

## **The equity risk premium - an unresolved puzzle**

Government bonds are largely considered to be risk-free. The probability of default is close to zero as the government always has the ability to raise taxes in order to fund its liabilities. In addition, there is no uncertainty regarding the returns on government bonds. Corporate debt, whether through bonds or equity, however is not. Here investors are fully exposed to the possibility of default or lower than expected returns.

Conventional models of asset pricing such as CAPM state that in equilibrium there is a clear risk-return trade off. Riskier assets must offer higher yields so as to encourage investors to hold them in their portfolios. These higher returns can be thought of as the compensation for incurring additional risk over and above the rate on risk-free assets.

In this case it is not surprising that the returns on equities have exceeded those on government bonds, the difference being defined as the equity risk premium. However, a puzzle concerns the relative size of this premium- which appears much larger than it really should be. A paper by Mehra and Prescott (1985), 'The equity premium: A puzzle', published in the *Journal of Monetary Economics*, was the first to investigate the size of the equity risk premium. Looking at a century's worth of data on US shares and bonds, and having adjusted for inflation they found that equities on average returned 7% per annum compared to only 1% per annum for Treasury bills. This risk premium of 6% seems much higher than would be anticipated. It is calculated that the volatility of asset prices typically gives a risk premium of 1%, but this still leaves a 5% premium unaccounted for.

Given this pattern of relative returns, for the equity risk premium to be justified would require a high degree of risk aversion. In fact, if the 6% premium was a fair reflection of investor attitudes to risk it implies that they would rather take a sure loss of 17% than a 50:50 gamble between a 0% and a 20% loss (so an expected loss of 10%).

Over the last two decades many economists have attempted to explain this empirical puzzle. Some have suggested that stock markets are riskier than a simple analysis of looking at past returns might suggest. Fama and French (2000), 'Characteristics, covariances and average returns 1929-97' in the *Journal of Finance*, argue that the risk premium is actually a forward-looking construct, but most returns are empirical based on a past history of data that investors actually earned. It is possible that actual returns differed from expectations, so the impact of uncertainty is actually underestimated. By looking forward- a much truer measure of equity risk can be deduced. The Fama-French model based on investor expectations of dividend growth find an average risk premium of 3.6% per year between 1872 and 1999. Although higher than the Mehra-Prescott calculation, it still leaves a considerable proportion of the risk premium unexplained.

Fama and French also break their analysis down into two samples. Between 1872 and 1949 the expected risk premium was calculated to be 3.8% per year, compared to an actual premium of 4.1%, so not a huge difference. However, between 1950 and 1999 the annual expected risk premium of 3.4% actually fell far below the average actual premium

of 8.3%. Resolving the puzzle therefore requires an explanation as to why investors in stock markets have done so much better than they would have anticipated over the last 50 years.