

CGS as a proxy for the risk free rate

A report for the JIA

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1. Introduction

1.1. Terms of reference

- In December 2008 AER released the explanatory statement of its draft decision in relation to the review of National Electricity Rules (NER) weighted average cost of capital (WACC) parameters. CEG has been asked by the Joint Industry Associations (JIA) to provide a review of the explanatory statement to the extent that it addresses the accuracy of Commonwealth Government Security (CGS) yields as a proxy for the risk free rate.
- 2. This includes a review of the AER's, and its consultant's, consideration of our previous report *Establishing a proxy for the risk free rate*, dated September 2008.

1.2. Structure of report

- 3. The remainder of this report has the following structure.
 - Section 2 provides a review of the AER's consideration and some context to recent events in financial markets;
 - Section 3 provides a discussion of the relevance of these events for AER decision making; and
 - Appendix A provides a description of recent changes in spreads between nominal and indexed CGS yields.



2. AER review and recent events

2.1. Previous report and AER response

4. The key conclusion of our previous report (summarised on page 1 of that report) was that CGS yields were depressed relative to the true risk free rate used to price corporate assets by virtue of the special characteristics that attach to Government bonds. We also noted:

"The current historically high convenience yields on nominal CGS make them a poor proxy for the true risk free rate that should be used in the CAPM to price non Government assets (on which a convenience yield does not exist).

Superior proxies for the risk free rate are yields on State Government debt, fixed for floating swaps and the yields on CDS insured bonds – all of which have negligible risk of default."

5. The AER has responded in its draft decision that:¹

"While the AER recognises that the credit spread between CGS and other 'low risk' assets may not be completely explained by relative levels of default risk, the arguments for the existence of a 'convenience yield' are questionable. As Handley points out, the finance literature contains many potential explanations for the non-default risk component of credit and swap spreads. On this basis the AER considers there is no 'unambiguous' evidence that the spreads are driven purely by the relatively higher liquidity of CGS as claimed by CEG."

And:²

"..the AER considers that CEG (and the JIA) has not presented sufficient persuasive evidence justifying a move away from CGS as the appropriate proxy for the risk free asset."

6. As a generally response, we did not and do not dispute that there may be explanations other than liquidity differences for spreads between CGS and negligible default risk securities. In fact we list these and they include higher transparency and certainty associated with CGS yields. The point we make is not

¹ AER, *Review of the weighted average cost of capital (WACC) parameters: Explanatory statement*, December 2008 ('draft decision'), p.97

² Ibid, p.97



that there is a particular attribute about CGS that make them different from equity with a zero beta but there are a number of such 'non-beta' attributes that distinguish CGS from other assets. Importantly, the higher the price that these non-beta attributes attract in the market then the worse CGS become as a proxy for the risk free rate (ie, the worse CGS yields become as the predictor of the return a firm with zero beta must offer investors to attract equity).

- 7. As it happens, we consider that there is currently a great deal of evidence that the market is paying a very high premium for the special attributes of CGS (be they liquidity or anything else). As a consequence, CGS yields are currently a particularly poor proxy for the risk free rate.
- 8. It must be recalled that our (and the AER's) purpose is to identify a risk free rate to use in the CAPM to estimate the cost of equity for non Government assets. This would ideally be the yield on an asset with zero CAPM risk (a zero beta) but otherwise similar qualities to the non Government equity being priced. In particular, this includes similar levels of liquidity.
- 9. Therefore the "differential liquidity" explanation noted by Handley from the literature³ supports rather than refutes a view that CGS are likely to be poor proxy for the risk free rate in this circumstance. In this regard it does not matter whether the pricing of liquidity is semantically thought of a raising non CGS required returns or lowering CGS required returns⁴ either way CGS returns underestimate the required return for an asset of similar beta but different liquidity (such as equity). Both equities and State Government debt are less liquid than CGS and, therefore, other proxies, such as a risk free State Government bond are more likely to provide a basis for determining the cost of equity than a risk free CGS.

2.2. Recent relevant changes in financial markets

- 10. Since we provided our previous report there have been a number of developments in financial markets. All of these are consistent with a large increase in the willingness of investors to pay for liquidity (or unwillingness to hold illiquid assets without increased compensation). The most dramatic of which have been:
 - the creation of Commonwealth Government guaranteed bank debt and that being issued at a yield of 178bp to 248bp above CGS yields – despite both

³ Liquidity is Handley's primary alternative *potential* explanation. See last paragraph on page 4. Handley, Comment on CEG Report, "Establishing a proxy for the risk free rate", November 2008.

⁴ Handley appears to raise this distinction as important but does not expand on its relevance. See last paragraph on page 4 of Handley, Comment on CEG Report, "Establishing a proxy for the risk free rate", November 2008.



CGS and Government guaranteed debt being guaranteed by the same entity (ie, the Commonwealth of Australia);

- a dramatic increase in the increase in the spread between yields on CGS and State Government debt (to an unprecedented level of more than 100bp); and
- a dramatic reduction in the spread between (illiquid) indexed and (liquid) nominal CGS.
- 11. Put simply, what was previously strong evidence for the existence of a historically high gap between CGS yields and other riskless assets has now become undeniable. We discuss the first two development below and the last (which is more complex) in Appendix A to this report.

2.2.1. High spreads between CGS and Commonwealth guaranteed bank debt

12. The Commonwealth Government has provided a guarantee for debt issued by Australian banks. This makes the default risk associated with these bonds identical to the default risk attached to CGS. Nonetheless, these bonds were issued at premiums to the bank bill swap rate of between 100bp (3 years maturity) and 160bp (5 years maturity) in the week ending 11 December 2008.⁵ The 3 (5) year swap rate was 78bp (88bp) above the CGS yield in that week.⁶ This means that this debt was being issued at 178bp to 248bp more than the relevant CGS yield.

2.2.2. CGS vs State Government debt

13. The figure below describes the difference between CBASpectrum's estimate of the yield on a 10 year NSW/Qld/Vic State Government bond with 10 years to maturity with a 10 year nominal CGS yield. It can be seen that the historical average difference in yields has been around 20 basis points (0.20%). However, this has recently risen to 120bp (1.20%). This is an unprecedented difference in yields.

⁵ Australian Financial Review, Bond guarantee fails to hit the spot, December 13 -14 2008.

⁶ As reported by CBASpectrum.





Figure 1: Spread between CGS and State Government 10 year nominal debt

- 14. This difference in yields simply cannot be explained by the difference in default probabilities between the Commonwealth and State Governments.⁷ Rather, it is strong evidence of the heightened demand for the liquidity of CGS in a financial crisis (noting that State Government debt is less commonly traded and less liquid than nominal CGS).
- 15. When implementing the CAPM there is no basis to believe that the yield on CGS is a better proxy for the risk free rate than the yield on State Government debt (indeed the reverse is true⁸).

Source: CBASpectrum

A 1.2% pa default premium over the ten year life of a bond implies a probability of default over that period in the order of 12% (10*1.2%). As far as we are aware there is no serious analyst suggesting that State Governments (who have never defaulted on debt) have this order of magnitude probability of default going forward.

⁸ When using the CAPM to estimate the cost of equity one would ideally use the yield on an asset with zero CAPM risk (zero beta) but otherwise similar qualities to the equity being priced. In particular, this includes similar levels of liquidity. Both equities and State Government debt are less liquid than CGS and, therefore, a risk free State Government bond is more likely to provide a basis for determining the cost of equity than a risk free CGS (that is also much more liquid).



3. What this means for the AER decision making

- 16. In our view the first and foremost issue for the AER is to recognise that its central task is to allow an overall cost of equity for the businesses to raise capital in financial markets. By adopting CGS yields as the risk free rate in the NER at this time without a compensating increase in the MRP, the allowed cost of equity will be at historic lows, due to the current historically low CGS yield. This is despite, as we have noted in our companion report⁹, the market cost of equity being at an historic high.
- 17. Ultimately, whether one believes that this is because the CGS yield is a poor proxy for the CAPM risk free rate or simply because the MRP is at historic highs is irrelevant. Whatever is the correct explanation, reducing other CAPM parameters without regard to the impact on the overall allowed cost of equity will widen an already large gap between the NER cost of equity and the actual cost of equity required by investors.
- 18. Notwithstanding these high level observations, the evidence we cite above is, in our opinion, compelling evidence for at least part of the explanation being the inadequacy of CGS as a proxy for the risk free rate in the CAPM. The AER's model for the cost of equity assumes that a firm that has an equity beta of zero will be able to raise equity offering investors the same return that the Commonwealth Government offers investors on CGS. We believe that this is demonstrably an inappropriate assumption when:
 - Australian banks have to offer investors 178-248bp more than this when issuing *debt* (not equity) that is 100% guaranteed by the Commonwealth Government; and
 - State Governments having to offer investors 100+bp more than this despite State Governments having a default probability that is imperceptibly different to the Commonwealth Government.
- 19. The implication of this is profound. It means that no matter what the equity beta for a firm, it will not be able to raise equity by offering 248bp less than investors can get by buying Commonwealth guaranteed five year bank debt. That is, it is not reasonable to assume that a firm issuing *equity* (even if it has a zero beta) will be able to attract investors at a lower *expected* return than the *certain* return available by investing in Commonwealth Government *guaranteed* 5 year bank debt. A decision taken at this time to match prevailing conditions in the market for funds would require the AER to add at least 248bp to the five year CGS yield when attempting to estimate the required return on equity with a zero beta.

⁹ CEG, Forward looking estimates of the equity premium, January 2009 Competition Economists Group www.CEG-AP.COM



- 20. This is important because the above evidence strongly supports the view that setting the NER cost of capital based on CGS will underestimate the required return on equity by around the same amount (248bp). This is separate but strong corroboration for the results of our DGM analysis¹⁰ which suggests that the falling CGS yields have **not** been reflected in a lower cost of equity.¹¹
- 21. Other than supporting the view that the non risk free rate NER parameters should be set conservatively (and certainly not reduced), the AER faces some difficulty in further acting on this information. The AER could define an alternative risk free rate but the value of this as a proxy for the underlying risk free rate may vary over time and may be overtaken by events. Indeed, the impact of the Government guarantee of bank debt appears to have reduced the usefulness of bank bill swap rates as a proxy for the CGS. The effect has been that the spread between these and CGS has fallen to be even less than the spread between both Government guaranteed bank debt and CGS and State Government debt and CGS (which likely reflects the increased premium investors are prepared to pay for liquidity and the higher liquidity of the swap market compared to the guaranteed debt market).
- 22. Another option for the AER would be to simply adopt an estimate of the cost of equity that does not vary the CGS. This would be consistent with regulatory practice in the UK and the advice of Smithers and Co to the UK regulators that:

"Given our preferred strategy of fixing on an estimate of the equity return, any higher (or lower) desired figure for the safe rate would be precisely offset by a lower (or higher) equity premium, thus leaving the central estimate of the cost of equity capital unaffected."¹² [Emphasis added.]

23. This recommendation has been largely adopted by UK regulators. For example in its 26 June 2006 Initial Proposals Ofgem (the UK gas and electricity regulator) stated:

"In DPCR4, as described above, we observed that the CAPM model gave a wide range of estimates for the cost of equity, reflecting a significant variation between long term average values for the cost of equity and observed market data at a given point in time. We concluded that we could not rely on observed

¹⁰ CEG, *Forward looking estimates of the equity premium*, January 2009

¹¹ A decision taken right now to match prevailing conditions in the market for funds would require the AER to add at least 248bp to the CGS yield. Even if the MRP were reduced by the same amount (consistent with a redefinition of the MRP to be relative to zero risk non CGS assets) and an equity beta of 0.8 retained, this would imply a cost of equity 50bp higher than the AER current method.

¹² Smithers and Co, A Study into Certain Aspects of the Cost of Capital for Regulated Utilities in the U.K., A report commissioned by the U.K. economic regulators and the Offce of Fair Trading. (2003) page 49



market data due to exceptional factors pushing down interest rates and the instability of the equity beta." (Page 30)

- 24. However, whatever its merits, this option may be difficult for the AER to adopt as it has not been the subject of consultation to date.
- 25. In our view the best thing the AER could do would be to retain the ability to make an adjustment to the CGS yield at the time of a regulatory determination to the extent that current evidence at the time suggests the CGS yield is a poor proxy for the risk free rate.
- 26. Under this approach the NER would define the risk free rate as equal to the yield on CGS but where the AER retains an ability to add an increment to this based on current evidence of substantial differences in yields between CGS and other zero or very low risk instruments provided that increment could be persuasively shown to result in a more accurate estimate of the prevailing forward looking cost of equity.

Recommendation

The NER continue to set the risk free rate equal to the yield on CGS as the default option. However, the AER be given the ability to add an increment, based on then prevailing evidence from the yields on other zero or very low risk instruments – provided that increment could be persuasively shown to result in a more accurate estimate of the prevailing forward looking cost of equity.



Appendix A. Dramatic reduction in breakeven inflation rates

- 27. Sudden changes in the break even inflation rate derived from the CGS market can be explained by one of two factors:
 - a sudden change in investors demand for liquidity; or
 - a sudden change in investors' expectations about inflation and their willingness to pay for inflation indexation.¹³
- 28. As can be seen in the figure below. Since September 2007 there has been a very large fall in the 10 year break even inflation rate taken from the CGS market. In the month of September 2008 it averaged 3.40% but since then it has fallen to 1.43% on 2nd of January 2009.

¹³ For example, a sudden reduction in investors' expectations of inflation should, other things equal be reflected in lower prices being paid for inflation indexed bonds – causing their yields to increase and the break even inflation rate to fall.





Figure 2: Break-even 10 year inflation rate derived from Australian 10 year CGS yields

- 29. This dramatic reduction in the breakeven inflation rate is symptomatic of a surge in convenience yield being paid for nominal CGS but not being paid for indexed CGS. This is consistent with a heightened demand for liquidity as nominal CGS are much more liquid than indexed CGS (with the latter no longer issued by the Commonwealth Government).
- 30. A similar phenomenon has been observed around the developed world. For example, in the US (where the US Treasury bond rate is the most liquid in the world) the effect has been to drive break even inflation below zero. That is, nominal Treasuries are yielding *less than* CPI indexed Treasuries.
- 31. Our view is that this fall in the break even inflation rate has clearly been driven primarily by a massive increase in the demand for liquidity as a result of the global financial crisis (rather than a fall in expectations of the average inflation rate over the next ten years). This view is supported by the US Federal Reserve which has recently ceased to report its estimate of implied inflation derived from differences in yields on indexed and nominal Treasury bonds on the basis that:

Source:RBA data, CEG analysis



"We have discontinued the liquidity-adjusted TIPS expected inflation estimates for the time being. The adjustment was designed for more normal liquidity premiums. We believe that the extreme rush to liquidity is affecting the accuracy of the estimates."¹⁴

32. Our view is also consistent with the fact that the break even inflation rate has fallen because nominal CGS yields have fallen, rather than because indexed CGS yields have risen. That is, the fall in the break even inflation rate is due to investors paying more for nominal bonds not paying less for indexed bonds. This can be seen in the below figure. This figure demonstrates that over the period since June 2008, the indexed bond rate has actually fallen slightly. Thus, none of the fall in the break even inflation rate is due to a rise in indexed CGS and more than 100% of the fall in the break even inflation rate is due to the fall in nominal CGS yields.



Figure 3: 10 Year CGS yields and break-even inflation

Source: RBA data, CEG analysis

¹⁴ http://www.clevelandfed.org/Research/data/TIPS/lpremium.cfm



33. This figure also illustrates how nominal 10 year CGS yields have fallen over the last six months relative to indexed CGS yields (and consequently how the breakeven inflation rate has fallen). From the 2 June 2008 to 2 January 2009, 10 year nominal CGS yields have fallen 2.68% while indexed bond yields have effectively remained steady (and have actually fallen 0.13%). As a consequence, the breakeven inflation rate on 2 January 2008 had dropped to 1.46%.