

Estimating market risk premium

Understanding the risks involved when investing your own or other people's money is fundamental. But how are these risks assessed and what weight is given to these risks?

PROFESSOR ROBERT G. BOWMAN believes that the use of historical data to arrive at an Australian market risk premium (MRP) is flawed and that investment managers should be using the American MRP as a benchmark.

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The market risk premium (MRP) is the single most problematic estimate in implementing the Capital Asset Pricing Model. It is an expectation, not directly observable and unavoidably judgemental. The difficulties of estimating the MRP are considerable and have been discussed in many forums. Yet there has been surprisingly little research into its estimation. The most common approach is to assume that historical measurements of MRP are relevant to a forward-looking rate.

The historical evidence in Australia that is most commonly referred to is Officer (1989), which covers the period 1882 to 1987. Updating that data through 2000 gives an ex post MRP slightly below 7.0%. But is the historical evidence in Australia of any use in estimating a forward-looking MRP? I believe not. "(H)istorical estimates of the market risk premium are not necessarily appropriate as the risk premium to be incorporated in the CAPM is a forward looking concept, based on expectations of the future." (ACCC, 1999, p18).

The MRP for Australia today and going forward is set in an international market.

However, the Australian debt and equity markets, until fairly recently, were subject to controls and intervention with little direct influence from international markets. The markets were domestic; foreign investment was not able to flow freely into and out of Australia. This is a very fundamental difference and the basis for challenging the relevance of the historical evidence.

While it is possible to identify a recent period where markets were open to international investment, the period would be too short to provide a reliable ex ante estimate of MRP. Cornell, Hirshleifer and James (1997, p16) state that, "The unfortunate fact is that stock prices are so variable that the risk premium cannot be estimated precisely even with 20 years of data."

An alternative approach Australia today is an open economy. Investment funds flow freely into and out of the country and the currency. It is appropriate to assume that Australian debt and equity securities are priced in international markets, and that the Australian MRP is set in an international market.

If Australia's markets are now part of an international market place, what does that imply for the Australian MRP?

We can think of Australia's MRP as being equal to an international MRP benchmark plus a premium for incremental risks associated with the equity market in Australia. For this purpose it is easiest and most informative to use the United States as the benchmark.

Contrary to the situation in Australia, the US has been an open economy for virtually all of its existence. The quantum of evidence and analysis of the US equities markets (and its MRP) would probably exceed that of all other countries in the world combined. The historical evidence is as good as is available for any country in the world, and the US would be widely regarded as the appropriate benchmark against which to measure risk premiums.

MRP in the United States

The most common reference for MRP in the US is from Ibbotson Associates, and the most common period is from 1926. For the 75 years 1926 through 2000, the MRP was 9.2%. There is controversy over whether the ex post MRP in the US is reasonable to use as an ex ante estimate. Merton (1980) estimates historical MRPs under a variety of plausible assumptions about investor behaviour. He finds that MRP can range from 8% to 12% depending on the assumptions made.

Mehra and Prescott (1985) examined the ex post MRP and asked whether its magnitude was reasonable. They used standard general equilibrium models and estimated the level of risk aversion needed to explain the historical MRP. They found that the level calculated as necessary to explain the MRP was not a reasonable level of risk aversion; hence an "equity premium puzzle."

However, Mehra and Prescott's results can be attacked for unreasonable assumptions as to models and utility functions. Benartzi and Thaler (1995) show that if investors are particularly averse to losses and have a time horizon of about one year, there is no puzzle. The observed MRPs are consistent with rational investor behaviour, and a one-year

time horizon is consistent with a number of important cycles faced by investors including annual reports of firms and tax reporting. Swan (2001) shows that a premium for illiquidity is sufficient to explain the puzzle in the Australia and the USA.

It is particularly interesting that Mehra and Prescott state (pp145-146), "Our conclusion is that most likely some equilibrium model with a friction will be the one that successfully accounts for the large average equity premium."

"In a recent ranking by Business Week (July 10, 2000) of the 1000 largest companies in the world (by market value), Australia had 15 companies, which represented less than 1% of the market value of the 1000."

They do not suggest that the magnitude of MRP observed is irrational. Mehra also noted in a letter to The Economist (8 August 1998, p6) that, "Our paper has the additional implication that the equity premium will remain high as the population ages and the proportion of 45-65-year-olds increases."

There is a significant group of finance practitioners and academics who believe the strong bull market in the US over the past two decades is attributable, at least in part, to a decline in the MRP. This group argues that the current ex ante MRP is lower than the ex post evidence indicates and perhaps substantially. Presumably the recent decline in the US market has moderated this perspective.

In a broad based online poll of financial economists, Welch (2000) found that the average MRP was 7-8% depending on the horizon assumed for the risk-free rate. This poll would have included those who believe there has been a recent drop.

In assessing the available literature and evidence, the bounds of a reasonable range for MRP seem to be 6% to 9% with a point estimate of 7.5%. The upper bound

acknowledges the historical evidence, while the lower limit imputes a downward adjustment in recognition of the Mehra and Prescott result and perceived implications on MRP of recent market movements. This range and point estimate should serve as the benchmark from which to estimate the MRP for Australia.

Applying the United States MRP to Australia

Before accepting this US estimate for the benchmark MRP, there are some challenges that must be considered. For instance:

- differences in taxation
- differences in equity markets and indices
- country risk
- time horizon.

Differences in taxation

There are many differences between the system of personal taxation in Australia and in the US. The differences that are important are the Australian dividend imputation system, the tax rates, the treatment of capital gains and the opportunities to shelter tax. The tax regime that is important is mainly the forward-looking tax system in Australia, although historical tax structures may be important to interpreting the US historical MRP data.

Probably the most important difference is dividend imputation. A superficial comparison would indicate that dividends incur no new tax in Australia but incur full tax in the US. If prices are set on an after-investor-tax basis, the required rate in Australia would be lower by the tax on dividends in the US. There are a number of reasons why this analysis is inadequate.

For both countries, there is clear evidence of dividend clienteles. Investors assess the tax consequences of dividends in making their investment decisions. High tax rate taxpayers migrate to companies with dividend policies that are more favourable to their tax circumstances (generally low dividend paying companies).

Importantly, the investors that matter are the price setters. This almost certainly does not include all investors, but rather a relatively small number of highly sophisticated investors. It is reasonable to assume these investors are skilled at managing their tax

affairs to minimise taxation. Since Australia has open markets, the price setting investors may not be Australian taxpayers. Lonergan (2001) makes this point and concludes that dividend imputation has not appreciably reduced the cost of equity. Although many, perhaps most, US investors pay tax on dividends, it may be that the price setting investors do not. This is made even more likely in that there are more opportunities to shelter and defer tax in the US than there are in Australia.

The progressive personal tax rates in the two countries are roughly similar. Both countries have capital gains tax, but Australia's is based upon a form of real gains while the US has preferential rates for qualifying gains.

There are obvious differences in the taxation systems between the two countries. At first glance, the differences seem to favour a lower MRP in Australia. But a closer analysis shows that arguments can be made for adjustment in either direction. I do not see a clear basis for predicting the direction.

Differences in equity markets and indices

The equity markets in the US differ in many ways from the Australian equity market. The Australian market has a larger representation of resource-based companies, while the US market has more high-tech and leading edge companies.

Resource companies are important in forming an optimal portfolio in Australia and also to have high levels of systematic risk. There would be a higher representation of "new economy" companies on the US markets, and these companies will tend to be high growth and high risk. However, the empirical evidence most commonly used to estimate the US MRP is based upon the Standard & Poor's 500 Index. This index comprises a highly diverse set of companies that is not overly represented by high-risk companies. The compositions of the two countries' markets are consistent with the MRP in Australia being higher than the US MRP.

The average size of listed companies in Australia is less than in the US. In a recent ranking by Business Week (July 10, 2000) of the 1000 largest companies in the world (by market value), Australia had 15 companies,

which represented less than 1% of the market value of the 1000. The US had 484 companies, representing 55% of the total market value. The largest Australian company (Telstra) would have ranked 64th in the US.

We know that size is negatively related to both total risk and systematic risk. A measure of this can be gleaned from the Ibbotson data. Over the period 1926 through 1996, a portfolio of small stocks, defined as the smallest 20% of all firms listed on the NYSE, showed a return that was 6.52% higher than the return on the S&P500. Note that although the portfolio is labelled small stocks, they are all listed on the NYSE. They are not small stocks relative to the Australian stockmarket.

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As a measure of total risk, the standard deviation of the small stocks was nearly double the standard deviation of the S&P500. An estimate of the systematic risk (beta) of the small stocks portfolio can be made by dividing the excess return (over the risk-free rate of return) of the small stocks by the excess returns of the market portfolio (ie, the S&P500). This calculation gives a portfolio beta for small stocks of 1.75.

The Australia market is higher risk than the US market and should have a higher MRP. The question is whether there is a reasonable way to estimate the magnitude of the higher risk in terms of return.

An intuitive way to quantify the difference is to think of it in terms of systematic risk. If the firms in the Australian market were listed on an exchange with the S&P 500 firms, what would be the average beta of the Australian firms? In my opinion, the average beta would be in the range of 1.2-1.5. To convert this to a rate of return, assume an MRP of 7.5% and apply the beta estimate in

excess of one to get an addition to the benchmark MRP of 1.5 to 3.75%.

Country risk

The incremental riskiness of a country is often covered by the umbrella term "country risk". This risk is related to the risk that a government will abruptly alter its policies with respect to investments in the country (including expropriations), shifts in monetary or fiscal policy, regulatory changes, defaults and tax changes.

A broad look at country risk can be found in Euromoney, which publishes one of the most prominent evaluations of country risk. The objective of the ratings is to capture the risk related to investment in a country.

In its latest ranking (September 2000) Australia was ranked 18th of the 185 countries ranked. Another study by Damodaran (2000) based on credit ratings ascribes a premium of 0.65% for Australia over the US.

The literature and empirical evidence support the conclusion that political risk is priced domestically. However, perhaps the country risk premium is all priced in the risk-free return such that there is no additional premium necessary in the MRP. The challenge is to estimate the premium, if any, that will be impounded in Australia's MRP as a result of its country risk.

To some extent, the discussion of differences between the Australian and US markets captures a dimension of a country risk premium. Although it seems likely that there is an incremental premium attributable to MRP, the magnitude of it is a matter of informed judgement. My preference is to not add to the benchmark MRP.

Time horizon

In estimating MRP a time horizon needs to be specified for choosing the risk-free asset. The US evidence on MRP cited above is based upon the difference between equity returns and the returns on Treasury bills (i.e., a very short horizon). The MRP estimation most commonly used for Australia is based upon a ten-year, risk-free rate. For an MRP that reflects a long time horizon, which would generally be appropriate for corporate finance applications, the Ibbotson Associates data also includes information on

intermediate-term (at least seven years) government bonds as well as Treasury bills.

Over the period from 1926, there was an average annual return premium of 1.4% for intermediate-term government bonds over Treasury bills. For a long horizon MRP estimate, this premium should be added to the benchmark MRP. For a short horizon MRP, no adjustment is necessary.

SUMMARY

Assuming we want to estimate a long horizon MRP, the information above is summarised as follows:

- Taxation – no clear adjustment although perhaps a deduction
- Market differences – addition to benchmark of 1.5 to 3.75%
- Country risk – no adjustment although likely an increase
- Time horizon – deduction from benchmark of 1.4%

There is uncertainty in these estimates, and the net effects can be debated. Based on the above analysis, I believe an additional premium of at least 0.3% should be added to the benchmark US MRP when applying it to Australia.

The MRP is a very important parameter to financial economists, yet it is frustratingly difficult to estimate. It is interesting to note how much attention is paid to issues such as finely calibrating the appropriate beta, which is then applied to a MRP that is figuratively pulled out of thin air. Is beta 0.9 or 1.0? Is MRP 5% or 9%?

The main thesis of this paper is that the common practice of basing an estimate of MRP in Australia on historical MRP outcomes is fundamentally flawed. We need a new and better approach.

It is suggested Australia use an approach based upon using the US MRP as a benchmark. The forward-looking US MRP is estimated to be 6% to 9% with a point estimate of 7.5%. There are a number of issues that can be considered to adjust the US benchmark. I believe that on balance they support an adjustment of at least +0.3% (+1.7% for a short horizon MRP). In my opinion the appropriate MRP to use for Australia is 7.8% (9.2% for a short horizon MRP).

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