Brookfield Rail

Brookfield Rail Pty Ltd
ABN 42 094 721 301
2-10 Adams Drive
Welshpool WA 6106 Australia
GPO Box S1411 Perth WA 6845 Australia

T +61 8 9212 2800
F +61 8 9212 2922
E info@brookfieldrail.com
www.brookfieldrail.com

28 March 2013

Jeremy Threlfall
Assistant Director, Rail
Economic Regulation Authority
PO Box 8469
Perth Business Centre
PERTH WA 6849

By email: publicsubmissions@erawa.com.au

Dear Jeremy,

Issues Paper: Consultation on the WACC for regulated railways

We refer to the Economic Regulation Authority's (**Regulator**) invitation for submissions from interested parties on the 2013 update of the WACC values for regulated railway networks in Western Australia.

Brookfield Rail Pty Ltd (**BR**) has engaged Synergies Economic Consulting Pty Ltd to assist in BR's preparation of its submission. BR strongly believes that the recommendations it outlines in this submission will satisfy the ERA's criteria for amending the current WACC calculations. BR recommends the ERA adopts the following approaches in its determination of the WACC:

Risk Free Rate & Market Risk Premium

- An estimate of the ten year risk-free rate should be used. This long term estimate should be matched to a long term historical estimation of the Market Risk Premium (MRP). The ten year averaged risk free rate is 5.22% (as at 7 March 2013) and analysis suggests that a value of between 6% and 7% is a reasonable range for the MRP.
    - If the ERA insists on using a contemporary estimate using a 20 day average, it should be matched with a contemporary forward looking MRP. The 20 day average is 3.48% (as at 7 March 2013) and a medium term forward-looking MRP estimate from Bloomberg is 8.77%.

Debt Risk Premium

- The most appropriate method to estimate the ten year yield on BBB rated bonds is to extrapolate the Bloomberg seven year yield to ten years. The seven year bonds are chosen due to liquidity issues with ten year bonds. The current 20 day average for ten year BBB rated bonds is 2.72%.

Attachment A to this letter provides more detailed comments on each of the key recommendation above.

If any further clarification is required in relation to this submission, please do not hesitate to contact the undersigned.

Yours sincerely,

Paul Hamersley
General Manager Commercial
Brookfield Rail Pty Ltd

Attachment A

Synergies
ECONOMIC CONSULTING

Determining the risk-free rate and debt margin for WA railways

Submission in response to ERA's Issues Paper

March 2013

Synergies Economic Consulting Pty Ltd
www.synergies.com.au

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Figures and Tables

1 Introduction

Synergies Economic Consulting (Synergies) has been engaged by Brookfield Rail to address a number of issues and questions raised by the Economic Regulatory Authority (ERA) of Western Australia in regard to the Weighted Average Cost of Capital (WACC) for railway networks covered by the Railways (Access) Code 2000.

The ERA has recently issued an Issues Paper[1]. In this paper, the ERA is seeking comments regarding its annual determination of a WACC to be applied in the determination of floor and ceiling prices for access to declared railway infrastructure, including the Brookfield Railway Network. This report addresses only those issues relating to the risk-free rate and the cost of debt.

In the ERA's 2008 Determination[2], the risk-free rate estimate was the 20 day average of the yield on ten year Australian Commonwealth Government (ACG) bonds. The cost of debt was the risk-free rate plus a premium. The premium was the spread between the yield on BBB+ rated ten year bonds and the yield on ten year ACG bonds. The BBB+ yield was obtained from the data provider CBASpectrum. These two parameters are updated annually during the five year regulatory period from 2008 to 2013 using the described methodology.

The current Issue Paper seeks comments regarding an appropriate methodology and estimated WACC parameters. Brookfield's response to the ERA Issues Paper will be in two parts, this current report and a following report dealing with the methodological issues in the determination of the appropriate WACC. This current report only deals with the risk-free rate and the cost of debt as these parameters need to be estimated again for the final year of the 2008 methodology used to determine the WACC.

The risk-free rate and the cost of debt are of issue now as using the current methodology to estimate these two parameters may understate their 'true' value.

Most importantly, in our view, the risk-free rate estimated using the current methodology understates the 'true' risk-free rate in the current economic environment as there has been a 'flight to quality' by investors. This introduces a bias into the risk-free rate proxy estimate and the effect of the bias results in the risk-free rate being understated.

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[1] Issues Paper, Railways (Access) Code 2000: Weighted Average Cost of Capital, WACC Determination – Railway Networks, 7 February 2013

[2] Final Determination, 2008 Weighted Average Cost of Capital for the Freight (WestNet Rail) and Urban (Public Transport Authority) Railway Networks, 23 June 2008

In addition, the cost of debt cannot be estimated using the 2008 methodology as CBASpectrum no longer provides estimates of the yield on ten-year BBB+ rated bonds.

2 Risk-free rate

2.1 ERA - Risk-free rate issues and questions

The ERA has identified three key issues relating to estimation of the nominal risk-free rate:

- the choice of the proxy for risk-free assets;
- the term to maturity; and
- the averaging period

With regard to the risk-free rate estimate, the ERA has asked the following questions:

- Are there any viable alternatives to Commonwealth Government Securities as an appropriate proxy for the nominal risk-free rate of return for railway networks? (Question 19)
- What is the appropriate period for determining the term of the risk-free rate? (Question 20)
- What is the best proxy for the nominal risk-free rate of return for railway networks? (Question 21)

2.2 Risk-free Rate

The risk-free rate measures the return an investor would expect from an asset with zero volatility and zero default risk. The yield on long-term Australian Commonwealth Government bonds is the best proxy for a risk-free return as the government can honour all interest and debt repayments.

2.2.1 Term of the risk-free rate proxy

The question with regard to term is if a five year or ten year term be used to estimate the risk-free rate.

Ten year term

A key issue for the risk-free rate is the appropriate bond maturity to adopt and a maturity of ten years is appropriate for a number of reasons including:

- it provides prudent risk management of assets and liabilities for companies with long lived assets.[3]
- it reflects actual financing practices of infrastructure companies.
- it is commonly (although not solely) used by Australian regulators.

Standard commercial practice is for companies to match average asset lives with bond maturity, so that for long life assets the appropriate bond maturity is the longest dated traded bond. This allows the company to service its debt from the revenue generated by the assets without being exposed to interest rate risk. When valuing a long life asset, a longer term rate is needed to match the life of the cash flows. A long term Commonwealth government borrowing rate is the ten year bond rate and this rate is often used without adjustment.

A number of regulators have recognised that infrastructure businesses do fund the operations using longer term debt. For example the Queensland Competition Authority (QCA) in the SunWater decision[4] allowed hedging costs in the cost of debt in recognition that even though the yield on a five year bond was used to estimate the cost of debt, additional hedging costs were allowed to reflect how infrastructure businesses operate and fund themselves. The hedging costs were effectively the difference between the cost of debt with a term of ten years and the cost of debt with a term of five years.

Additionally the Independent Pricing and Regulatory Tribunal of New South Wales (IPART) stated:[5]

> We recognise that the evidence indicates that using a 10-year term to maturity reflects actual financing practices. The key advantage of a 10-year term is that it is more consistent with the funding practices of the capital market for long life regulated infrastructure assets.

Accordingly, the ten year (nominal) Commonwealth Government bond is typically considered by practitioners to be the most relevant benchmark to apply as it is the longest dated liquid bond.

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[3] For example, "According to (the matching) strategy, long-term investments should be financed with long-term funds and short-term investments should be financed with short-term funds. By matching the life of an asset and the duration of its financing source, a firm can minimize the risk of not being able to finance the asset over its entire useful life." (G. Hawawini and C. Viallet, Finance for Executives: Managing for Value Creation (4th ed), South-Western Cengage Learning (2011), page 73).

[4] QCA, Final Report SunWater, Irrigation Price Review: 2012-17, Volume 1, May 2012

[5] IPART, Review of method for determining the WACC: Dealing with uncertainty and changing market conditions, Other industries - Discussion Paper, December 2012, page 41.

Five year term

Until approximately 2010 all Australian regulators used a term of ten years for the risk-free rate estimate. Since 2010 some regulators, including the ERA in the Dampier to Bunbury Natural Gas Pipeline Access Arrangement in 2011[6], have commenced using a five year rate.

The argument for a five year term is an NPV = 0 argument, which is based on the premise that regulation or, more specifically, the regulatory period sets the term of the risk-free rate as opposed to normal market/commercial practice. The logic here is that a regulated entity should not earn abnormal profits. However, only in very limiting circumstances, will a five year risk-free rate result in a zero NPV outcome for a regulated business.

A zero NPV will only occur if the infrastructure provider has no forward start loans during the regulatory period. At the start of the regulatory period, the infrastructure business borrows funds and earns a regulated rate of return for a five year period. If the regulated business borrows the funds for five years and earns a regulated rate of return which includes in its calculation a risk-free rate of ten years, as the ten year rate is higher than the five year rate over which the funds are borrowed, the regulated business may earn excess profits.

If the service provider does not have to borrow during the regulatory period for renewals capital expenditure or expansionary capital expenditure then a pricing outcome will be a zero NPV using a five year term. The infrastructure business therefore needs to borrow all funds at the start of the regulatory period and undertake the renewals and expansionary expenditure at the start of each regulatory period. Obviously this is unrealistic.

A realistic situation is that funding is required and investments are undertaken during the regulatory period. In this realistic situation, the five year term will result in a negative NPV. The negative NPV is a result of an upward sloping yield curve.

The normal yield curve is upward sloping. The five year rate is a composition of forward rates so that the five year rate is the geometric average of the expected forward rates over the regulatory term. For the yield curve to be upward sloping, forward rates are higher than the average rate which is the five year risk-free rate.

Assume that the asset management plan for the regulated business requires expansionary capital expenditure during the regulatory period. A risk adverse

[6] Economic Regulation Authority, March 2011, Draft Decision on Proposed Revisions to the Access Arrangement for the Dampier to Bunbury Natural Gas Pipeline

infrastructure business will arrange, for example, a forward start loan today to borrow in three years. With upward sloping yield curves, the forward rate will be greater than the five year rate. The infrastructure business will earn its maximum allowable revenue calculated using the five year rate but it will have to pay a rate higher than the five year rate. In present value terms, this results in a negative NPV.

Hence, the five year term does not comply with the NPV = 0 outcome. Rather, it results in a negative NPV such that the infrastructure provider will erode value if it undertakes investments or borrows to renew assets. In our view, regulators need to create incentives for regulated infrastructure businesses to pursue efficiencies and service delivery improvements, including new investments. The five year term does not achieve this outcome.

It is necessary to consider the logic of regulation to determine if regulation or market practice should set the term of the risk-free rate.

There is an economic principle that competitive markets promote outcomes that maximise economic efficiency and consumer welfare. All are better off in a competitive market. Businesses that are regulated do not operate in competitive markets. Regulation seeks to replicate the benefits of competitive markets as far as it possibly can to promote economic welfare. The aim of regulation is to capture efficiency benefits of supply by an infrastructure business, while reducing risks of efficiency losses arising from the exercise of substantial market power.

It is important to note that regulated solutions can never be as dynamic as market solutions so the nature of regulatory intervention is important. Poorly designed or overly intrusive regulatory approaches can reduce incentives for investment and productivity improvements. A regulator applying a five year risk-free rate forces an infrastructure owner to fund long life assets with five year debt and to limit the amount of capital expenditure for both renewals and expansionary purposes. This obviously is an inefficient outcome of regulation.

Conclusion

A five year term will result in a negative NPV when yield curves are normal. This provides a strong disincentive to undertake new investments. A five year term also provides an incentive for regulated businesses to inefficiently fund long term assets with short term debt. The appropriate term that reflects competitive market behaviour is the ten year term.

2.2.2 Uniqueness Bias

As stated earlier it is common to use the ACG bond yield as a proxy for the risk-free rate of return. Questions have arisen as to the appropriateness of this proxy due to the presence of a bias relative to the risk-free rate it is representing. The bias, termed 'uniqueness bias' results in the yield on Government bonds being less than the risk-free rate used in the Capital Asset Pricing Model (CAPM).

Figure 1 below illustrates that the risk-free rate using the yield on 10 year ACG bonds. Yields have never been as low as the current yield. The figure below displays the yield since they first traded in Australia in 1935.

Figure 1 10 year ACG yields

Source: Reserve Bank of Australia January 2013

The presence of the bias means that it is inappropriate to use unadjusted Government bond yields as a proxy for the risk-free rate of return. It is therefore critical to identify the bias and then correctly adjust or remove it.

The reason for the bias, which results in the yield on Government bonds being lower than the CAPM risk-free rate, is that the ACG bonds have unique characteristics. The demand for the bonds is high given:

- the source of liquidity that government debt provides;
- some investors have the desire for sovereign debt;
- Government bonds are the required collateral for futures trading, and

- Government bonds are simple to understand without any complicating attached covenants or features.

Estimating the Bias

The Reserve Bank of Australia (RBA) has observed the bias and they have provided an insight into estimating the bias:[7]

> Premia for credit default swaps (CDS), which measure the cost of insurance against a specific company defaulting, have fallen sharply in the past year and spreads between corporate bond and swap rates have also fallen. In contrast, interest rate spreads between corporate bonds and Commonwealth Government securities (CGS) have risen over the past six months, although this appears to reflect strong demand for CGS, particularly from overseas investors, rather than a judgment about credit quality in the Australian corporate sector.

With the growth in the market for credit default swaps (CDS) it is now possible to quantify any bias that may exist. A CDS is effectively an insurance premium that insures against default risk. If for example the yield on BBB corporate bonds was 7% and the cost of the CDS was 50 points then a zero risk yield would be 6.5%. This yield can then be compared with the Government bond yield and if there is a difference then there may be a bias. Table 1 illustrates the differences as discussed which we have termed an implied bias.

Table 1 Risk-free rate bias

	BBB Yield	CDS	Implied risk-free rate	Bond yield	Implied Bias
May -12	5.90%	2.73%	3.94%	2.39%	1.55%
Jun -12	6.08%	2.76%	4.05%	2.57%	1.48%
Jul -12	5.96%	2.63%	4.06%	2.65%	1.41%
Aug -12	5.69%	2.43%	3.95%	2.59%	1.36%
Sep -12	5.41%	2.35%	3.75%	2.56%	1.19%
Oct -12	5.30%	2.22%	3.82%	2.71%	1.11%
Nov-12	5.33%	2.19%	3.91%	2.74%	1.17%
Dec-12	5.16%	2.13%	3.75%	2.82%	0.93%
Average					**1.28%**

Source: Reserve Bank, Capital Markets Yields and Spreads – Non-government Instruments F3

We contend that the risk-free rate estimate used in the CAPM needs to incorporate an adjustment for the uniqueness bias. We do not suggest that the bias adjustment should

[7] March 2004 RBA Financial Stability Review Report p15

be 1.28% as the above calculation is only used to determine if a uniqueness bias exists, which it does.

To overcome the bias a long term average estimate of the risk-free rate should be used. A long term average will smooth out the bias.

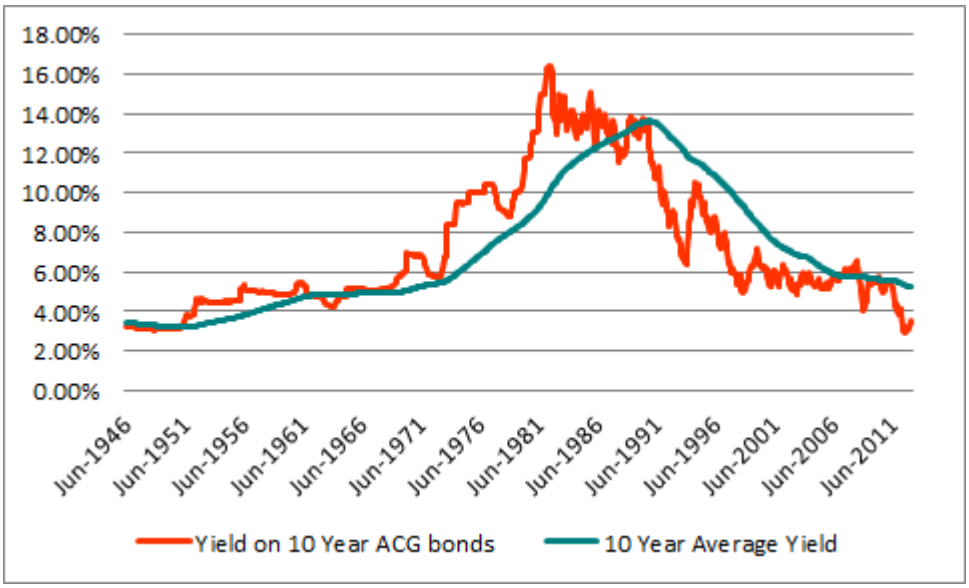
Long term average

In a recent submission to the Australian Energy Market Commission (AEMC), Queensland Treasury Corporation (QTC) suggested that a long term average of the yield on the ten year bond should be used as a measure of the risk-free rate. The logic of this argument is that the equity beta is estimated over a five year historic period, the market risk premium is an historic average so for consistency, the risk-free rate should be estimated using historic data.

Using a longer term average will have the same effect as removing the bias and most importantly will be consistent with other parameters in the CAPM being the beta estimate and the market risk premium.

Figure 2 displays the movement in the ten year average compared to the movement in yields on ten year ACG bonds.

Figure 2 10 year ACG yields



Source: Reserve Bank of Australia and Bloomberg March 2013

A ten year average is 5.22% (as at 7 March 2013) compared with the 20 day average of 3.48% at the same date.

20 Day Average

The 20 day average of the yield on ten year ACG bonds may be used to estimate the risk-free rate but other CAPM parameters need to be estimated taking consideration of this. A contemporary 20 day averaged risk-free rate would need to be matched with a contemporary measure of the Market Risk Premium (MRP).

The MRP is the amount an investor expects to earn from a diversified portfolio of investments (reflecting the market as a whole) that is above the return earned on a risk-free investment. The key difficulty in estimating the MRP arises from it being an expectation and therefore not being directly observable.

The MRP can be estimated either:

- using long term historical data matched with a long term average risk-free rate estimate if a bias exists; or
- using a contemporary forward-looking market data matched with a current estimate of the risk-free rate.

Historical data provides a long term MRP estimate while forward-looking data provides more of a short to medium term MRP estimate.

Prior to the global financial crisis, both forward looking estimates and historic estimates were similar. Since the global financial crisis, there is much greater volatility in the market resulting in much greater differences between historic estimates and forward looking estimates.

The MRP is typically estimated using a long term historical estimate where the difference between the return on an accumulation index and the yield on government bonds is estimated. These estimates suggest that a value of between 6% and 7% is a reasonable range for the MRP.

The prevailing market conditions suggest that the current short and medium term MRP is well above 6.0%. A short term forward-looking MRP can be estimated using forward markets such as options on the SPI (Share Prices Index) contracts. Such estimates are only valid for the time period implied by the option or the forward period and typically they extend for no more than twelve months. The current estimate using this approach is an MRP of approximately 18%. However, we believe that the MRP should be assessed over a medium term rather than a short term time horizon.

Bloomberg[8] provides a medium term view of the future. Bloomberg estimate the MRP using a Dividend Discount Model (DDM). The DDM equates current share prices with expected future dividends. The MRP is implied in this relationship. Recent medium term estimates have been:

Table 2 Medium term MRP estimates

	June 2012	June 2011	June 2010
MRP Estimate	8.77%	9.45%	10.16%

Source: Bloomberg

Conclusion

If the risk-free rate is estimated using long term historical data then the MRP should also be estimated using long term historical data. On the other hand, if the risk-free rate is estimated using current data, being a 20 day average, then the MRP should also be estimated using current or forward-looking data.

The table below provides two valid estimates of the MRP being a long term historical average and a medium term forward-looking estimate from Bloomberg.

Table 3 MRP and risk-free rate estimates

	Long-term historic estimate	Medium-term forward looking estimate
MRP Estimate	6% - 7%	8.77%
Risk-free Estimate	5.22%	3.48%

Source: Bloomberg

Current economic conditions have resulted in a bias in the yield on ten year ACG bonds. ACG bond yields are the lowest since they were first traded in Australia in 1935 and additionally there is large volatility in the equities market. Under these conditions our preference is to use a long term (ten year) average risk-free rate as this is consistent with the approach currently applied to the other CAPM parameter estimates.

Our suggested estimate is a risk-free rate of 5.22% when using an MRP of 6 – 7%.

[8] Bloomberg is financial services data provider. The service and its reputation is described in the next section regarding cost of debt.

3 Cost of debt

3.1 ERA – Cost of debt issues and questions

The cost of debt capital is normally calculated as the risk-free rate plus a margin for credit or default risk. The debt margin is estimated as the difference between the yield on 10 year BBB corporate bonds and the risk-free rate. The ERA currently estimates the debt premium by selecting a sample of Australian corporate bonds within a pre-determined Standard and Poor's credit band. A 20-trading day average of the yields for each security is observed and adjusted for the risk-free rate which is matched with the term to maturity on each corporate bond in the sample.

A weighted average of the debt margins is then estimated. The ERA has calculated these weighted averages using a "scenario based approach". This approach weights debt risk premiums by the term to maturity only, not including the amount issued. The ERA applied this approach in the 2012 WACC determination for Brookfield Rail.

Subsequent to this the ERA has adopted a joint weighting system for all WACC determinations since June 2012, where bonds with a longer term to maturity and/or a higher amount on issue are given more weight in the estimation of the debt margin.

With regard to the debt margin the ERA has asked the following questions:

- Are there more appropriate alternatives to the bond yield approach for estimating the debt risk premium? (Question 40)
- Are there any considerations associated with the bond yield approach that have not been made by the Authority? (Question 41)
- Should Moody's credit ratings of Australian corporate bonds be included in the selection criteria for the benchmark sample? (Question 42)
- If the bond yield approach is adopted, should the current scenario based weighting approach continue to be used, or should a joint weighting approach or some other averaging approach be adopted? (Question 43)

3.1.1 Debt margin

For Brookfield, the debt margin is estimated as the difference between the yield on 10 year BBB corporate bonds and the risk-free rate.

BBB yield curves are not observable in the market for a range of maturities. It is therefore necessary to derive the yield curve from observable financial data.

History

Prior to the sub-prime crisis in 2007, there were a number of corporate debt issues in the BBB market for terms of ten years or greater. This market allowed the 10 year yield for BBB rated securities to be calculated. The two main independent financial data providers CBASpectrum[9] and Bloomberg[10] each calculated the yield. The ERA in 2008 relied upon CBASpectrum's estimates.

Since the sub-prime crisis and the global financial crisis that followed it, it was extremely difficult for BBB rated businesses to issue securities with a ten year maturity. This in turn has made it difficult to estimate a yield on 10 year BBB rated securities.

In 2007 Bloomberg ceased publishing the 10 year BBB rate. The reason for not publishing the ten year rate was the lack of liquidity in the debt market. There were no ten year BBB corporate bonds on issue. The issue now is what to use as a ten year BBB estimate that is published by an independent provider, is transparent, credible and reputable.

There are two issues being:

- the source of the data; and
- how to estimate the yield from the data

Each of these are addressed in turn.

3.2 Source of data - Bloomberg

The market for the provision of financial data is estimated to be worth $16 billion per annum of which one reporter of financial data, Bloomberg, has a share which is approximately one third, with estimated revenue of $6.6 billion. Bloomberg has been a leading data provider for more than 30 years. As a respected global data service with specialist skills and expertise in capital markets, Bloomberg has access to sophisticated tools and resources that it uses in analysing market data. Regulators consistently relied on Bloomberg BBB fair value 10 year yield curves when they were available. Bloomberg therefore is a respected and independent global data service that has specialist skills and expertise in capital markets.

[9] CBASpectrum is an analytical platform developed in 2001 by the Commonwealth Bank, providing users with a measure of the underlying fair-value yield of Australian bonds.

[10] Bloomberg LP provides financial software tools such as analytics and equity trading platform, data services and news to capital markets.

The ERA's analysis and concerns about using Bloomberg implies that there is something wrong with the methodology used to construct these estimates. However, there is no clear foundation or rationale provided for why there may be a problem with Bloomberg's fair value estimates.

Bloomberg's selection criteria

The methodologies proposed by the ERA involves the inclusion of BBB bond issues, not all of which are currently included in the group that Bloomberg uses to construct its fair value curve (noting that the composition of this sample will change through time). A question of fundamental importance to this issue is why there are BBB bond issues in the market that are not being referenced by Bloomberg in constructing its fair value curves. While we do not have sufficient information regarding how the curves themselves are constructed, we do know something about how they determine whether a bond will be included in its sample.

Bloomberg generates Australian Bloomberg Fair Value (BFV) curves for both sovereign and some credit-rated sectors of differing maturities. The BFV curves are used to generate Bloomberg Fair Values for bonds in the different sectors. For example, Bloomberg currently derives a BFV seven year BBB curve and this can be used to estimate BFV prices for BBB rated bonds of similar maturity. Similarly the BFV seven year BBB curve indicates the current cost of debt for BBB rated firms seeking funds from the debt market. The sample includes all BBB rated bonds.

Only selected bonds are included in the estimation of the BFV curve to ensure that the curve is reliable. For the bond to be included in the estimation, the bond must be 'well priced'.[11] To be well-priced, the bond must be liquid to ensure that the price is reliable.

Prices generally can be either indicative, executable or traded prices:[12]

- Indicative prices comprise approximately 90% of all of the bond prices that are available on the Bloomberg bond database. Indicative prices are provided by bond market participants called market makers. Market makers have no obligation to execute trades at indicative prices so it is therefore not unusual to see indicative prices being very different from actual market/traded prices.
- Executable prices are available only for bonds traded on some electronic trading system. Most bonds are traded over-the-counter (OTC) and in this market counterparties deal directly with each other as opposed to via an exchange in the

[11] Lee, M. (2007). Fixed Income Specialist, Bloomberg LP, 'Bloomberg Fair Value Market Curves' International Bond Market Conference 2007, Taipei.

[12] Lee, M. (2007).

exchange traded market. As a result of this there is a lack of quality executable prices being reported.

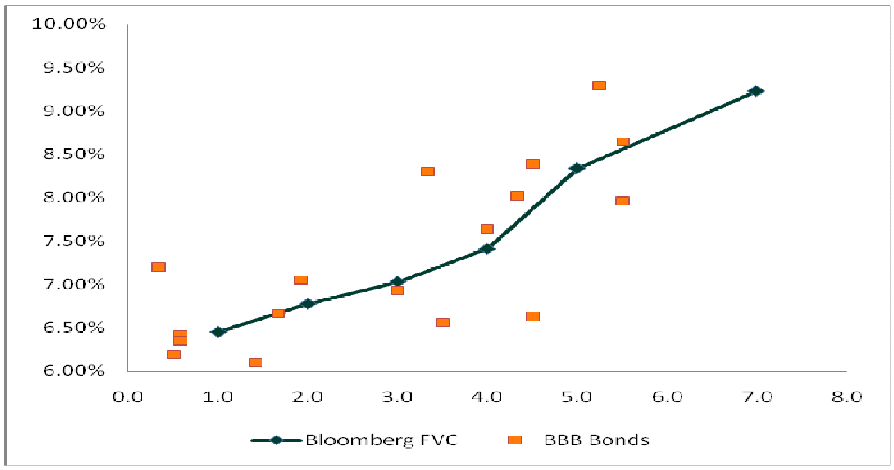
- Traded prices are trades which have been executed.

In the estimation of the BFV curve, Bloomberg collects various prices, including indicative prices and executable prices for bonds that have a high level of liquidity. Bloomberg excludes those bonds that are considered to be outliers, that is, have prices that are significantly higher or lower than comparable bonds.

To estimate the representative yield Bloomberg relies on actual reliable observations for a given rating and for a given time to maturity. For example, if Bloomberg wants to estimate a seven year yield then it would use reliable prices of bonds that mature around this time. As depicted in Figure 3 below, Bloomberg then fits a line to the data points to estimate the yield. In doing so, Bloomberg's estimation technique minimises the sum of squared deviations between actual observations and estimates of fair yields.

It must be remembered that Bloomberg survives and continues to thrive on the fact that they provide analytical services to financial markets. Bloomberg is the leader in financial information across industries, and across the world[13]. Global financial markets trust the Bloomberg service. Comfort can be taken from the fact that the sophisticated financial market trusts them.

Figure 3 Estimating yields



Source: Bloomberg

[13] http://www.bloomberg.com/professional/

Why liquidity is important

Price discovery is one of the most important functions of any exchange (or organised marketplace, such as the bond market). The most reliable prices in any market are derived from those which emerge when the greatest concentration of trading takes place. There is a direct and strong relationship between number of trades and reliable prices. Importantly if there is little concentration of trading, as in a thin market, prices are not reliable as they do not accurately reflect supply and demand at the time. Even though prices are transparent and are known instantaneously, there is little confidence that the resultant price is one that would be negotiated in an open and unrestricted market between knowledgeable, willing and informed buyers and sellers acting at arm's length.

A necessary prerequisite for an efficient price discovery process is a market which is an efficient mechanism for pricing transactions. The ideal is a market in which prices provide accurate signals for resource allocation, that is, a market in which firms make production and investment decisions and investors choose among the securities that represent ownership of the firms' activities under the assumption that prices at any time "fully reflect" all available information. A market in which prices "fully reflect" all available information is called an "efficient market".[14]

An efficient price discovery process is required so that prices are reliable and they do accurately reflect supply and demand at the time. Conditions at a point in time are reflected in price. In an efficient market, prices would reflect a change in market conditions. This is not the case in an inefficient market. In an inefficient market, prices do not reflect available information or current conditions. The inefficient prices cannot be validly analysed to examine factors affecting either supply or demand.

Price discovery involves the process of buyers and sellers arriving at a transaction price for a given quality and quantity of a product at a given time and place. It involves several interrelated concepts, among them:

- market structure (number of participants in the market, size of the market, location of the market, and the competitiveness of buyers and sellers in the market);
- market behaviour (buyer procurement and pricing methods);
- market information and price reporting (amount, timeliness, and reliability of information); and
- markets for risk management instruments and alternatives.

[14] See Fama, E. (1970). 'Efficient Capital Markets'. Journal of Finance. 25, pp. 383-417.

The variation in reported prices (week-to-week or daily), both above and below the market price level results from many factors directly affecting price discovery. A major contributing factor is the frequency of trading in the market. In a situation where there is only a small amount of trading as in the case of a thin market, prices will not be reliable and one should exercise little confidence in the resultant price. A thinly traded market cannot be an efficient market, nor would prices reflect all available information.

There is a plethora of empirical evidence investigating and reporting the effects of thin trading in markets.[15] This evidence has established that a high volume of liquidity facilitates price discovery. Similarly a low volume of liquidity or thin trading generates inefficient price discovery. The thinner the market the greater the chance of an inefficient price as the price discovery process breaks down so that the resultant price does not correctly reflect supply and demand conditions. The price that is observed in a thinly traded market is far more likely to diverge from the "true price" that would be expected to emerge from a deep market.

This relationship between price discovery and trading has been well researched.[16] For low volume or thinly traded stocks, the efficiency of the price discovery itself is low. The efficiency of price discovery is positively correlated with trading volume.

The 'noisiness' of prices and the efficiency of price discovery has been estimated in studies, including one by Baias et al.[17] The ratio of the 'true' return and the observed return was modelled to examine pricing errors. It was found that the efficiency of the price discovery process for a thin market compared to a normal market was between 10% and 50%. This means that the observed price could be as little as 10% of a price that would be observed in an efficient market. For a thinly traded security, the price may change with a new trade but the observed price is likely to be inefficient as it is unlikely to be the 'true' price. More trades need to occur for the observed price to be equal to the 'true' price.

Implications

The consequence of this is that an analysis of observed prices to determine a material change in price could result in a correct conclusion only by chance. Prices in thin markets are distorted and do not reflect all information pertaining to price. In order to

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15 See Banz, R. (1981).'The Relationship between Return and Market Value of Common Stock', Journal of Financial Economics, 19, pp. 41-44; Beedles, W., Dodd, P. and Officer, R. (1988). 'Regularities in Australian Share Returns', Australian Journal of Management, pp. 1-29; Reinganum, M. (1981a). 'Misspecficication of Capital Asset Pricing: Empirical Anomalies Based on Earnings' Yields and Market Values', Journal of Financial Economics, 9, pp. 19-46.

16 Barclay,M., Litzenberger, R. and Warner, J., (1990). 'Private Information, Trading Volume and Stock return Variances'. Review of Financial Studies, 3, 233-253.

17 Biais, B., Hillion, P. and Spatt, C., (1999). 'Price Discovery and Learning During the Preopening Period in the Paris Bourse'. Journal of Political Economy, 107, pp.1218-1248.

provide relevant and current information regarding lenders' expectations of future returns (in this case, the expected cost of debt), there needs to be sufficient turnover. If there is a lack of turnover the information that is reflected in the latest observed yield is not likely to be reflective of current market conditions.

Bloomberg considers trading activity in determining whether to include a bond in its sample for the purpose of constructing its BBB fair value curve. IPART has not referred to the issue of liquidity or considered the potential characteristics of the bonds it has included in its sample. The failure to recognise the potential implications of this problem is a fundamental flaw.

The dearth of suitable data is a problem. While the ERA is attempting to arrive at a reasonable estimate of the cost of debt it is imperative that the bonds will provide prices/yields that are actually indicative of the cost of debt. The fact that the ERA use bonds as reported by Bloomberg does not necessarily mean that the yields are reliable. The vast majority of prices/yields are indicative and do not bind the 'price maker'.

The ERA's approach does not present better alternatives to relying on Bloomberg's fair value curve. Indeed, given the significance of these issues and the potential complexities underpinning them, reliance should continue to be placed on an independent, reputable data provider that has specialist skills and expertise in this area. At the current time, this means placing sole reliance on Bloomberg's fair value estimates.

To correctly estimate the cost of debt for a business that is efficiently funded, the ERA should use the Bloomberg fair value yield.

3.3 Estimating the ten year BBB yield

The ERA use a selection of bonds that are rated BBB- or higher. To accurately estimate a BBB+ yield would require a degree of precision that is not possible given the 'noisy' data. Recall Figure 3 where the fitted yield minimises the squared standard deviations. A reliably estimated difference between BBB and BBB+ is lost in the deviation of observed yields. The yield on BBB rated bonds is sufficient.

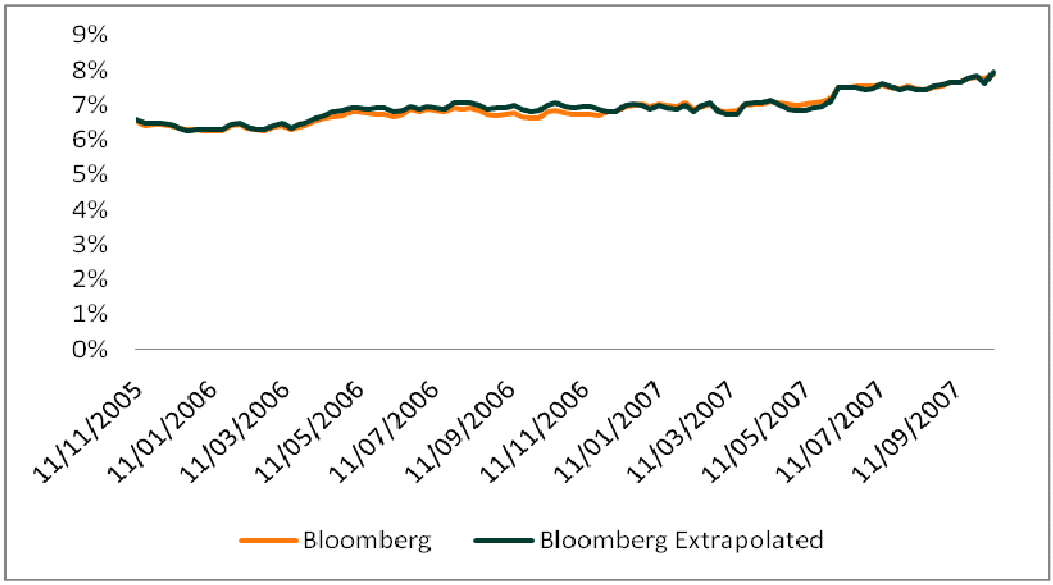
To estimate the ten year BBB corporate yield an approach that could be adopted is to extrapolate the published seven year BBB rated bond yields to a ten year yield assuming that the term structure between five and seven year bonds is applicable to the period for seven to ten years. For example, if the seven year BBB yield is 6% and the five year BBB yield is 5% then the estimated ten year BBB yield is estimated as 6% plus (6% - 5%)/2years x 3years = 7.5%.

Figure 4 below illustrates the ten year BBB extrapolated yield and the published ten year BBB yield. The ten year BBB yield ceased to be published by Bloomberg in October 2007 due to the thinness of the market. For the two years[18] prior, the average rates were 6.89% for the published ten year BBB yield and 6.93% for the extrapolated yield. The difference between the two yields was 0.04% or 4 basis points. Long term, past experience suggests that there is little difference between the extrapolated yield and the yield that was published by Bloomberg.

When the global financial crisis passes and long term BBB bonds are again able to be issued into the market, we anticipate that data providers will again be able to supply estimates of yields for BBB rated securities. It is noted, however, that the relatively small size of the Australian market means that liquidity issues are always like to exist for 10 year BBB debt.

Given the small comparative sample of corporate bonds, it is important to continue to use an independent, transparent and reputable data provider so that all users have confidence in the estimates. Synergies believes that the preferred option now is to use the extrapolated seven year BBB yield as this yield historically almost perfectly matched the published ten year BBB yield.

Figure 4 Published Bloomberg ten year BBB yield and extrapolated yield



Source: Bloomberg

[18] Two years was chosen as this was the only time that data was consistently available

Conclusion

The appropriate method to adopt to estimate the ten year yield on BBB rated bonds is to extrapolate the Bloomberg seven year yield to ten years. This estimated yield is averaged over a 20 day period and deducted from the average yield on a ten year ACG bond for the same 20 day period.

The 20 day BBB debt margin as at 7 March 2013 was 2.72%.

In summary, the most appropriate alternative to the ERA's bond yield approach for estimating the debt risk premium is to use Bloomberg and extrapolate the data. The major concern with the bond yield approach is that this is an alternate method to that used by a globally respected data provider who uses a robust and credible approach to estimating yields.

4 Conclusion

The long term estimate of the ten year risk-free rate is 5.22%. This estimate should be used with a historically estimated MRP of 6% - 7%. Should a contemporary estimate for the risk-free rate be used, then the 20 day average is 3.48%. This contemporary estimate should be matched with a contemporary or forward-looking MRP estimate of 9%.

The debt risk premium can be estimated from using Bloomberg data to extrapolate a yield for ten year BBB rated bonds. The current 20 day average for ten year BBB rated bonds is 2.72%.

We recognise this approach differentiates between the assessment of the risk free rate for equity purposes (based on a long term average) and for debt purposes (based on a contemporary rate). The reason for this divergence reflects the desire to best identify the relevant opportunity cost.

Despite the problems with liquidity in assessing the case of the cost of debt, there is readily available data that is able to be benchmarked off the current risk free rate, as proxied by the ACG 10 year bond yield, to form a view as to the debt risk premium. Hence, reliance on the ACG 10 year bond yield is appropriate in these circumstances as a proxy for the risk free rate for assessing the debt risk premium.

However, in the context of applying the risk free rate for equity purposes, we note that the normal proxy, being the ACG 10 year bond yield, has been trading with a yield that has not been experienced in recorded history. There is clear evidence of this yield affecting the MRP. Given the current approach of a 6% MRP, we believe the most appropriate proxy for the risk free rate is a 10 year average of the ACG 10 year bond yield rather than the rate at which it is currently trading.