

Appendix B

Estimating the Market Risk Premium for Australia using a Benchmark Approach

- 1 The market risk premium (“MRP”) for Australia in 2005 and going forward is set in an international market. Investment funds now move freely into and out of the country and the currency. 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.
- 2 In a recent study, Rangunathan found that the Australian stock market was segmented from the world capital markets during the period 1974 to 1983. Over the period 1984 to 1992, Australia was integrated with the world markets. She says,¹ “*Consistent with expectations, our test indicates that the capital market, segmented prior to deregulation, was integrated in the post-deregulation period.*” It seems likely that integration would have increased subsequent to the end of this study in 1992. This is a very fundamental difference and is the basis for challenging the relevance of the historical evidence.²
- 3 In the absence of relevant historical information, in my opinion estimating MRP using a benchmarking approach is appropriate.³ With this approach, a benchmark country is chosen based upon its having the most reliable estimate of MRP available. Then the potential differences between the MRP in that country and the MRP in Australia are considered. The benchmark MRP is adjusted for the estimated difference between the two countries to arrive at an estimate of the MRP in Australia.
- 4 Using this approach, Australia’s MRP can be thought of as being equal to an international benchmark MRP plus a premium for the incremental risks associated with the Australian equity market.
- 5 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.
- 6 The most common reference for MRP in the US is from Ibbotson Associates, and the most common period is from 1926. For the 78 years, 1926 through 2003, the risk premium for large stocks over the long-term (20-year) government bonds was 7.2%.⁴ An alternative source is Dimson, Marsh and Staunton, which covers from

¹ V. Rangunathan, “The Effect of Financial Deregulation on Integration: An Australian Perspective,” *Journal of Economics and Business*, November 1999, pp 505-514.

² Although Australian markets have been open to international investment for nearly two decades, that is too short to provide a reliable *ex ante* estimate of MRP. For example, B. Cornell, J. Hirshleifer and E. James (“Estimating the Cost of Equity Capital,” *Contemporary Finance Digest*, 1997, p 16) state, “The unfortunate fact is that stock prices are so variable that the risk premium cannot be estimated precisely even with 20 years of data.”

³ See R. Bowman (“Estimating the Market Risk Premium,” *JASSA*, issue 3, Spring 2001, pp 10-13) for a thorough coverage of this approach to estimating the MRP.

⁴ Ibbotson Associates, “Risk Premia over Time Report: 2004.

1900 through 2002. They report a premium over bonds of 6.4%, which increases to 6.6% if 2003 is added.⁵ The estimates have a standard error of 3%.

- 7 In a broad based online poll of financial economists, Welch found that the average estimate of MRP was 7-8% depending on the horizon assumed for the risk free rate, with 7.1% relative to 10-year government bonds.⁶ Welch has reported an update of his survey⁷ that indicates respondents on average had become more pessimistic and reduced their estimates by an average of 1.6%. A caution needs to be made about these polls. First, they were from an open online poll and the respondents are likely to be educated with respect to the MRP, but there were none of the normal controls on participation. Second, the polls were taken during a period of considerable turmoil in the US markets. The first result was toward the end of the “bubble” when many people felt markets were over-valued. The second poll was taken around the time the bubble was being corrected, which would most likely have had a transitory impact on perceptions of the MRP.
- 8 There have been numerous empirical estimations of the MRP in the US. A common result of a stream of research on the volatility of the US markets is that the historical returns seem high relative to that volatility. However, this is a contentious area of research. Much of the early research in this area challenged the reasonableness of the historical MRP as a forward-looking estimate. Predictions of a forward-looking MRP ranged from about the historical level down to as low as 2%. Recent research has been more successful in reconciling historical returns with rational behaviour of investors and the markets.
- 9 The use of historical information to estimate a forward-looking MRP is logical, but subject to measurement error and distortions. The approach requires an assumption that the conditions underlying the historical returns are expected to be present in the future. Clearly this is a strong assumption and is unlikely to be appropriate when comparing the US equity markets in the twentieth century with those markets going forward. A comprehensive review of the literature in this area is beyond the scope of this report. However, there are four changes that I believe are particularly important in assessing the MRP.
- 10 There has been an explosion in the breadth of investment alternatives available to investors, both domestic and international. As a result, investors are far better positioned to efficiently diversify their portfolios. This change includes the growth in mutual funds and pension plans. Economies, at least in the industrialised world, have apparently learned to control inflation.⁸ This results in interest rate stability, which is a substantial reduction of risk for businesses. A wide range of new financial securities have been introduced that have advanced portfolio risk management tremendously. Finally, and perhaps the most important, transactions and monitoring costs have declined markedly. I include the improved liquidity of the markets as a reduction in transactions costs.

⁵ E. Dimson, P. Marsh and M. Staunton, “Global Evidence on the Equity Risk Premium” (undated).

⁶ I. Welch, “Views of Financial Economists on the Equity Premium and on Professional Controversies,” *Journal of Business*, 2000, pp 501-537.

⁷ I. Welch, “The Equity Premium Consensus Forecast Revisited,” Cowles Foundation Discussion Paper No. 1325, September 2001.

⁸ Just how enduring or strong this is will be revealed in the future. For purposes here it is sufficient that market participants believe that there will be relative interest rate stability in the future.

- 11 Reflecting these changes in an estimate of a long-horizon MRP is necessarily subjective and uncertain. Interesting perspectives on a forward-looking long-horizon MRP come from the authors of the two best known sources of historical estimates, as cited above. Ibbotson⁹ has estimated a MRP of 6.2%. Dimson, Marsh and Staunton¹⁰ have proposed an estimate of 5% as a plausible forward-looking MRP.
- 12 UBS Investment Bank recently released a report¹¹ on estimating WACC.
- We provide pragmatic solutions including: a global market risk premium of about 5%, based on historical data, market expectations, and a review of the literature*
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- Yet under the forces of globalism and capital market convergence, many experts now suggest that increasingly the US market may serve as the best proxy for a future global market risk premium. The U.S. has the largest economy and the most liquid capital markets. Consequently, the 5% risk premium seems appropriate for other markets, after adjusting for differences in tax rates, etc.*
- 13 Notice that UBS is suggesting an approach to estimating the MRP for markets in other countries using the same approach as I employ here.
- 14 The corporate finance textbook by Brealey and Myers is perhaps the most known and respected of all. They state the belief that the MRP based on long-horizon bonds is in the range 4.5% to 7%.¹²
- 15 In assessing the available literature and evidence, my estimate of the forward-looking, long-horizon US MRP is 5.5%.¹³
- 16 To estimate the appropriate MRP in Australia, I now consider differences in taxation, in equity markets and indices, and country risk that might cause Australia's *ex ante* MRP to be different from the US MRP.

Taxation

- 17 There are many differences in the structure of the personal income tax systems between Australia and the US, notably taxation of capital gains, Australia's dividend imputation system, and the US's generally lower tax rates and opportunities to shelter income from tax.

⁹ R. Ibbotson, "Predictions of the Past and Forecasts for the Future," and "The Supply of Stock Market Returns" (with P. Chen), both available on the Ibbotson Associates website at <http://www.ibbotson.com>

¹⁰ Ibid, p 13.

¹¹ UBS Investment Bank, "The WACC User's Guide," March 2005.

¹² R. Brealey and S. Myers, *Principles of Corporate Finance* (7th ed), 2003 (McGraw-Hill/Irwin: Boston), p 160. They state their belief as 6% to 8.5% measured against US Treasury bills. The difference between bills and long-term bonds has historically been about 1.5%.

¹³ I note that the reasonable range around this estimate is large. Ibbotson has reported that the standard error on the historical estimates of MRP is 2.7%. See Ibbotson's comments in I. Welch, "Research Roundtable Discussion: The Market Risk Premium," available on Welch's website at <http://welch.econ.brown.edu/academics/>

- 18 The difficulty is that the relevant tax structures in Australia and the US are those of the marginal investors that determine security prices and hence the forward-looking MRP. This issue is discussed in some detail in Appendix E on the value of imputation credits.
- 19 If the relevant investors in Australia are Australian resident taxpayers, then the tax advantages of the dividend imputation system are relevant. If the relevant investors are not Australians and/or not able to benefit from the dividend imputation system, then dividend imputation does not impact on the forward-looking MRP. In this case, the major tax advantage for Australia relative to the US is irrelevant.
- 20 If the marginal investor in Australia is domestic, the differences in taxation have the effect of being largely offsetting, although in my view there may be a marginal tax advantage in Australia. If the marginal investor is not Australian, then there is likely to be a marginal tax advantage in the US.
- 21 On balance, I do not see a clear case to be made for a measurable difference in favour of either country.

Market differences

- 22 The equity markets in the US differ in many ways from the Australian equity market. An incomplete list of factors that would support a higher MRP in Australia include being a smaller market, with less liquidity, smaller companies, less diversity and fewer risk management opportunities.
- 23 The Australian market has a larger representation of resource-based companies, which have high levels of systematic risk. The US market has more high-tech and leading edge companies, but the empirical evidence most commonly used to estimate the US MRP is based upon the Standard & Poor's 500 Index. This index is of a highly diverse set of companies that is not over represented by high-risk companies.
- 24 The ACCC agrees that the Australian market is riskier than the United Kingdom stock market in its report on the 1999 undertaking¹⁴ when it says (para A4.6) the Australian market is "... a higher risk, more resource-based, economy".
- 25 It is well known that small companies earn an average return that is greater than the return estimated using the CAPM.¹⁵ The reasons for this are not all clear, but it is likely to be related to some measure of risk that is not captured by the CAPM. It is also well known that the size of firms is negatively related with their beta. Smaller firms tend to have higher betas.
- 26 The average size of listed companies in Australia is less than in the US. In a recent ranking by *Business Week* (July 14, 2003) of the 1000 largest companies in the world (by market value), Australia had 27 companies, which represented 1.7% of

¹⁴ Australian Competition Consumer Commission, "A report on the assessment of Telstra's undertaking for the Domestic PSTN Originating and Terminating Access services," dated July 2000.

¹⁵ Evidence of this is provided for Australia in J. Halliwell, R. Heaney and J. Sawicki, "Size and Book to Market Effects in Australian Share Markets: A Time Series Analysis," *Accounting Research Journal*, 1999, pp 122-137; and C. Gaunt, P. Gray and J. McIvor, "The Impact of Share Price on Seasonality and Size Anomalies in Australian Equity Returns," *Accounting and Finance*, March 2000, pp 33-50.

the market value of the 1000. The US had 488 companies, representing 56% of the total market value. The largest Australian company (Telstra) would have ranked 54th in the US. Clearly Australia's equity market is significantly smaller and, on that basis alone, would be expected to be higher risk.

- 27 There is no agreed model for adjusting MRP for size factors or industry composition. One of the best-known books on valuation¹⁶ discusses the need for an adjustment for the smaller size of countries relative to the US as follows: "*If you use a beta relative to the local market, you should use a market risk premium that reflects the size of the local market.*" (p371) In an example, they analyse Denmark and suggest an increment to that country's MRP of 1.5%.
- 28 The compositions of the markets in the two countries are consistent with the MRP in Australia being higher than the US 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, assuming an MRP of 5.5% and applying the beta range estimate, would equal an addition to the benchmark MRP of 1.1% to 2.75%.

Country risk

- 29 The incremental risk of a country is often referred to as "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.
- 30 The literature and empirical evidence support the conclusion that political risk is priced domestically. However, it is likely that the country risk premium for a developed country such as Australia is priced in the risk free return such that there is no additional premium necessary in the MRP. My preference is to not add to the benchmark MRP.

Summary¹⁷

- 31 To estimate a long horizon MRP for Australia, the information above is summarised as follows:

Taxation – no clear adjustment

Market differences – addition to benchmark of 1.1% to 2.75%

Country risk – no adjustment although perhaps an increase

- 32 This analysis indicates that an adjustment to the US MRP should be an increase in the range 1.1% to 2.75%. The mid-point of this range is 1.9%. This adjustment should be added to the estimated US MRP of 5.5%.

¹⁶ McKinsey & Company, Ltd, *Valuation: Measuring and Managing the Value of the Companies*, 2000 (John Wiley & Sons: New York).

¹⁷ There are two separable issues here; the appropriate MRP for the US and the premium over the US MRP that is appropriate for Australia.

- 33 In my opinion, a conservative estimate of a long-horizon (10-year) MRP for Australia is 7.0%.

Adjusting to a 5-year maturity

- 34 The MRP estimate above is based upon using a 10-year maturity for the risk free rate. It is necessary to be consistent in the measurement of the risk free rate in the two places it is used in the CAPM. That requires that the MRP be estimated using a 5-year maturity for the risk free rate.
- 35 The available estimates of the MRP in Australia are almost exclusively based upon the 10-year government bonds. However, the difference between the MRP estimated using 5-year bonds and using 10-year bonds should be equal to the average spread¹⁸ between the two maturities over the period of the MRP estimate. The MRP based on a 10-year maturity government bond needs to be increased by this spread for application in the CAPM using a 5-year maturity government bond.
- 36 I develop my estimate of MRP using the US as a benchmark. The approximate spread between the two maturities in the US is 0.30% (the 10-year rate is higher).¹⁹ If I adjusted from a 10-year maturity to a 5-year maturity in developing the US estimate of MRP, this is the spread that would be appropriate. But procedurally I develop the Australia 10-year MRP, so a spread for Australia is appropriate.
- 37 The Reserve Bank of Australia publishes month-end data from January 1972, and the spread over the period through September 2005 is 0.20%. However, this includes periods when interest rates in Australia were aggressively managed by the government and debt markets were not open to international investors. Also, rates from mid-1979 through late 1991 were in double digits and thus not indicative of rates going forward from the periods in which I am now estimating a WACC. For these reasons, I do not regard the rates prior to the mid-1990s as reliable for forecasting rates and maturity spreads going forward. The average spread for the ten years from September 1995 through September 2005 was 0.27%.
- 38 In my opinion, the spread to use to adjust the MRP between 5-year and 10-year maturities for government bonds is approximately 0.3%.
- 39 My estimate of the MRP for a 5-year maturity to use in estimating WACC for ULLS and SSS is the MRP estimate for a 10-year maturity (of 7%), plus the average spread by which the rate on the 10-year bond is expected to exceed the rate on the 5-year bond (of 0.3%). Therefore, my estimate of the MRP for purposes of estimating the WACC for ULLS and SSS is 7.3%.
- 40 For use in the WACC of ULLS and SSS, a 5-year horizon is appropriate. The average spread by which the rate on the 10-year bond is expected to exceed the rate on the 5-year bond (of 0.3%). Therefore, my estimate of the MRP for purposes of estimating the WACC for ULLS and SSS is 7.3%.

¹⁸ The “spread” is the difference between the yields on different bonds. In this case it is the difference between the rate on the 5-year bond and the rate on the 10-year bond.

¹⁹ Ibbotson and Associates (Risk Premia over Time Report: 2004) reports a difference of 0.4% between the US equity risk premium using long-term (20-year) government bonds and using intermediate-term (5-year) government bonds. The difference between 5 and 10-year bonds is virtually always larger than the difference between 10 and 20 year bonds. It is my judgement that the total spread should be apportioned 0.3% to the 5 to 10 year difference and 0.1% to the 10 to 20 year difference.