLUDING THOUGHTS

We have summarised new evidence on the historical risk premium for sixteen countries over 102 years. Our work results in a set of forward-looking, geometric risk premia for the United States, United Kingdom and for the world all falling within a range of around 2.5 to 4.0 per cent. We show in Triumph of the Optimists that this corresponds to arithmetic mean risk premia of around 3.5 to 5.25 per cent. These estimates are lower than the historical premia quoted in most textbooks and surveys of market professionals.

The other critical, and often overlooked, variable is the investment time horizon. As we have seen in our data, there have been negative ex post equity premiums in some markets for periods lasting forty years or more. Thus, in using estimates of the equity risk premium as a guide to the future, one must consider investment horizons that are truly long term.

Our findings are important for investors and companies alike. The bad news is that some investors may have observed high equity returns in the past and assumed that they would continue, when in reality they were due to a gradual re-rating that may now be complete. Returns will certainly not persist at the level of 16 percent that was recently cited in the Financial Times as the expectation of UK private investors. Many investors are likely to find that future equity returns fall below the expectations they held until very recently. ❚

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