Advanced Metering Infrastructure

SP AusNet Response to Draft Decision

Submitted: 11 September 2009

SP AusNet
A member of Singapore Power Group

About SP AusNet

SP AusNet is a major energy network business that owns and operates key regulated electricity transmission and electricity and gas distribution assets located in Victoria, Australia. These assets include:

- A 6,574 kilometre electricity transmission network indirectly servicing all electricity consumers across Victoria;
- An electricity distribution network delivering electricity to approximately 575,000 customer connection points in an area of more than 80,000 square kilometres of eastern Victoria; and
- A gas distribution network delivering gas to approximately 504,000 customer supply points in an area of more than 60,000 square kilometres in central and western Victoria.

SP AusNet's vision and mission is to make important things in life happen today and tomorrow. The SP AusNet company values are:

- Safety: to work together safely. Protect and respect our community and our people.
- Passion: to bring energy and excitement to what we do. Be innovative by continually applying creative solutions to problems.
- Teamwork: to support, respect and trust each other. Continually learn and share ideas and knowledge.
- Integrity: to act with honesty and to practise the highest ethical standards.
- Excellence: to take pride and ownership in what we do. Deliver results and continually strive for the highest quality.

For more information visit: www.sp-ausnet.com.au

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APPENDICES

1 Introduction

On 31 July 2009, the Australian Energy Regulator (AER) released the Draft Determination on the Victorian Advanced Metering Infrastructure (AMI) Review (draft determination)[1]. SP AusNet was required to respond in relation to the Initial Budget Application by 28th August 2009 and to the Initial Pricing Application by 11th September 2009. This submission is the latter and the former has already been published on the AER's website.

2 Weighted Average Cost of Capital (WACC)

On 31 July 2009, the AER released its draft determination on the Victorian Distribution Network Service Providers' (DNSP) initial AMI budget and charges applications (draft determination). In the draft determination, the AER determined that the debt risk premium should be 3.09%. The AER based its debt risk premium on the BBB 8 year fair yield curve published by Bloomberg plus the spread between the 8 and 10 year A rated Bloomberg fair yields.

The DNSPs consider that the AER's debt risk premium used in the draft determination cannot be supported after giving proper consideration to all of the relevant issues. Instead, the DNSPs propose a debt risk premium of 4.84%. The DNSPs consider that their proposed debt risk premium is a conservative estimate and is supported by various other sources of evidence regarding 10 year BBB+ corporate bond rates.

This debt risk premium is calculated based on the corporate bond issued by Tabcorp in April 2009, and is supported by a wide range of other indicators of the debt risk premium that are set out in the attached submission entitled Joint submission by the Victorian DNSPs on the Debt Risk Premium, 11 September 2009. Attached as Appendix 1 to this joint submission and referred to throughout is an independent expert report that has been provided by Tom Hird of CEG entitled Estimating the cost of 10 year BBB+ debt during the period 17 November to 5 December 2008 (the CEG report). The submission is a joint submission by the Victorian DNSPs (CitiPower, Powercor, UED, Jemena and SPI Electricity) in relation to the calculation of the debt risk premium by the AER in the draft determination.

[1] Draft Determination Victorian advanced metering infrastructure review – 2001-11 AMI Budget and Charges applications.

3 Movement in Provisions

SP AusNet has been provided with information in relation to the AER's adjustments to SP AusNet's June Pricing proposal and understands that the AER has made adjustments to the Audited Regulatory accounts in order for them to reflect the cash reporting of costs.

SP AusNet understands that this approach was not documented in the AER's Framework and Approach Paper[2] but is consistent with the treatment undertaken by the Essential Services Commission (ESC) in the 2006-10 Electricity Distribution Price Review[3]. The ESC stated

> *Provisions are taken by the distributors in order to recognise a future liability now. The distributors have a range of provision accounts for, for example, employee entitlements, environmental obligations, safety obligations, doubtful debts and obsolete stock. Each year the distributors assess the balance of these provisions. They pay liabilities from the provision accounts, increase the balance of the provision accounts through a charge to profit and make other adjustments to the provision accounts.*
> *In the Draft Decision, the Commission reversed all movements in provisions charged to the profit and loss statement and substituted the relevant cash outgoing. This resulted in expenditure being recorded in the year it is incurred rather than when the provision is changed.*[4]

SP AusNet has reviewed the adjustments undertaken by the AER and now understands the AER's desire to offset the provision movements against the items of expenditure that they relate to. SP AusNet have included in the attached pricing templates the provisions adjusted to the correct expenditure category.

SP AusNet had previously indicated to the AER that the movement in provisions mainly relate to indirect overheads, specifically the asbestos provision. The net movement in the asbestos provision in both the 2007 and 2008 regulatory periods have now been excluded from the reported regulatory accounts as these do not represent cash outflows. Based on subsequent review of provisions, SP AusNet notes that the balance of the movement in provisions in 2007 (being a decrease of $1,147,146) and in 2008 (being a decrease of $1,493,791) relates to net additional provision movements made in relation to employee entitlements and the previously unfunded shortfall in the defined benefits superannuation scheme. This superannuation scheme is for employees who perform metering services and not for costs relating to individuals who are included in the indirect overheads cost category. Therefore, the movement in provisions have been adjusted against metering data services instead of indirect overheads.

2 AER 'Framework and approach paper – Advanced Metering Infrastructure 2009-11' January 2009
3 Electricity Distribution Price Review 2006-10 Final Decision Volume 1 - Statement of Purpose and Reasons
4 ibid, Section 5.2.4 – Movements in Provisions page 167

Appendix 1

Joint Submission by the Victorian DNSP's on the Debt Risk premium

SP AusNet
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AER draft determination on 2009-2011 AMI budget and charges applications

Joint submission by the Victorian DNSPs on the debt risk premium

11 September 2009

RPO / 0478011

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1. Executive summary

On 31 July 2009, the AER released its draft determination on the Victorian DNSPs' initial AMI budget and charges applications (**draft determination**).

This submission is a joint submission by the Victorian DNSPs (CitiPower, Powercor, UED, Jemena and SPI Electricity) in relation to the calculation of the debt risk premium by the AER in the draft determination.

Attached as Appendix 1 to this submission and referred to throughout this submission is an independent expert report that has been provided by Tom Hird of CEG entitled *Estimating the cost of 10 year BBB+ debt during the period 17 November to 5 December 2008* (**the CEG report**).

In the draft determination, the AER determined that the debt risk premium should be 3.09%. The AER based its debt risk premium on the BBB 8 year fair yield curve published by Bloomberg plus the spread between the 8 and 10 year A rated Bloomberg fair yields.

The DNSPs consider that the AER's debt risk premium cannot be supported after giving proper consideration to all of the relevant considerations.

The DNSPs propose a debt risk premium of 4.84%. This debt risk premium is calculated based on the corporate bond issued by Tabcorp in April 2009, and is supported by a wide range of other indicators of the debt risk premium that are set out in this submission.

The DNSPs consider that their proposed debt risk premium is a conservative estimate, and is supported by various other sources of evidence regarding 10 year BBB+ corporate bond rates.

The AMI OIC sets out four requirements for the calculation of the debt risk premium:

- it must be determined using the 'observed annualised Australian benchmark corporate bond rate for corporate bonds';
- the bonds must have a BBB+ credit rating;
- the bonds must have a maturity period of 10 years; and
- measurement must occur between 17 November and 5 December 2008.

However, due in large part to the effects of the global financial crisis, there is no measure of the debt risk premium that meets all four of these requirements.

In these circumstances, the AER is required to have regard to all relevant evidence and to determine the best approximation of a debt risk premium that meets the AMI OIC requirements. That exercise requires the AER to consider all applicable measures of the debt risk premium, have regard to the reliability of each measure, and consider the overall picture that emerges from those measures regarding the most likely value of the debt risk premium.

In this submission, the DNSPs analyse the Bloomberg fair yield curves that the AER relies on in the draft determination. That analysis demonstrates that the AER's approach fails to meet three of the four AMI OIC requirements.

This submission also analyses the reliability of the Bloomberg fair yield curves that the AER relies on and shows that those curves are not reliable for a number of reasons, including:

- the fair yield curves are not based on actual trades, and during the AMI measurement period there was insufficient data for them to be a reliable measure, particularly in relation to 10 year bonds. This fact is supported by Bloomberg's recent decision to cease publishing its long maturity curves, including the 8 year BBB curve that the AER relied on;
- the manner in which the curves are calculated is not transparent and involves considerable discretion;
- the approach by Bloomberg and the AER to the removal of outliers cannot be justified; and
- the movement of the Bloomberg curves is inconsistent with consensus opinion on the effects of the global financial crisis.

Bloomberg's fair yield curves are an analytical tool that is intended by Bloomberg to be used to show if a bond is trading expensive or cheap when compared to similar bonds. The Bloomberg fair yield curves were never designed or intended by Bloomberg to operate as a regulatory measure of the cost of debt. Due in large part to the effects of the global financial crisis, the Bloomberg fair yield curves are simply unsuited as a measure of the debt risk premium during the AMI measurement period.

The DNSPs' proposed debt risk premium is then explained and it is demonstrated that the Tabcorp bond issue is a reliable measure of the debt risk premium during the AMI measurement period.

This submission also examines a wide variety of other relevant methods of determining the debt risk premium that are at least as reliable as Bloomberg as an indicator of a debt risk premium that meets the AMI OIC requirements. The results of those alternative methods of determining the debt risk premium are contrasted with the AER's approach and show that the AER's approach results in a debt risk premium that is markedly lower than all other measures of the debt risk premium.

That analysis includes CEG's analysis of the yields of over 600 corporate bonds during the AMI measurement period. CEG's analysis produced several measures of the debt risk premium, all of which are significantly higher than the AER's position in the draft determination.

Based on this analysis, the CEG report concluded that:[1]

> 238. Based on the facts and analysis reported earlier in this report I consider that all of the available evidence suggests that the AER/Bloomberg BBB+ fair value curve is unreliable and downward biased as a proxy for determining a benchmark rate. On this basis I do not consider that sole reliance on this method can comply with the legislative requirements.
>
> 239. I conclude that the there are more reliable alternative proxies as set out in section 6. Adopting one, or a combination of these proxies, will result in a benchmark rate at least 1.5% higher than derived using the AER/Bloomberg BBB+ fair value curve.

[1] CEG report, page 77.

The following table summarises all of the relevant measures of the debt risk premium that are discussed in this submission. The results are ordered from the lowest to the highest debt risk premium.

DRP measure	Yield	Debt risk premium
Draft determination, based on Bloomberg fair yield curves	**7.72%**	**3.09%**
RBA (average of November and December 2008 BBB spreads for 1-5 year maturity)	9.11%	4.48%
AMP March 2009 A- bond issue	9.12%	4.49%
Secondary trades during the AMI measurement period of bonds issued by Australian corporates in the US market	9.24%	4.61%
CEG report: BBB+ mean (4 to 16 year fixed and floating rate observations)	9.43%	4.80%
Tabcorp April 2009 BBB+ bond issue	**9.48%**	**4.84%**
CEG report: BBB+ mean (4 to 16 year fixed rate observations)	9.55%	4.92%
CBASpectrum BBB+ 10 year fair yield curve	9.55%	4.92%
CEG report: BBB+ mean (all fixed rate observations)	9.71%	5.08%
CEG report: BBB+ to A- mean (4 to 16 year fixed and floating rate observations)	9.80%	5.17%
Overseas issues during the AMI measurement period: mean of A rated 10 year bonds	9.90%	5.27%
CEG report: BBB+ mean (all fixed and floating rate observations)	10.05%	5.42%
CEG report: BBB+ to A- mean (all fixed rate observations)	10.09%	5.46%
CEG report: BBB+ to A- mean (4 to 16 year fixed rate observations)	10.28%	5.65%
DNSPs' bond pricing envelope: raw average (8 to 11 years)	10.65%	6.02%
Bonds issued by Australian corporates in the US market (mean of all bonds)	11.10%	6.47%
Bonds issued by Australian corporates in the US market (mean of 10 year bonds)	11.18%	6.55%
Overseas issues during the AMI measurement period: mean of BBB rated 10 year bonds	11.26%	6.63%

DRP measure	Yield	Debt risk premium
DNSPs' bond pricing envelope: adjusted average (8 to 11 years)	11.32%	6.69%
CEG report: BBB+ to A- mean (all fixed and floating rate observations)	11.34%	6.71%

This table shows that the approach taken in the draft determination produces the lowest possible debt risk premium. That debt risk premium is clearly out of line with all other estimates of the debt risk premium.

The debt risk premium calculated based on the Tabcorp issue also results in a debt risk premium that is lower than almost three-quarters of the other estimates of the debt risk premium. However, the Tabcorp result is much closer to the majority of the other results. It is within 0.5% of nine other results, including CBASpectrum, the RBA average, AMP's March 2009 A- bond issue, the CEG report's calculation of the mean spread to CGS on BBB+ bonds and the mean yields on longer maturity BBB+ and BBB+ to A- bonds, and two measures of overseas bond rates.

The AER's approach is accordingly unsupportable when proper consideration is given to all relevant considerations.

The DNSPs' proposed debt risk premium, which is based on the Tabcorp bond issue, is significantly more consistent with the weight of the supporting evidence.

Proper consideration of all relevant matters shows that the Tabcorp yield is a conservative estimate of the debt risk premium, and that there would be strong grounds for arguing that the debt risk premium should be higher than indicated by the Tabcorp issue. However, for the purposes of the AMI determination, the DNSPs propose that the debt risk premium should be 4.84% based on the conservative indicator of the Tabcorp bond issue and all of the other supporting evidence contained in this submission.

2 The AMI OIC requirements for the debt risk premium

2.1 The regulatory framework for determining the debt risk premium

The requirements for determining the debt risk premium and the other aspects of the WACC are governed by the Advanced Metering Infrastructure Order in Council of 25 November 2008 (**AMI OIC**).

The AMI OIC provides that the AER will apply a building block approach to determine the costs that can be passed through by the businesses as part of the AER's charges determination. Those building blocks include a return on capital, which is to be calculated using the WACC.

'WACC' is defined in the AMI OIC as:

> benchmark weighted average cost of capital calculated in accordance with the formula set out in clause 6.5.2(b) of the National Electricity Rules.

Clause 6.5.2(b) of the NER includes the debt risk premium as one of the parameters in the WACC formula. Clause 6.5.2(e) of the NER defines the debt risk premium for the purposes of that formula as follows:

> The debt risk premium for a regulatory control period is the premium determined for that regulatory control period by the AER as the margin between the annualised nominal risk free rate and the observed annualised Australian benchmark corporate bond rate for corporate bonds which have a maturity equal to that used to derive the nominal risk free rate and a credit rating from a recognised credit rating agency.

Clause 4.1(i)(i) of the AMI OIC provides that the input parameters used to calculate the WACC for the initial AMI WACC period must be calculated:

> with measurement of the market observables to occur on:
>
> (A) the last 10 business days of November 2008; and
>
> (B) the first 5 business days of December 2008,
>
> with the market observables to be determined on the basis of that measurement and otherwise in accordance with the Statement of Regulatory Intent issued by the AER pursuant to clause 6.5.4 of the National Electricity Rules.

The AMI OIC defines the debt risk premium as one of the 'market observables' to be used in determining the WACC.

The debt risk premium itself was not subject to review in the AER's WACC Statement of Regulatory intent (**SORI**). However, the SORI did address:

- the appropriate credit rating for the debt risk premium, which the SORI stated to be BBB+; and
- the maturity period for the nominal risk free rate (which under clause 6.5.2(e) of the NER is also the maturity period that applies to the debt risk premium), which the SORI stated to be 10 years.

2.2 The AMI OIC requirements

It follows from the above regulatory framework that there are four requirements for the calculation of the debt risk premium:

- it must be determined using the 'observed annualised Australian benchmark corporate bond rate for corporate bonds' (see clause 6.5.2(e) of the NER and the definition of 'WACC' in the AMI OIC);
- the bonds must have a BBB+ credit rating (see the SORI, clause 6.5.2(e) of the NER, the definition of 'WACC' in the AMI OIC and clause 4.1(i)(i) of the AMI OIC);
- the bonds must have a maturity period of 10 years (see the SORI, clause 6.5.2(e) of the NER, the definition of 'WACC' in the AMI OIC and clause 4.1(i)(i) of the AMI OIC); and
- measurement must occur between 17 November and 5 December 2008 (the **AMI measurement period**) (see clause 4.1(i)(i) of the AMI OIC).

In this submission, we refer to these four requirements as the **AMI OIC requirements**.

2.2.1 The meaning of 'observed'

The AMI OIC requires the debt risk premium to be determined using the 'observed annualised Australian benchmark corporate bond rate for corporate bonds'.

There is no definition of 'observed' in the AMI OIC, the NER or any other relevant legislative material.

The meaning of 'observed' therefore must be based on its ordinary meaning, although given that it is used in a highly technical area (WACC and the calculation of corporate bond rates) that meaning would be influenced by the context in which it is used and any specialist meaning the term has in the finance industry.

The most relevant dictionary definition of ‘observed’ is the first definition given in the Macquarie Dictionary (3rd edition), which is ‘to see, perceive or notice’.

The DNSPs consider that the common understanding of the term 'observed' in the finance industry is that it refers to a number that can be produced from data that can be pointed to as being 'real' in the market. It is most likely to be used to refer to a traded price, and would not generally be understood as including an 'estimate'.

This interpretation is supported by the AMI OIC's reference to the debt risk premium as a 'market observable'. The use of that term clearly indicates that the drafters of the AMI OIC intended the debt risk premium to be determined based on market data. The specification of a three-week window for measuring the debt risk premium also suggests that the drafters intended it to be based on actual market activity during that period.

The DNSPs consider that 'observed' means based on actual market data. Using market data implies that the bond rates that are used are based on two-way price activity between a willing buyer and a willing seller to arrive at a market price. A bid or offer by one party that is not accepted by any other party, and is therefore not traded, cannot be a market price

In the case of corporate bond rates, the 'observed' data should therefore consist of actual trades, whether new issues or secondary market trades. Estimates or indicative prices that are prepared by banks or other people and that are not based on actual trades cannot be classed as 'observed'.

2.2.2 The meaning of 'benchmark'

There is also no applicable definition of 'benchmark' in any of the relevant legislative materials.

The DNSPs consider that 'benchmark' in this context refers to a typical corporate bond rate. That interpretation is consistent with the ordinary meaning of the term 'benchmark'.

The DNSPs also consider that the meaning of benchmark is coloured by the preceding use of 'observed'. The use of these terms together show that the debt risk premium is to be based on the usual rates seen in the market.

As with the meaning of 'observed', this interpretation of 'benchmark' is also consistent with the AMI OIC referring to the debt risk premium as a 'market observable'. If the drafters of the AMI OIC had intended the debt risk premium to be based on something other than the typical corporate bond rate in the market, such as an 'efficient' rate (whatever that might mean), then they would not have referred to the debt risk premium as a 'market observable'. It is not possible to observe an 'efficient' rate by reference to the market.

The AER makes the following statement in the draft determination (in the context of excluding alleged 'outliers'):

> The AER considers that these bonds should not be included in any sample of bonds used to estimate an efficient benchmark corporate bond rate.[2]

This reference to estimating an 'efficient' benchmark bond rate shows that the AER has misdirected itself as to the requirements of the AMI OIC. There is nothing in the AMI OIC to support an interpretation that the debt risk premium is to be based on an 'efficient' corporate bond rate. The NER imposes requirements of efficiency in several other contexts, but it always does so explicitly, and in any event those other provisions of the NER are not relevant to the AMI OIC.

Instead, the AMI OIC expressly requires the debt risk premium to be based on the 'observed' benchmark corporate bond rate.

It is also extremely unclear what efficiency means in the context of a corporate bond rate, and how that concept could be relevant to determining a corporate bond rate.

2.2.3 The meaning of 'BBB+'

The credit rating for the debt risk premium is the credit rating determined by the AER in the SORI.

In the SORI, the AER determined that '[t]he credit rating level is BBB+'. The SORI does not explain what ratings agency this rating is based on. However, the final decision that

[2] Draft determination, page 121.

accompanies the SORI makes it reasonably clear that the AER intended this rating to refer to a rating from Standard and Poor's.

The DNSPs have therefore taken the approach that the credit rating for the debt risk premium in the AMI determination must also be BBB+ from Standard and Poor's.

2.3 There is no measure of the debt risk premium that meets all four of the AMI OIC requirements

The AMI OIC requires that all four of the AMI OIC requirements be satisfied. However, due in large part to the effects of the global financial crisis, there is no measure of the debt risk premium that meets all of the AMI OIC requirements.

The global financial crisis significantly affected the market for corporate bonds, especially corporate bonds with long terms to maturity and BBB+ (or lower) credit ratings. The loss of confidence in the markets and the flight to Government guaranteed debt made it almost impossible for a BBB+ corporate to issue new debt during the AMI measurement period. The level of trading in the secondary market for corporate bonds also declined to unprecedented levels.

These changes had a dramatic effect on the ability to measure a debt risk premium that complies with all of the AMI OIC requirements, as is shown from the following quotes that are referred to in the CEG report:

> "The market for non-financial institutions corporate bonds, similar to the assumed BBB+ grade used in the WACC model, effectively vanished from capital markets in the first half of 2008 against a total for $6.5 billion for the whole of 2007".[3]
>
> ...
>
> "Funding markets shut completely following the collapse of Lehman Brothers [in September 2008]. All global financial markets were dislocated by this event, but not surprisingly term debt markets were about the most affected."[4]

CEG summarises the effects of the global financial crisis on the market for BBB+ 10 year corporate bonds as follows:[5]

> In summary, during the AMI period the conditions in the secondary market for corporate bonds, which is the market covered by Bloomberg and CBASpectrum (being the other publisher of BBB+ fair value estimates), were such that:
>
> - there were few, if any, actual transactions in the secondary bond market;
> - there were no long dated BBB+ fixed coupon bonds and there have been very limited issue of new bonds (especially at the BBB+ credit rating); and
> - there was very low liquidity (in the sense that it is difficult to buy and sell without affecting prices) and there is a high premium associated with liquidity.

[3] Quote from Deloitte in a November 2008 report for the AER, see page 8 of the CEG report.

[4] Quote from a speech by the RBA Assistant Governor (Financial Markets) on 31 March 2009, see page 12 of the CEG report.

[5] CEG report, page 12.

2.4 The AER must therefore have regard to all relevant indicators of the DRP and adopt a measure that is consistent with all of the evidence

The result is a situation that the drafters of the AMI OIC did not foresee, where there is no available measure of the debt risk premium that meets all of the AMI OIC requirements.

In these circumstances, the AER is required to have regard to all relevant evidence and to determine the best approximation of a debt risk premium that meets all of the AMI OIC requirements.

That exercise necessarily involves the exercise of some discretion by the AER. However, the AER must exercise its discretion in a reasonable manner after having regard to all relevant considerations. The AER cannot ignore or give no weight to relevant considerations, such as the various measures of the corporate bond rate that have previously been provided by the DNSPs and the additional measures that are provided in this submission. The AER also cannot exercise its discretion in an unreasonable way by basing its decision on a measure of the corporate bond rate that is unreliable and inconsistent with the overwhelming majority of the evidence that is before the AER.

The DNSPs consider that the AER's approach to calculating the debt risk premium in the draft determination fails to meet these requirements.

3 The AER's use of the Bloomberg fair yield curves

3.1 Overview of the approach taken in the draft determination

In the draft determination, the AER determined that the debt risk premium should be 3.09%. The AER based its debt risk premium on the BBB 8 year fair yield curve published by Bloomberg plus the spread between the 8 and 10 year A rated Bloomberg fair yield.

The AER rejected the debt risk premium that was proposed by the DNSPs of 4.84%. The basis for the DNSPs' proposed debt risk premium was set out in the DNSPs' joint paper on the debt risk premium of 1 June 2009.[6] The DNSPs' proposed debt risk premium was calculated based on the 5 year BBB+ corporate bond issued by Tabcorp in April 2009, and was supported by various other sources of evidence regarding 10 year BBB+ corporate bond rates.

In the draft determination, the AER agreed that the DNSPs' analysis shows that the BBB Bloomberg fair yield curve is below all of:

- the CBASpectrum BBB+ fair yield curve;
- the yield on BBB corporate bonds as published by the RBA;
- yields for United States BBB/BBB+ bonds, including bonds issued by Australian corporates in the United States; and
- the Tabcorp bond.[7]

However, the AER did not accept that this information indicates that the Bloomberg fair yield curves are not a reliable measure of the debt risk premium.

Instead, the AER supported its use of Bloomberg by comparing it to:

- Bloomberg's data for the Snowy Hydro bond on two days during the AMI measurement period; and
- UBS and CBASpectrum data for the Snowy Hydro, GPT and Santos bonds (although the AER excluded GPT, which had a significantly higher yield, on the basis that it was an 'outlier').[8]

Based on the supporting evidence of these two individual bonds, and dismissing the contrary evidence of all of the bonds that the DNSPs analysed in the DNSPs' June 2009 paper, the AER determined that:

> Consequently, having considered the observed yields over the entire averaging period, and the yields published by other data sources, the AER found no evidence that the

[6] *Debt risk premium for use in the initial AMI WACC period, paper produced jointly by the Victorian Electricity Distribution Businesses, 1 June 2009* (the **DNSPs' June 2009 paper**).

[7] Draft determination, page 121.

[8] Draft determination, pages 121-122.

> Bloomberg fair yield curve underpriced yields observable in the Australian corporate bond market.[9]

This claim that there is 'no evidence' that Bloomberg underpriced the observed corporate bond rate is extremely surprising and is not supportable on the evidence that was before the AER. All of the information that the DNSPs provided to the AER is relevant evidence that Bloomberg underpriced the observed bond rate. The AER appears to have decided to not have regard to that evidence, or to give it zero weight.

In any event, this submission (and the attached CEG report) contains considerable new information that further supports the DNSPs' proposed debt risk premium and the fact that the Bloomberg fair yield curves produce a result that is significantly lower than the observed benchmark 10 year BBB+ corporate bond rate.

3.2 How the Bloomberg fair yield curves are calculated

Bloomberg's process for calculating fair yield curves

The exact process that Bloomberg uses to calculate its fair value curves is very unclear and non-transparent.

The DNSPs have asked Bloomberg a number of questions regarding the process. However, Bloomberg has been unwilling to provide the DNSPs with details as to how the curves are generated saying that this information is proprietary. The DNSPs have also been provided by Bloomberg with the response that Bloomberg sent to the ACCC/AER in response to a letter by the ACCC/AER dated 29 July 2009 asking Bloomberg a number of questions (**Bloomberg's letter to the AER**). [10]

Based on the information that is available to the DNSPs, Bloomberg's system of deriving the fair curves appears to be based on five steps:

1. Banks contribute prices for the bonds. There is no way of knowing whether these quotes were traded prices. Indeed, the DNSPs' analysis and research strongly suggests that there were few, if any, trades among the bonds in the Bloomberg BBB fair yield curve during the AMI measurement period and that the quotes given to Bloomberg were only estimates.

2. An input into the generation of the Bloomberg curve is the Bloomberg Generic Price ('BGN'). This BGN is based on the quotes of five dealers. The prices do not have to be traded or even 'executable' to be used. Bloomberg uses an undisclosed algorithm to convert the dealer quotes used to the BGNs. The BGNs are often different to the data that was input in step 1. The DNSPs do not know what Bloomberg does to the dealer quotes in converting them to the BGNs, as Bloomberg is unwilling to disclose any details regarding this process.

[9] Draft determination, page 122.

[10] Letter (undated) from Robin Pickover of Bloomberg to Anne Plympton, General Manager, Regulatory Development Branch, ACCC entitled *Re: Criticisms of Bloomberg FMC methodology and results*.

3. Bloomberg then inputs the BGN prices into an undisclosed algorithm to generate the fair curve, which includes the exclusion of 'outliers' on an undisclosed basis. The proprietary algorithms that Bloomberg uses are not disclosed, although the DNSPs understand this process is based on some kind of 'least squares' model together with an 'options adjusted spread' model. The prices Bloomberg uses for this step may be the BGNs, but Bloomberg has stated that it can also use other prices and even quotes from outside the credit category. Bloomberg will not disclose the additional pricing that it uses as inputs to the fair curve generation.

4. There is also an override capacity that allows Bloomberg analysts to vary the results from step 3 in an undisclosed manner. Bloomberg will not disclose the circumstances in which the Bloomberg analysts 'override' the straight 'mathematical' or formulaic derivation of the fair curve.

5. There also seems to be a process whereby Bloomberg uses assumptions about the line fit between two maturity points where there is no data or only scant data, but again this process is purposively undisclosed by Bloomberg and unknown by the DNSPs.

The AER's adjustments to the Bloomberg BBB fair yield curve

In the draft determination, the AER modifies the Bloomberg fair yield curves to produce its estimate of the debt risk premium for a BBB+ 10 year bond.

This additional step is necessary because Bloomberg does not produce a fair yield curve for 10 year BBB+ bonds. The AER acknowledges in the draft determination that 'Bloomberg has ceased publishing a 10 year BBB fair yield due to the lack of long dated BBB rated bonds in the market'.[11]

As a result, the AER uses the bond rate calculated from the Bloomberg 8 year BBB fair yield curve and then adjusts that curve for the spread between Bloomberg's 8 and 10 year A rated fair yields. The AER claims in the draft determination that the result is a measure of the rate for corporate bonds with a BBB+ rating and 10 year maturity.

The AER also averages the results from the Bloomberg fair yield curve over the AMI measurement period.

3.3 The Bloomberg fair yield curves do not meet the AMI OIC requirements

The AER's process therefore involves taking an 8 year fair yield curve that is based on estimates of BBB rated bonds and modifying it by reference to 8 and 10 year curves that are based on estimates of A rated bonds. None of these curves reflect the observed BBB+ 10 year bond rate during the AMI measurement period.

As a result, the Bloomberg BBB 8 year fair yield curve that the AER bases its draft determination on clearly does not meet all of the AMI OIC requirements. It only meets one of those requirements (it is measured during the AMI measurement period), and does not meet the other three requirements:

[11] Page 120 of the draft determination.

- **Not observed**: The Bloomberg fair yield curves are not based on 'observed' corporate bond rates, and are instead based on estimates that are provided by banks and then subjectively modified by Bloomberg in a highly non-transparent fashion.

- **Not 10 years**: The AER's debt risk premium is based on Bloomberg's 8 year BBB curve. That 8 year curve is based on estimates of corporate bonds that almost without exception have a maturity period of three to four years or less, and none of the corporate bonds have 8 or 10 years to maturity.

- **Not BBB+**: The AER uses Bloomberg's BBB curve, and modifies it by reference to Bloomberg's A curves. None of those curves are a measure of BBB+ corporate bonds.

Each of these points is explained below.

3.3.1 The fair yield curves are not 'observed'

The rates produced by the Bloomberg fair yield curves are not a measure of 'observed' corporate bond rates. The reasons for this fact are demonstrated by the description in section 3.2 above of how the Bloomberg fair yield curves are calculated.

The Bloomberg fair yield curves are based on estimates not actual market trades

The first reason why the Bloomberg curves are not a measure of the 'observed' bond rate is that the input data that Bloomberg uses is based on estimates rather than actual trades of corporate bonds in the market.

This fact is confirmed in Bloomberg's letter to the AER, which states:[12]

> BFV curves are created daily based off of bonds that fulfil the criteria of a curve, ie: rating, currency, market, etc. If a bond meets this curve and has a BGN price the bond will be included in the curve. There are times when Trade prices will be utilized in the creation of the curve, but it is not a requirement for the basic curve construction.

The particular weaknesses of the estimates relied on by Bloomberg during the AMI measurement period are discussed in more detail in section 3.4.1 below.

Bloomberg then adjusts the input data in a subjective and non-transparent way to produce the fair yield curves

This input data is then used by Bloomberg to create Bloomberg generic prices (BGNs), to which Bloomberg then applies undisclosed algorithms to create a fair yield curve. Bloomberg has also stated that it can input prices other than BGNs into these algorithms, including quotes from outside the credit category. Bloomberg also uses assumptions about the line fit between two maturity points where there is no data or only scant data available, which is particularly the case for longer maturity periods. Finally, Bloomberg analysts have discretion to override this curve to create a curve that the analyst considers to be more appropriate.

This process means that, even if the data that was used to create the fair field curves was a reasonable estimate for the observed market rate, the resulting fair yield curves are created

[12] Bloomberg's letter to the AER, page 1.

after a process involving considerable adjustments by Bloomberg and the curves cannot be said to be an observed measure of the market rate.

The non-transparency of this process is discussed in more detail in section 3.4.3 below.

The AER then adjusts the Bloomberg fair yield curves further to try to create a 10 year measure

As is discussed in more detail below in relation to the 10 year maturity requirement, the AER does not simply use one of the Bloomberg fair yield curves as the measure of the corporate bond rate. Instead, the AER takes the Bloomberg BBB 8 year fair yield curve and modifies it to create an estimate of a 10 year fair yield curve.

The AER has previously recognised that Bloomberg's fair yield curves are not an observed measure of the debt risk premium

The AER has made several previous comments that the Bloomberg fair yield curves are not an 'observed' measure of corporate bond rates and are instead only 'estimates' or 'predictors' of the observed yield. The following comments from the recent NSW distribution determination are examples of the AER's acknowledgement of this fact:

> The Babcock and Brown Infrastructure Group and the Adelaide Airport bonds were excluded because the yields reported by Bloomberg were fair yield estimates not yields based on prices from observed trades.[13]
>
> The review indicated that Bloomberg provided *estimates* of BBB+ rated long-term fair yields that were more consistent with the *observed yields of similarly rated actual bonds*.[14] [our emphasis]
>
> Bloomberg fair yields are a better *predictor of observed yields* than an average of Bloomberg and CBASpectrum fair yields or CBASpectrum fair yields alone. [our emphasis][15]
>
> Bloomberg data *should be used to estimate the debt risk premium* based on its analysis of the fair yields reported by Bloomberg and CBASpectrum, observed yields of BBB+ corporate bonds and the methodologies adopted by these two data providers. [our emphasis][16]

The resulting measure that is used by the AER is therefore several steps removed from anything that could be described as an 'observed' corporate bond rate. The Bloomberg curves therefore do not meet this AMI OIC requirement.

More compliant measures of 'observed' corporate bond rates include the Tabcorp bond issue (see section 4 below), the AMP bond issue (see section 5.2 below) and US and other overseas data (see sections 5.5 to 5.7 below).

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[13] Page 223 of the AER's *New South Wales distribution determination 2009-2010 to 2013-2014, Final decision, 28 April 2009*.

[14] As above, at page 226.

[15] As above, at page 232

[16] As above, at page 232

3.3.2 The fair yield curves are not based on corporate bonds with a 10 year maturity

As noted above, the AER acknowledges in the draft determination that 'Bloomberg has ceased publishing a 10 year BBB fair yield due to the lack of long dated BBB rated bonds in the market'. Instead, the AER uses Bloomberg's BBB fair yield curve, which is stated to be an 8 year curve, and then adjusts that curve to create an estimate of the rate for a 10 year maturity.

As a result, the Bloomberg BBB fair yield curve is not an observed benchmark for a 10 year corporate bond rate. At best, the Bloomberg fair yield curve is an observed benchmark for an 8 year corporate bond rate (although as discussed above the DNSPs consider that Bloomberg cannot be considered to be an 'observed' rate for even an 8 year maturity period).

However, the Bloomberg BBB fair yield curve cannot even be accurately described as a measure of 8 year corporate bond rates. The Bloomberg BBB fair yield curves during the AMI measurement period were not based on any bonds with a maturity of 8 years. Based on the limited information that is available regarding the bonds that were actually used by Bloomberg, it appears that almost all of the bonds that were used by Bloomberg to calculate this fair yield curve had maturity periods of no more than three to four years.

Accordingly, on no interpretation could the Bloomberg BBB curve be considered to be a measure of the 'observed annualised Australian corporate bond rate' for bonds with a 10 year maturity.

The Bloomberg curves therefore do not meet this AMI OIC requirement.

The AER's decision to use the Bloomberg fair yield curves is no more compliant with the 10 year maturity period requirement than the DNSPs' proposal to use the Tabcorp 5 year bond. It is less compliant with this requirement than several of the alternative measures the DNSPs discuss below, such as CEG's analysis of bond issues during the AMI measurement period with maturities of 4 to 10 years (see section 5.1 below), bond issues by Australian corporates into the US market (see section 5.5 below) and bonds issued in overseas markets during the AMI measurement period (section 5.7 below).

3.3.3 There is no BBB+ fair yield curve

The AER's debt risk premium is based on Bloomberg's 8 year fair yield curve for BBB rated bonds. The AER then modifies that curve by reference to Bloomberg's 8 year and 10 year curves for A rated bonds. None of these curves are a measure of the 'observed annualised Australian corporate bond rate' for bonds with a BBB+ rating.

The fact that the Bloomberg BBB fair value curve that the AER has relied on is not a measure of the BBB+ corporate bond rate is confirmed by the following statement in Bloomberg's letter to the AER:[17]

[17] Bloomberg's letter to the AER, page 2.

e) The Bloomberg BBB FMC was generated using bonds other than those rated BBB+ by S&P.

Comment:

Correct. This curve includes all BBB bonds BBB-/BBB/BBB+. At the current time we are unable to separate the curves into separate rating specific curves as there are insufficient bonds available with pricing in order to populate 3 separate curves.

The Bloomberg curves therefore do not meet this AMI OIC requirement. More compliant measures of a BBB+ corporate bond rate include the Tabcorp bond (see section 4 below) and CEG's analysis of BBB+ bond yields during the AMI measurement period (see section 5.1 below).

3.4 The Bloomberg fair yield curves are not a reliable indicator of a corporate bond rate that complies with the AMI OIC requirements

As demonstrated above, the Bloomberg BBB fair yield curve does not meet the AMI OIC requirements. The Bloomberg fair yield curves are therefore, at best, just one relevant consideration that the AER may have regard to when estimating a debt risk premium that complies with the AMI OIC requirements.

As explained in this section 3.4, there are also significant problems with the reliability of the Bloomberg fair yield curves that mean that it is unreasonable for the AER to base the debt risk premium on the Bloomberg curves.

Bloomberg's fair yield curves are an analytical tool that is intended by Bloomberg to be used to show if a bond is trading expensive or cheap when compared to similar bonds. The Bloomberg fair yield curves were never designed or intended by Bloomberg to operate as a regulatory measure of the cost of debt. Due in large part to the effects of the global financial crisis, the Bloomberg fair yield curves are not appropriate as a measure of the debt risk premium during the AMI measurement period. The following comments are not a criticism of Bloomberg, but are intended to show that the AER is attempting to use the Bloomberg fair yield curves for a purpose that those curves are simply not suited.

3.4.1 The fair yield curves are not based on actual trades and during the AMI measurement period there was insufficient data for them to be a reliable measure of BBB+ 10 year bonds

As explained above:

- the Bloomberg fair yield curves are based on estimates that are provided by banks, not actual market trades; and
- during the AMI measurement period, there were very few actual trades of corporate bonds, and no trades of BBB+ corporate bonds with 10 years to maturity.

As a result, the Bloomberg fair yield curves were based on estimates that were created with very limited information.

The difficulty in obtaining reliable information on corporate bond rates during the AMI measurement period is illustrated by the following quote from John Kimpton, Client Relationship Manager of Yieldbroker:

> The period from late November to early December 2008 was characterised by overall low market turnover and a broadening in market spreads for all asset classes. Corporate spreads (in both fixed and floating rate debt) were particularly affected with participant banks unwilling to provide pricing to end investors, with turnover in this sector being negligible. Yieldbroker also experienced difficulty in obtaining reliable indicative pricing data for corporate debt over this period, with the indicative yields for individual securities provided by pricemakers at participating banks varying widely.[18]

As a result of this absence of new bond issues and very low level of trades in the secondary market during the AMI measurement period, there is considerable doubt as to the reliability of the estimates that were used as inputs into the Bloomberg fair yield curves. This lack of actual market data meant that the banks that provided estimates to Bloomberg had very limited information on which to base their estimates. It appears that the estimates were based on trades from well before the AMI measurement period despite overwhelming evidence that the corporate bond rates had materially increased during the AMI measurement period.

In order to assess the level of actual trades during the AMI measurement period, the DNSPs asked seven banks whether any BBB to A rated corporate bonds were traded in this period and the term of those bonds. The results of this exercise are described in Appendix 4.

The answers of the five banks that provided information showed that:

- there appear to have been 30 or less trades during the entire AMI measurement period; and
- almost all of those trades related to bonds with less than three years to maturity, with the remainder being less than five years to maturity except for three trades in an A rated 6.5 year bond.

This lack of corporate bond issues and trades particularly affected the reliability of the Bloomberg curves in measuring the yields of bonds with long maturity periods. The AMI OIC requires the debt risk premium to be a measure of the yield on a corporate bond with a 10 year maturity period.

The lack of transparency in the Bloomberg data makes it difficult to know exactly what bonds were used to calculate the relevant fair yield curves, but it is reasonably clear that during the AMI measurement period the Bloomberg fair yield curves were not based on any bonds with a maturity close to 10 years. The information that is available to the DNSPs indicates that the Bloomberg curves were not based on any bonds with more than 6-7 years to maturity (and the only bond with such a maturity was Santos) and almost all of the bonds had no more than three to four years to maturity.

[18] Email from John Kimpton to Matthew Lemke (consultant to Powercor), 2 September 2009. Yieldbroker is the major broker in the fixed income market in Australia. It gives investors the ability to view live indicative prices and request competitive two-way markets in over 700 debt securities and captures over 30% of secondary market transactions in the dealer-to-client market.

Bloomberg's letter to the AER acknowledges these facts (although also recognising that the actual composition of the fair yield curves is not transparent so there is no way to confirm which bonds were used) in the following statement:

> **h) The Bloomberg BBB FMC was overly reliant on the yield of a single bond (Santos) in its projection of longer term maturities.**
>
> Comment:
>
> Again, similar to stated previously, the current bond makeup of the curve does not necessarily indicate what the makeup of the curve was historically. At this time, it is correct that Santos is the only bond that we have on the curve in the longer maturities.[19]

Given that rates will generally be higher for a longer term bond, this absence of data regarding longer term bonds makes the Bloomberg curves a particularly unreliable estimate of the yield on a 10 year bond and means that the Bloomberg curves are likely to materially underestimate the rate for a 10 year bond.

The following sections from the CEG report demonstrate how Bloomberg's reliance on estimates that were prepared during a time of unprecedented illiquidity and uncertainty affected the reliability of the Bloomberg fair yield curves: [20]

> 30. Consistent with the above views few, if any, actual transactions in the secondary bond market occurred during the AMI averaging period. In any case, given that such bonds are not generally traded in a centralised exchange but are bought and sold 'over the counter' it can be difficult to observe the prices on the trades that actually take place.
>
> 31. Even in normal market conditions yields attributed to a bond will generally not represent the results of actual trading on that day. Indeed Bloomberg has stated in 2007, before the full onset of the financial crisis, that up to 90% of the prices in its bonds database were indicative, not executable. The prices reported by financial institutions, to a large extent, simply reflect the informed opinion of industry players about a fair price for a particular bond.
>
> 32. It comes as no particular surprise then, that the yields reported for the same bond on the same day often vary considerably. For example, on 5 December 2008 various sources were quoting the yields shown in Table 1 below.

Table 1: Comparison of estimated yields on 5 December 2008

Issuer	Maturity	UBS	CBA	NAB Markets	ABN Amro
GPT	22/08/2013	13.140	16.608	13.538	10.939
Santos	23/09/2015	7.356	6.704	9.211	6.580

Source: Bloomberg, CBASpectrum, UBS.

> 33. Clearly, there would be significant arbitrage profits to be had if all of these yields reflected yields at which these institutions were willing to trade. For example, it would be very profitable to buy the Santos bond from NAB (quoting the highest yield which implies the lowest price for the bond) and sell it to ABN Amro (quoting the lowest yield). On the GPT bond it would be most profitable to buy from ABN Amro and sell to UBS.

[19] Bloomberg's letter to the AER, page 3.

[20] CEG report, page 13 (footnotes omitted).

> 34. Two observations can be made about this. First, the quotes in the above table simply cannot be prices at which the banks are willing to trade (or even prices at which they have traded on that day). Rather, they simply represent yields at which these institutions believe a trade would take place if it did take place on that day. Second, the wide divergence between the yield estimates for the same bond suggests that there has not been any recent known trades (ie, prior to the end of the AMI averaging period on 5 December 2008) of the bonds to anchor price expectations.

The DNSPs have also undertaken an analysis of the Santos bond that is believed to have been the only bond with a longer maturity that was used by Bloomberg to create the fair yield curves. This analysis is attached as Appendix 2. It shows that, prior to the global financial crisis, estimates of the yield for the Santos 2015 bond were reasonably consistent, but that during the AMI measurement period yield estimates for this bond were highly divergent and there was no market consensus price.

This analysis shows that the Bloomberg fair yield curves were based on data that was highly unreliable and does not reflect actual market trades. It also shows that there was considerable uncertainty in the market regarding the true value of BBB+ corporate bonds during this period.

The DNSPs proposed debt risk premium is based on an actual new bond issue by Tabcorp, and therefore does not suffer the same problems as the Bloomberg measure in this respect.

3.4.2 The fact that there is insufficient data for Bloomberg to calculate a fair yield curve for long maturity bonds is confirmed by Bloomberg's recent decision to cease publishing its long maturity curves

Bloomberg no longer publishes the 8 year BBB fair yield curve that the AER relied on in the draft determination.

On 29 August 2009, Bloomberg ceased publishing this curve. The longest BBB fair yield curve that Bloomberg now publishes is a 7 year curve. Bloomberg has advised the DNSPs that it shortened the 8 year curve to 7 years because there are 'no longer 8 year securities to calculate these curves'.[21]

On the same date, Bloomberg also ceased publishing its 8 year, 10 year and 15 year A fair yield curves. The longest fair yield curve that Bloomberg publishes for A rated securities is now 7 years, less than half of the previous longest term.

This shortening of the curves that Bloomberg publishes appears to represent an acknowledgement by Bloomberg that its curves are not a reliable indicator of the true value of longer term corporate bonds. Although this shortening occurred after the AMI measurement period, there has been a significant increase in liquidity in corporate bonds in the nine months since the AMI measurement period, so this weakness would have been even greater during the AMI measurement period.

This shortening of the curves appears to be part of a pattern of continued shortening of the fair yield curves by Bloomberg due to a lack of data on longer term maturity bonds. As the AER acknowledges in the draft determination, Bloomberg previously published a 10 year BBB fair

[21] Discussion between Matthew Lemke (consultant to Powercor) and the Helpdesk at Bloomberg on 3 September 2009.

yield but ceased publishing that curve prior to the draft determination 'due to the lack of long dated BBB rated bonds in the market'.[22]

The shortening of these curves therefore supports the view that Bloomberg's fair yield curves are not a reliable indicator of the 10 year corporate bond rate.

3.4.3 The manner in which the fair yield curves are calculated is not transparent

As noted above, the DNSPs have asked Bloomberg a number of questions as to how the fair yield curves are created, and the summary of the Bloomberg process in this submission is based on several months of questions and answers backwards and forwards with Bloomberg. However, the DNSPs still do not have a full understanding of how Bloomberg creates the fair value curves.

As explained in section 3.2 above, based on the information that is available to the DNSPs, Bloomberg's system of deriving the fair curves appears to be based on five steps:

1. Banks contribute prices for the bonds. There is no way of knowing whether these quotes were traded prices. Indeed, the DNSPs' analysis and research strongly suggests that there were few if any trades among the bonds in the Bloomberg BBB (and A) fair yield curves during the AMI measurement period and that the quotes given to Bloomberg were only estimates.

2. An input into the generation of the Bloomberg curves is the Bloomberg Generic Price ('BGN'). This BGN is based on the quotes of five dealers. The prices do not have to be traded or even 'executable' to be used. Bloomberg uses an undisclosed algorithm to convert the dealer quotes used to the BGNs. The BGNs are often different to the data that was input in step 1. The DNSPs do not know what Bloomberg does to the dealer quotes in converting them to the BGNs, as Bloomberg is unwilling to disclose any details regarding this process.

3. Bloomberg then inputs the BGN prices into an undisclosed algorithm to generate the fair curve, which includes the exclusion of 'outliers' on an undisclosed basis. The proprietary algorithms that Bloomberg uses are not disclosed, although the DNSPs understand this process is based on some kind of 'least squares' model together with an 'options adjusted spread' model. The prices Bloomberg uses for this step may be the BGNs, but Bloomberg has stated that it can also use other prices and even quotes from outside the credit category. Bloomberg will not disclose the additional pricing that it uses as inputs to the fair curve generation beyond the BGNs.

4. There is also an override capacity that allows Bloomberg analysts to vary the results from step 3 in an undisclosed manner. Bloomberg will not disclose the circumstances in which the Bloomberg analysts 'override' the straight 'mathematical' or formulaic derivation of the fair curve.

5. There also seem to be a process whereby Bloomberg uses assumptions about the line fit between two maturity points where there is no data or only scant data, but again this process is purposively undisclosed by Bloomberg and unknown by the DNSPs.

[22] Page 120 of the draft determination.

The manner in which each of these steps occur is highly non-transparent and it is unclear precisely what occurs at each stage.

Bloomberg states that it does not retain any of the input data that it uses to create its fair yield curves. Bloomberg also does not disclose its algorithms or the way in which the curves can be modified by analysts at the final stage, and Bloomberg states that this information is confidential and proprietary. As a result, the AER has not been able to scrutinise the Bloomberg methodology to determine that it will result in a reasonable and reliable estimate of the debt risk premium.

These facts are confirmed in Bloomberg's letter to the AER:

> When referencing which bonds are on the curve, unless a screen shot has been taken of the bonds on the curve, on the date in question, there is no way for us to know what bonds were on the curve, on the date in question. Although at this time there is no bond at that maturity point, there may have been previously. Further details of how we determine maturity points where there are no bonds, are proprietary.[23]

In Appendix 3 to this submission, the DNSPs have set out an analysis of the process used by Bloomberg and whether it meets the normal global standards for calculating a reference rate.

3.4.4 The calculation of the fair yield curves involves significant discretion

The creation of the fair yield curves by Bloomberg is a multi-step, complicated, non-transparent, unverifiable process involving undisclosed proprietary models, and considerable Bloomberg discretion on a non-disclosed basis.

In particular, Bloomberg has stated that: [24]

- 'The absence of a BGN cannot always be taken to mean that the bond in question was not taken into consideration in curve creation.'
- 'The Bloomberg analyst has discretion to use approved alternate pricing to flesh out a curve when it is needed. Bloomberg could also use, depending on the reliability of the pricing source, another source such as a CBBT or a BCMP price to flesh out a curve.'
- 'Analysts do have the discretion to refer to other curves in a 'set' (which might be other Australian dollar credit curves) to 'flesh out' a curve. If there are bonds on the curves in other ratings then Bloomberg may determine that they will keep a curve out longer than they have bonds, and monitor the shape and movement by that of the curves in other ratings.'
- 'Bloomberg fits 'point to point' according to a 'least squares method' to minimise the option adjusted spread for bonds of a given credit quality. So if there is only 1 extant BBB bond between constant maturity points Bloomberg will generally still fit the curve between the 5 and 7 year points.'

[23] Bloomberg's letter to the AER, page 2.

[24] Emails from Robin Pickover of Bloomberg to Matthew Lemke (consultant to Powercor) dated 15 July 2009 and 10 September 2010, and email from Robin Pickover of Bloomberg to Julie Williams dated 18 May 2009.

Appendix B of the CEG report also analyses the level of discretion exercised by Bloomberg in creating the fair value curves. The CEG report demonstrates that there is a high level of discretion exercised by Bloomberg in relation to:

- estimating 'consensus' bond yields;
- excluding outliers; and
- fitting curves.

The CEG report concludes in relation to the implications of this high level of discretion that:[25]

> i) Bloomberg uses discretion and a proprietary approach in arriving at its pricing for individual bonds. The effect of the exercise of this discretion on its estimated pricing for individual bonds is unknown;
>
> ii) Bloomberg appears to limit the construction of its fair value curves to rely heavily on information contained in bond prices within that credit rating and only peripherally to information contained in bonds in other credit ratings. This can be advantageous where that bond pricing data is plentiful. However, in the current market circumstances when bond pricing data is scarce it can be problematic.
>
> iii) Bloomberg uses discretion in determining which of these bonds it will use to determine the fair value curves. The basis for this discretion in unknown. The effect of this discretion in recent history appears to be to reduce estimated fair value curves.
>
> iv) To the extent that this reflects a Bloomberg policy of estimating fair value curves for liquid corporate bonds then it is likely to make the Bloomberg fair value curves an inappropriate proxy for the NER benchmark corporate bond rate in a market where most corporate bonds are illiquid.
>
> v) Bloomberg uses discretion in the construction of the fair value curves (both within periods it has data and beyond the periods for which it has data). The effect of this discretion is to reduce the estimated fair value spread to CGS for long dated bonds. It is unclear what basis Bloomberg might have for assuming that this is appropriate.

3.4.5 The approach to the removal of 'outliers' cannot be justified

In the draft determination, the AER states that:

> it is not unexpected that the fair yields published by Bloomberg were lower than the yields published by CBASpectrum and the RBA because Bloomberg excludes outlier bonds in the derivation of its fair yield values. The AER understands that CBASpectrum and the RBA did not exclude outliers in the calculation of their yields.[26]

There are several serious problems with this inference that the exclusion of outliers makes the Bloomberg fair yield curves a more reliable measure of the debt risk premium than alternative measures that do not exclude outliers.

The first problem is that it is not known what approach Bloomberg took to the exclusion of outliers, which bonds Bloomberg classified as outliers, or what was the basis for that classification. The AER has not described Bloomberg's approach to the exclusion of outliers, and it appears that the AER has no information on Bloomberg's approach.

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[25] CEG report, page 94.

[26] Draft determination, page 121.

It appears from comments by Bloomberg that Bloomberg does not have any specific rules that it applies to exclude outliers. Instead, outliers are excluded in a non-transparent and discretionary manner.

Bloomberg's letter to the AER states this fact very clearly in the following passage:

> In response to bonds that are considered outliers on a curve, the criteria for exclusion are not transparent.[27]

While it may in some circumstances be appropriate to exclude certain bonds as outliers, or at least to reduce the weight given to those outliers, it is not possible to say that the Bloomberg approach is more reliable simply because it excludes outliers. It is equally likely that the exclusion of outliers causes the Bloomberg fair yield curves to be unreliable and not reflect the observed market rate.

The AER has made no attempt to undertake an examination of which bonds to have regard to or not have regard to and the implications of excluding outliers for the reliability of the curve, and it appears that it does not have sufficient information to enable it to do so. Classifying a bond as an outlier simply because its yield is higher than the yield of other bonds does not make the measure more reliable. Instead, it simply makes the measure inherently biased towards lower yielding bonds, especially given that no low yielding bonds are excluded as outliers.

The AER states in the draft determination that:

> During the AMI measurement period some bonds were reporting significantly higher yields indicating that investors no longer considered these bonds to be of investment grade. The AER considers that these bonds should not be included in any sample of bonds used to estimate an efficient benchmark corporate bond rate.[28]

Even putting to one side the fact that the AER does not know which bonds were excluded by Bloomberg as outliers or why they were excluded, this statement is also problematic because it asserts that the reason why the yields for several bonds have risen is that 'investors no longer considered these bonds to be of investment grade'. That assertion is not consistent with supporting evidence regarding the effects of the global financial crisis. There is strong evidence that yields for corporate bonds were increasing dramatically during this period as a result of the global financial crisis, particularly for relatively low rated BBB+ bonds.

An increase in the yields of BBB+ bonds during this period is entirely consistent with Standard and Poor's description of the BBB rating, which is:

> BBB: An obligation rated 'BBB' exhibits adequate protection parameters. However, adverse economic conditions or changing circumstances are more likely to lead to a weakened capacity of the obligor to meet its financial commitment on the obligation.[29]

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[27] Bloomberg's letter to the AER, page 2.

[28] Draft determination, page 121. As noted in section 2.2.3 above, the AER's reference to estimating an efficient benchmark also shows that the AER has misunderstood the requirements of the AMI OIC, which require the debt risk premium to be based on observed corporate bond rates, not an estimate of an 'efficient' corporate bond rate, whatever that may mean.

[29] CEG report, page 18 (footnote omitted).

The global financial crisis was a time of unprecedented 'adverse economic conditions' and 'changing circumstances' so it was entirely expected that the yields on many BBB+ bonds would increase during this period.

The exclusion of those bonds as outliers solely on the basis that their yields were materially higher than some of the other bonds cannot be justified. There is no evidence that these higher yields did not simply relate to more up-to-date estimates of the market's actual value of BBB+ corporate debt at the relevant time, or the fact that estimates of actual yields varied more than usual during this period.

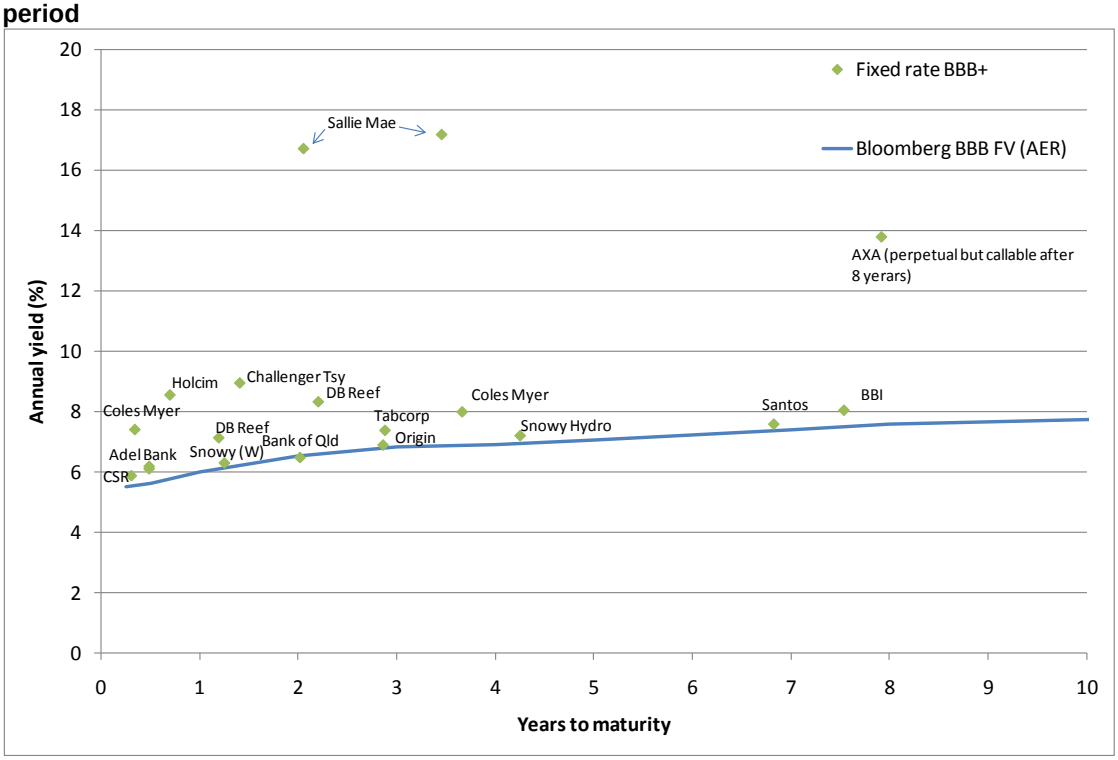
The exclusion of outliers is also particularly problematic given that the data set of corporate bonds in the Australian corporate bond market is small and some of the longer dated bonds have a relatively small amount of bonds on issue (eg Santos 2015 has just $100 million of bonds on issue). In an environment already constrained for price information, the exclusion of outliers only serves to further reduce the information pool on which the data is based, and makes it difficult to arrive at a reliable method for identifying outliers.

CEG's analysis of bond yields during the measurement period also shows that the differences between Bloomberg's fair yield curves and all other measures of the debt risk premium cannot be explained by any reasonable approach to the exclusion of outliers. The only way in which the exclusion of outliers could explain the differences between the Bloomberg fair yield curves and the bond data that CEG has analysed is if Bloomberg excluded the majority of the bonds as outliers, including all the bonds that are materially above the fair yield curve but no bonds that are below the fair yield curve.

The following graphs and commentary from the CEG report are particularly compelling in this respect:[30]

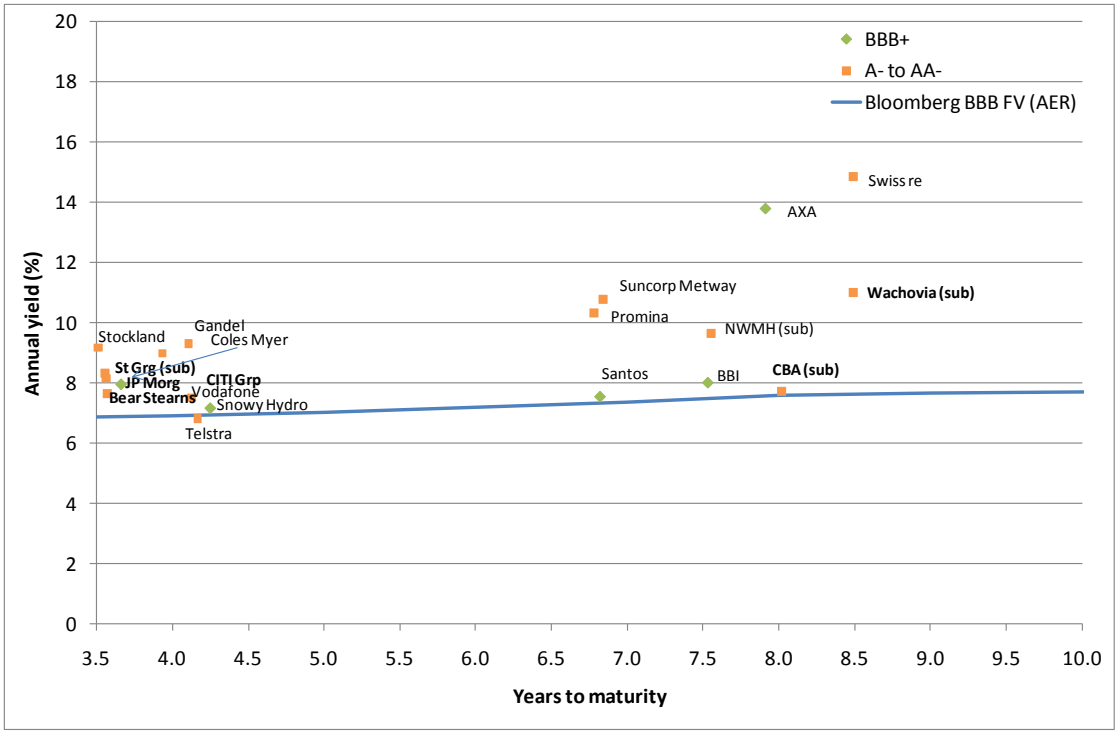
[30] CEG report, pages 25, 30, 32 and 33.

Figure 3: Average yield estimates for BBB+ fixed coupon bonds during AMI averaging period



...

Figure 8 Average yield estimates for BBB+ to AA- rated fixed coupon bonds during AMI averaging period – bonds with maturity between 3.5 and 10 years



...

96. I now turn to whether the bond yields included in the UBS rate sheet are somehow skewed by the inclusion of "outliers" in the analysis and whether this could explain why the AER proxy for the benchmark corporate bond rate underestimates the average of these bond yields.

> 97. Consideration of this issue is straight forward. Of the 20 unique issuers of fixed rate bonds with ratings between BBB+ and AA- all but one have a higher yield than the AER/Bloomberg fair value curve predicts for BBB+ bonds. The exceptional issuer is Telstra which is A rated and has only a fractionally lower yield than the AER/Bloomberg BBB+ fair value. The only basis for concluding that this effect was explained by "outliers" would be to assume that all, or almost all, corporate bond issuers are outliers. This is despite the fact that most of these bonds have a rating higher than BBB+ and, consequently, the AER/Bloomberg BBB+ fair value curve should be overestimating the yields on these bonds.
>
> 98. I am unaware of any definition of an outlier that would involve treating most, let alone all, of the available data as outliers.

The CEG report also discusses the treatment of outliers in more detail at pages 55 to 57.

3.4.6 The rate at which a DNSP could issue a new bond in the market will be at a significant premium to the Bloomberg fair yield curves

Bloomberg has advised the DNSPs that:

> Bearing in mind that the curves are representative of secondary market prices and trading sizes, new issues have always been issued at a premium to this curve. In settled market conditions, the premium required to 'get away' a new issue might have been quite small. My experience has been that the premium has increased during this period of market turbulence as buyers have demanded a greater risk premium.[31]

Similar comments are made in the CEG report: [32]

> 17. Finally, it is relevant to note that the cost of debt to a firm is the interest rate incurred by the firm at the time of issue. There are sound economic reasons for believing that the interest rate at which bonds trade at in the secondary market will be lower than the interest rate at which those bonds are issued initially (other things constant). This reflects the fact that the initial sale of the bonds represents the sale of 100% of the relevant bonds over a short period (often over a single day in a book build process). By contrast, secondary trades of the bond are almost always for much smaller parcels of the bond (a few percent of the total amount outstanding). Unless the corporate bond market is perfectly liquid then an initial sale of a large volume of bonds will always, other things equal, result in a lower bond price (higher yield) than subsequent secondary sales.
>
> ...
>
> 95. I consider that the secondary market yields estimated by UBS (and others) are likely to be materially lower than the yields that would have had to be paid by similar companies to issue new debt during the AMI averaging period (which was particularly affected by the impact of the global financial crisis).

Accordingly, the Bloomberg fair yield curves will necessarily provide an estimate of the debt risk premium that is lower than the debt risk premium that the DNSPs would incur if they sought to raise funds in the market.

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[31] Email from Robin Pickover of Bloomberg to Julie Williams of Powercor dated 17 May 2009. Also referred to in the DNSPs June 2009 paper to the AER.

[32] CEG report, pages 6 and 32 (footnotes omitted).

Bloomberg has also stated that:

> BFV is not intended to be used as a predictive price of newly issued bonds. BFV, by definition, is a value, intended to indicate if a bond is trading rich or cheap as compared to peer bonds (as defined by the curve).[33]

Bloomberg therefore expressly disclaims any suggestion that its fair yield curves can be used as a benchmark of the actual cost of capital that would be faced by a DNSP. That disclaimer raises significant questions about the appropriateness of the AER placing sole reliance on those curves to calculate the debt risk premium.

3.4.7 The movement of the fair yield curves is inconsistent with consensus opinion on the effects of the global financial crisis

The global financial crisis had a dramatic effect on bond markets. The rates for Government bonds fell to record lows while the rates for corporate bonds increased markedly as investors' appetite for risk disappeared.

The result should be a significant increase in the debt risk premium, which measures the spread between the observed rates of 10 year Commonwealth Government bonds and 10 year corporate bonds. This effect should have been particularly pronounced for relatively low rated BBB+ corporate bonds.

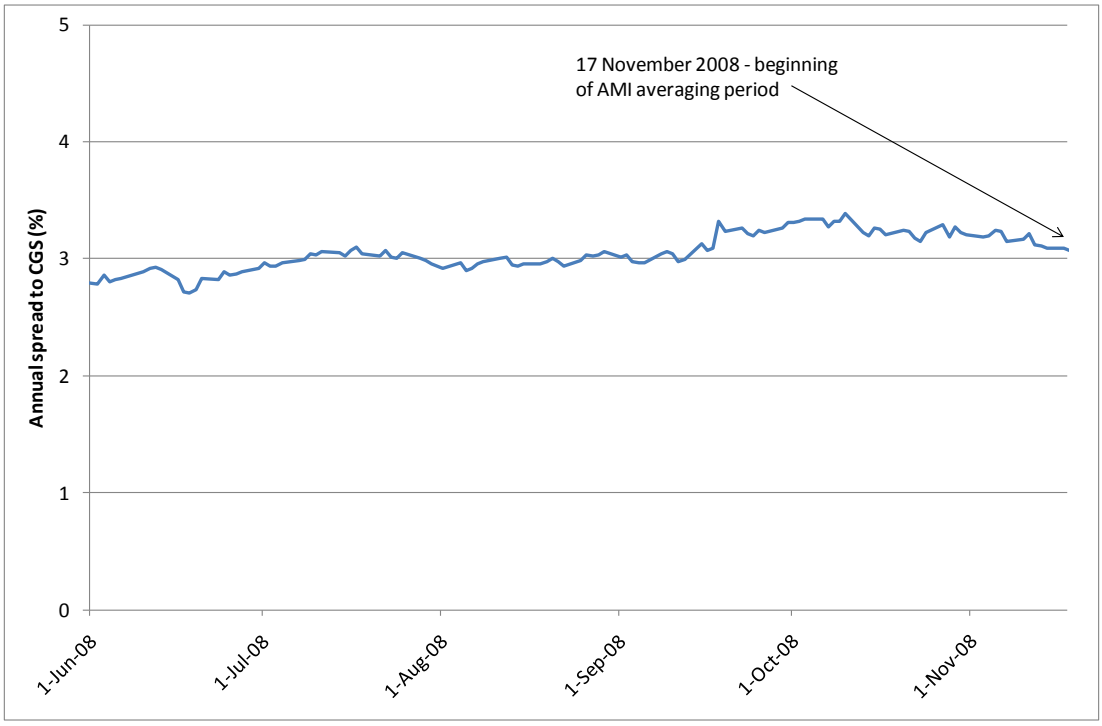
However, during the worst of the global financial crisis, the Bloomberg fair yield curves did not show any material increase in the debt risk premium. That lack of change is totally at odds with all evidence regarding the effect of the global financial crisis. It is a clear sign that the Bloomberg fair yield curves were not a reliable measure of the debt risk premium during this period and that the estimates on which the curves were based had not been updated to reflect what was occurring in the market.

The effects of the global financial crisis on bond markets are described in section 3.1 of the CEG report. The following graph and commentary from the CEG report summarises the lack of change in the debt risk premium as measured by Bloomberg during the global financial crisis:[34]

[33] Bloomberg's letter to the AER, page 3.

[34] CEG report, page 19.

Figure 1: Bloomberg (AER) estimated spreads to CGS on 10-year BBB+ corporate bonds



Source: Bloomberg, RBA

This figure shows that debt premia as estimated by Bloomberg did not rise materially over the period September to November. There appears to be no significant reaction to the events of September and October 2008. This pattern does not appear to accord with what one would reasonably expect to be the case given the perceived financial and economic conditions and the definition of BBB credit ratings.

The CEG report then compares Bloomberg's corporate bonds spreads with RBA estimates and concludes that:[35]

66. The Bloomberg data indicate a levelling off of spreads from about June 2008, at around or just less than 300 basis points. However, the RBA's estimates indicate that, after a brief downturn, spreads continue to increase to over 400 basis points.

67. In my opinion the Bloomberg fair value yields did not adequately capture the effect of the global financial crisis on debt markets over the period through to the beginning of the AMI averaging period on 17 November 2008, either in terms of:

    - what would have been expected as a result of the crisis, as per the statements of experts (including the RBA) as described at section 2 above; and
    - the data for BBB bond yields published by the RBA.

[35] CEG report, page 23.

3.4.8 The information that the AER uses to support the Bloomberg fair yield curves is not reliable

In the draft determination, the AER seeks to support its use of the Bloomberg fair yield curve by comparing it to:

- Bloomberg's data for the Snowy Hydro bond on two days during the AMI measurement period; and
- UBS and CBASpectrum data for the Snowy Hydro, GPT and Santos bonds.[36]

However, the AER decided not to have regard to the GPT bond, which had an average yield of 13.8%, on the basis that it should be treated as an 'outlier'.[37]

As a result, the AER only considered the bond rates for two bonds. Those two bonds had only 4 years (Snowy Hydro) and 6-7 years (Santos) to maturity.

The AER has not provided any evidence that the information regarding these two bonds is based on actual trades in these bonds during the AMI measurement period. The DNSPs inquiries of banks (see Appendix 4) did not reveal any evidence that there were any trades in either Santos bonds or Snowy Hydro bonds during the AMI measurement period.

Even this limited evidence could only support the Bloomberg curves because the AER chose to treat the highest of the three bonds that it had information about as an 'outlier' but not treat Santos as an outlier despite Santos not being reflective of a typical BBB+ corporate bond. That approach cannot be justified and leads to a misleading result.

The approach of excluding GPT as an outlier with a high yield but not excluding Santos as an outlier with a low yield is unjustified and unreliable. As discussed in the CEG report, Santos was effectively debt free at the time and as a result the market would have perceived the risk associated with Santos bonds to be significantly lower than usual for BBB+ bonds.

The CEG report states in relation to Santos:[38]

> 215. The explanation for this peculiarly low yield would appear to be at least partly explained by the fact that at the time Santos was effectively debt free. On 31 December 2008 Santos reported current assets (cash and cash equivalents plus other liquid assets) of $2.48bn which exceeded interest bearing loans and borrowing of $2.45bn. Santos' cash and cash equivalents plus the value of swap contracts alone were reported at $1.95bn leaving net debt (interest bearing loans less $1.95bn) at only $0.51bn. On 31 December 2008 Santos equity market capitalisation was around 8.5bn. This gives Santos a debt to market equity ratio of around 6% and a debt to total assets (equity plus debt) of around 5%. This very low level of debt, combined with a long maturity profile for the debt it had, would appear to have insulated Santos' from the events in credit markets at the time – a fact explicitly acknowledged by Santos.
>
> ...
>
> 217. It is reasonable to conclude that the very low levels of debt owed by Santos meant that it was not typical of a BBB+ rated firm – and certainly was not typical of the hypothetical

[36] Draft determination, pages 121 to 122.

[37] Draft determination, page 122.

[38] CEG report, pages 67 to 68 (footnotes omitted).

> benchmark 60% geared regulated utility. This is not a reason for excluding the yield on the Santos bond from calculations of a BBB+ benchmark rate. The Santos bond was BBB+ rated at the time and other factors would have entered into this long term credit rating (including expected increases in Santos' future capital expenditure and volatility in energy prices to which it is exposed).

The AER's only evidence to support the use of the Bloomberg fair yield curves is therefore based on indicative estimates of two corporate bonds with maturity period of 4 and 6-7 years.

The AER has also failed to adjust the yields on these two bonds to reflect the fact that their terms are less than 10 years and they would therefore be expected to underestimate the yield on a 10 year bond.

This evidence therefore provides very little support for the use of the Bloomberg fair yield curves. The unreliable nature of relying on just these two corporate bonds is further demonstrated in section 5.1 below which discusses CEG's analysis of over 600 corporate bonds, which shows that the Bloomberg fair yield curve is below almost all relevant corporate bond yields during this period.

3.4.9 Conclusion on the reliability of the Bloomberg fair yield curves

The above weaknesses with the data used by Bloomberg and the process undertaken by Bloomberg mean that the Bloomberg fair yield curves are not a reliable indicator of a debt risk premium that meets the AMI OIC requirements.

The conclusion of the CEG report on the reliability of the Bloomberg fair yield curves is as follows:[39]

> Based on the empirical evidence outlined above it is my opinion that the AER/Bloomberg BBB+ fair value curve is not a reliable estimator of benchmark BBB+ yields based on observations from the corporate bond market. This conclusion holds at every maturity level but is especially strong at longer maturities approaching 10 years.

[39] CEG report, page 46.

4 The DNSPs' proposed measure of the debt risk premium: the Tabcorp bond issue in April 2009

The DNSPs propose that the appropriate debt risk premium is 4.84%. This debt risk premium is based on the bond issue by Tabcorp in April 2009.

The DNSP's June 2009 paper discusses Tabcorp's bond issue in detail. The Tabcorp bond issue is also summarised in the following section of the CEG report:[40]

> Tabcorp announced the issue of a 5 year BBB+ rated bond on 24 March 2009. The Tabcorp bond issue is a 5 year issue and was rated at BBB+ by Standard and Poors immediately prior to its issue. It will pay a floating interest rate which is reset every three months to be equal to the then prevailing 3 month bank rate plus a margin of 400bp to 450bp. On 1 April 2009 Tabcorp announced the results of a bookbuild process that set the margin in the middle of this range at 425bp. Tabcorp will also pay a 'bonus' interest payment of 0.25% for the first year to some retail investors. The issue size is expected to be around $200m.

The DNSPs' June 2009 paper and the CEG report describe how the rate of the Tabcorp bond issue can be converted into an annualised fixed yield to maturity rate. The CEG report states that this process results in an equivalent fixed annualised yield in excess of 8.87% (the actual equivalent rate may be higher due to bonus interest that is payable by Tabcorp).

The DNSPs have then adjusted this rate to arrive at an estimate of the yield on the Tabcorp bond had it been issued during the AMI measurement period and had it had a maturity period of 10 years. This process results in a yield of 9.48%, which equates to a debt risk premium of 4.84%.

The process used to reach this figure is described in the DNSPs' June 2009 paper and in the CEG report. The CEG report states:[41]

> In my view converting observed trades from outside the AMI period into equivalent yields inside the AMI period is a reliable approach to determining the benchmark rate in the AMI period given the paucity of traded data during the AMI averaging period. I also note that the Victorian DB's estimate falls within a reasonable range given other available data.

This Tabcorp issue is a very reliable measure of the debt risk premium for the AMI determination. Although the issue was outside the AMI measurement period, it is the first non-financial sector corporate bond and first BBB+ corporate bond issued in Australia since October 2007. The Tabcorp issue is therefore very clearly a measure of the BBB+ observed Australian corporate bond rate.

The Tabcorp issue is for a maturity of 5 years, which is less than the 10 year maturity required by the AMI OIC, but there is no available data on 10 year bonds issued or traded in Australia during or near the AMI measurement period. The Bloomberg 8 year fair yield curve that the AER has relied on is also not a measure of 10 year bond rates, and the data that was used to prepare those curves primarily related to bonds with maturity period of three years or less.

[40] CEG report, page 36 (footnotes omitted).

[41] CEG report, pages 52 to 53.

Given that yields can reasonably be expected to be higher for longer term bonds, the unadjusted Tabcorp 5 year bond can reasonably be interpreted as a conservative estimate of a 10 year BBB+ bond rate. The Tabcorp rate will also be an underestimate because of the issuing costs that are incurred for new issues. Those costs are discussed in Appendix A of the CEG report.

The Tabcorp bond issue therefore provides important current information on the yield demanded by investors for BBB+ corporate debt in the current environment, and acts as a lower bound on the actual BBB+ corporate bond rate.

The CEG report considers the reliability of the Tabcorp bond as a measure of the 10 year BBB+ corporate bond rate and reaches the following conclusions:[42]

> 141. The best available evidence of actual trades in BBB+ (and other) rated bonds proximate to the AMI averaging period confirms the analysis undertaken in prior periods (ie, the lead up to and during the AMI averaging period). Namely, the AER/Bloomberg BBB+ fair value curve significantly underestimates the market observed yields on BBB+ bonds (and even on higher rated bonds).
>
> 142. The Tabcorp bond is the best observation available of a traded BBB+ bond with a medium term maturity that is proximate to the AMI averaging period. Importantly, it is also an observation of the cost of debt *to an issuer* and therefore is desirable as a source of information on the benchmark rate (see criterion i at paragraph 50). The yield at issue on the Tabcorp bond issue can reasonably be viewed as an underestimate of the benchmark rate because the issue was a retail issue and, as such, incurred higher direct transaction costs in reaching retail customers with the pay-off for incurring these costs being lower interest costs paid by Tabcorp.
>
> 143. This observation provides a clear basis for believing that Bloomberg fair value estimates underestimate the benchmark rate.
>
> 144. Of course, the Tabcorp issue is only one observation for one bond. However, the AER/Bloomberg methodology is also effectively based on a single bond (as described below, Santos drives the value of the Bloomberg BBB 8 year fair value). There is also no evidence that the Bloomberg Santos price reflects an actual trade of the bond as opposed to an estimate of its yield. In addition, the Bloomberg estimate for Santos is based on an estimate of the yield associated with a hypothetical trade in the secondary market and not the interest costs to the issuer (as is the case for the Tabcorp observation).
>
> 145. On this basis, to the extent that one was required to set the benchmark on the basis of a single observation it would be preferable for that observation to be based on the actual traded price for the Tabcorp new issue than on a Bloomberg estimate of the hypothetical secondary market traded price for Santos.

Given the inability to observe the corporate bond rate accurately during the AMI measurement period, the AER must have regard to and place considerable weight upon actual bond issues outside of that period. In circumstances where there is no measure of the debt risk premium that meets all four of the AMI OIC requirements, the AER cannot disregard the Tabcorp issue simply because it is outside of the AMI measurement period.

Equally, the fact that the maturity period of the Tabcorp bond is only 5 years does not allow the AER to disregard it. That is particularly so given that the AER's proposed measure is clearly not a measure of 10 year bonds. The DNSPs have converted the Tabcorp yield into a 10 year

[42] CEG report, pages 44 to 45.

rate and it meets this AMI OIC requirement at least as well as the Bloomberg 8 year BBB fair yield curve.

The DNSPs do not justify their proposed debt risk premium solely on the basis of the Tabcorp bond issue. Instead, the DNSPs have chosen Tabcorp as the measure of the debt risk premium because it is a reliable measure of the debt risk premium and it is strongly supported by a consideration of the range of potential measures of the debt risk premium that are discussed in the next section of this submission.

The DNSPs could have instead proposed another of the measures that are set out in the next section. However, the DNSPs consider that having regard to all of the potential measures of the debt risk premium, the Tabcorp issue provides a debt risk premium that is significantly more reliable than the AER's approach in the draft determination but that is still a conservative estimate of the debt risk premium.

5 Alternative measures of the debt risk premium

This section discusses other measures of the debt risk premium that are a more reliable, or at least equally reliable, measure of the 10 year BBB+ corporate bond rate when compared to the AER's approach in the draft determination.

This section also demonstrates that the Bloomberg fair yield curves produce a debt risk premium that is markedly lower than any of these other measures. Indeed, as shown in section 5.1, the Bloomberg fair yield curves are lower than almost all observed bond yields during the AMI measurement period.

The information in this section shows that the Bloomberg curves are not a reliable measure of the debt risk premium for a 10 year BBB+ corporate bond and that, having regard to the range of possible measures, no reasonable regulator would choose to rely on Bloomberg as the measure of the debt risk premium. This information also shows that the Tabcorp bond issue is significantly more consistent with the range of potential measures of the debt risk premium.

5.1 CEG's analysis of bond yields during the AMI measurement period

The CEG report contains an analysis of data for over 600 Australian corporate bonds during the AMI measurement period. The data set is described in the CEG report as follows:[43]

> I have obtained yield estimates during the AMI averaging period for over 600 bonds issued in Australian dollars but not issued by Commonwealth or State Governments. The yield estimates are sourced from Bloomberg, AFMA, UBS rate sheets, CBASpectrum and Reuters. From Bloomberg I have individual yield estimates from Westpac, ANZ, NAB markets, ABN Amro. Not all of these yield sources provide a yield estimate for every bond. .The three most comprehensive sources in terms of bonds covered are UBS, AFMA and CBASpectrum. I have used the Standard and Poor's credit ratings assigned to each bond as reported by UBS where this is available and by AFMA where it is not. In some cases I have altered the credit rating assigned to these bonds by UBS/AFMA to reflect known discrepancies with actual ratings during the AMI period (eg, GPT is rated BBB while UBS has it rated at BBB+). The full set of data used is provided in separately in spreadsheet form.

CEG has then analysed this data to determine a measure of the BBB+ Australian corporate bond rate during the AMI measurement period.

5.1.1 CEG's analysis of BBB+ rated bonds

The results of CEG's analysis of BBB+ rated fixed bonds are shown in the following table, which is derived from tables 9 and 10 from the CEG report:[44]

	All BBB+ fixed bonds	**BBB+ fixed bonds with 4 to 16 years maturity**
Mean (% yield)	5.08	4.92
Median (% yield)	3.70	3.50

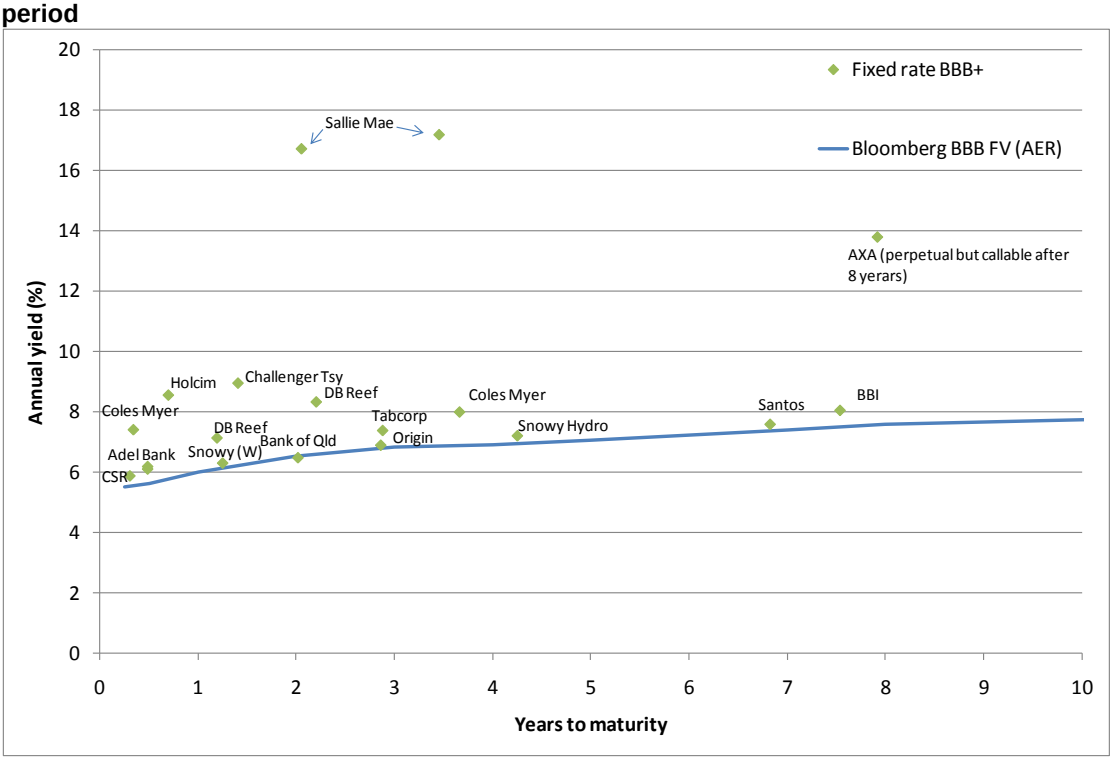
[43] CEG report, page 24.

[44] CEG report, pages 53 and 54.

	All BBB+ fixed bonds	BBB+ fixed bonds with 4 to 16 years maturity
Trimmed mean (% yield)	4.23	4.21
Number of observations	15	4

The following diagram from the CEG report compares the results of CEG's analysis of BBB+ rated bonds during the AMI measurement period with the Bloomberg fair yield curve used by the AER:[45]

Figure 3: Average yield estimates for BBB+ fixed coupon bonds during AMI averaging period



The CEG report then contains the following conclusion regarding the comparison of this data with the Bloomberg fair yield curve:[46]

> 74. As is clearly evident from the above graph the AER/Bloomberg fair value curve passes below the lower envelope of all of the BBB+ bonds for which there are yield estimates. It passes only marginally above only one observation (Bank of Queensland) and passes below all of the other 16 observations of unique issuers (mostly materially below these).
>
> 75. Purely based on this fact one would conclude that the AER/Bloomberg fair value underestimates the typical yield on BBB+ rated debt. [...]

[45] CEG report, page 25.

[46] CEG report, pages 25 to 26.

5.1.2 A- to AA- rated bonds

The CEG report goes on to consider whether the results of an analysis of higher rated bonds support CEG's analysis of BBB+ rated bonds, or whether those higher rated bonds can explain the divergence between CEG's data and the Bloomberg fair yield curve.

The results of CEG's analysis are shown in the following sections of tables 9 and 10 from the CEG report:[47]

Table 9: Average spread to CGS across all maturities

	BBB+	BBB to A-	BBB+ to AA-	BBB+ to AAA
Fixed bonds only				
Observations	15	39	68	130
Mean (%)	5.08	5.46	5.54	4.12
Median (%)	3.70	3.70	4.42	3.33
Trimmed mean(%)	4.23	4.54	4.57	3.34

Table 10: Average spread to CGS across maturities from 4 to 16 years

	BBB+	BBB to A-	BBB+ to AA-	BBB+ to AAA
Fixed bonds only				
Observations	4	11	21	51
Mean (%)	4.92	5.65	5.77	3.87
Median (%)	3.50	6.00	5.90	3.35
Trimmed mean(%)	4.21	5.09	5.34	3.67

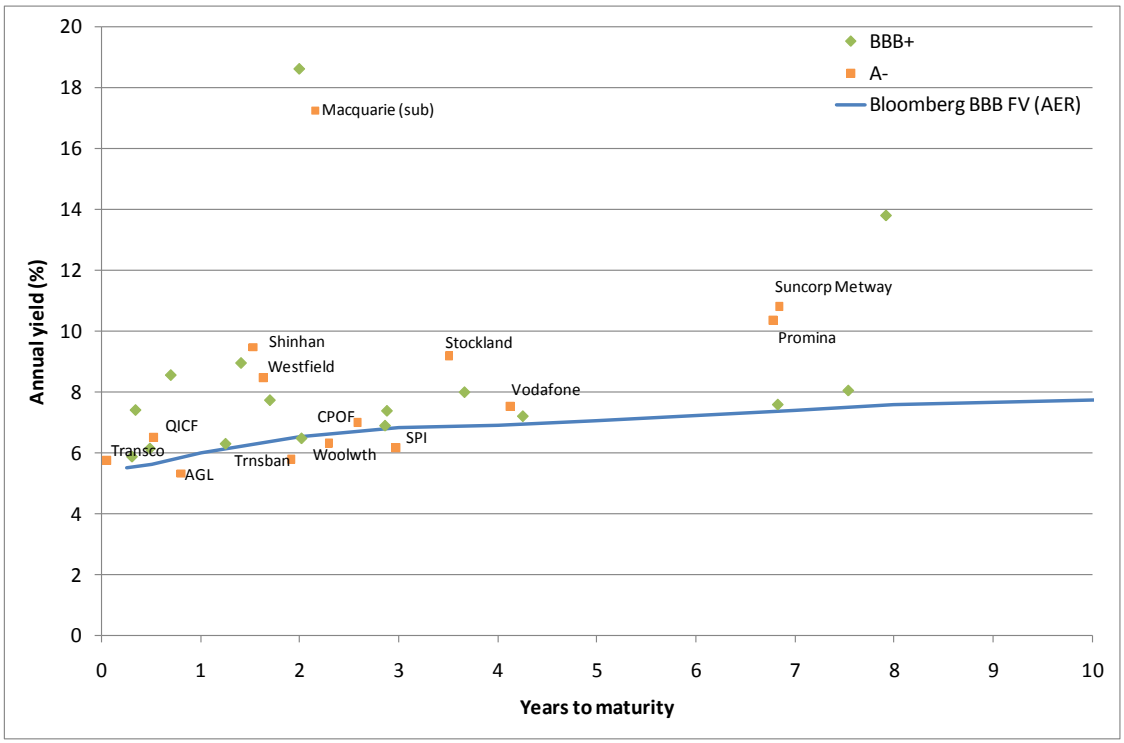
The CEG report also shows the effects of extending the analysis to include yields for A-, A and AA- bonds (respectively) in the following diagrams and commentary:[48]

> 76. I have also examined the yields on A- bonds but, rather than supporting the adoption of BBB+ fair value curve below the majority of BBB+ yields the opposite is true. Not only is the AER/Bloomberg fair value curve below the majority of BBB+ bond yield estimates it is also below the majority of A- bond yields. This is true at all maturities but is especially true at longer maturities (above 3.5 years) where the AER/Bloomberg fair value curve is below all nine of the available observations. The below graph only plots one data point for each issuer (ie, each data point is a unique issuer) and only labels the A- bonds (the BBB+ bonds being labelled in the previous figure).

[47] CEG report, pages 53 and 54. Only the parts of these tables that relate to fixed bonds have been reproduced here. The full tables are set out in section 5.1.3 below.

[48] CEG report, pages 26 to 29.

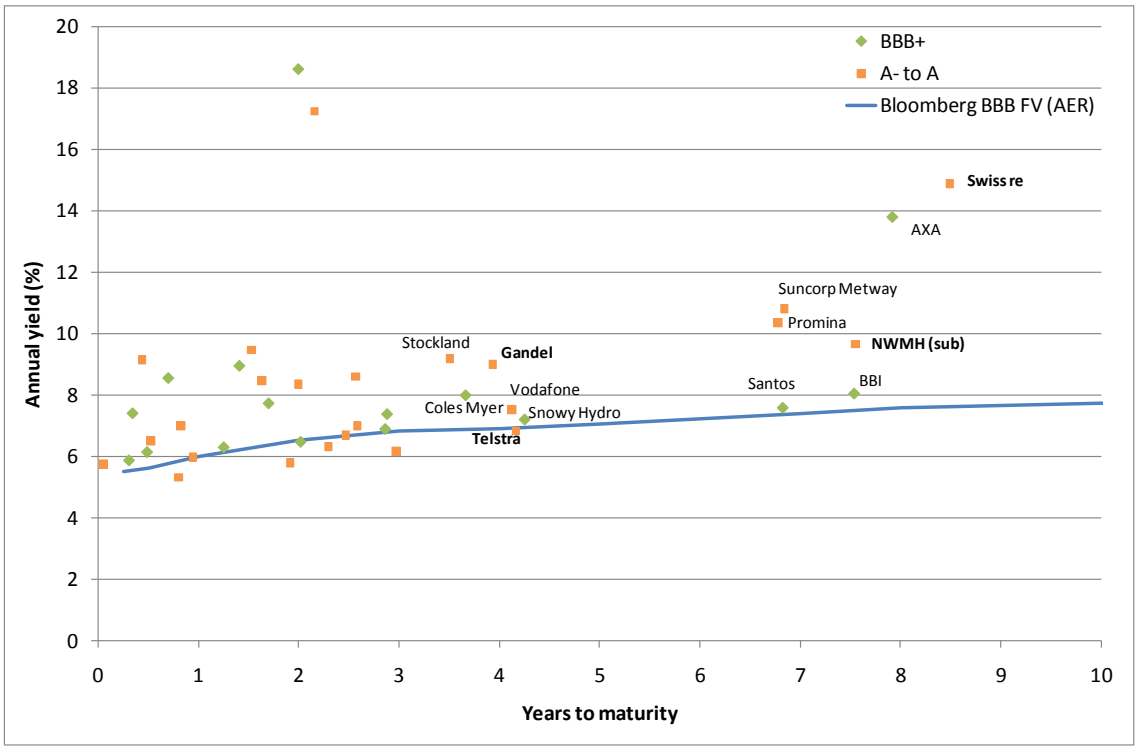
Figure 4: Average yield estimates for BBB+ and A- rated fixed coupon bonds during AMI averaging period



...

78. I have also extended the analysis to include A rated bonds but excluding BBB bonds – in order that every observation correspond to a BBB+ or higher credit rating. These are shown in the below figure where I have labelled all bonds with more than 3.5 years to maturity and the new A rated bonds are labelled in bold. As can be seen, the AER Bloomberg BBB+ fair value curve continues to underestimate all estimated yields for BBB+, A- and A rated fixed coupon bonds with more than four years to maturity.

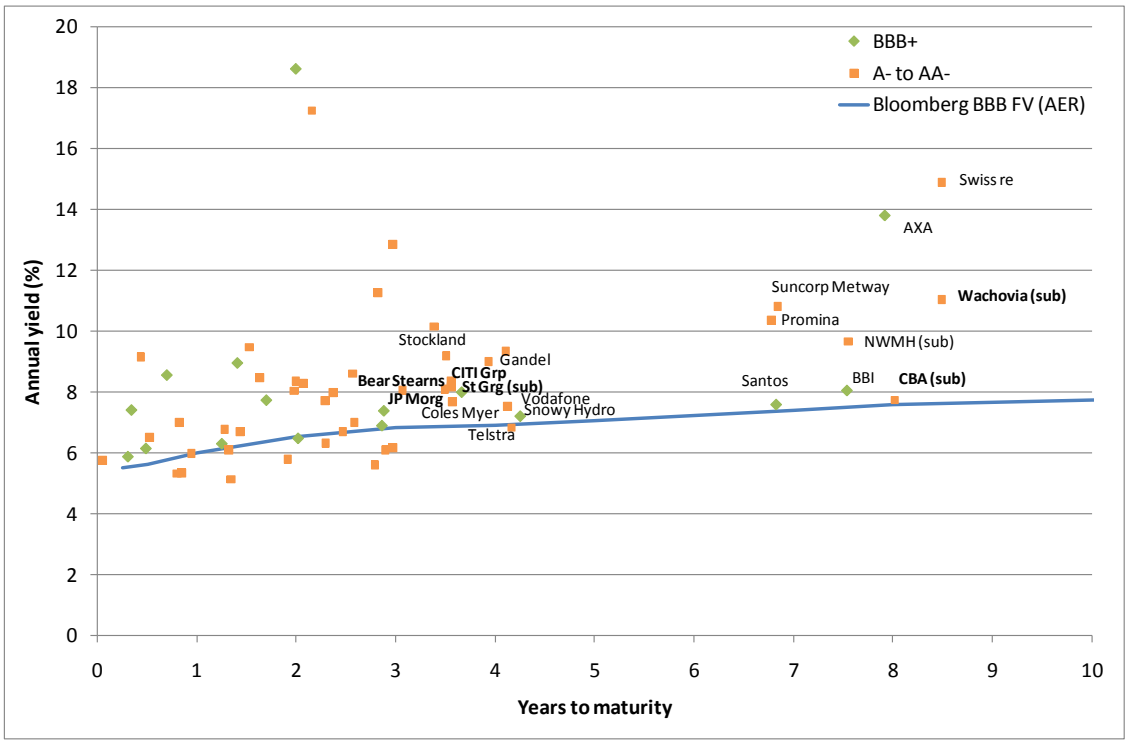
Figure 6: Average yield estimates for BBB+ to A rated fixed coupon bonds during AMI averaging period



79. As can be seen, above 3.5 years to maturity every observation (from BBB+ to A rated) is above the Bloomberg BBB+ fair value curve – with the single exception of Telstra.

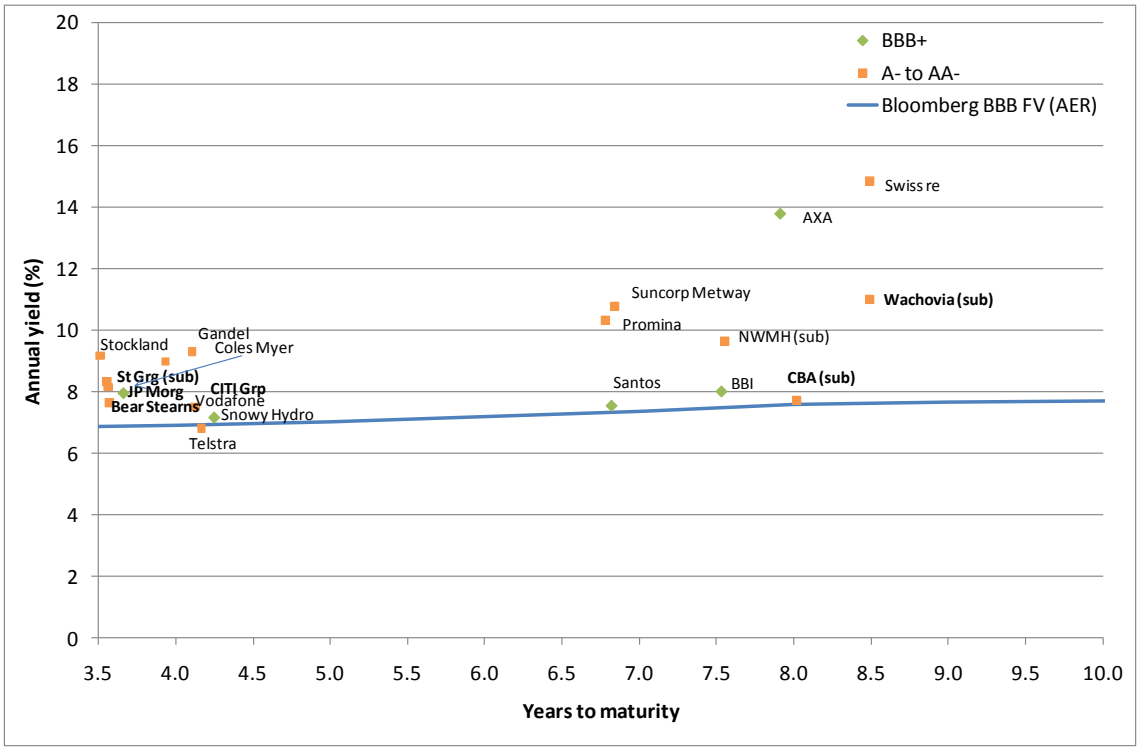
80. Even when the analysis is extended to include all fixed coupon corporate bonds with credit ratings between BBB+ and AA- the same conclusion is found. This can be seen in the below figure which demonstrates that the AER/Bloomberg fair value curve underestimates the yield on the vast majority of BBB+ to AA- bonds and underestimates all but one of the yields on bonds with more than 3.5 years to maturity.

Figure 7: Average yield estimates for BBB+ to AA- rated fixed coupon bonds during AMI averaging period



The CEG report also separately analyses longer term bonds, which is shown in the following diagram:[49]

Figure 8 Average yield estimates for BBB+ to AA- rated fixed coupon bonds during AMI averaging period – bonds with maturity between 3.5 and 10 years



This analysis of higher rated bonds is a relevant consideration when determining the BBB+ corporate bond rate in circumstances where there is no measure of the BBB+ corporate bond rate that complies with all of the AMI OIC requirements.

The rates for these higher rated bonds will be a conservative measure of the BBB+ rated bond, because in normal market conditions the yields for higher rated bonds would be expected to be lower.

5.1.3 Floating rate bonds

The CEG report also analyses data for floating rate bonds. As the CEG report notes:[50]

> 100. In addition to issuing fixed coupon bonds corporations also commonly issue bonds with variable interest rates – commonly terms floating rate notes or floating rate bonds. Floating rate notes pay a fixed coupon plus a variable coupon over the life of the bond. The variable coupon is almost always reset every three months based on the prevailing 3 month interest rate in the swap market (the 3 month bank bill swap rate). On any given trading day a floating rate note can be converted into a fixed coupon bond. This is done by the issuer of the bond entering into a swap contract where they promise to pay a fixed amount to a third party in exchange for the third party promising to pay them the floating payments on the bond over the remainder of the bonds life. This is discussed more in the following section.

[49] CEG report, page 30.

[50] CEG report, page 33.

101. The swap market is sufficiently liquid for us to observe what the equivalent fixed coupon yield is on a floating rate bond today. Indeed, this is precisely how floating rate bonds are priced and quoted in the market. That is, the yield on floating rate bonds is quoted as the bank bill swap rate to the end of the maturities life plus a "trading margin" where the sum of these two values is the equivalent fixed yield on a floating rate note.

The results of CEG's analysis are shown in the following tables from the CEG report:[51]

Table 9: Average spread to CGS across all maturities

	BBB+	BBB to A-	BBB+ to AA-	BBB+ to AAA
Fixed bonds only				
Observations	15	39	68	130
Mean (%)	5.08	5.46	5.54	4.12
Median (%)	3.70	3.70	4.42	3.33
Trimmed mean(%)	4.23	4.54	4.57	3.34
Fixed and floating bond				
Observations	20	54	93	177
Mean(%)	5.42	6.71	5.77	4.29
Median(%)	3.91	4.27	4.38	3.30
Trimmed mean(%)	4.35	4.83	4.43	3.50

*Source: Bloomberg, UBS, AFMA, CBASpectrum, Reuters, and CEG analysis.

Table 10: Average spread to CGS across maturities from 4 to 16 years

	BBB+	BBB to A-	BBB+ to AA-	BBB+ to AAA
Fixed bonds only				
Observations	4	11	21	51
Mean (%)	4.92	5.65	5.77	3.87
Median (%)	3.50	6.00	5.90	3.35
Trimmed mean(%)	4.21	5.09	5.34	3.67
Fixed and floating bond				
Observations	5	16	28	68
Mean (%)	4.80	5.17	5.67	4.00
Median (%)	3.50	5.00	5.63	3.50
Trimmed mean (%)	4.39	5.02	5.17	3.85

*Source: Bloomberg, UBS, AFMA, CBASpectrum, Reuters, and CEG analysis.

[51] CEG report, pages 53 and 54.

The CEG report goes on to conclude:[52]

> 177. In my view, these observations support an estimate of the benchmark BBB+ DRP of at least 5.0% and up to 6.0% (defined by the range of measures of central tendency reported in the samples for BBB to A- issuers and BBB+ to AA- issuers in Table 10). The midpoint of this range is 5.5%.

This information regarding floating rate bonds is a relevant consideration when determining the debt risk premium. There is nothing in the AMI OIC that limits the 'observed annualised benchmark corporate bond rate' for BBB+ 10 year corporate bonds to fixed rate bonds only. Floating rate bonds can be easily converted into a fixed rate to allow for a 'like for like' comparison with fixed rate bonds.

5.1.4 CEG's conclusions from comparing the results of this analysis with the Bloomberg fair yield curves

Having undertaken this analysis, the CEG report concludes as follows in relation to the reliability of the approach that the AER took in the draft determination:[53]

> 86. During the AMI averaging period, the AER/Bloomberg BBB+ fair value curve clearly does not accurately predict/reflect the yield estimates for corporate bonds of BBB+ rating or higher for which yield estimates are available from a large number of sources. This is true at all maturities but is especially true for longer maturities (eg, greater than 3.5 years).
>
> 87. If the AER/Bloomberg BBB+ fair value curve was accurate it would predict higher yields than actually attributed bonds rated higher than BBB+. However, the reality is that the vast majority of A- to AA- bonds have higher estimated yields than the AER/Bloomberg BBB+ fair value curve.
>
> 88. In the case of BBB+ to AA- corporate bonds with a time to maturity of more than 3.5 years, all but one of the 19 issuers of these bonds attract a higher yield than the AER/Bloomberg BBB+ fair value curve. The differences are not trivial, with the average mean difference being 2.1%.
>
> 89. The fact that the AER/Bloomberg BBB+ fair value curve is lower than all but one of the issuers with longer dated bonds means that the AER/Bloomberg fair value curve is a downward biased estimator of yield estimates not only on long dated BBB+ rated bonds but also of bonds rated A- to AA-.

5.2 The bond issue by AMP in March 2009

AMP Group Financial Services issued approximately $300 million of A- subordinated floating rate bonds guaranteed by AMP Group Holdings Limited in March 2009, with the fixed coupon on these bonds being set at 4.75% on 11 March 2009. The AMP bond has a potential maturity of 10 years, although in practice its term is likely to be 5 years.

The CEG report considers this bond issue and converts the bond's yield to an annualised fixed yield to maturity rate of 9.12%. The resulting debt risk premium is 4.49%.

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[52] CEG report, page 55.

[53] CEG report, page 31.

The DNSPs consider that this AMP bond issue is also a relevant consideration that the AER must take into account. As with the Tabcorp bond issue, it is clear evidence of the observed Australian corporate bond rate.

5.3 CBASpectrum

CBASpectrum publishes fair yield curves for the Australian debt market. Bloomberg and CBASpectrum are, to the DNSPs' knowledge, the only services that produce fair yield estimates of Australian corporate bonds with specific credit ratings and maturities.

As with Bloomberg, the purpose of the CBASpectrum curves is to provide an estimate of bond yields. The process used by CBASpectrum in preparing its fair yield curves and the differences between the processes used by CBASpectrum and Bloomberg are discussed in the CEG report.[54]

5.3.1 CBASpectrum BBB+ 10 year fair yield curve

CBA Spectrum publishes a 10 year BBB+ fair yield curve.

Averaged over the AMI measurement period, the CBASpectrum BBB+ 10 year fair yield curve produces a fair yield of 9.55%. The resulting debt risk premium is 4.92%.

This CBASpectrum fair yield curve satisfies more of the AMI OIC requirements than Bloomberg's fair yield curves because:

- the CBASpectrum curve is a BBB+ curve, as required by the AMI OIC, while Bloomberg is a BBB curve that includes BBB-, BBB and BBB+ rated bonds; and
- the CBASpectrum curve is a 10 year curve, as required by the AMI OIC, while Bloomberg's longest BBB curve is 8 years and is required to be modified by the AER to attempt to create a 10 year curve.

Unlike Bloomberg, CBASpectrum does not remove outliers when it is creating its fair yield curves. This fact makes CBASpectrum more representative of the observed benchmark corporate bond rate, as required by the AMI OIC. It also improves the reliability of CBASpectrum, especially during the AMI measurement period where there was already a very small number of observations to measure, and given that Bloomberg's approach to the exclusion of outliers is non-transparent and highly subjective with the result that the AER cannot be satisfied that using Bloomberg is reasonable and will produce a reliable estimate.

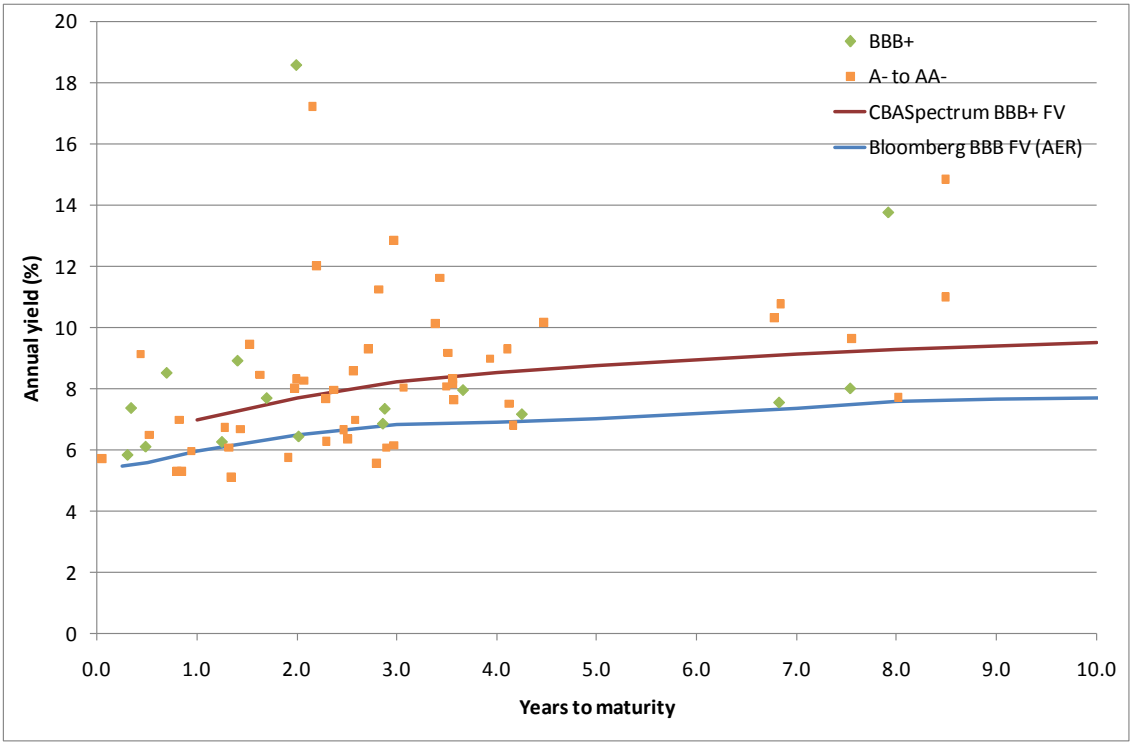
The CEG report analyses the differences between Bloomberg and CBASpectrum methodologies and the reasons for the differences in their results.[55] CEG states that in 'normal' market conditions, the differences between the results of Bloomberg and CBASpectrum are relatively small. However, since the start of the global financial crisis, the differences have become large.

[54] CEG report, section 7.

[55] CEG report, section 7.

The following diagram from the CEG report shows a comparison of the Bloomberg fair yield curve and the CBASpectrum fair yield curve, each plotted against the bonds analysed by CEG.[56] It demonstrates that CBASpectrum produces a result that is more reflective of the bonds that CEG analysed.

Figure 11: Average yield estimates for BBB+ to AA- rated fixed coupon bonds during AMI averaging period



The CEG report considers the reliability of the CBASpectrum fair yield curve and reaches the following conclusions:[57]

151. In contrast to the AER/Bloomberg fair value estimates, I find that the CBASpectrum estimates:

- behaved in the manner expected of a fair value estimate following the worsening of the global financial crisis. Specifically, rather than credit spreads staying relatively constant through September, October and November 2009 (as reported by Bloomberg), CBASpectrum estimated increasing credit spreads in the period leading up to the AMI averaging period – consistent with theory and published BBB yield estimates by the RBA;
- better fit the data for yield estimates during the AMI averaging period; and
- better described the yields observed on actual trades of BBB+ (and other rated) debt post the AMI averaging period.

152. For these reasons I find the CBASpectrum BBB+ fair value estimate to be a more reliable proxy for the benchmark BBB+ rate during the AMI averaging period. I step through the evidence underlining each of the dot points in the following subsections.

[56] CEG report, page 50.

[57] CEG report, page 47.

5.3.2 Average of CBA Spectrum and Bloomberg

Another potential measure of the debt risk premium would be to average the Bloomberg and CBASpectrum fair yield curves.

A simple average of CBASpectrum and Bloomberg would result in a debt risk premium of 4.01%.

Such an average has the benefit of increasing the data pool that is used compared with using Bloomberg alone, which is particularly relevant given the low amount of data that was available during the AMI measurement period.

5.4 RBA data

In the DNSPs' June 2009 paper, the DNSPs provided data reported by the RBA for corporate bond yields and spreads between Commonwealth Government bonds and corporate bonds. The following table was included as Attachment 4 of that paper:[58]

[58] Annexure 4 of the DNSPs' June 2009 paper. This table is an excerpt from the Statistical Tables of the April 2009 *RBA Bulletin*. The data is available from the RBA's web site at: http://www.rba.gov.au/Statistics/Bulletin/F03.pdf.

F.3 Capital Market Yields and Spreads — Non-government Instruments

	Corporate bonds with 1 to 5 years maturity											
	Yields per cent per annum			Spreads over bonds issued by the Australian Government basis points			Spreads over swap rates basis points			5-year credit default swap spreads basis points		
	AA	A	BBB	AA	A	BBB	AA	A	BBB	AA	A	BBB
2005 Jun	5.67	5.81	5.96	56	69	84	13	27	42	12	31	49
2006 Jun	6.32	6.44	6.55	53	66	75	14	25	38	9	24	44
2007 Jun	7.01	7.08	7.32	58	66	88	15	25	45	5	19	50
2007/08												
Mar	8.43	8.78	8.87	223	259	267	109	144	152	98	145	184
Apr	8.62	8.94	8.95	218	251	250	100	133	132	66	98	141
May	8.69	9.05	9.15	192	230	236	95	132	139	59	81	120
Jun	8.90	9.38	9.45	216	265	267	106	155	159	84	100	142
2008/09												
Jul	8.35	8.89	9.05	211	266	277	108	162	175	80	107	161
Aug	7.77	8.39	8.81	207	270	311	104	166	208	98	124	188
Sep	7.61	8.38	8.77	249	326	365	135	212	251	103	159	220
Oct	6.67	7.88	8.73	221	342	429	134	254	343	117	212	350
Nov	5.88	7.14	7.90	240	362	446	166	286	371	138	260	418
Dec	5.87	7.24	7.53	279	415	449	211	347	383	161	312	535
Jan	5.40	6.83	7.13	270	409	443	211	352	389	138	280	414
Feb	5.52	7.12	8.09	248	406	503	207	365	463	189	303	398
Mar	6.21	8.07	8.93	301	485	574	261	443	534	159	342	475
Daily												
2 Mar	5.60	7.21	8.10	257	417	507	213	373	464	..	..	..
3 Mar	5.67	7.32	8.36	259	422	527	213	377	484	..	..	..
4 Mar	5.54	7.19	8.36	252	415	534	211	374	494	..	..	..
5 Mar	5.52	7.29	8.19	250	425	517	212	387	479	196	339	478
6 Mar	5.43	7.24	8.25	252	430	534	212	391	495	..	..	..
9 Mar	5.34	7.18	8.16	253	434	535	212	393	495	..	..	..
10 Mar	5.43	7.28	8.25	255	438	536	213	396	495	..	..	..
11 Mar	5.46	7.29	8.26	254	436	534	215	397	496	..	..	..
12 Mar	5.41	7.23	8.20	256	437	535	214	395	494	213	366	500
13 Mar	5.91	7.32	8.24	298	439	533	254	396	491	..	..	..
16 Mar	5.96	7.38	8.34	299	440	537	256	398	496	..	..	..
17 Mar	6.01	7.40	8.39	297	436	535	256	396	496	..	..	..
18 Mar	6.00	7.39	8.55	297	436	550	257	397	509	..	..	..
19 Mar	5.92	7.29	8.42	304	442	554	258	397	507	174	361	474
20 Mar	6.03	7.48	8.54	308	454	559	262	409	513	..	..	..
23 Mar	6.16	7.63	8.68	307	456	560	262	412	515	..	..	..
24 Mar	6.23	7.70	8.87	307	456	572	264	414	529	..	..	..
25 Mar	6.28	7.75	8.92	305	454	570	264	414	529	..	..	..
26 Mar	6.37	7.86	9.04	303	455	571	262	414	530	159	342	475
27 Mar	6.33	7.85	9.06	298	453	573	258	414	532	..	..	..
30 Mar	6.25	7.76	8.97	298	452	572	259	414	532	..	..	..
31 Mar	6.21	8.07	8.93	301	485	574	261	443	534	..	..	..

Sources: AFMA; Bloomberg; RBA; UBS AG, Australia Branch

This table shows that in November and December 2008 the RBA was reporting spreads of 4.46% and 4.49% for BBB rated bonds. The RBA was also reporting spreads of 3.62% and 4.15% for A rated bonds.

These spreads were for bonds of a maturity of 1 to 5 years. It is reasonably safe to assume that yields and spreads for 10 year bonds would have been higher than these rates due to the increased risk associated with longer maturity corporate bonds. This RBA data can therefore be used to set a lower bound for an estimate of the observed BBB+ 10 year corporate bond rate and debt risk premium.

The CEG report discusses this RBA data and states:[59]

> The AER/Bloomberg fair value curve estimated spreads to CGS for 10 year BBB+ rated bonds of 3.09%. By contrast the RBA was reporting spreads to CGS for 3 years BBB debt of 4.46% in November and 4.49% in December (not annualised). This alternative source of yield estimates also suggests that the AER/Bloomberg fair value curve underestimates the actual yields estimated in debt markets.

5.5 Bonds issued by Australian corporates in the US market

In the DNSPs' June 2009 paper, the DNSPs provided information regarding 5, 7 and 10 year corporate bonds issued by Australian corporates into the United States bond market near the time of the AMI measurement period.[60]

The DNSPs have updated the calculations of the effective spread over the Australian corporate bond rate and have set out revised tables below. A 5 year BBB+ bond issue by Caltex has been added to the first table.[61]

5-year

Company	Spread over US Treasury at Issue	Effective Spread over Aust CGL	Launch/ Announcement Date	Issue Type	Issue Amount	Rating
QBE Insurance	770	802	30-Dec-08	144a reg S	US$210mn	A3/A-
Woodside	625	615	24-Feb-09	144a reg S	US$400mn	Baa1/A-
Brambles	550	556	15-Mar-09	144a reg S		NAIC-2
BHP Billiton	400	400	18-Mar-09	US Public - SEC registered	US$1.55bn	A1/A+
Rio Tinto	752	794	14-Apr-09	US Public - SEC registered	US$2bn	Baa1/BBB
Caltex Aust	615	839	14-Apr-09	USPP	US$50mn	BBB+
Westfield	549	564	27-May-09	144a reg S	US$700mn	A-/A2/A-

[59] CEG report, page 34.

[60] Annexure 1 of the DNSP' June 2009 paper.

[61] These tables show 5, 7 and 10-year US dollar bond issues by Australian non-bank companies in the US, with the effective swap back to A$ as a spread to the Commonwealth bond rate, had the issuers entered into a cross-currency swap to fixed rate A$ at the time of the issue. Notes regarding the calculations for these tables are set out in Appendix 5.

7-year

Company	Spread at Issue	Effective Spread over Aust CGL	Launch/ Announcement Date	Issue Type	Issue Amount	Rating
Brambles	550	586	15-Mar-09	USPP		NAIC-2
Caltex Australia	615	666	14-Apr-09	USPP	US$125mn	BBB+
APA Pipelines	575	620	14-May-09	USPP	US$65mn	

10-year

Company	Spread at Issue	Effective Spread over Aust CGL	Launch/ Announcement Date	Issue Type	Issue Amount	Rating
BHP Billiton	400	476	18-Mar-09	US Public - SEC registered	US$1.75bn	A1/A+
Woodside	613	663	24-Feb-09	144a reg S	US$600mn	A-
Brambles	550	629	15-Mar-09	144a reg S		NAIC-2
Rio Tinto	658	780	14-Apr-09	US Public - SEC registered	US$1.5bn	Baa1/BBB
APA Pipelines	575	728	14-May-09	144a reg S	US$75mn	

The average spread to the Commonwealth bond rate across all maturities is 6.47%. The average spread to the Commonwealth bond rate for the 10 year bonds is 6.55%

In the draft determination, the AER states that it 'does not consider it appropriate to compare the Bloomberg Australian fair yields against the yields of international bonds.'[62]

The DNSPs do not consider that the AER is entitled to disregard this US data. In the circumstances where there is no measure of the debt risk premium that meets all four of the AMI OIC requirements, this US data is a relevant consideration in relation to the calculation of the debt risk premium and the AER is required to have regard to it.

The DNSPs consider that there are good arguments that corporate bonds issued by Australian corporates in the US market are a measure of the 'observed annualised Australian benchmark corporate bond rate'. In any event, given that there is no other bond data that meets all of the AMI OIC requirements, the AER cannot disregard this data simply because the AER considers that it fails to meet this one of the four AMI OIC requirements.

[62] Draft determination, page 121.

The data relating to 10 year maturity bonds issued by Australian corporates in the US is particularly relevant to the assessment of the debt risk premium given that there is very little other data relating to bonds with a 10 year maturity and the AER's approach in the draft determination is not based on any data regarding 10 year bonds. This information is clearly relevant and the AER must have regard to it.

5.6 Secondary trades during the AMI measurement period of bonds issued by Australian corporates in the US market

In the DNSPs' June 2009 paper, the DNSPs provided information regarding secondary trades during the AMI measurement period for corporate bonds previously issued by Australian corporates into the US market.

The table below updates the table from page 13 of the DNSPs' June 2009 paper and shows the non-annualised effective spread to the US risk free rate (the US Treasury bond) and the calculated spread to the Australian risk free rate (the Australian Commonwealth Bond Rate) for bonds that were issued by Australian companies in the US prior to the AMI measurement period, based on trading levels for the bonds on 24/11/2008 (being a date in the AMI measurement period).[63]

Company	Maturity	Effective Spread over US Treasury	Effective Spread over Aust CGL	Launch/ Announcement Date	Issue Type	Issue Amount	Rating
Wesfarmers	10-Apr-13	511	496	03-Apr-08	Reg S	US$650mn	Baa1/BBB+
Qantas	20-Jun-13	579	597	17-Jun-03	Reg S	US$450mn	Baa2/BBB
Fosters	01-Oct-14	324	381	28-Sep-04	Reg S	US$300mn	Baa1/BBB+
BHP	15-Dec-15	543	597	05-Dec-05	SEC reg'd	US$700mn	A1/A+
Qantas	15-Apr-16	358	421	28-Mar-06	Reg S	US$514mn	Baa2/BBB
Westfield	15-Apr-18	311	332	09-Apr-08	Reg S	US$1.1bn	A2/A-

The average spread to the Commonwealth bond rate across all maturities and credit ratings is 4.61%.

As with the information in section 5.5, the DNSPs consider that this information is a relevant measure of the debt risk premium in circumstances where there is no measure that complies with all of the AMI OIC requirements.

[63] Notes regarding the calculations for this table are set out in Appendix 5.

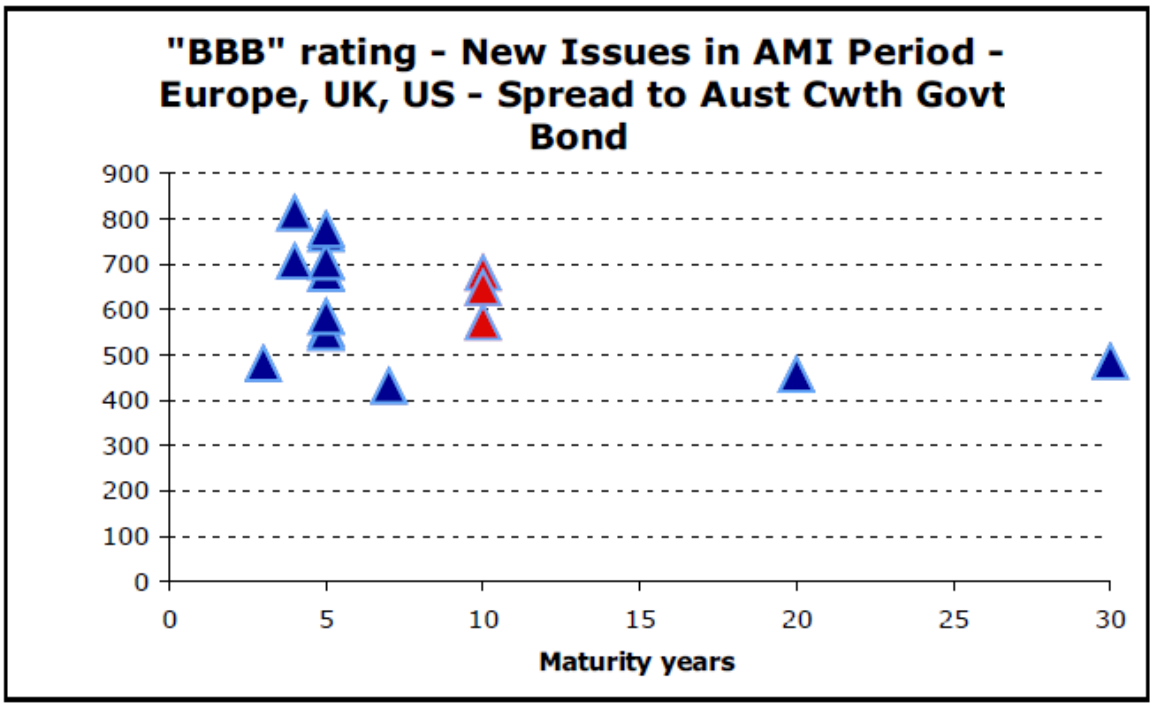
5.7 Other bonds issued in overseas markets during the AMI measurement period

The DNSPs have also analysed the spreads to the relevant Australian Commonwealth Government Bond (calculated after swap to Australian dollars) for new bond issues in Europe (Euros), the US (US$), and the UK (sterling) during the AMI measurement period. This analysis does not include bonds issued by Australian corporates in the US, which are considered separately in section 5.5 above.

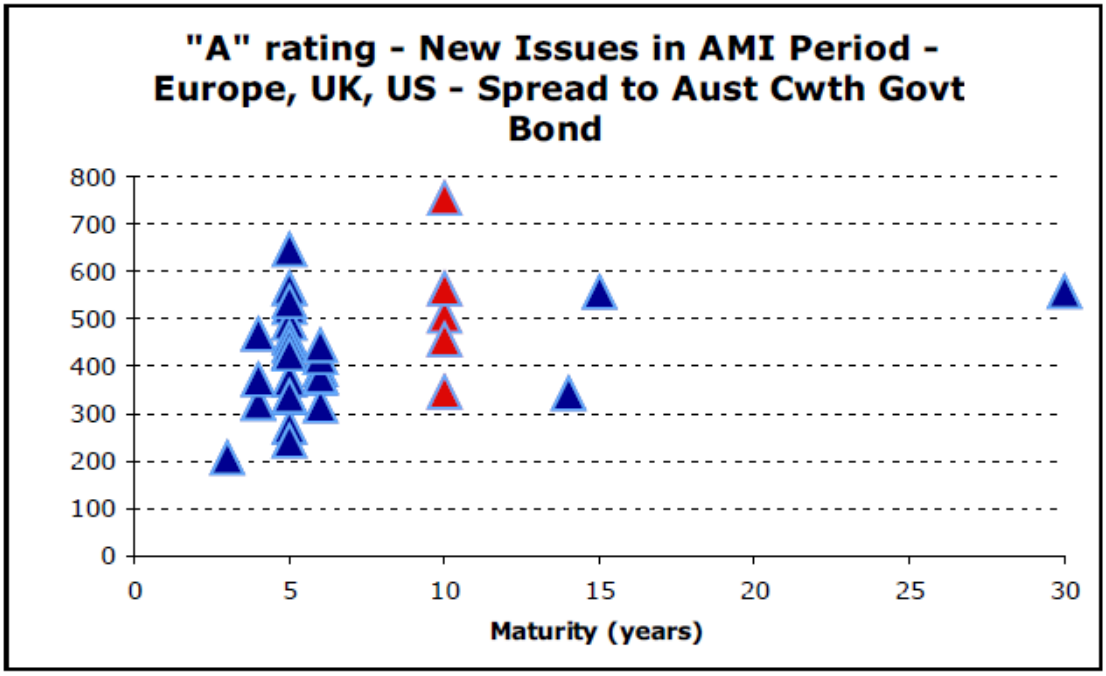
These rates are observed rates that are based on corporate bond issues that were bought and sold in the market during the AMI measurement period.

Although this data relates to corporate bonds outside of Australia, the DNSPs consider that it is relevant in the context where no measure of the debt risk premium meets all of the AMI OIC requirements.

The data regarding these overseas bond issues is summarised in the following graphs and table.[64]



[64] Note that the "BBB" rating category in the table and graphs includes BBB-, BBB and BBB+. The "A" rating category includes A-, A, A+, AA-, AA and AA+. Notes on the calculations used in preparing the graphs and table are set out in Appendix 5.



Average (annualised) spread: New issues in AMI measurement period - Europe, US and UK (in basis points)

Maturity	Range "BBB" rated	Average Spread "BBB" rated	Range "A" rated	Average Spread "A" rated	Range - Electricity & Gas Distribution Companies Only	Average Spread - Electric & Gas Distribution Companies Only
3 years	483	483	207	207		
4 years	709-815	762	323-469	389		
5 years	551-779	662	245-647	435	272-770	482
6 years			318-445	389	318-420	369
7 years	433	433				
8 years						
10 years	**574-684**	**636**	**347-756**	**527**	**347-756**	**574**
14 years			344	344	344	344
15 years			558	558		
20 years	459	459				
30 years	488	488	559	559		

As demonstrated in the above table, for BBB rated bonds the average spread to the Australian Commonwealth Government Bond rate (after swap to Australian dollars) for new issues in Europe, the US and the UK in the AMI measurement period with a 10 year maturity period was 6.36%, with a range of 5.74-6.84%.

For A rated bonds, the average spread to the Australian Commonwealth Government Bond rate (after swap to Australian dollars) for new issues in the AMI measurement period with a 10 year maturity period was 5.27%, with a range of 3.47-7.56%.

The average 10 year spread to the Australian Commonwealth Government Bond rate for the electricity and gas distribution companies only across all rating categories with a 10 year maturity period was 5.74 basis points, with a range of 3.47-7.56%.

5.8 Bond pricing envelope

The DNSPs have prepared a bond pricing envelope with the objectives of:

- developing a statistical estimate of the range within which the fair value of a BBB to BBB+ rated bond would likely have been during the AMI measurement period; and
- determining the mean estimate of a BBB to BBB+ rated bond over the AMI measurement period.

Data used

Price estimates have been sourced from the following:

1. Bonds rated BBB to BBB+, issued by Australian corporates and trading in the Australian Domestic Bond Market:
    a. Underlying prices contributed by various banks into data gathering systems of AMFA, Bloomberg, and daily rate sheets
    b. Reuters pricing estimates generated from:
        i. Reuters Pricing Service
        ii. Yieldbroker data services
        iii. Reuters Multi-contributor
    c. CBASpectrum Bond price database
2. Bonds rated BBB to BBB+, issued by Australian corporates and trading in the secondary global bond markets, swapped back to Australian dollars using standard swap pricing methodology
3. New Issues in the global bond market by all issuers rated BBB to BBB+ into the US, UK and European bond markets, during the AMI period

Methodology

The DNSPs have, in principle, followed the methodology used by AFMA in generating their daily AFMAdata Independent Bond Valuation (as outlined on their website) and have generated a price estimate for all price contributions that lie within "1" standard deviation from the raw mean.

All data has been weighted appropriately to ensure that each data point (ie each corporate bond) has the same level of contribution into pricing averages.

Step 1 – For the purpose of this analysis, the bond curve was segmented into three time periods:

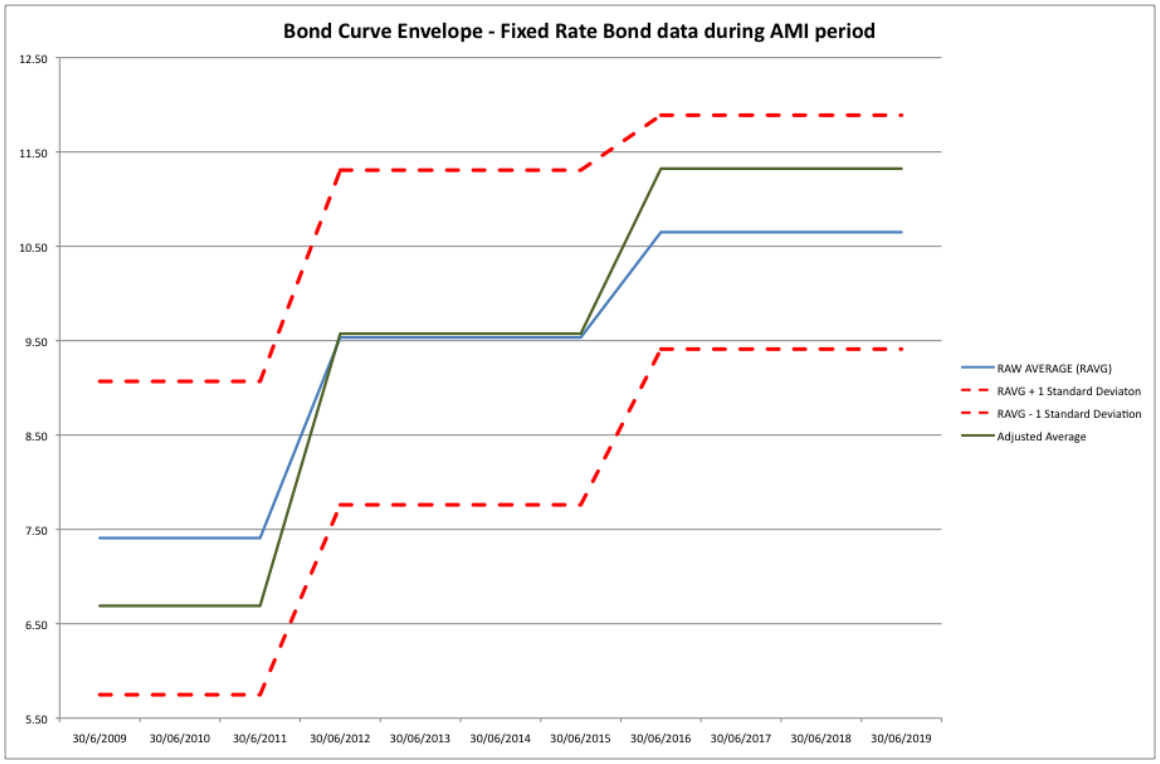
1. The "Short End" – from 1 to 3 years
2. The "Mid Curve" – from 4 years to 7 years
3. The "Long End" – from 8 years to 11 years

Step 2 – The data set of all price contributions for each segment was subjected to the following treatments:

1. Calculation of the Raw Average (RAVG) – This is the simple average of all data in the data segment.
2. Calculation of the Standard Deviation of all data in that segment
3. Calculation of the "1" Standard Deviation envelope of RAVG plus and minus "1" Standard Deviation.
4. Calculation of the Adjusted Average using data that was between the upper and lower bounds of the above envelope.

Results

	Short End (1 – 3 years)		**Mid Curve (4 – 7 years)**		**Long End (8 – 11 years)**	
	Yield	**Debt risk premium**	**Yield**	**Debt risk premium**	**Yield**	**Debt risk premium**
Raw Average (RAVG)	7.41 %	2.78%	9.53 %	4.90%	10.65 %	6.02%
RAVG + 1 SD	9.07%	4.44%	11.31 %	6.68%	11.89 %	7.26%
RAVG – 1 SD	5.75 %	1.12%	7.76 %	3.13%	9.41 %	4.78%
Adjusted Average	6.69 %	2.06%	9.57 %	4.94%	11.32 %	6.69%



Conclusions

This analysis corroborates the other results discussed in this section 5 and supports the view that the Tabcorp bond issue is a conservative estimate of the debt risk premium and the Bloomberg fair yield curves significantly underestimate the debt risk premium.

6 Conclusion

Where no single measure of the debt risk premium complies with all of the AMI OIC requirements, the AER must have regard to all relevant indicators of the debt risk premium and adopt a measure that is consistent with all of the evidence.

The following table summarises all of the relevant measures of the debt risk premium that are discussed in this submission.[65] The results are ordered from the lowest to the highest debt risk premium.

DRP measure	Yield	Debt risk premium
Draft determination, based on Bloomberg fair yield curves	**7.72%**	**3.09%**
RBA (average of November and December 2008 BBB spreads for 1-5 year maturity)	9.11%	4.48%
AMP March 2009 A- bond issue	9.12%	4.49%
Secondary trades during the AMI measurement period of bonds issued by Australian corporates in the US market	9.24%	4.61%
CEG report: BBB+ mean (4 to 16 year fixed and floating rate observations)	9.43%	4.80%
Tabcorp April 2009 BBB+ bond issue	**9.48%**	**4.84%**
CEG report: BBB+ mean (4 to 16 year fixed rate observations)	9.55%	4.92%
CBASpectrum BBB+ 10 year fair yield curve	9.55%	4.92%
CEG report: BBB+ mean (all fixed rate observations)	9.71%	5.08%
CEG report: BBB+ to A- mean (4 to 16 year fixed and floating rate observations)	9.80%	5.17%
Overseas issues during the AMI measurement period: mean of A rated 10 year bonds	9.90%	5.27%
CEG report: BBB+ mean (all fixed and floating rate observations)	10.05%	5.42%
CEG report: BBB+ to A- mean (all fixed rate observations)	10.09%	5.46%
CEG report: BBB+ to A- mean (4 to 16 year fixed rate observations)	10.28%	5.65%

[65] This table summarises results that are explained in the earlier sections of this submission. The nominal risk free rate for determining the debt risk premium is 4.63%, as set out in the draft determination.

DRP measure	Yield	Debt risk premium
DNSPs' bond pricing envelope: raw average (8 to 11 years)	10.65%	6.02%
Bonds issued by Australian corporates in the US market (mean of all bonds)	11.10%	6.47%
Bonds issued by Australian corporates in the US market (mean of 10 year bonds)	11.18%	6.55%
Overseas issues during the AMI measurement period: mean of BBB rated 10 year bonds	11.26%	6.63%
DNSPs' bond pricing envelope: adjusted average (8 to 11 years)	11.32%	6.69%
CEG report: BBB+ to A- mean (all fixed and floating rate observations)	11.34%	6.71%

This table shows that the approach taken in the draft determination produces the lowest possible debt risk premium. That debt risk premium is clearly out of line with all other estimates of a debt risk premium that complies with the AMI OIC requirements. Indeed, the next lowest result is 45% higher than the AER's debt risk premium, and several of the measures are more than double the AER's proposed debt risk premium.

The debt risk premium calculated based on the Tabcorp issue also results in a debt risk premium that is lower than almost three-quarters of the other estimates of the debt risk premium. However, the Tabcorp result is much closer to the majority of the other results. It is within 0.5% of nine other results, including CBASpectrum, the RBA average, AMP's March 2009 A- bond issue, the CEG report's calculation of the mean spread to CGS on BBB+ bonds and the mean yields on longer maturity BBB+ and BBB+ to A- bonds, and two measures of overseas bond rates.

As demonstrated by this table and the analysis in sections 3 and 5 of this submission, the Bloomberg fair yield curves are an unreliable estimate of the debt risk premium and significantly underestimate the observed corporate bond rate for BBB+ 10 year bonds. The use of the Bloomberg fair yield curves is inconsistent with all relevant supporting evidence, and they cannot reasonably be relied upon by the AER as the measure of the debt risk premium.

The DNSPs' proposed debt risk premium, which is based on the Tabcorp bond issue, is significantly more consistent with the weight of the supporting evidence.

The DNSP's approach is a conservative measure and there would be grounds for justifying a higher debt risk premium than the Tabcorp rate of 4.84%, but there is clearly no basis for adopting a debt risk premium of 3.09% based on the Bloomberg fair yield curves.

Appendix 1: CEG report

The CEG report is attached as a separate document.

Spreadsheets containing the data used in the CEG report will follow separately.

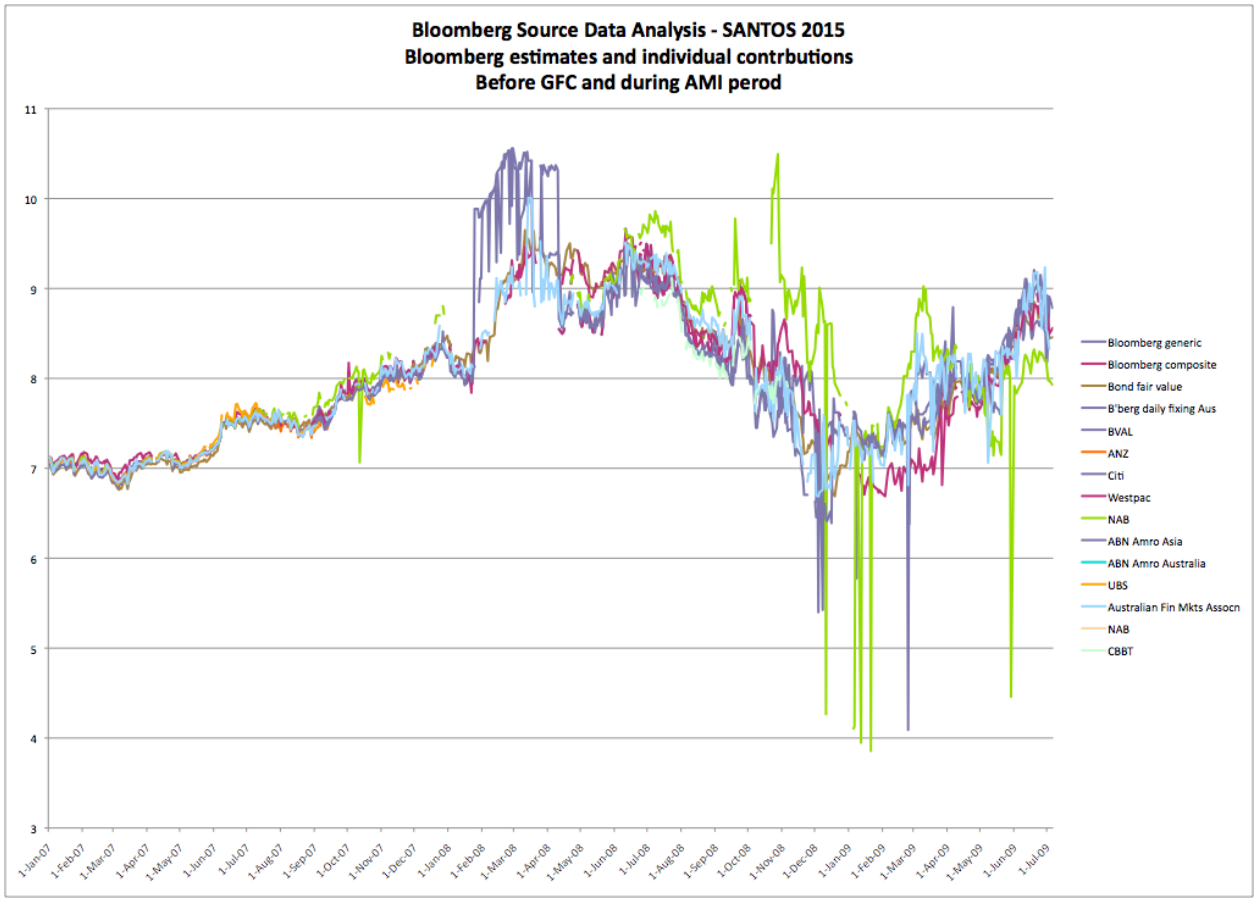
Appendix 2: Analysis of the source data estimates used by the AER

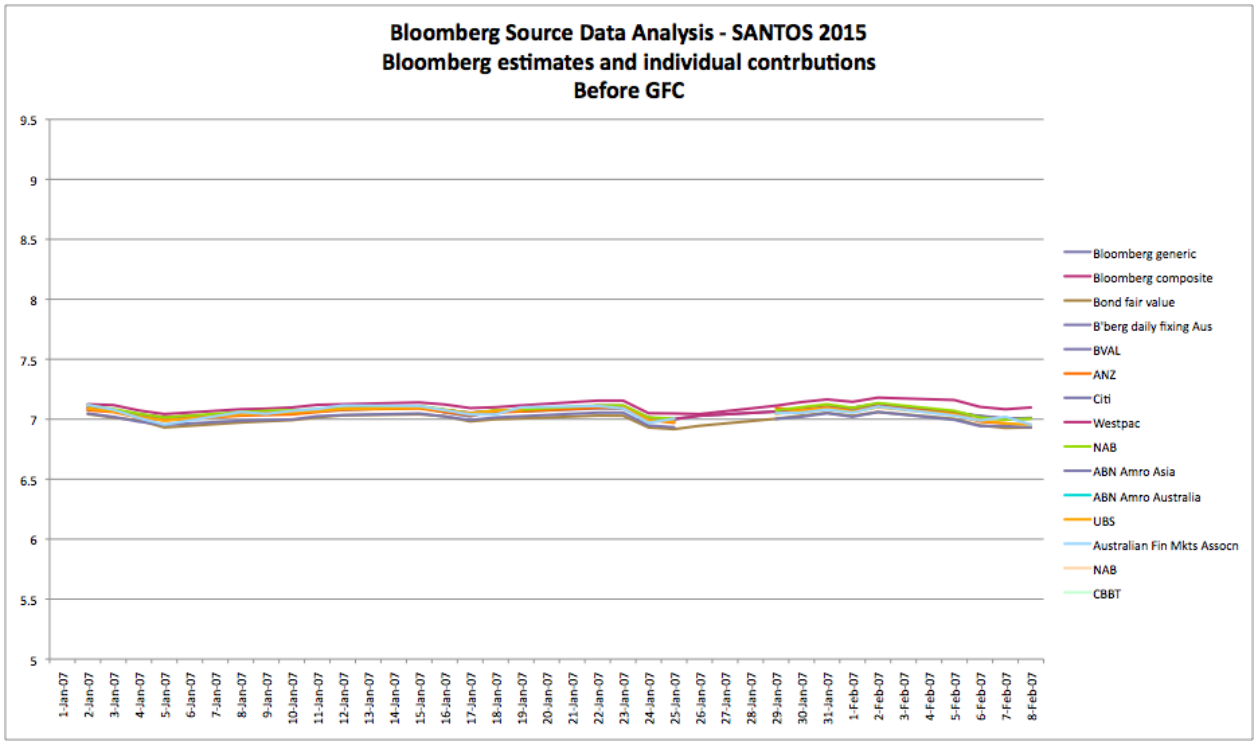
This analysis looks at the source data used by agencies such as Bloomberg and AFMAdata in the generation of their estimates of end of day pricing. We have restricted our analysis to the longest dated bond in the BBB category as it has the greatest influence on the AER's estimate.

Bloomberg

We did an analysis of the Bloomberg source data from various contributors to get an understanding of the internal consistency of this data. We reviewed a period from January 2007 so as to compare the data distribution before and after the Financial Crisis.

We show below the charts for SANTOS 2015 and a few other BBB bonds of similar maturity:




Bloomberg Source Data Analysis - SANTOS 2015
Bloomberg estimates and individual contrbutions
Before GFC
9.5
9
8.5
8
7.5
7
6.5
6
5.5
5
1-Jan-07
2-Jan-07
3-Jan-07
4-Jan-07
5-Jan-07
6-Jan-07
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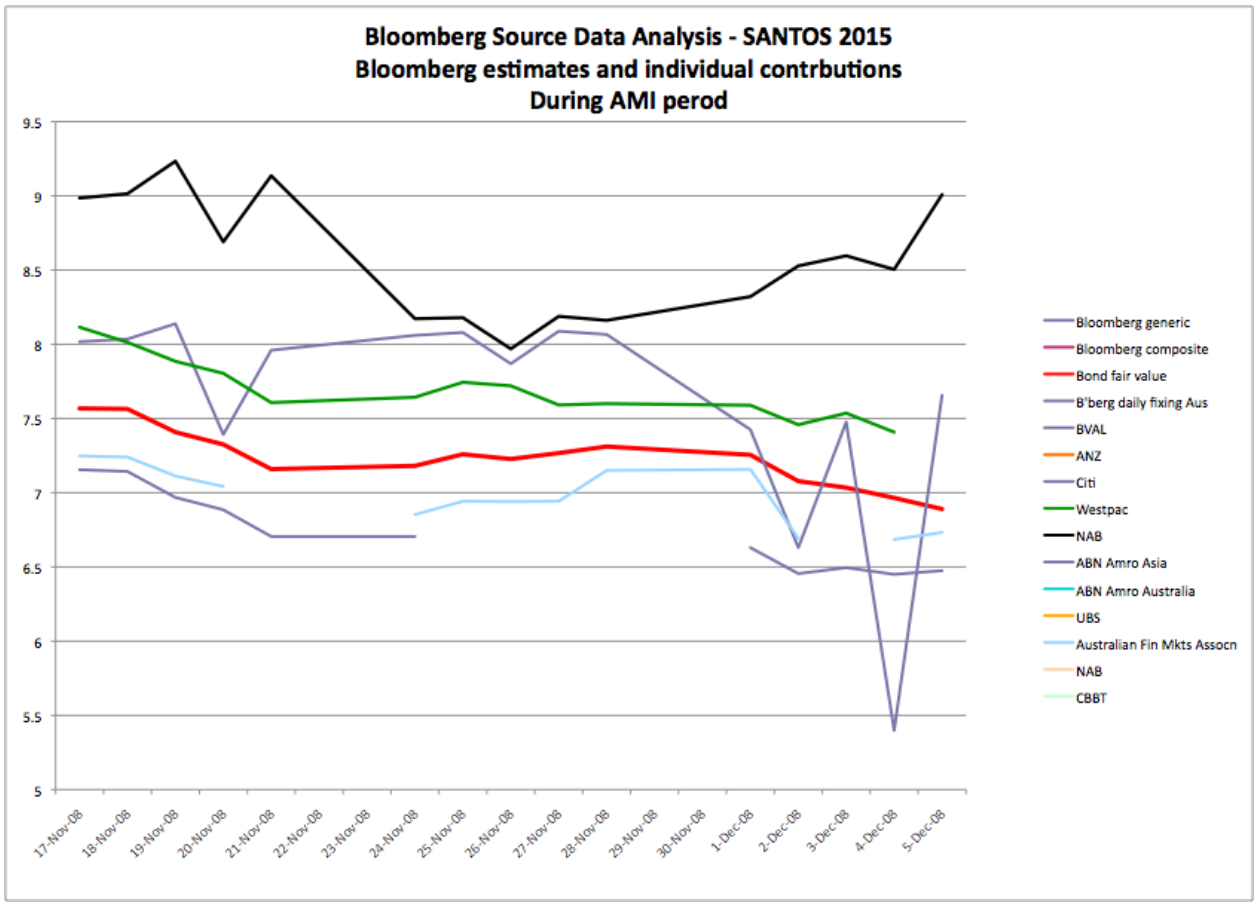
Bloomberg Source Data Analysis - SANTOS 2015
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BVAL
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Australian Fin Mkts Assocn
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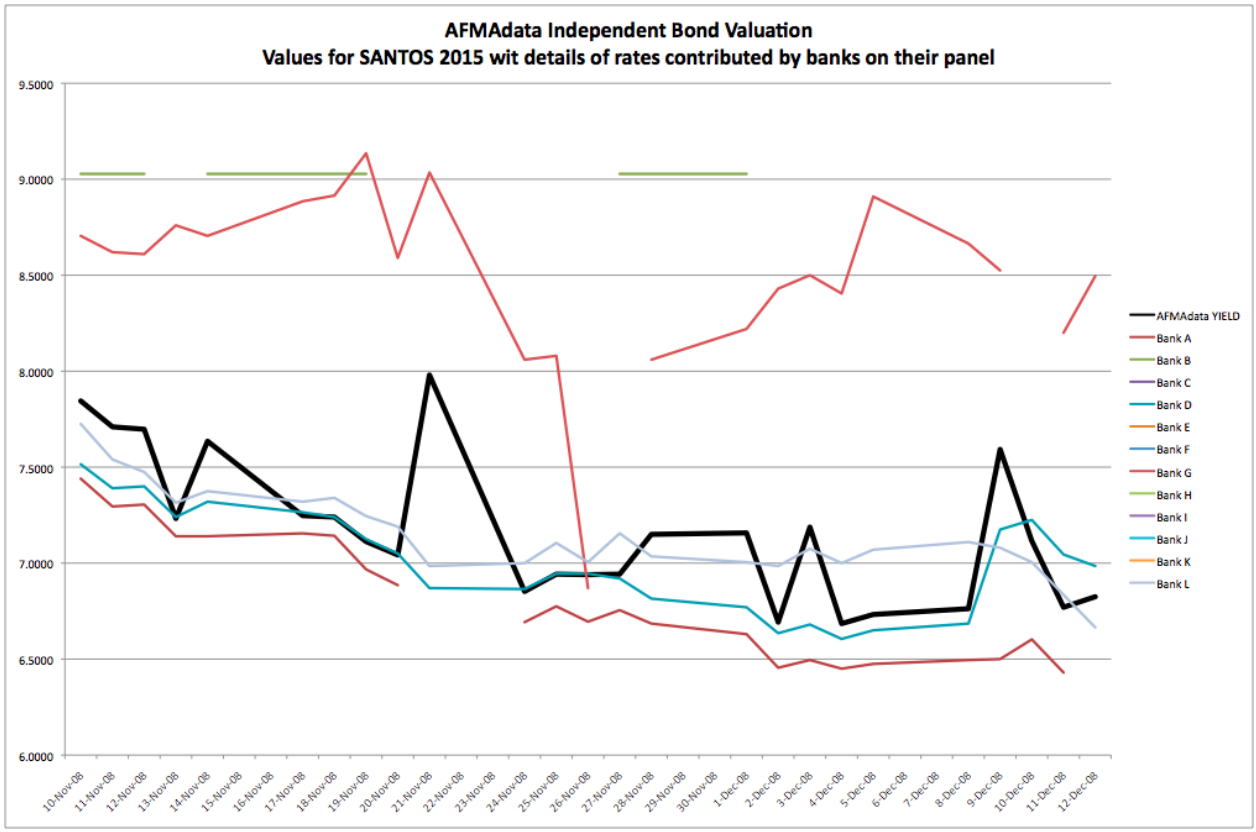
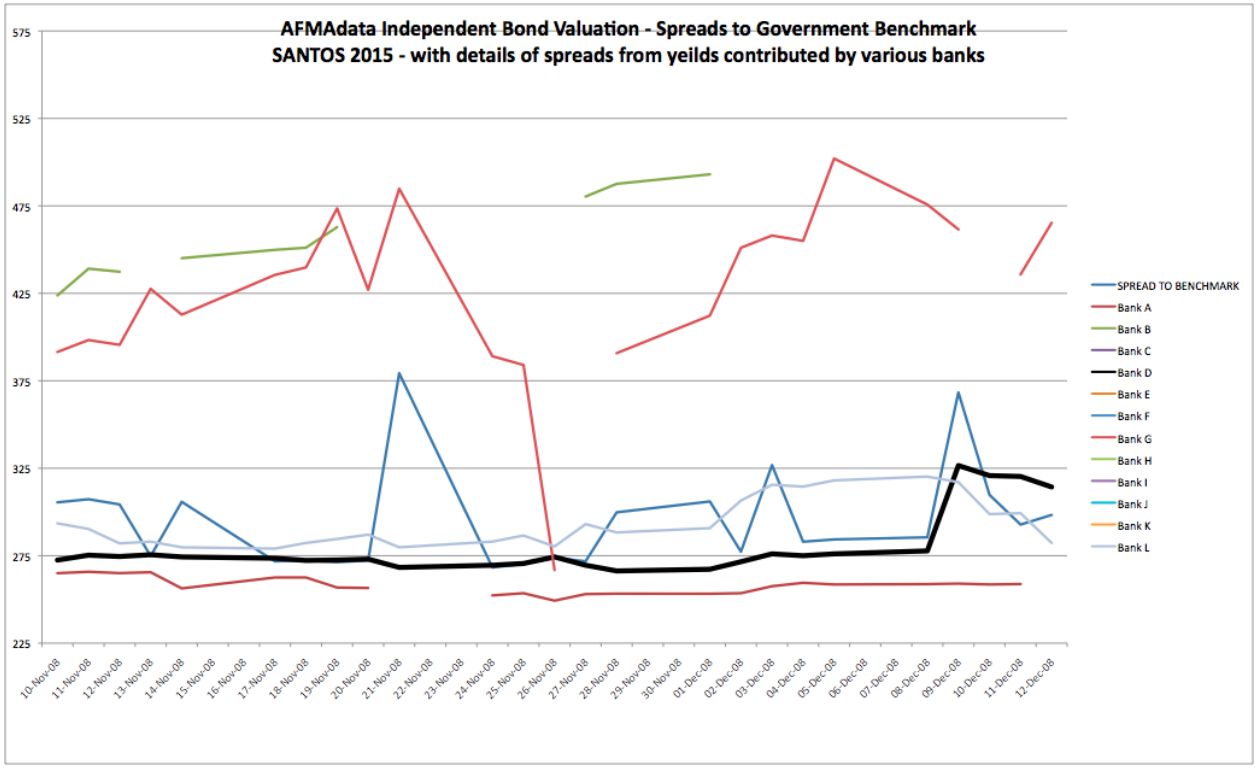
Key Observations:

1. The contributions from individual banks during the pre-GFC period were tightly grouped and there was greater consensus on pricing levels of the bond. During the AMI measurement period this consensus broke down and we saw a fundamental breakdown between those that believed Santos pricing was unaffected by the GFC and those that marked much higher.
2. A number banks stopped inputting prices into Bloomberg during the AMI measurement period and even those that did were inconsistent.

AFMAdata

Below is a graph that plots the pricing the SANTOS 2015 bond by AFMAdata from end of day prices taken from 12 banks on their panel.





A few observations on the above:

1. The Santos bond is a small issue of only A$100 million and just makes it into AFMAdata's minimum threshold criteria. This makes it very illiquid at the best of times and it is possible that the bond did not trade during the AMI measurement period. In a sense, the individual contributions by banks represent estimates of fair value and may not have been ratified by observed trades.
2. Of the 12 banks on the AFMA panel only 5 chose to provide end of day prices for this bond. Three were concentrated at the lower end of the scale while 2 were consistently pricing the bond at a higher yield. This shows that during the AMI period there were two very different opinions on where the bond was to be priced and it does not appear that it was resolved via an actual observed trade.
3. When we look at the spread over CGS, the AFMA valuation is almost flat over the AMI measurement period and jumps marginally immediately after
4. One of the contributors appears to have used a flat rate for the entire period irrespective of movements in pricing of CGS bonds.

Appendix 3: Assessment of Bloomberg fair yield curves as a reference rate setting mechanism

CRITERIA	LONDON INTERBANK OFFER RATE (LIBOR)[66]	AUSTRALIAN BBSW RATE[67]	BLOOMBERG FAIR CURVES
Who operates the reference rate?	British Bankers Association (BBA) – a non-profit making entity that is the main representative of the banks in the London market	Australian Financial Markets Association (AFMA)	Bloomberg – a profit-making entity
Is the reference rate built for the purpose?	Yes	Yes	Bloomberg fair curves are not specifically designed for the AER's purpose
Is the reference rate prepared with the intention that it be relied upon by the intended user for its intended purpose?	Yes	Yes	No, Bloomberg does not prepare the fair curves for the AER or with the AER in mind, and therefore Bloomberg has no 'duty of care' that what it produces meets the AER's purpose and can be relied upon
Where are the rates sourced from?	Depending on the currency, a panel of 8-16 banks. Contributor banks are selected for currency panels with the aim of reflecting the balance of the market for a given currency based upon three guiding principles: 1. scale of market activity 2. credit rating 3. perceived expertise in the currency concerned.	The BBSW panel comprises organisations which input rates for the calculation of the BBSW rate set. The number of panellists is determined by AFMA. There are currently 14 members.	Bank contributions – no designated panel. Expertise and market involvement/ participation of banks in the Australian fixed income bond market unknown and not verified.

[66] British Bankers Association at http://www.bbalibor.com/bba/jsp/polopoly.jsp?d=1627

[67] AFMA : Bank Bill Swap Reference Rate (BBSW) BBSW Procedures at http://www.afma.com.au/afmav6wr/_assets/main/lib90012/bank%20bill%20swap%20reference%20rate%20procedures.pdf

CRITERIA	LONDON INTERBANK OFFER RATE (LIBOR)[66]	AUSTRALIAN BBSW RATE[67]	BLOOMBERG FAIR CURVES
Who compiles the data sent in?	Reuters Thomson is the calculation agent – completely independent of the BBA. They audit data submitted by panel banks and create the rates using the definitions provided by the FX & MM Committee, and they do so under the supervision of BBA.	The BBSW rate setting calculation mechanism is determined by AFMA in consultation with AFMA's BBSW Committee.	Bloomberg
How is the data 'trimmed'' and the rate calculated?	Each contributor rate is ranked in descending order and then drop the top and bottom quartiles. The middle two quartiles reflecting 50% of the bank quotes are then averaged (simple average)	The calculation mechanism calculates the average mid rate for all input rates, rounding up to two decimal places if necessary. From these mid-rates an elimination process will eliminate the highest and lowest rates for each individual tenor until a maximum of eight mid-rates remain. These contributions will then be displayed on page BBSW. **Notes** (i) If between five and eight eligible input rates are available for any tenor, only those contributions will be displayed on BBSW for that tenor. (ii) If less than five eligible input rates are available for any tenor, no contributions will be displayed and no average rates will be displayed for that tenor. (iii) Rates displayed on page BBSW on a row by row basis across all tenors will not necessarily belong to the same contributor.	5 steps, as described in section 3.2 of the submission.
What is the process for reviewing the bank panel?	Every year the FX & MM Committee of the BBA undertakes an assessment of each	An election for the BBSW panel is held at AFMA's discretion. The BBSW Committees may	No review known/ specified

CRITERIA	LONDON INTERBANK OFFER RATE (LIBOR)[66]	AUSTRALIAN BBSW RATE[67]	BLOOMBERG FAIR CURVES
	panel, based upon a review by the BBA of the contributors. The review re-evaluates each bank by ranking them according to their total money market and swaps activity over the previous year and selecting the banks with the largest scale of activity with due concern given to the other 2 criteria. The review is not limited to contributors as any Banks can submit themselves to the evaluation process for any currency.	recommend to the AFMA Market Governance Committee that an election be conducted if and when circumstances warrant; eg. resignation of a panellist, non-contribution of reference rates, contribution of out-of-market reference rates, changed participant circumstances etc. Ballot Procedure - Nominations shall be called from organisations who are the foremost traders of short dated securities (or otherwise as recommended by the AFMA Negotiable/Transferable Instruments ('NTI') Committee) and the current BBSW panellists. All current AFMA eligible BBSW Reference Banks (AFMA Prime Banks) will automatically be appointed to the BBSW panel without being subject to any ballot procedures. All current AFMA eligible BBSW Reference Banks (AFMA Prime Banks) and other AFMA Financial Market Members who nominate themselves for the BBSW panel are eligible to vote on the nominations, however voting is not compulsory.	
What is the question put to the banks?	Every contributor bank is asked to base their Libor submissions on the following question; "At what rate could you borrow funds, were you to do so by asking for and then accepting inter-bank offers in a reasonable	Each bank is ask for its view of the mid rates (mid of bid/offer rates for each tenor) for BBSW reference bank bills of exchange (AFMA Prime Bank paper - as defined by AFMA) at 10.00 am.	No specific question. Banks don't contribute their offer or bid rates. No volume specified to the banks. Banks provide prices when they like on the Bloomberg platform. There is no specific

CRITERIA	LONDON INTERBANK OFFER RATE (LIBOR)[66]	AUSTRALIAN BBSW RATE[67]	BLOOMBERG FAIR CURVES
	market size just prior to 11 am?"		rate setting process that the banks follow.
Can bank contributors see other rates before publication of the rate?	Banks cannot see each others' rates as they submit, only after final publication. Banks' rates submissions are confidential	Banks cannot see each others' rates as they submit, only after final publication. Banks' rates submissions are confidential	There is some capacity for banks to see other banks' pricing online.
What is the default mechanism if the rate cannot be calculated	A bank panel chosen by AFMA for the contingency rate setting mechanism taking into consideration market conditions.	A bank panel chosen by AFMA for the contingency rate setting mechanism taking into consideration market conditions.	Unknown.
Is there a process for rate disputes?	Yes. There is a formal dispute and complaints process	Yes. There is a formal dispute and complaints process	Unknown where there is a perceived pricing error.

Appendix 4: Information from banks regarding actual trades in corporate bonds during the AMI measurement period

In order to assess the level of actual trades during the AMI measurement period, the DNSPs asked seven banks the following question:

> Confirm whether [Bank] executed any BBB, BBB+, A- or A rated corporate bond trades in the period between 17 November 2008 and 5 December 2008. If [Bank] did trade such corporate bonds could you please indicate if they were bonds that were shorter than 3 years to maturity. Please note that we are not after detail of the corporate issuer or the counterparties and we are really only after confirmation of whether any corporate bond deals were traded.

Five banks provided answers to this question, one bank responded that it was not willing to provide this information, and one bank did not reply.

The answers of the five banks that provided information showed that:

- there appear to have been less than 30 trades during the entire AMI measurement period in total across all five banks;
- almost all of those trades related to bonds with less than three years to maturity;
- the remaining small number of trades related to bonds with three to five years to maturity, except for three trades in an A rated 6.5 year bond;
- there were no trades in BBB bonds with more than five years to maturity during the AMI measurement period;
- the GPT bond that the AER excludes as an outlier in the draft determination was traded at least twice during the AMI measurement period; and
- in contrast, none of the responses provided evidence of trades in Santos or Snowy Hydro during the AMI measurement period.

The DNSPs do not have permission to provide the actual responses from the banks as part of this submission. The DNSPs could endeavour to seek permission to provide this information on a confidential basis if required by the AER.

Appendix 5: Notes on the calculations used in sections 5.5 to 5.8[68]

Section 5.5: Bonds issued by Australian corporates in the US market

The method used to generate the spread to the Commonwealth Government Bond rate is as follows, in broad summary:

- the rate at which the company issued the bond is taken swapped to a spread over the floating rate in the currency (e.g. US Libor) using the foreign currency interest rate swap rate at the time of the bond issue ("issue date");
- this spread is then swapped to a spread over the Australian BBSW rate – this involves a 'cross currency basis swap'. Due to the difficulty of accessing basis swap quotes in the AMI measurement period, we have conservatively assumed a zero basis point spread on the basis swap. We have also allowed for appropriate basis point conversions (e.g. 1 US basis point does not equate to 1 Australian basis point);
- the spread over BBSW is then converted to an absolute fixed Australian rate using the Australian interest rate swap rate at the time;
- the absolute Australian rate is then deducted from the Commonwealth Bond rate at the time (the last two steps are similar to the way we converted the Tabcorp floating rate spread to a spread over the Commonwealth Bond rate);
- the results have not been annualised; and
- the various interest rate and basis swap rates used in the calculations were taken from Bloomberg.

The above method is a commonly applied cross currency swaps methodology although banks have proprietary models to perform the calculations so there will undoubtedly be some variance with our calculations. (It is simply not possible to 'tie up' the rates between various swaps providers/banks so the calculations are therefore only estimates).

Section 5.6: Secondary trades during the AMI measurement period of bonds issued by Australian corporates in the US market

1. The table in section 5.6 shows the non-annualised effective spread to the US risk free rate (the US Treasury bond) and the calculated spread to the Australian risk free rate (the Australian Commonwealth Bond Rate) for bonds that were issued by Australian

[68] The tables, data and charts used in sections 5.5 to 5.8 have been complied by consultants to the DNSPs on a best efforts and best endeavours basis using information available on Bloomberg and other data provider systems and services. The information does not purport to contain all relevant data and may be incomplete. The data and calculations have not been independently verified, audited or corroborated. The data and calculations used in the tables, data and charts are estimates only. The DNSPs' consultants do not warrant or make any claim to the accuracy, completeness, reliability or suitability of the information. The DNSPs' consultants are not liable for any loss or damaged that may be suffered or that may result or occur because of any errors or omissions in the data or calculations whether through negligence, misrepresentation, misstatement or otherwise.

companies in the US prior to the AMI measurement period based on trading levels for the bonds on 24/11/2008 being a date in the AMI measurement period.

2. The average spread to the Commonwealth bond rate is 461 basis points although this cuts across several maturities.

3. The Effective Spread over the US Treasury is calculated, in broad summary, by taking the yield at which the bond was trading (as appearing in Bloomberg) on 24/11/2008 and subtracting the Treasury rate (interpolated as necessary depending on the time to maturity) on 24/11/2008.

4. The Effective Spread to the Commonwealth Bond Rate is calculated as follows, in broad summary:

    a. swapping the yield at which the bond was trading (as appearing in Bloomberg) on 24/11/2008, to a spread over US$ Libor using the US interest rate swap rate on 24/11/2008;

    b. this spread is then swapped to a spread over the Australian BBSW rate – this involves a 'cross currency basis swap'. Due to the difficulty of accessing basis swap quotes in the AMI measurement period, we have conservatively assumed a zero basis point spread on the basis swap. We have also allowed for appropriate basis point conversions (e.g. 1 US basis point does not equate to 1 Australian basis point);

    c. the spread over BBSW is then converted to an absolute fixed Australian rate using the Australian interest rate swap rate on 24/11/2008;

    d. the absolute Australian rate is then deducted from the interpolated Commonwealth Bond rate on 24/11/2008 (the last two steps are similar to the way we converted the Tabcorp floating rate spread to a spread over the Commonwealth Bond rate);

    e. the results have not been annualised; and

    f. the various swap rates used in the calculations were taken from Bloomberg;

    The above method is a commonly applied cross currency swaps methodology although banks have proprietary models to perform the calculations so there will undoubtedly be some variance with our calculations. (It is simply not possible to 'tie up' the rates between various swaps providers/banks so the calculations are therefore only estimates).

Section 5.7: Other bonds issued in overseas markets during the AMI measurement period

The method used in section 5.7 is the same as set out above for section 5.5.

Appendix 2

CEG Report – Estimating the cost of 10 year BBB+ debt during the period 17 November to 6 December 2008

SP AusNet
A member of Singapore Power Group

Estimating the cost of 10 year BBB+ debt during the period 17 November to 5 December 2008

Tom Hird

September 2009

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1. Terms of reference

1. DLA Phillips Fox has asked me to advise on the compliance of various proxies for the 'observed annualised Australian benchmark corporate bond rate for corporate bonds'. This is an input into the estimation of the Debt Risk Premium (which is derived by subtracting the yield on Commonwealth Government Securities from the 'observed annualised Australian benchmark corporate bond rate for corporate bonds'). The relevant sections of my terms of reference are set out below.

1. Compliance of Bloomberg and other DRP measures with the legislative requirements

The requirements under the AMI OIC for the calculation of the DRP are that:

- it must be determined using the 'observed annualised Australian benchmark corporate bond rate for corporate bonds';
- the bonds must have a BBB+ credit rating;
- the bonds must have a maturity period of 10 years; and
- measurement is to occur between 17 November and 5 December 2008 (**the measurement period**),

(**the legislative requirements**)

In the draft determination, the AER determines that the DRP should be 3.09%. This determination is based on fair yield curves published by Bloomberg during the measurement period. The AER's reasons are set out on pages 118-124 of the draft determination.

Can you please advise on:

- whether the Bloomberg fair yield curves that the AER relies on in the draft determination comply with the legislative requirements, and the extent to which they comply with the legislative requirements; and
- what other sources could reasonably be used to measure the DRP, and to what extent do those other sources comply with the legislative requirements.

2. Reliability of Bloomberg and other DRP measures

Can you please advise on:

- whether the Bloomberg fair yield curves that the AER relies on in the draft determination are a reliable and accurate estimate of a DRP that complies with the legislative requirements; and

- whether there are other sources that could be used to measure the DRP and that are a more reliable and accurate estimate of a DRP that complies with the legislative requirements.

2. Criteria for estimating the cost of Debt

2.1. Interpretation of the 'benchmark rate'

2. In order to answer my terms of reference it is necessary to proceed on the basis of an interpretation of the meaning attached to the '*observed annualised Australian benchmark corporate bond rate for corporate bonds for bonds with a BBB+ credit rating and a maturity of 10 years'*.

3. I interpret this to mean that it is the yield that would be paid on a typical BBB+ rated bond with a maturity of 10 years and that this typical yield must be assessed based on actual observations of yields in the corporate bond market. Specifically, observations from the bond market should have primacy over any preconceived conceptual notions of what the yield on a 10 year BBB+ bond should be absent those market observations.

4. I do not consider that the term *benchmark corporate bond rate* (in general or applied to BBB+ 10 year debt) has a standard or common usage in finance theory or practice. However, I do note that, in the context of economic regulation, the term 'benchmark' does have a common meaning. Given that the cost of debt is an input into the economic regulation of the AMI assets it may be relevant to consider the general meaning that is attached to the use of the term 'benchmark' in this wider context.

5. In order to give regulated businesses an incentive to operate efficiently, it is necessary to set revenues in a manner that is independent of, or at least not entirely dependent on, the actual conduct of the regulated firm. This gives rise to what is commonly described as 'benchmarks' against which the firm has an incentive to lower its own costs. If a regulated firm is able to perform at a lower cost than the 'benchmark' set by the regulator then the firm earns a financial reward being a profit in excess of the normal ('benchmark') level of profits. By contrast, if the firm operates at a higher cost than the benchmark then the firm incurs a financial penalty and has profits that are lower than the normal ('benchmark') level of profits. The same is true of service standard benchmarks – where firms are rewarded for operating at higher quality of service than the relevant benchmark and penalised for operating at lower quality of service.

6. This specific use of the term 'benchmark' in economic regulation is consistent with the interpretation of the benchmark cost of debt to mean 'typical' cost of debt. If incentive regulation were to always set expenditure/performance benchmarks at a level that is better than the typical firm can expect to achieve then typical firms (ie, most firms) will be unable to recover their true costs and will earn less than normal economic profits. This would be contrary to the stated objectives of economic regulation.

7. The current context involves setting the cost of capital based on a hypothetical 'benchmark' financing strategy that involves a firm adopting debt gearing of 60%

(which is a high level of gearing relative to most companies) and issuing 10 year debt. These 'benchmark' financing assumptions gives rise to:

- an assumed 'benchmark' equity beta of 1.0 (which is used in conjunction with an MRP of 6.0%); and
- an assumed 'benchmark' BBB+ credit rating from Standard and Poor's.

8. These benchmark assumptions, and observations of yields on Commonwealth Government and corporate bonds, give rise to an overall cost of capital. This is a benchmark cost of capital. If firms are able to lower their cost of capital below this then they receive a financial benefit and, if not, they receive a financial penalty. There are range of ways in which a firm might attempt to lower their cost of capital below the regulatory benchmark:

   - adopt a less aggressive level of gearing and thereby benefit from a higher credit rating and lower equity beta (but suffer as a result of having a greater proportion of their financing in the form of higher cost equity);
   - engage in other strategies that may lower debt or equity costs – such as hedging various risks, issuing hybrid debt/equity instruments, financial transparency with investors, prudent debt refinancing timelines etc.

9. In this context, one could interpret the use of 'benchmark' in the words 'observed annualised Australian benchmark corporate bond rate for corporate bonds for bonds with a BBB+ credit rating and a maturity of 10 years' to simply mean that the relevant *regulatory* benchmark was the cost of issuing 10 year BBB+ rated debt corporate debt. One could further infer that if such an assessment resulted in a range in which 10 year BBB+ debt would be issued then a 'typical' or 'central' point in that range should be adopted such that the typical issuer of BBB+ debt could be expected to achieve that interest rate on their debt.

10. In this context, a firm who is able to organise their financing strategy to lower their equity beta and/or to raise then credit rating (or to trade off a higher equity beta for a raise equity beta and lower the other in a manner that lowers the overall cost of capital) has an incentive to do so.

2.2. General criteria

11. In my view, in order to be accurate and reliable, any methodology for estimating the cost of debt should as far as possible:

    i. result in an unbiased estimate of the cost of issuing debt and a small standard error (ie, when the method does misestimate the benchmark rate it should only do so by a small amount);

ii. incorporate all relevant information and not rely on irrelevant information;

iii. produce results that are consistent with accepted expert opinion (including academic finance theory and empirical research);

iv. produce results that are timely and responsive to changes in market conditions; and

13. In order to assess these qualities it is also desirable that the methodology:

v. be transparent including transparency about how and to what end discretion has been employed.

2.3. Relevant economic issues

14. In this report I assess how one would estimate the accuracy of an estimate of the interest rate that would typically be incurred by a firm issuing a bond that has:

- no put/call/conversion options attached to it;
- a maturity of 10 years where the issuer makes fixed payments to the bond holder over the ten years and those payments are denominated in Australian dollars; and
- a credit rating of BBB+ from Standard and Poor's.

15. For these types of bonds, there are other features that may affect its yield. These include:

- whether the coupon payment is high or low. The higher the coupon payment the shorter the "duration" being the average timing of payments associated with the bond. For a "bullet" bond with a single payment at the time of maturity and no intervening coupons then the duration of the bond is equal to its maturity. For all other bonds the duration is shorter than its maturity. If the yield curve is upward sloping then, other things equal, for two bonds with identical maturity the bond with the shorter duration will have a lower yield to maturity – reflecting the fact that shorter duration bonds pay more of their value in earlier periods (over which the required yield to that point in time is lower when the yield curve is upward sloping);
- whether there is likely to be a liquid[1] secondary market for the bond. The more liquid the secondary market for a bond the more attractive will be the bond at the

[1] A liquid secondary market is one where a buyer or seller could, over a short period, accumulate/liquidate a large value of the relevant asset without raising/depressing its price.

time of issuance (lower the yield to maturity) because investors will know that the cost of selling the bond, should they need to do so in the future, will be lower; and

- whether the probability of default for a bond is higher or lower than the average for bonds with a BBB+ rating.

16. I will assess different estimates of the cost of debt against a 'benchmark rate' where that benchmark rate is 'typical' of bonds with differing duration, liquidity and default risk but which nonetheless have a BBB+ rating.

17. Finally, it is relevant to note that the cost of debt to a firm is the interest rate incurred by the firm at the time of issue. There are sound economic reasons for believing that the interest rate at which bonds trade at in the secondary market will be lower than the interest rate at which those bonds are issued initially (other things constant). This reflects the fact that the initial sale of the bonds represents the sale of 100% of the relevant bonds over a short period (often over a single day in a book build process). By contrast, secondary trades of the bond are almost always for much smaller parcels of the bond (a few percent of the total amount outstanding). Unless the corporate bond market is perfectly liquid then an initial sale of a large volume of bonds will always, other things equal, result in a lower bond price (higher yield) than subsequent secondary sales.[2]

18. Of course, determining the actual level of this premium is very difficult because it is very rare for an investor to participate in an initial bond sale and then immediately turn around and sell that bond in the secondary market. By the time secondary market sales are recorded it is not possible to know definitively whether the price change reflects a new issue premium or other factors that have affected the cost of debt since the initial issue was made.

2.4. Consideration of current market conditions

19. Following the onset of the global financial crisis, the market for corporate bonds has changed materially. The impacts of these changes are summarised in the below quotes from various sources:

20. Before the crisis was fully developed the International Monetary Fund (IMF) stated in April 2008:

[2] Of course, this does not mean that the first secondary trades after an initial issue will always occur at a lower yield to maturity. Changes in market conditions between the time of initial issue and the time of subsequent secondary trade may cause the observed yield on some secondary trades to be higher than the yield at time of issue.

"The financial market crisis that erupted in August 2007 has developed into the largest financial shock since the Great Depression, inflicting heavy damage on markets and institutions at the core of the financial system,"[3]

21. Since then, the crisis has progressed further and reached a new level in September 2008.[4] The IMF in its October 2008 World Economic Outlook clearly identified the events of September 2008 as signalling a 'new phase' for the crisis:

"The financial crisis that first erupted with the U.S. subprime mortgage collapse in August 2007 has deepened further in the past six months and entered a tumultuous new phase in September. The impact has been felt across the global financial system, including in emerging markets to an increasing extent. Intensifying solvency concerns have led to emergency resolutions of major U.S. and European financial institutions and have badly shaken confidence."

22. Similarly, the Organisation for Economic Cooperation and Development (OECD) states in the context of its November 2008 Economic Outlook No. 84:

"This Economic Outlook represents a substantial downward revision from just a few months ago: many of the downside risks previously identified have materialised. The financial turmoil that erupted in the United States around mid-2007 has broadened to include non-bank financial institutions and rapidly spread to the rest of the world. Following the collapse of Lehman Brothers in mid-September, a generalised loss of confidence between financial institutions triggered reactions akin to a 'blackout' in global financial markets."[5]

23. An important consequence of this is that there has been a significant flight of capital to the safety and liquidity of nominal Government bonds. This has been described by the US Federal Reserve as an "extreme rush to liquidity".

"We have discontinued the liquidity-adjusted TIPS expected inflation estimates for the time being. The adjustment was designed for more normal liquidity premiums.

---

3 IMF, World Economic Outlook, April 2008 page xv.

4 On the 7th of September the two largest buyers and securitisers of US mortgages ('Fannie Mae' and 'Freddie Mac') were placed in conservatorship. On Sunday 14th September the bankruptcy of investment bank Lehman Brothers and the sale of Merrill Lynch to Bank of America (with US government guarantees attached) were both announced. On Tuesday the 16th of September it was announced that the US Government would effectively take over 80% of the equity in one of the world's largest insurers (AIG) which had suffered a liquidity crises and was unable to find lenders to save it from insolvency. The US Government provided an $85 billion credit facility in exchange for taking over 80% of the equity in AIG.

5 OECD, Economic Outlook No. 84, Editorial, Managing the global financial crisis and the economic downturn and summary of projections, Klaus Schmidt-Hebbel, OECD Chief Economist, page 3.

***We believe that the extreme rush to liquidity is affecting the accuracy of the estimates.*"[6]**

24. Australian credit markets have been similarly affected. Deloitte in a November 2008 report for the AER has stated:

> *The market for non-financial institutions corporate bonds, similar to the assumed BBB+ grade used in the WACC model, effectively vanished from capital markets in the first half of 2008 against a total for $6.5 billion for the whole of 2007*[7]
>
> *The small volume of corporate bond issues that has taken place in 2008 has been in the main restricted to large financial institutions, and credit spreads have increased significantly*
>
> *In the past, 5 and 10 year bonds were widely issued, but in the current market, the little volume that is being issued is primarily 3 year bank debt, with very little liquidity in 5 year facilities.*
>
> *In the current market it would be difficult (if not impossible) to attempt to refinance billions of dollars of debt in a 5-40 day [sic]*
>
> *From published research and discussions with market makers, the expectations are for the domestic corporate bond market to remain illiquid, possibly into 2010 and beyond. Given the historic events in credit markets, market makers were reticent to make any predictions… Their expectations are for the corporate bond market to have a very slow recovery, particularly for BBB+ issuances.*[8]
>
> *As per discussions with Market Makers there is currently no liquidity in the domestic corporate bond market, and international banks and fund managers are withdrawing funds from the market, restricting the size of the pool of money available to invest.*
>
> *The recent financial crisis demonstrates that in times of severe market conditions, liquidity in the primary and secondary markets can decline or even disappear. The lack of liquidity in the primary debt market implies business entities cannot raise finance via debt issuance without paying higher borrowing costs… On the other hand, the lack of liquidity in the secondary market implies capital providers in the primary market (investors) cannot convert debt securities to cash quickly at reasonable prices and hence would demand a higher rate of*

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

7 Page 5.

8 Page 9.

return from investments in the debt market. In both cases, the lack of liquidity will result in the addition of a liquidity premium to the investors' required rate of return and hence will increase the costs of accessing debt.[9]

25. Similarly, the Reserve Bank of Australia's (RBA) November Statement on Monetary Policy states:

> *"World financial markets have come under severe stress in the period since the last Statement [in August 2008]. Strains in credit markets escalated in early September, and the period since then has been marked by further large declines in equity prices and exceptional volatility across a range of markets…*
>
> *The renewed turmoil was sparked by the failure or near-failure of a number of financial institutions in the United States and Europe…*
>
> *These events saw an intensification of the credit tightening that was already beginning to take hold in a number of countries. While this had previously been mainly apparent in increased funding costs, which were typically passed on to borrowers in the form of higher lending rates, the renewed turmoil saw this develop into a serious tightening in credit availability. As confidence in the financial sector deteriorated, banks became more uncertain about their ability to sustain their funding, and this in turn made it more difficult for them to lend to sound borrowers in the non-financial sector.*[10]
>
> *Corporate bond issuance has remained low in recent months (Graph 74). Thirteen small bonds were issued in the September quarter, totalling around $1¾ billion. This is significantly lower than the average quarterly issuance of around $5½ billion before the credit turmoil. Two small corporate bonds were issued in October. As has been the case with most corporate issues in 2008, all of the recent deals were issued offshore.*[11]

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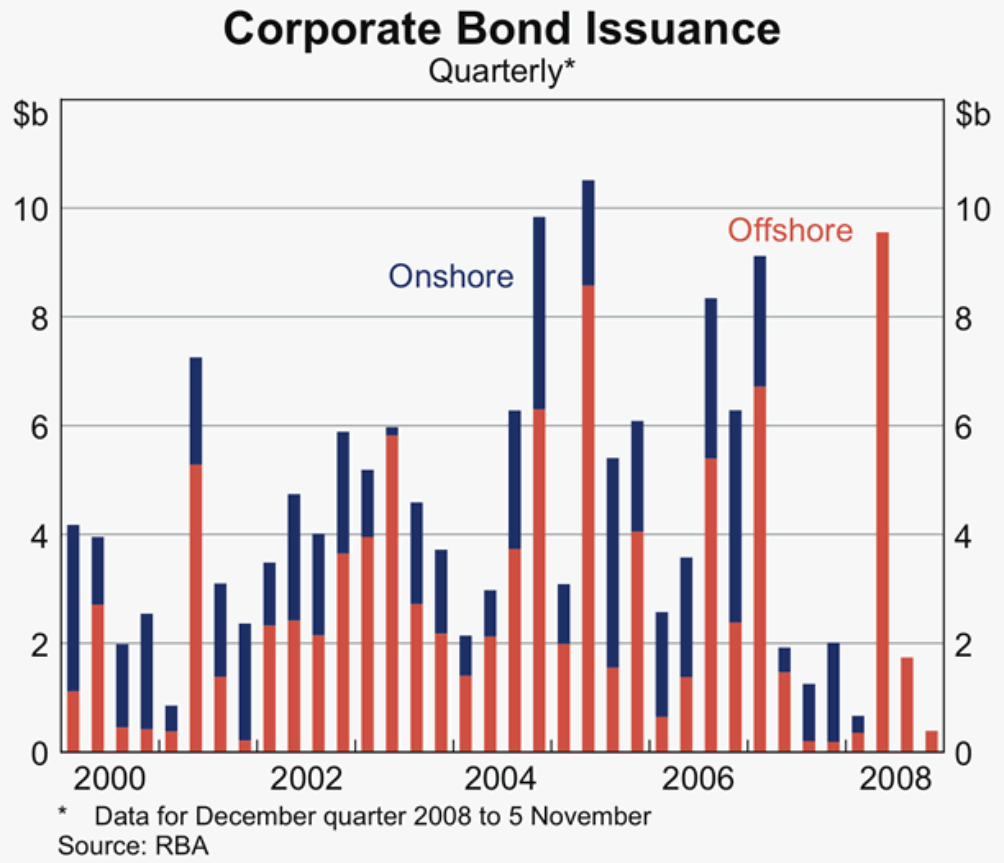
9 Page 18.

10 RBA, *Statement on Monetary Policy*, 10 November 2008, page 1.

11 Ibid, Page 56.

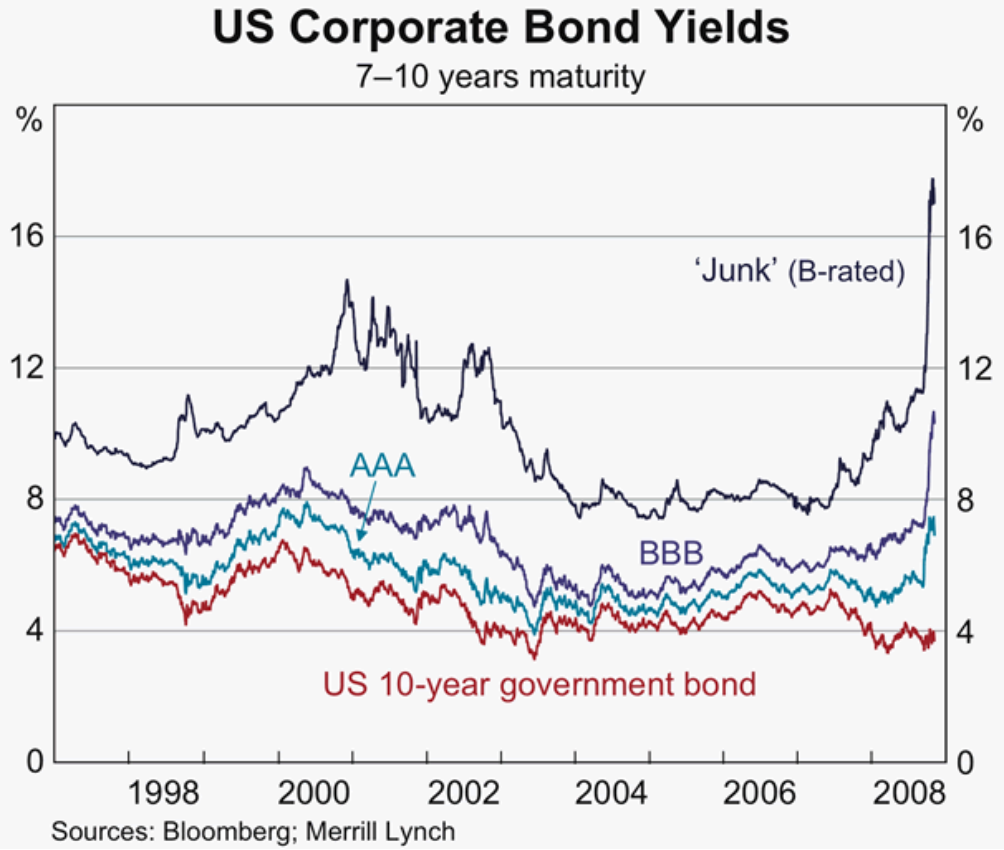
Graph 74



The deterioration of credit market conditions and the failure of several large financial institutions saw corporate debt yields [in the US] *increase significantly through September and October as default risk concerns escalated. Spreads on corporate debt surpassed their mid-March highs and 2000 peaks…*[12]

[12] Ibid, Page 13.

Graph 13



Corporate bond issuance in the United States was very weak in the September quarter and well below the already subdued level of issuance seen earlier in 2008; issuance was around three times less than in the June quarter for both financials and non-financials, reflecting the current very difficult conditions for longer term funding.[13]

Market contacts indicate that the secondary market has become more illiquid during the recent heightened turbulence, with few trades taking place. [14]

26. The RBA's February 2009 statement noted:

While the global financial system remains under considerable strain, there have been some signs of an improvement in financial conditions recently. The extreme volatility that affected all markets in October and November following

[13] Ibid, page 14.

[14] Ibid, page 57.

the Lehman's collapse has abated in the past two months. There have also been some signs of improvement in the functioning of credit markets in response to the substantial assistance measures taken by authorities in a number of the major economies. These measures have included injections of capital into financial institutions, the provision of government guarantees and various actions taken by central banks to improve market liquidity. While spreads in money markets remain high, yields have fallen to historically low levels in many countries. Debt issuance at longer terms has picked up, dominated by bonds issued by banks using government guarantees…[15] *However, global issuance of unguaranteed debt remains weak."*[16]

27. In a speech on 31 March 2009,[17] the RBA Assistant Governor (Financial Markets) commented on the effects of the global financial crisis on Australian financial markets as follows:

"Funding markets shut completely following the collapse of Lehman Brothers [in September 2008]. All global financial markets were dislocated by this event, but not surprisingly term debt markets were about the most affected…

In the wake of the dislocation induced by Lehman's, many countries, including Australia, moved to guarantee bank debt issuance. Soon after the introduction of the guarantee, Australian banks were able to once again access term debt markets… There has, however, been little investor appetite for unguaranteed debt, despite other indications of an improvement in credit market conditions."

28. In summary, during the AMI period the conditions in the secondary market for corporate bonds, which is the market covered by Bloomberg and CBASpectrum (being the other publisher of BBB+ fair value estimates), were such that:

- there were few, if any, actual transactions in the secondary bond market;
- there were no long dated BBB+ fixed coupon bonds and there have been very limited issue of new bonds (especially at the BBB+ credit rating); and
- there was very low liquidity (in the sense that it is difficult to buy and sell without affecting prices) and there is a high premium associated with liquidity.

29. I discuss these conditions in turn below and identify the issues that they raise for estimating an average benchmark yield on 10-year, BBB+ corporate debt. I use the term "the benchmark rate" as a short hand for this concept.

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15 RBA, *Statement on Monetary Policy,* 6 February 2009, page 1.

16 Ibid, page 22.

17 Speech titled *Some Effects of the Global Financial Crisis on Australian Financial Markets,* delivered by Guy Debelle, RBA Assistant Governor (Financial Markets) to Finance Professionals Forum, Sydney, 31 March 2009.

2.4.1. Few trades in corporate bonds

30. Consistent with the above views few, if any, actual transactions in the secondary bond market occurred during the AMI averaging period. In any case, given that such bonds are not generally traded in a centralised exchange but are bought and sold 'over the counter' it can be difficult to observe the prices on the trades that actually take place.

31. Even in normal market conditions yields attributed to a bond will generally not represent the results of actual trading on that day. Indeed Bloomberg has stated in 2007, before the full onset of the financial crisis, that up to 90% of the prices in its bonds database were indicative, not executable.[18] The prices reported by financial institutions, to a large extent, simply reflect the informed opinion of industry players about a fair price for a particular bond.

32. It comes as no particular surprise then, that the yields reported for the same bond on the same day often vary considerably. For example, on 5 December 2008 various sources were quoting the yields shown in Table 1 below.

Table 1: Comparison of estimated yields on 5 December 2008

Issuer	Maturity	UBS	CBA	NAB Markets	ABN Amro
GPT	22/08/2013	13.140	16.608	13.538	10.939
Santos	23/09/2015	7.356	6.704	9.211	6.580

Source: Bloomberg, CBASpectrum, UBS.

33. Clearly, there would be significant arbitrage profits to be had if all of these yields reflected yields at which these institutions were willing to trade. For example, it would be very profitable to buy the Santos bond from NAB (quoting the highest yield which implies the lowest price for the bond) and sell it to ABN Amro (quoting the lowest yield). On the GPT bond it would be most profitable to buy from ABN Amro and sell to UBS.

34. Two observations can be made about this. First, the quotes in the above table simply cannot be prices at which the banks are willing to trade (or even prices at which they have traded on that day). Rather, they simply represent yields at which these institutions believe a trade would take place if it did take place on that day. Second, the wide divergence between the yield estimates for the same bond suggests that there has not been any recent known trades (ie, prior to the end of the AMI averaging period on 5 December 2008) of the bonds to anchor price expectations.

[18] Bloomberg, *Bloomberg Fair Value Market Curves*, International Bond Market Conference, Taipei, 2007.

2.4.2. Using all of the available information

35. It is not necessarily the case that two bonds with the same time to maturity and same credit rating will attract the same price and, in fact, one may often observe very different prices for such bonds (eg, if the market for those bonds have different levels of liquidity). Even if there were a bond that just happened to have exactly 10 years to maturity and be rated at BBB+, this does not mean that we can, or should, rely completely upon the estimated yield reported for this bond to serve as the benchmark rate.

36. Furthermore, using a single observation as the required 'benchmark' means that all the information embodied in all other bond prices is thrown away, under the implied assumption that this is not useful in explaining the yield on 10-year BBB+ rated bonds. As a general rule it is wasteful and inefficient to exclude data that may potentially assist to improve an estimate of a benchmark yield for 10-year BBB+ corporate debt.

37. In particular, if we have limited observations of yields on BBB+ rated bonds then it will be prudent to infer the benchmark rate for BBB+ bonds from the yields on higher and lower rated bonds. This is because we know that, by definition, the benchmark rate for an A rated bond of a particular maturity is lower than the benchmark rate for a BBB+ rated bond of the same maturity. Thus, if we can accurately estimate the benchmark rate for the A rated bond this puts a floor on the benchmark rate for a BBB+ rated bond. Similarly, an accurate estimate of the benchmark rate for a BBB- bond puts a ceiling on the benchmark rate for a BBB+ bond.

38. Using information on bond yields from other credit ratings in this fashion it is possible to arrive at a range for the benchmark BBB+ rated bond even if we have no observations of yields on BBB+ bonds. Equally, if the sample of available yield estimates for BBB+ rated bonds is not large (in a statistical sense), it is appropriate to supplement information on BBB+ rated yields with information from yields on bonds of other ratings when arriving at a benchmark BBB+ rate.

39. For example, imagine there were only one BBB+ rated bond that happened to have a 10 year maturity and that bond had an estimated yield that of 7.0%. However, imagine that we also had 100 observations of A- rated bonds with around 10 years to maturity and that all of these A- rated bonds had yields of between 8.0% and 9.0%.

40. Based solely on the single observation for a BBB+ rated bond we would assume that the best estimate of the benchmark 10 year BBB+ rate was 7.0% - as this is our only observation. However, based on the information embodied in the 1,000 observations of A rated bond yields we can accurately (with statistical precision) infer that the best estimate for the benchmark yield on an A rated bond is somewhere in the range of 8.0% to 9.0%. Having done so we know that the benchmark BBB+ rate must be above this level. Thus, notwithstanding the single observation of a BBB+ yield at 7.0% we would still set the benchmark rate for the BBB+ bond at more than 8.0% - reflecting the information available in the form of yields on A rated bonds.

41. This does not mean that the single BBB+ observation is treated as an 'outlier' and ignored (given zero weight). Rather, it simply means that the observation is identified as atypical and given a weight that is proportionate to its relative value in all of the information that is available to us - which is a weight of around 1 in 1,001.

42. Any reasonable estimation technique would give the 7.0% observation some weight and this would tend to have the effect of lowering the both the BBB+ benchmark rate and the benchmark rate for A rated bonds (for precisely the same logic as outlined above) relative to a scenario where that observation did not exist. However, equally, any reasonable estimation technique would equally give the 7.0% observation only a very small weight (reflecting the fact that it is only one in 1,001 available and relevant observations).

43. As I will describe below, the methodology employed by CBASpectrum to arrive at fair value bond yields for BBB+ rated bonds (and for all credit ratings) does make use of the available information on all bonds including those of other credit ratings. It does this using relatively sophisticated statistical techniques (jointly estimating all fair value curves simultaneously). By contrast, Bloomberg's methodology appears to make less use of bond yields in other credit ratings to inform the BBB fair value curve. That said, there are clear examples where Bloomberg does impose restrictions on its BBB fair value curve to make sure that it does not cross its A fair value curve – but it would appear that these are more in the way of ad hoc adjustments rather than any consistent aspect of its methodology.

44. The AER's methodology for estimating a 10-year yield on BBB+ corporate bonds using Bloomberg's fair value estimate provides an example of how this principle can be used in practice. Since Bloomberg no longer reports yields for BBB debt of 10-year maturity, rather than simply accepting the yield on 8-year BBB debt as the best estimate for this value the AER sought to improve on this estimate by using information about the relative yields on 8-year and 10-year A rated debt, as estimated by Bloomberg. In theory, this adjustment makes efficient use of the information that is available to achieve a better estimate for the yields on 10-year BBB+ rated corporate bonds.[19]

2.4.3. Low liquidity and high liquidity premium

45. In a financial crisis there is heightened uncertainty about the returns on both corporate debt and equity. As discussed below, this tends to create what is known as a 'flight from risk' or a 'flight to safety'. As a consequence, investors reduce their demand for illiquid products and increase their demand for liquid instruments, such as government bonds, increasing demand for these products. This is partly because of the uncertainty about when major investors are going to need quick access to cash to

[19] In practice, as I show in section 3, the Bloomberg estimates that the AER relies upon in calculating this revised estimate are not themselves founded upon actual data and hence each of the estimates that the AER relies upon are problematic.

settle other obligations and partly because the heightened uncertainty about the value of corporate assets tends to make these markets less liquid. Moreover, the collapse of investment banks (and investment banking generally) has meant there are fewer players with less deep pockets willing to 'make the market' for a particular bond or stock by buying/selling it when they believe it is being mispriced.

46. All things being equal, this means that in general investors are likely to seek to sell out of corporate bonds, thus reducing the prices and increasing the yields. However, for the reasons described above, bonds that retain some liquidity will be less affected by this trend and will retain higher prices and lower yields than the majority of bonds, which have been left illiquid. That is, in the context of the current financial crisis, the premium for liquidity is considerably higher than it has been historically, and this effect will cause more liquid bonds to have materially lower yields than illiquid bonds.

47. Because there is little trading in corporate bonds at the moment, it is also the case that many bonds are traded infrequently. Methodologies that estimate a benchmark cost of debt that have reference to only the most liquid bond yields will be biased, to the extent that these bonds are not representative of their class and, as described above, may have lower yields than the typical bond.

48. In a market where there are many bonds that are traded liquidly (and a minority that are not) this bias is not likely to be material. That is, as long as there is a relatively large pool of liquid bonds, particularly of the type that closely approximate the benchmark we require, this can give some confidence that the average yield over these bonds is a good approximation for the benchmark, relative to other methodologies that might use more information.

49. However, consistent with the description of market conditions in sections 2.3 and 2.4.1, the typical corporate bond during the AMI averaging period, is best described as illiquid. To the extent that the concept of the *benchmark rate* is one that reflects the typical characteristics of a 10 year BBB+ bond then a consistent fair value estimate, in the then (and current) market conditions, would not be one that restricted itself to the most liquidly traded bonds.

2.5. Specific criteria when selecting data sources

50. Consistent with the five general criteria listed above I incorporate into these criteria more detailed criteria reflecting the above observations. The methodology should, as far as is practical:

    i. reflect an unbiased estimate of the representative yield at the time of issue for 'typical' corporate bonds with a maturity of 10 years and a BBB+ long-term credit rating;

    ii. utilise a methodology that is not unnecessarily reliant on a single or small number of observations and/or individual views but efficiently uses the totality

of information available, particularly where the available BBB+ information is sparse;

iii. gives rise to estimates that are consistent with expert opinion (including standard predictions of finance theory and past empirical relationships);

iv. give rise to estimates that are consistent with current market conditions and those estimates should change as market conditions change; and

v. be transparent including in relation to how discretion is applied. If that discretion results in yield estimates that are inconsistent with other potential proxies for the benchmark rate this inconsistency should be able to be explained in terms of why the alternative proxies are worse estimates for the benchmark rate.

51. There is also possibly a sixth criterion that would be desirable. This criterion does not flow from consideration of finance issues but more from consideration of process issues. Specifically, given that parties to regulatory proceedings may have vested interests in the outcome of the estimated benchmark corporate bond rate then ideally:

vi. the source of the estimate would be as independent as possible from interested parties to the regulatory proceedings.

3. Accuracy of AER/Bloomberg in the lead up to AMI averaging period

52. During the period six months through to October 2008, market commentary, such as from the RBA, observed that the spreads to CGS were increasing dramatically as the yields on government debt decreased. In this section I compare Bloomberg's fair value estimates to the observations of the RBA over this period in order to shed light on how effective Bloomberg's fair value estimates were in capturing the effects of the changed credit market conditions.

3.1. Response to the global financial crisis

53. A relevant test of the appropriateness of the fair value estimates produced by Bloomberg is to compare the effect that the global financial crisis has had on these estimates.

54. In my view the only reasonable expectation is that, following the escalation of the financial crisis in September 2008, risk premiums on corporate debt, and especially relatively low rated BBB+ corporate debt, should have increased markedly. This reflects the fact that risk premiums naturally increase for all risky assets during times of crisis. It also reflects the fact that BBB+ rated debt is a rating that, according to Standard and Poor's:

> *BBB: An obligation rated 'BBB' exhibits adequate protection parameters. However, adverse economic conditions or changing circumstances are more likely to lead to a weakened capacity of the obligor to meet its financial commitment on the obligation.*[20]

55. It is appropriate to assume that investor's perceptions of economic conditions became 'more adverse' between September 2008[21] and the AMI averaging period. During that period the Australian equity market (a barometer of perceptions about economic conditions) fell by 29%.

56. As already described above, the IMF stated the financial crisis "*entered a tumultuous new phase in September".* The OECD stated in October 2008 "*This Economic Outlook represents a substantial downward revision from just a few months ago: many of the*

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20 *Understanding Standard & Poor's Rating Definitions* , June 2009, available at http://www2.standardandpoors.com/spf/pdf/fixedincome/Understanding_Rating_Definitions.pdf

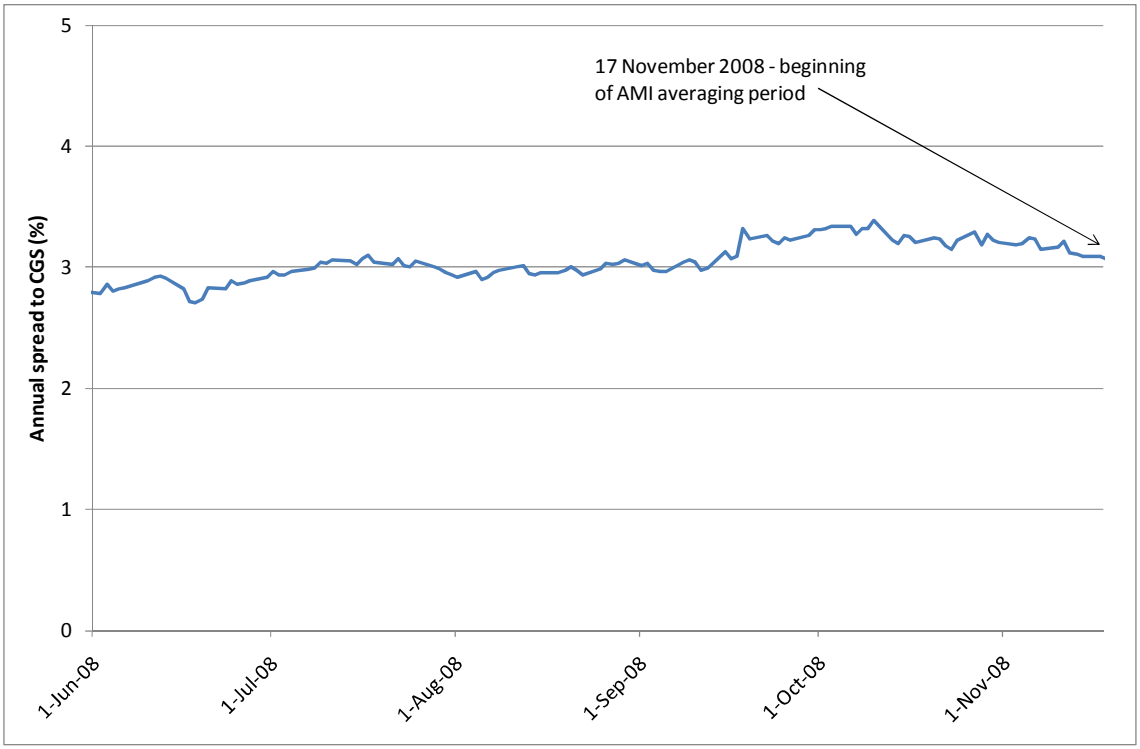
21 On the 7th of September the two largest buyers and securitisers of US mortgages ('Fannie Mae' and 'Freddie Mac') were placed in conservatorship. On Sunday 14th September the bankruptcy of investment bank Lehman Brothers and the sale of Merrill Lynch to Bank of America (with US government guarantees attached) were both announced. On Tuesday the 16th of September it was announced that the US Government would effectively take over 80% of the equity in one of the world's largest insurers (AIG) which had suffered a liquidity crises and was unable to find lenders to save it from insolvency. The US Government provided an $85 billion credit facility in exchange for taking over 80% of the equity in AIG.

*downside risks previously identifi*ed have materialised. … *Following the collapse of Lehman Brothers in mid-September, … triggered reactions akin to a 'blackout' in global financial markets."* The RBA stated in February 2009 that "*The extreme volatility that affected all markets in October and November following the Lehman's collapse has abated in the past two months".* In March 2009 the RBA Assistant Governor (Financial Markets) commented that: "*Funding markets shut completely following the collapse of Lehman Brothers [in September 2008]. All global financial markets were dislocated by this event, but not surprisingly term debt markets were about the most affected…"*

57. One must presume that risk premiums associated with BBB+ debt (ie, debt that is, according to Standard and Poor's, more likely to be affected by "*adverse economic conditions or changing circumstances")* would increase in October and November relative to previous levels.

58. Figure 1 below shows a recent history of debt risk premia over CGS estimated by Bloomberg for 10-year BBB+ bonds, using the AER's methodology.

Figure 1: Bloomberg (AER) estimated spreads to CGS on 10-year BBB+ corporate bonds



Source: Bloomberg, RBA

59. This figure shows that debt premia as estimated by Bloomberg did not rise materially over the period September to November. There appears to be no significant reaction to the events of September and October 2008. This pattern does not appear to accord with what one would reasonably expect to be the case given the perceived financial and economic conditions and the definition of BBB credit ratings.

3.2. Consistency with Reserve Bank estimates

60. I discuss above how the AER/Bloomberg 10-year fair value debt risk premia appear to be inconsistent with the perceptions of market commentators, including the RBA, over September, October and November 2008. In addition to its public statements, the RBA publishes daily estimates of bonds yields for maturities of between 1 to 5 years.

61. These estimates are reproduced in Table 2 below.

Table 2: RBA estimates of average corporate spreads to CGS on bonds with 1-5 years (midpoint 3 years) maturity

	Spreads to CGS		
Month	**BBB**	**A**	**AA**
July 2008	2.88	2.76	2.19
August 2008	3.22	2.80	2.14
September 2008	3.78	3.37	2.57
October 2008	4.43	3.53	2.27
November 2008	4.59	3.72	2.46
December 2008	4.61	4.26	2.85
January 2009	4.54	4.19	2.75
February 2009	5.17	4.16	2.53
March 2009	5.91	4.99	3.08
April 2009	5.54	4.76	2.89
May 2009	4.93	4.33	2.29
June 2009	4.20	4.09	1.78

Note: sourced from RBA and converted from semi-annual to annual basis

62. It is notable that the RBA reported that, consistent with expectations, risk premiums increased significantly from pre September 2008 up to the AMI averaging period (in November and December 2008). BBB spreads to CGS increased by 1.4%. This is clearly not reflected in the Bloomberg 10 year BBB+ spread to CGS as per Figure 1 above.

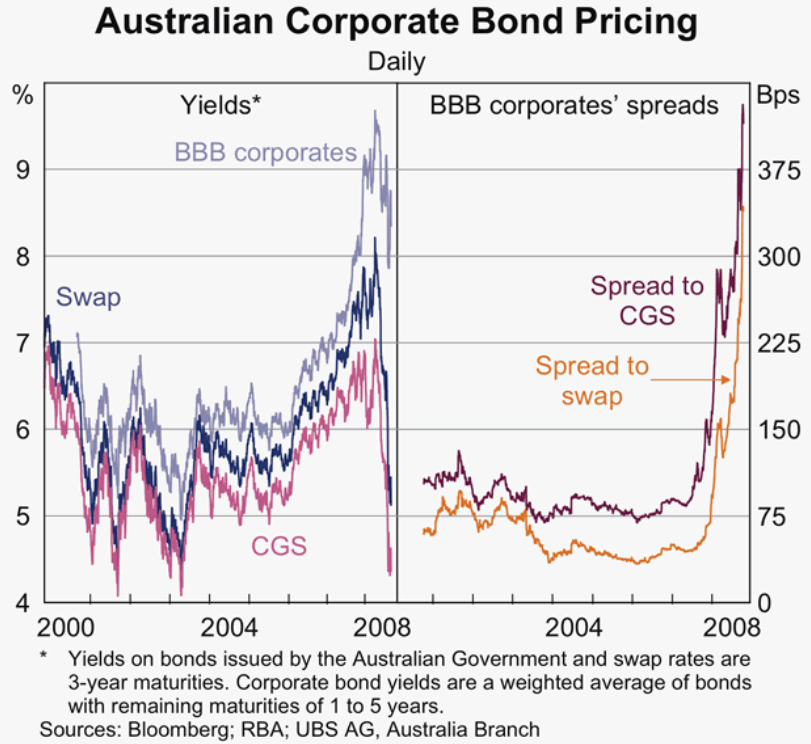
63. However, the RBA figures are for bonds of maturities between 1 and 5 years and are not therefore directly comparable to the Bloomberg data in Figure 1 above. However, the RBA shows these yields and spreads graphically in its February Statement on

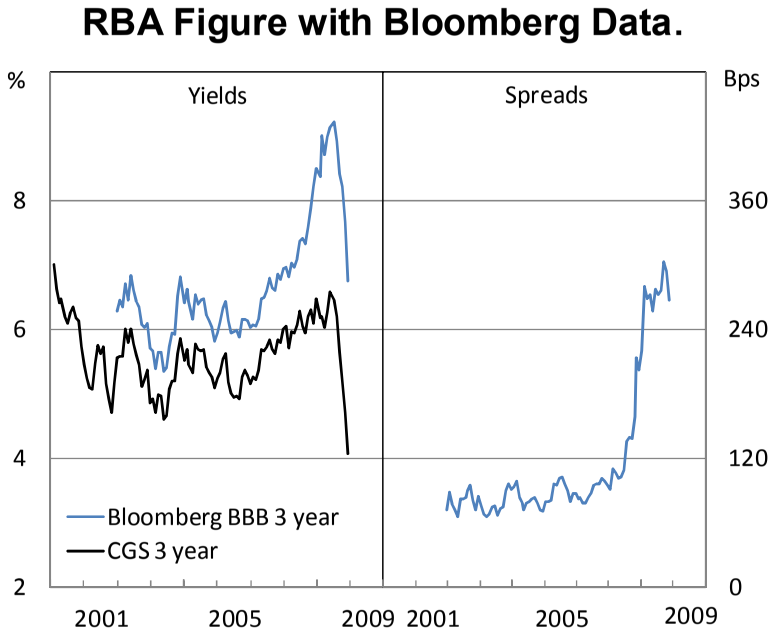
Monetary Policy.[22] I reproduce this chart in Figure 2 below and compare it to an equivalent chart produced using Bloomberg data for 3 year maturities.

64. There are two figures both of which have two panels in them. The left hand figure is reproduced from the RBA November Statement of Monetary Policy. In the right hand figure we have generated the same graph except we use Bloomberg fair value for 3 year BBB rated bonds. The discrepancy between the figures is most noticeable if one looks only at the right hand panel in each of the two figures. The right hand panel describes the spread to CGS for BBB bonds of the relevant maturity. The right hand panel in the RBA figure shows the spread to CGS for BBB bonds rising continually up to November 2008. However, the right hand panel of the figure generated using Bloomberg data shows the spread to CGS 'flatlining' at a much lower level over the second half of 2008.

[22] RBA, *Statement on Monetary Policy*, February 2009, p. 55

Figure 2: Comparison of Bloomberg corporate bonds spreads with RBA estimates





65. That Bloomberg spreads to CGS effectively stop increasing in any meaningful way in mid 2008 and do not increase post September is counter to the intuition and the widely held expert opinions that the risk premiums on corporate debt increased following the worsening of the financial crisis in September 2008. It is also inconsistent with the widening in spreads in the US market – which is the only market Australian corporations were issuing (non Government guaranteed) debt at the time – see section 5.2 below and also graph 13 on page 14 of the November Statement on Monetary.

66. The Bloomberg data indicate a levelling off of spreads from about June 2008, at around or just less than 300 basis points. However, the RBA's estimates indicate that, after a brief downturn, spreads continue to increase to over 400 basis points.

67. In my opinion the Bloomberg fair value yields did not adequately capture the effect of the global financial crisis on debt markets over the period through to the beginning of the AMI averaging period on 17 November 2008, either in terms of:

- what would have been expected as a result of the crisis, as per the statements of experts (including the RBA) as described above; and

- the data for BBB bond yields published by the RBA.

4. Accuracy of AER/Bloomberg during AMI averaging period

68. In this section I test the accuracy of the AER/Bloomberg BBB+ benchmark rate proxy against the observations of actual bond yield estimates during the AMI averaging period by financial institutions involved in the Australian corporate bond market.

4.1. Data used

69. I have obtained yield estimates during the AMI averaging period for over 600 bonds issued in Australian dollars but not issued by Commonwealth or State Governments. The yield estimates are sourced from Bloomberg, AFMA, UBS rate sheets, CBASpectrum and Reuters. From Bloomberg I have individual yield estimates from Westpac, ANZ, NAB markets, ABN Amro. Not all of these yield sources provide a yield estimate for every bond. The three most comprehensive sources in terms of bonds covered are UBS, AFMA and CBASpectrum. I have used the Standard and Poor's credit ratings assigned to each bond as reported by UBS where this is available and by AFMA where it is not. In some cases I have altered the credit rating assigned to these bonds by UBS/AFMA to reflect known discrepancies with actual ratings during the AMI period (eg, GPT is rated BBB while UBS has it rated at BBB+). The full set of data used is provided in separately in spreadsheet form.

70. Unless otherwise specified the data I provide is averaged for a specific issuer. This means that I give equal weight to each issuer rather than to each bond. For example, Sallie Mae has six BBB+ bonds (both fixed and floating) while Adelaide Bank has one. Were I to treat each bond as an independent observation I would give Sallie Mae six times the weight as Adelaide bank.

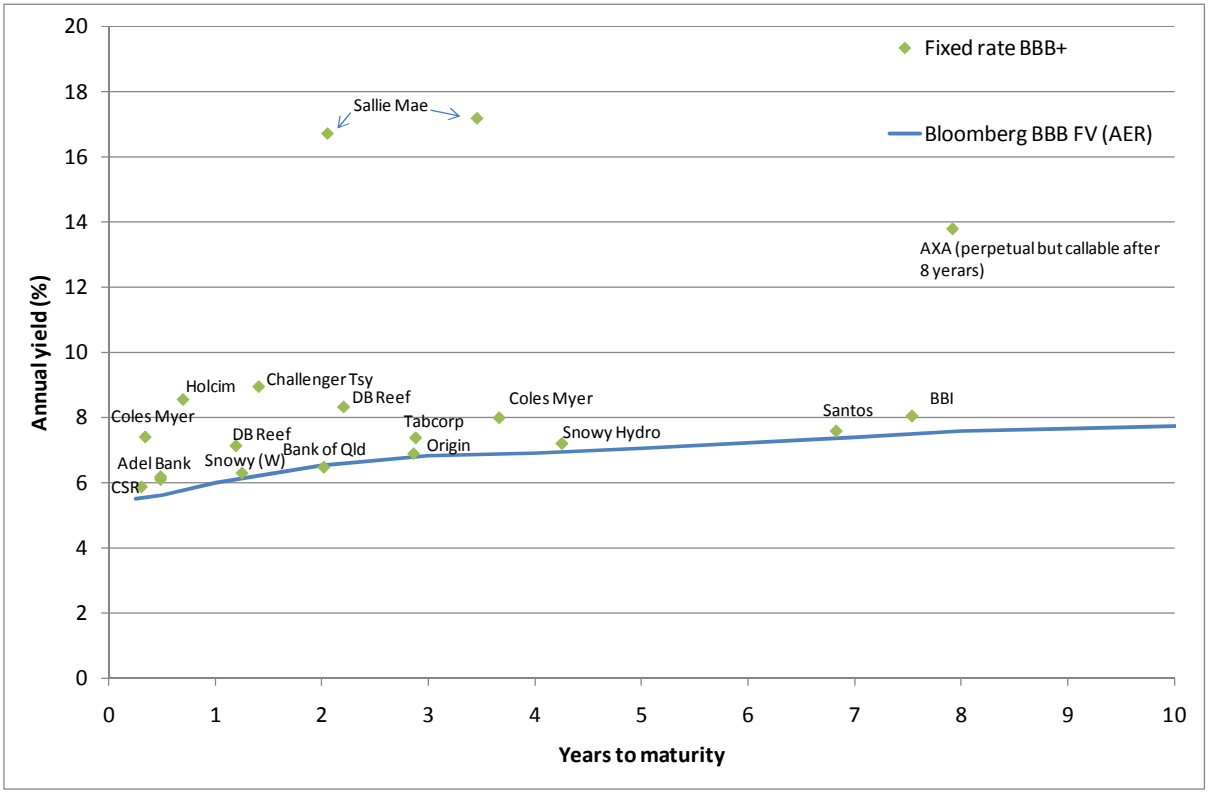
71. In the following graphs I report a single bond yield/maturity for Sallie Mae equal to the average for all six bonds. When I graph only those bonds with more than four years to maturity I include all issuers who have at least one bond in that maturity range (even if the average of all of their bonds is not in that maturity range). If an issuer has more than one bond in that maturity range I report the average of only those bonds in that maturity range.

4.2. Analysis of the yield data over AMI averaging period

72. In this section I provide an analysis of the average yield data for issuers over the AMI averaging period (17 November to 5 December 2008) and compare this to the AER/Bloomberg fair value BBB+ yield on that day.

73. The below figure provides a scatter graph that shows the average estimated yield (from all institutions who estimate a yield for that bond) for all fixed coupon BBB+ bonds against the AER/Bloomberg proxy for the benchmark rate for BBB+ bonds. The vertical axis of the figure is yield to maturity (reported on an annualised basis) and the horizontal axis is years to maturity. (This chart includes multiple bonds from single issuers.)

Figure 3: Average yield estimates for BBB+ fixed coupon bonds during AMI averaging period



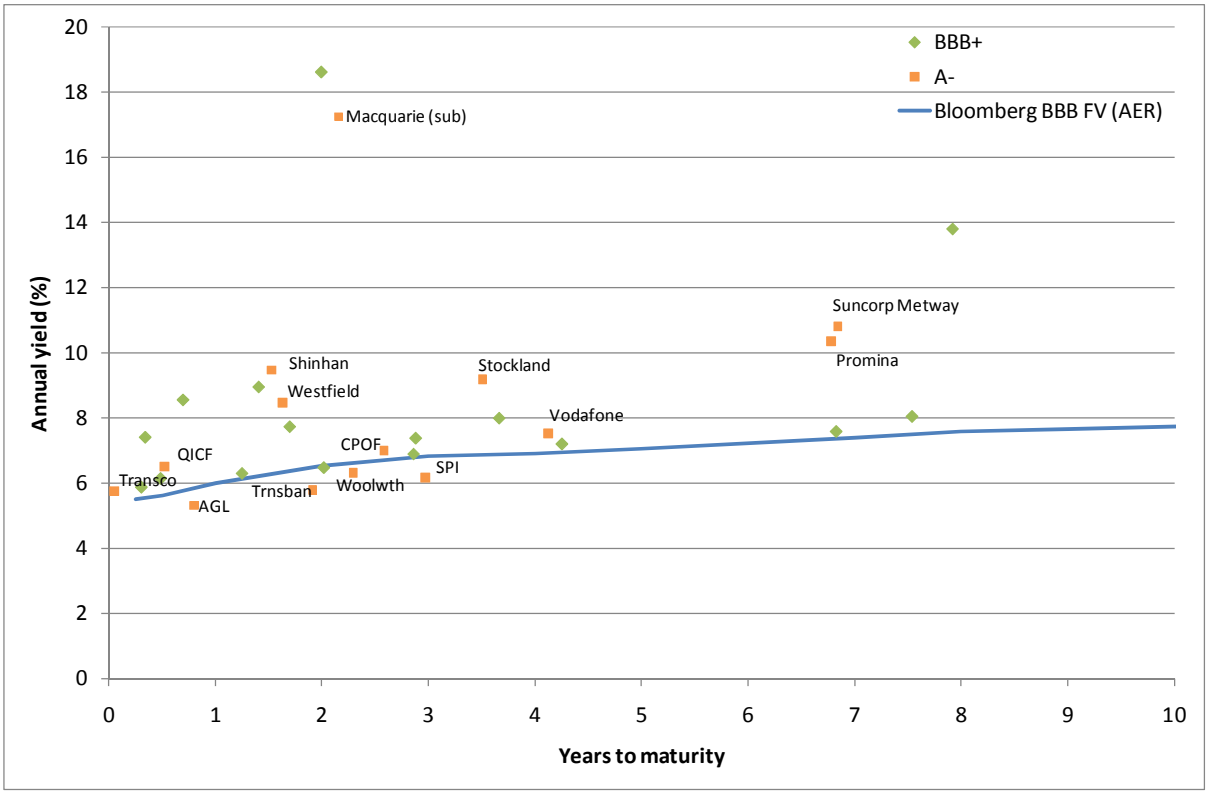
*The AXA bond is a perpetual bond that is callable after eight years. If it is not called it converts from a fixed coupon bond to a floating rate note at high margin to swap. This means it is most like a fixed coupon bond with a maturity of 10 years (and this is how it is treated in bank rate sheets). However, the option for AXA not to pay the principle in 8 years time means that it is likely to have a higher interest rate than if AXA did not have that option.

74. As is clearly evident from the above graph the AER/Bloomberg fair value curve passes below the lower envelope of all of the BBB+ bonds for which there are yield estimates. It passes only marginally above only one observation (Bank of Queensland) and passes below all of the other 16 observations of unique issuers (mostly materially below these).

75. Purely based on this fact one would conclude that the AER/Bloomberg fair value underestimates the typical yield on BBB+ rated debt. However, it is possible that this could be justified by having regard to information on bond yields from other ratings. Observations for BBB+ yields from 16 issuers is not a large sample (in statistical terms) and it is possible that a fair value curve that passes below 18 of these observations may be justified by a large number of low yields on slightly higher credit ratings (such as A- bonds).

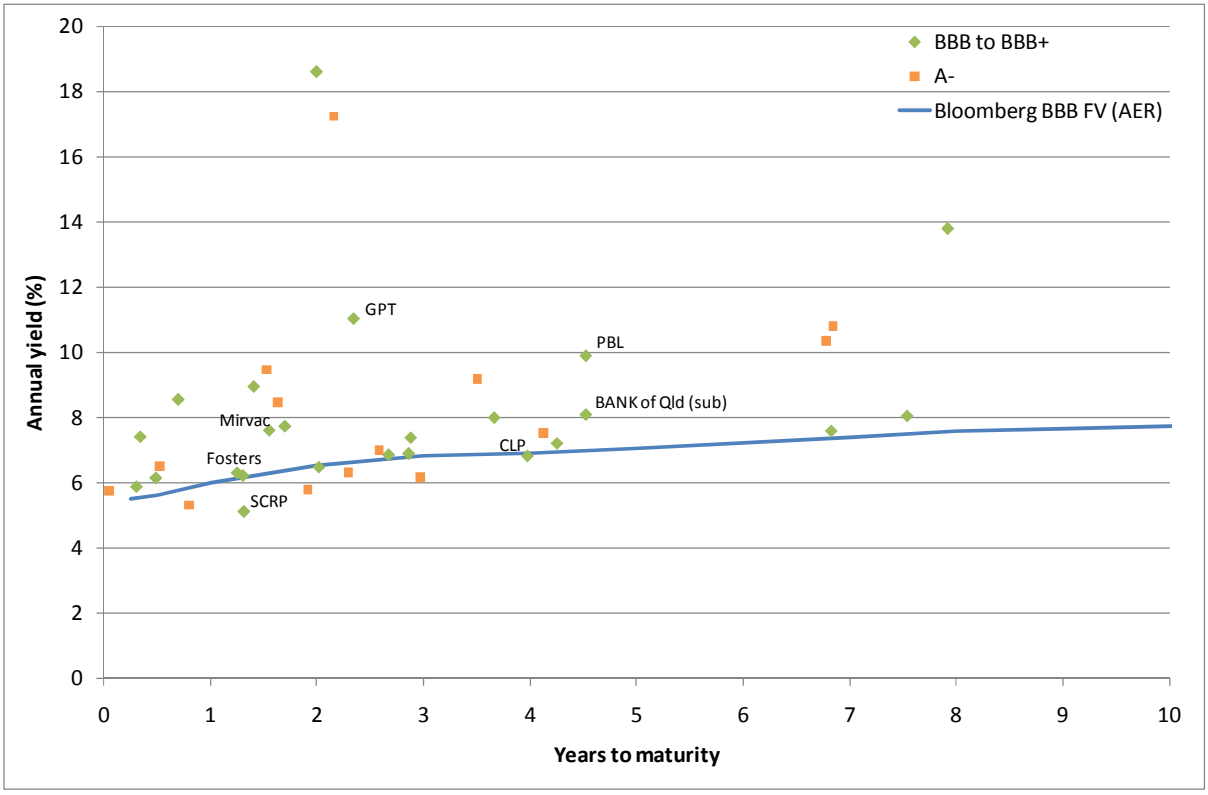
76. I have also examined the yields on A- bonds but, rather than supporting the adoption of BBB+ fair value curve below the majority of BBB+ yields the opposite is true. Not only is the AER/Bloomberg fair value curve below the majority of BBB+ bond yield estimates it is also below the majority of A- bond yields. This is true at all maturities but is especially true at longer maturities (above 3.5 years) where the AER/Bloomberg fair value curve is below all nine of the available observations. The below graph only plots one data point for each issuer (ie, each data point is a unique issuer) and only labels the A- bonds (the BBB+ bonds being labelled in the previous figure).

Figure 4: Average yield estimates for BBB+ and A- rated fixed coupon bonds during AMI averaging period



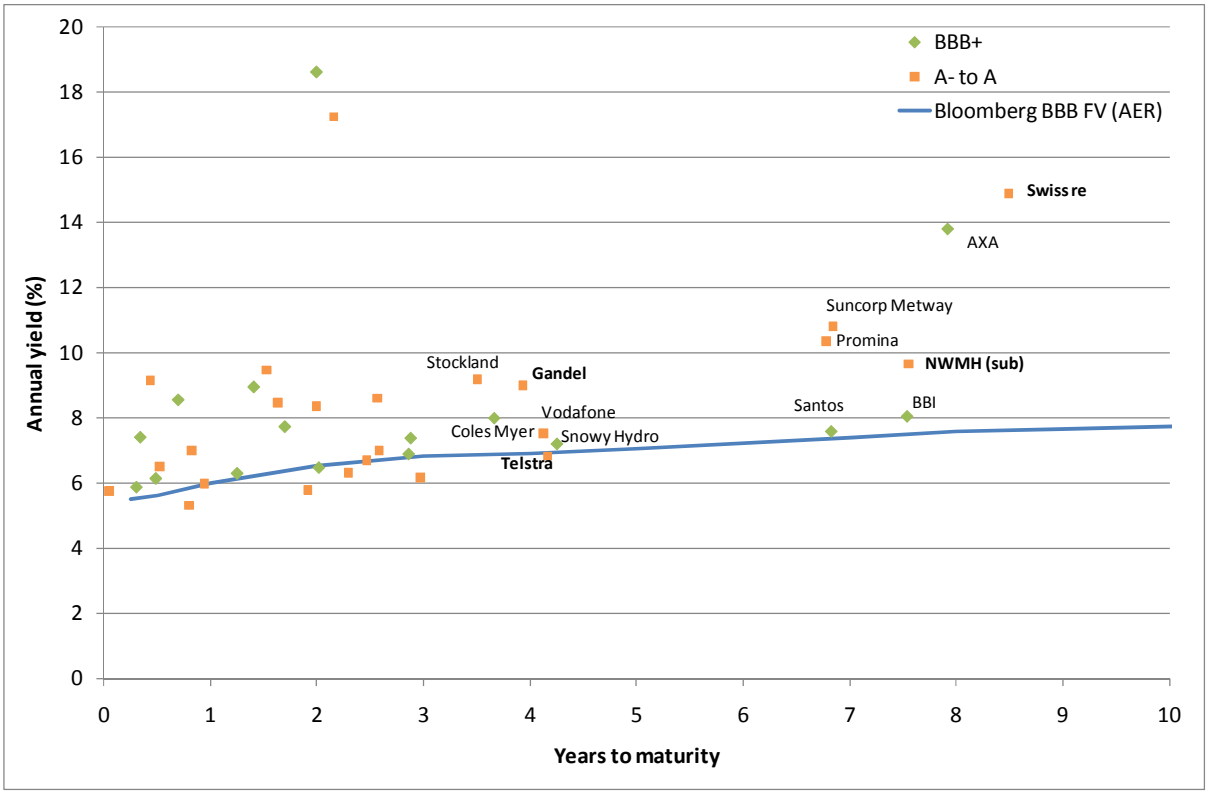
77. Of course, the average credit rating of observations in the above figure is above BBB+. I have also examined all observations in the credit rating range BBB to A- (where the median credit rating is BBB+). The below graph only plots one data point for each issuer (ie, each data point is a unique issuer) and only labels the BBB issuers (the BBB+ and A- issuers being labelled earlier figures).

Figure 5: Average yield estimates for BBB to A- rated fixed coupon bonds during AMI averaging period



78. I have also extended the analysis to include A rated bonds but excluding BBB bonds – in order that every observation correspond to a BBB+ or higher credit rating. These are shown in the below figure where I have labelled all bonds with more than 3.5 years to maturity and the new A rated bonds are labelled in bold. As can be seen, the AER Bloomberg BBB+ fair value curve continues to underestimate all estimated yields for BBB+, A- and A rated fixed coupon bonds with more than four years to maturity.

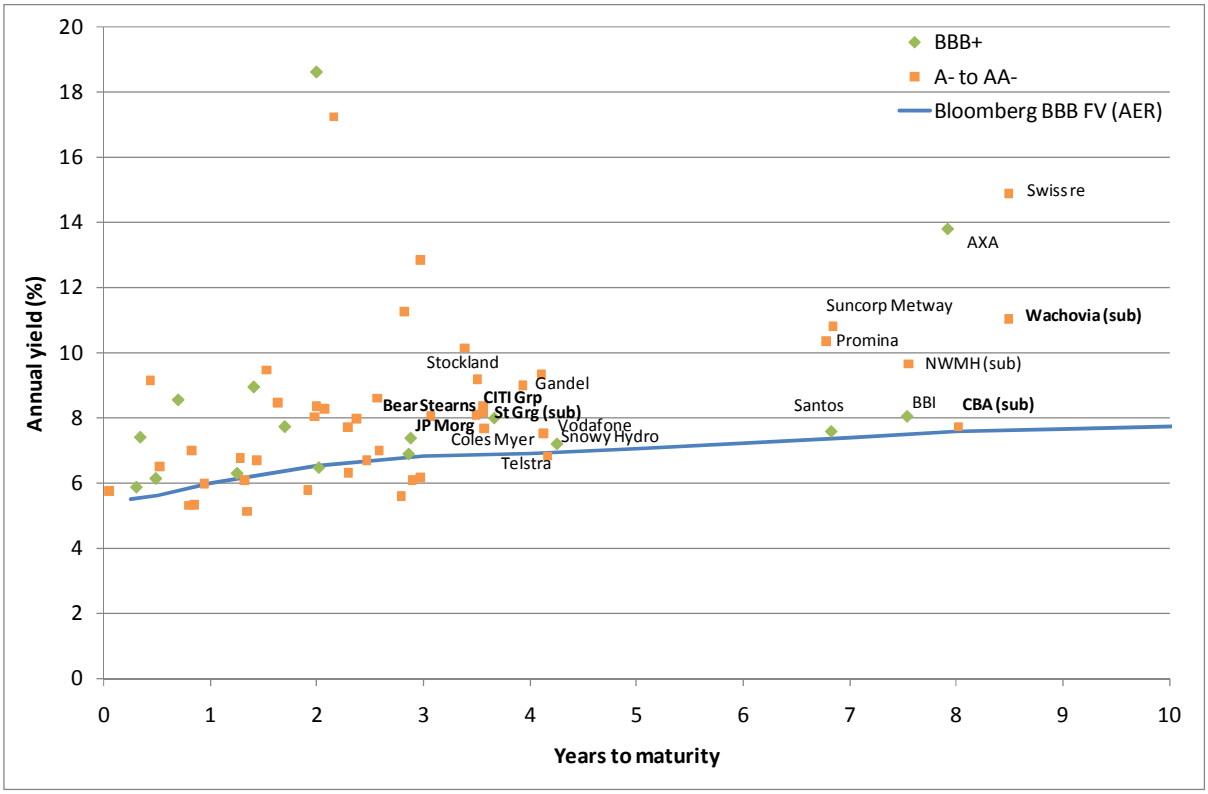
Figure 6: Average yield estimates for BBB+ to A rated fixed coupon bonds during AMI averaging period



79. As can be seen, above 3.5 years to maturity every observation (from BBB+ to A rated) is above the Bloomberg BBB+ fair value curve – with the single exception of Telstra.

80. Even when the analysis is extended to include all fixed coupon corporate bonds with credit ratings between BBB+ and AA- the same conclusion is found. This can be seen in the below figure which demonstrates that the AER/Bloomberg fair value curve underestimates the yield on the vast majority of BBB+ to AA- bonds and underestimates all but one of the yields on bonds with more than 3.5 years to maturity.

Figure 7: Average yield estimates for BBB+ to AA- rated fixed coupon bonds during AMI averaging period



81. It is interesting to note that the Santos 6.8 year maturity BBB+ bond (through which the AER/Bloomberg fair value curve passes just below) has an unusually low yield for its maturity and credit rating. As discussed in section 7.2, this may be explained by the fact that at the time Santos was effectively debt free.

82. A number of high level observations suggest themselves:

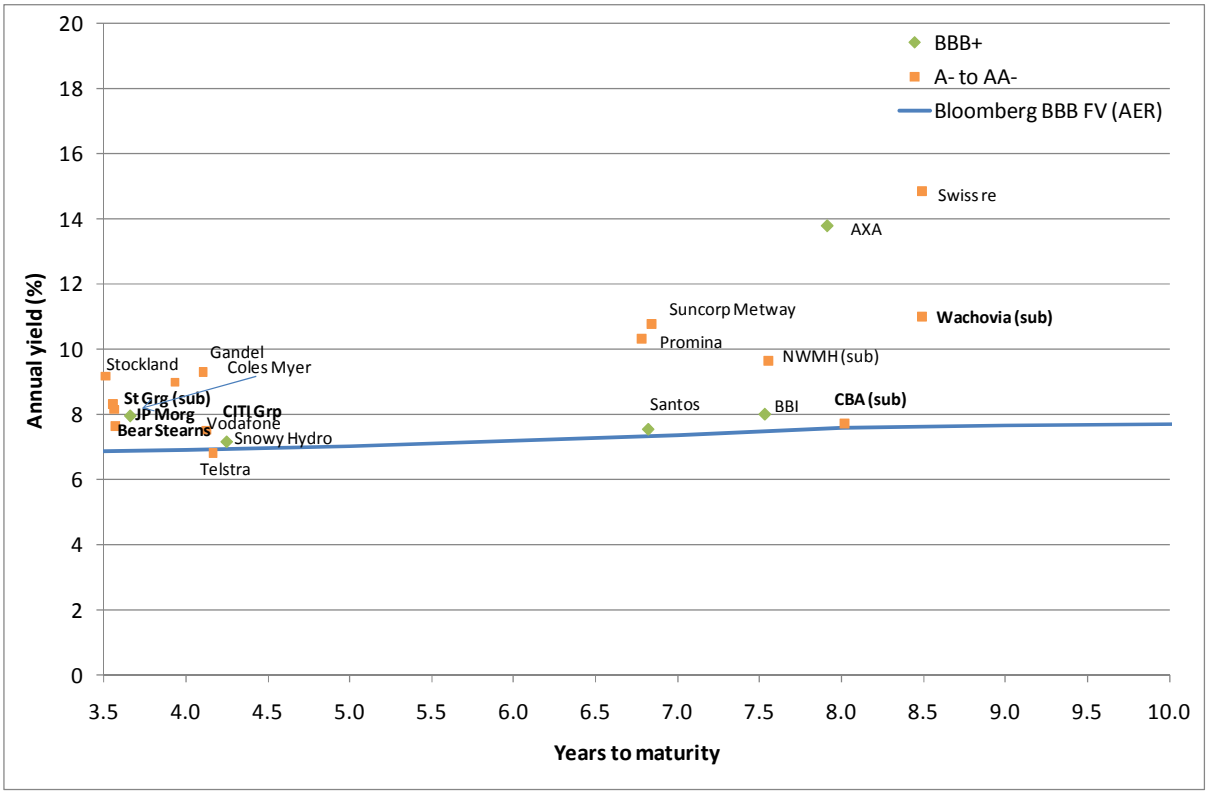
i. The Bloomberg fair value curve for BBB rated bonds falls below most estimates for yields on corporate BBB+ bonds and below most estimates of yields on corporate A- to AA- bonds.

ii. The effect described in i. above particularly pronounced for longer dated bonds (bonds with more than 3.5 years to maturity). In fact, there are 19 unique issuers for bonds with a maturity of between 3.5 and 10 years and the AER/Bloomberg fair value curve lies below all of these but for the Telstra observation;

iii. There is a wide dispersion in yield estimates within each credit rating category – with some BBB+ rated bonds having lower yields than some higher rated bonds.

83. The following figure represents the same data but focuses only on bonds with between 3.5 and 16 years to maturity.

Figure 8 Average yield estimates for BBB+ to AA- rated fixed coupon bonds during AMI averaging period – bonds with maturity between 3.5 and 10 years



84. When interpreting this data in the context of the AER/Bloomberg BBB+ fair value curve it is relevant to note that the mean (median) of the bonds that are more than 3.5 years to maturity is 9.2% (8.3%). This is 2.1% (1.4%) above the Bloomberg fair value curve for BBB rated bonds at 5.6 (4.2) years maturity (where 5.6 (4.2) years is the mean (median) time to maturity in the sample). It should also be kept in mind that only five of the 19 observations are for issuers with a BBB+ credit rating and the other 14 issuers all have a higher credit rating (with the average rating being between A and A+).

85. Similarly, for the entire sample the mean (median) yield is 8.6% (7.7%) and this is 1.8% (1.5%) above the AER/Bloomberg BBB+ fair value curve at 3 (2.5) years to maturity (where 3 (2.5) years is the mean (median) time to maturity in the sample).

Similarly, only 16 out of 63 unique issuers in this sample are BBB+ with the remaining issuers having a yield of between A- and AA- (with the average rating being between A and A+).

4.3. Implications for the reliability of the AER proxy for the benchmark BBB+ rate

86. During the AMI averaging period, the AER/Bloomberg BBB+ fair value curve clearly does not accurately predict/reflect the yield estimates for corporate bonds of BBB+ rating or higher for which yield estimates are available from a large number of sources. This is true at all maturities but is especially true for longer maturities (eg, greater than 3.5 years).

87. If the AER/Bloomberg BBB+ fair value curve was accurate it would predict higher yields than actually attributed bonds rated higher than BBB+. However, the reality is that the vast majority of A- to AA- bonds have higher estimated yields than the AER/Bloomberg BBB+ fair value curve.

88. In the case of BBB+ to AA- corporate bonds with a time to maturity of more than 3.5 years, all but one of the 19 issuers of these bonds attract a higher yield than the AER/Bloomberg BBB+ fair value curve. The differences are not trivial, with the average mean difference being 2.1%.

89. The fact that the AER/Bloomberg BBB+ fair value curve is lower than all but one of the issuers with longer dated bonds means that the AER/Bloomberg fair value curve is a downward biased estimator of yield estimates not only on long dated BBB+ rated bonds but also of bonds rated A- to AA-.

90. In my opinion any interpretation of the *benchmark corporate bond rate* must require that the chosen benchmark rate be consistent with the best estimate of market determined yields for individual BBB+ rated bonds. Further, the BBB+ benchmark rate should be, on average, higher than the market determined yields for higher rated bonds (such as A- to AA- bonds).

91. Absent evidence that the yield estimates sourced from a range of financial institutions are unreliable/unrepresentative of market determined yields then the evidence presented above clearly demonstrates that the AER/Bloomberg BBB+ fair value curve is not a suitable proxy for the *Australian benchmark corporate bond rate for BBB+ rated bonds* and that this is especially true at the longer maturities (ie, in the vicinity of 10 years).

92. There are only two possible reasons why one would not draw this conclusion based on the yield estimates described in this section. Specifically,:

i. if the yield estimates for bonds are generally higher than what the true market determined yield would be; and/or

ii. if the yields are accurately estimated but some of the bonds included in the sample have characteristics that means that these bonds should be given less weight in any such test (ie, should be treated as 'outliers').

93. On the first issue I have sourced yield estimates from a wide range of sources (contributors to Bloomberg, AFMA, UBS, CBASpectrum and Reuters) and do not consider there is any basis for believing that these sources overestimated market yields in that period.

94. In fact, if anything the quoted yields are likely to be underestimates of the cost of issuing debt in that period because the yield estimates quoted are for relatively small parcels of bonds of around $2m to $10m traded on the secondary market. In order to find a buyer for a larger bond issuance (in the order of hundreds of millions of dollars) then the selling price would need to be lower (yield higher). I discuss this in section 4.4 of my June 2009 report for ETSA, Ergon and Energex which is also before the AER.[23] The Victorian businesses also noted this point in their submission on the AMI cost of debt in which they quoted a statement from a Bloomberg representative that:

> *Bearing in mind that the curves are representative of secondary market prices and trading sizes, new issues have nearly always been issued at a premium to this curve. In settled market conditions, the premium required to 'get away' a new issue might have been quite small. My experience has been that the premium has increased during this period of market turbulence as buyers have demanded a greater risk premium.* [24]

95. I consider that the secondary market yields estimated by UBS (and others) are likely to be materially lower than the yields that would have had to be paid by similar companies to issue new debt during the AMI averaging period (which was particularly affected by the impact of the global financial crisis).

96. I now turn to whether the bond yields included in the UBS rate sheet are somehow skewed by the inclusion of "outliers" in the analysis and whether this could explain why the AER proxy for the benchmark corporate bond rate underestimates the average of these bond yields.

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[23] CEG, *Estimating the Cost of 10 year BBB+ debt*, June 2009.

[24] *Debt Risk Premium for use in the Initial AMI WACC Period*, A paper jointly prepared by the Victorian Electricity Distribution Businesses, 1 June 2009, page 17.

97. Consideration of this issue is straight forward. Of the 20 unique issuers of fixed rate bonds with ratings between BBB+ and AA- all but one have a higher yield than the AER/Bloomberg fair value curve predicts for *BBB+* bonds. The exceptional issuer is Telstra which is A rated and has only a fractionally lower yield than the AER/Bloomberg BBB+ fair value. The only basis for concluding that this effect was explained by "outliers" would be to assume that all, or almost all, corporate bond issuers are outliers. This is despite the fact that most of these bonds have a rating higher than BBB+ and, consequently, the AER/Bloomberg BBB+ fair value curve should be overestimating the yields on these bonds.

98. I am unaware of any definition of an outlier that would involve treating most, let alone all, of the available data as outliers.

99. I also note that this conclusion is not sensitive to the choice of maturity range for the analysis. Examination of Figure 7 demonstrates that extending the maturity range to include bonds with less/more than 3.5 years to maturity would still support the conclusion that the vast majority of BBB+ to AA- estimated bond yields are above the AER/Bloomberg BBB+ fair value curve – despite the average credit rating of these bonds being higher than BBB+.

4.4. Including floating rate notes in the analysis

100. In addition to issuing fixed coupon bonds corporations also commonly issue bonds with variable interest rates – commonly terms floating rate notes or floating rate bonds. Floating rate notes pay a fixed coupon plus a variable coupon over the life of the bond. The variable coupon is almost always reset every three months based on the prevailing 3 month interest rate in the swap market (the 3 month bank bill swap rate). On any given trading day a floating rate note can be converted into a fixed coupon bond. This is done by the issuer of the bond entering into a swap contract where they promise to pay a fixed amount to a third party in exchange for the third party promising to pay them the floating payments on the bond over the remainder of the bonds life. This is discussed more in the following section.

101. The swap market is sufficiently liquid for us to observe what the equivalent fixed coupon yield is on a floating rate bond today. Indeed, this is precisely how floating rate bonds are priced and quoted in the market. That is, the yield on floating rate bonds is quoted as the bank bill swap rate to the end of the maturities life plus a "trading margin" where the sum of these two values is the equivalent fixed yield on a floating rate note.

102. It is therefore relevant to examine whether including floating rate notes in the above analysis would alter the conclusions in anyway. Adding floating rate notes only adds 5 new unique issuers with maturities of greater than 3.5 years. These issuers have bonds with a mean time to maturity of 6.4 years and a yield of 10.4% (ie, 3.1% above

the Bloomberg fair value curve at 6.4 years). Details for these bonds are set out in the below table.

Table 3: Cost of debt based on 425bp margin above the swap rate

Issuer	Rating	Maturity	Yield
MSDW	AA-	3.6	12.6
ABNAMROSUB	A+	4.5	9.5
SUNINS SUB	A-	6.5	10.4
HSBC SUB	A	7.5	11.5
RELIANCE	A	10.2	7.9
Average	A+	6.4	10.4

4.5. Tested against RBA reported average bond yields

103. The AER/Bloomberg fair value curve estimated spreads to CGS for 10 year BBB+ rated bonds of 3.09%. By contrast the RBA was reporting spreads to CGS for 3 years BBB debt of 4.46% in November and 4.49% in December (not annualised). This alternative source of yield estimates also suggests that the AER/Bloomberg fair value curve underestimates the actual yields estimated in debt markets.

5. Accuracy of Bloomberg methodology post the AMI averaging period – tested against known trades

104. As noted by expert commentators, such as the RBA, there has been a lack of liquidity in the domestic corporate bond sector both in the primary and secondary markets. For example, in its November 2008 Statement of Monetary Policy, the RBA stated in respect of the primary market:

> *Corporate bond issuance has remained low in recent months (Graph 74). Thirteen small bonds were issued in the September quarter, totalling around $1¾ billion. This is significantly lower than the average quarterly issuance of around $5½ billion before the credit turmoil. Two small corporate bonds were issued in October. As has been the case with most corporate issues in 2008, all of the recent deals were issued offshore.* [25]

105. In respect of the secondary market the RBA stated:

> *Market contacts indicate that the secondary market has become more illiquid during the recent heightened turbulence, with few trades taking place.* [26]

106. The lack of known trades, and in particular bond issues, during the AMI averaging period means that, if one is solely restricted to contemporaneous observations, one must rely on yield estimates for various bonds. However, since the end of the AMI averaging period we have been able to observe actual trades and these confirm the findings in earlier sections that the AER Bloomberg BBB+ fair value curve underestimates actual yields in the bond market.

107. There are two specific sources for estimates of trades in bonds proximate to the AMI averaging period. These are:

- the issue in Australia of BBB+ (A-) debt by Tabcorp (and AMP) in March 2008;
- the issue of debt overseas by BBB+ (or higher rated) corporations.

108. The Tabcorp and AMP domestic issues are the exceptions that the RBA refers to in its May 2009 Statement of Monetary Policy where it states:

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25 Ibid, Page 56.

26 Ibid, page 57.

> *In recent months, there has been evidence of an increase in investor appetite for corporate debt, with the first such bonds issued since October 2008. Australian corporates have issued a record $16.7 billion of bonds since the last Statement, almost all of which was issued offshore (Graph 62). The bulk of issuance was accounted for by BHP Billiton and Rio Tinto, which issued bonds denominated in US dollars and euros.* (Page 55)

109. All of these observations involve interest rates on the actually traded debt exceeding the interest rate predicted by the contemporaneous AER/Bloomberg fair value curve.

5.1. The Tabcorp and AMP issues in Australia

5.1.1. Interest costs on the Tabcorp BBB+ debt issue

110. Tabcorp announced the issue of a 5 year BBB+ rated bond on 24 March 2009.[27] The Tabcorp bond issue is a 5 year issue and was rated at BBB+ by Standard and Poors immediately prior to its issue.[28] It will pay a floating interest rate which is reset every three months to be equal to the then prevailing 3 month bank rate plus a margin of 400bp to 450bp.[29] On 1 April 2009 Tabcorp announced the results of a bookbuild process that set the margin in the middle of this range at 425bp.[30] Tabcorp will also pay a 'bonus' interest payment of 0.25% for the first year to some retail investors.[31] The issue size is expected to be around $200m.[32]

111. The Tabcorp offer is a floating rate offer referenced to the 3 month BBSW rate. This means that in order to estimate the equivalent fixed yield to maturity for the Tabcorp issue one must add the five year swap rate.[33]

112. The actual process that Tabcorp would follow (and may well have followed) to achieve this fixed rate would be to hedge its floating rate liability associated with the bond by entering into a contract with a third party to pay that third party a fixed yield over 5

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[27] See page 6 of the Prospectus for the issue of Tabcorp bonds at http://www.asx.com.au/asxpdf/20090324/pdf/31gqwq62d8gqvs.pdf.

[28] See ASX announcement at http://www.asx.com.au/asxpdf/20090325/pdf/31grrc2xd1nf59.pdf.

[29] See section 1.15 of the Prospectus for the issue of Tabcorp bonds.

[30] See http://www.asx.com.au/asxpdf/20090401/pdf/31gvxc5xsd8t2c.pdf.

[31] See page 6 of the Prospectus for the issue of Tabcorp bonds.

[32] See ASX announcement http://www.asx.com.au/asxpdf/20090330/pdf/31gtthwsynzsry.pdf.

[33] The fact that a company can either issue fixed rate or floating rate and use the interest rates swap to convert either to its desired rate set format, means that borrowers can fund via the cheapest possible form - this implies Tabcorp used the floating rate note as this was at a lower yield than the fixed rate equivalent. In other words, had Tabcorp borrowed fixed rate it would have done so at a higher floating rate margin.

years in exchange for the third party paying Tabcorp a floating liability based on the 3 month bank bill rate. This is termed a 'fixed for floating swap'. In effect, Tabcorp would promise to pay a fixed coupon to the third party over the five year period and the third party would promise to pay Tabcorp the bank bill rate over those five years.

113. By entering into this transaction Tabcorp would be able to use the bank bill payments from its swap agreement to pay the bank bill related costs on its floating rate bond. This would leave Tabcorp with a net liability equal the fixed component of its swap agreement plus the fixed margin above the bank bill rate on its floating rate bond. That is, the net position would be identical to having issued a fixed coupon bond.

114. Such transactions are commonplace in financial markets and it is quite possible that this is precisely what Tabcorp did. Of course, Tabcorp does not have to enter into a 5 year swap. It can leave itself exposed to variations in the bank bill rate over the five years. However, the market price of bearing this risk itself is given by the 5 year swap rate.

115. There are two sensible dates on which to measure the swap rate for this purpose. The first is 24 March 2009 (the day of the announcement of the offer) which is the day Tabcorp committed to issue the debt at a specified margin (between 400bp and 450bp) above the swap rate. The 5 year swap rate was 4.34% on that day. The second is 1 April 2009 being the date that the margin was established in the middle of this range. The swap rate was 4.36% on that day.

116. Using the 1st of April date as an example, if we add 4.25% (being the fixed coupon margin) to the swap rate on 1st April (4.36%) then we get an equivalent fixed coupon yield to maturity of 8.61%. However, this is sum of four quarterly payments that would have to be made by Tabcorp over the remaining life of the bond. I understand that the cost modelling in the AMI process requires an "annualised" cost of debt calculation (ie, "as if" the interest payments were made at the end of a the year). One quarter of 8.61% paid quarterly is equivalent to a single annual payment of 8.89% $(=(1+0.0816/4)^4-1)$.

117. The table below summarises theses calculations and compares it to the AER/Bloomberg 5 year BBB+ fair value estimate on 24 March 2008 and 1 April 2008.

Table 4: Cost of debt based on 425bp margin above the swap rate

Date	24 March 2009	1 April 2009
Swap rate (quarterly)	4.34%	4.36%
Tabcorp fixed coupon margin (quarterly)	4.25%	4.25%
Tabcorp 5 year issue quarterly	8.59%	8.61%
Tabcorp 5 year issue annualised	**8.87%**	**8.89%**
AER/Bloomberg 5 year BBB+ fair value estimated	**7.68%**	**7.69%**

**Source: Bloomberg and CEG analysis.*

118. This table states that Tabcorp issued at a 5 year equivalent fixed annualised yield in excess of 8.87% (I say in excess because Tabcorp will also have to pay bonus interest on some proportion of its offer). The immediate next observation from this table is that Tabcorp is issuing at a yield that is substantially above (1.2% above) the AER/Bloomberg BBB+ fair value estimate.

5.1.2. Interest costs on the AMP A- debt issue

119. AMP issued approximately $300 million of A- floating rate bonds in early March 2008 – with the fixed coupon on these being set at 4.75% on 11 March 2009.[34]

120. The AMP issue will have a potential maturity of ten years.[35] Similar to the Tabcorp issue, the AMP debt will pay a floating interest rate which is reset every three months to be equal to the then prevailing 3 month bank bill rate (3 month BBSW) plus a margin set initially between 425bp to 475bp.[36] After five years the margin on any outstanding debt will be 150% of this initial margin (ie, 7.125% being 1.5*4.75%), however, AMP will have the right to extinguish the bond prior to this higher interest rate being paid.

121. This ability to 'call' the bond and the very high rates after five years if the bond is not 'called' effectively makes its term a 5 year bond. That is, the only circumstances in which AMP would not call the bond would be if interest rates on its debt had risen to more than 7.125% above the swap rate (in which case it would make sense for AMP to prefer to continue to pay that interest rate rather than refinance. This means that attempting to calculate a 10 year cost of debt based on the 4.75% and 7.125% coupon

[34] Standard & Poors has given a provisional rating of A- for the issue. See page 43 of the Prospectus for the issue of AMP bonds at http://www.asx.com.au/asxpdf/20090303/pdf/31gdmr9wwvqrzx.pdf. The 4.75% fixed coupon rate is http://www.asx.com.au/asxpdf/20090311/pdf/31gjdfqxfsjk9m.pdf

[35] After 5 years the issuer has the right, with regulatory approval, to redeem some or all of the notes issued, giving it characteristics of a 5 year issue.

[36] The initial margin will be set on the issue date.

margins would overestimate the likely cost of debt for AMP (as AMP is not committed to paying the 7.125% coupon margin). However, AMP is committed to paying the 4.75% coupon margin over the first five years so it is possible to estimate a 5 year cost of debt to AMP accurately.

122. The following table steps through the same calculations for AMP as for Tabcorp – the only difference being the calculations are undertaken for 11 March rather than 24 March and 1 April.

Table 5: Cost of debt based on 475bp margin above the swap rate

	11 March 2009
Swap rate (quarterly)	4.07%
AMP fixed coupon margin (quarterly)	4.75%
AMP 5 year issue quarterly	8.82%
AMP 5 year issue annualised	9.12%
AER/Bloomberg 5 year BBB+ fair value estimated	7.47%

*Source: Bloomberg and CEG analysis.

123. In the case of the AMP issue the AER/Bloomberg BBB+ fair value curve underestimated the yield on this bond by more than 1.65%. This is despite the AMP issue being rated A- (ie, a higher rating that BBB+).

5.1.3. Adjustment required for transaction costs

124. In the AMI decision the AER has allowed 12.5bppa in transactions costs associated with issuing debt. This is based on the assumption that the debt is issued entirely into the wholesale market. However, this is significantly less than the actual transaction costs incurred by both Tabcorp and AMP both of which had retail components to their issue and where retail issues tend to involve higher transaction costs.

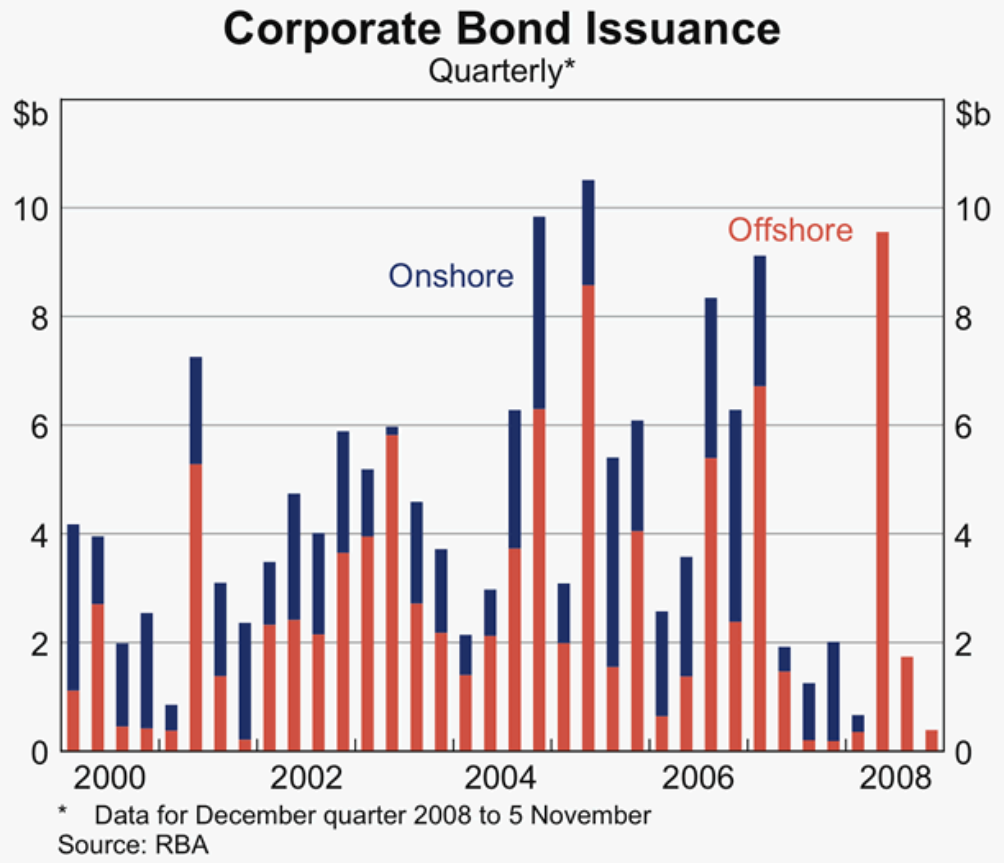
125. Tabcorp and AMP would only rationally have incurred the higher transaction costs associated with a retail issue if they believed that doing so would reduce their interest costs by more than it would increase their transaction costs. Thus, the Tabcorp and AMP issues constitute a lower bound estimate of the interest rate that would have been paid in the wholesale market at that time.

126. A conservative estimate of the extent to which the wholesale market interest rate would be higher is simply to take the difference between the AER's allowance for transaction costs (12.5bppa) and the actual transaction costs incurred by Tabcorp and AMP. I estimate this to be more than 0.5% pa (or 50bppa) – see appendix A for calculations.

5.2. Tested against actual trades in the US markets

127. Given the absence of any known trades during the AMI averaging period an alternative approach would be to look to known trades that occurred during the AMI averaging g period but in the US or European markets. Australian corporations were issuing exclusively into this market in the latter half of 2008 - as demonstrated by the following figure from the RBA November 2008 Statement of Monetary policy.

Graph 74



128. In the February 2009 Statement of Monetary policy the RBA states (referring to domestic bond issues)

> *There has been no corporate bond issuance since October 2008. Secondary market spreads on corporate bonds have increased by around 5 basis points since the last Statement, reaching a high of 450 basis points above CGS (Graph 79). However, due to the fall in CGS yields, corporate bond yields are currently around*

> *7.2 per cent – 150 basis points lower* than at the end of October 2008 and at levels last seen in August 2007. (Page 55.)

129. In this context I consider the AER was in error to express the following conclusion in the AMI draft decision:

> *The AER does not consider it appropriate to compare the Bloomberg Australian fair yields against the yields of international bonds. Market conditions will vary between the Australian bond market and the US bond market and it is expected that deviations between the two will occur, even after the bonds are swapped to Australian dollars.* (Page 121.)

130. Such a conclusion may be justified if we observed that Australian corporations were all choosing to issue debt in the Australian market. However, such a conclusion cannot hold if this is not the case – and in fact the opposite is true during the AMI period.

131. Given that we observe that corporations are preferring to issue debt overseas then we must conclude that the perceived cost of doing so is lower than the perceived cost of issuing debt domestically. Given that we know the perceived cost of issuing debt overseas is lower than the perceived cost of issuing debt domestically then we can use the estiamtes of the cost of issuing debt overseas as a lower bond estimate of the cost of issuing debt domestically. To simply exclude such evidence on the basis that it tells us nothing about domestic market conditions is illogical and inconsistent with what we observe about the actual behaviour of Australian corporations.

132. I am informed by Citipower that the following bond issues by major Australian companies took place in the US debt markets in the period immediately after the AMI period (with the first observation on 30 Dec 2008). I have not indepently verified these observations but nonetheless rely on them as faithful reproductions of the facts.

Table 6: Debt premia (not annualised) paid by Australian companies issuing debt in the US

	Spread over US Treasury at Issue	Launch/ Announcement Date	Rating	Spread to CGS after hedging exchange rate risk
5 year issues				
QBE Insurance	770	30-Dec-08	A3/A-	802
Woodside	625	24-Feb-09	Baa1/A-	615
Brambles	550	15-Mar-09	NAIC-2	556
BHP Billiton	400	18-Mar-09	A1/A+	400
Rio Tinto	752	14-Apr-09	Baa1/BBB	794
Caltex Australia	615	14-Apr-09	BBB+	839
Westfield	549	27-May-09	A-/A2/A-	564
7 year issues				
Brambles	550	15-Mar-09	NAIC-2	586
Caltex Australia	615	14-Apr-09	BBB+	666
APA Pipelines	575	14-May-09		620
10 year issues				
BHP Billiton	400	18-Mar-09	A1/A+	476
Woodside	613	24-Feb-09	A-	663
Brambles	550	15-Mar-09	NAIC-2	629
Rio Tinto	658	14-Apr-09	Baa1/BBB	780
APA Pipelines	575	14-May-09		728
Average	**586**			**647**

*Source: Citipower

133. The second column describes the debt premia measured relative to the US government bonds ("Treasuries"). The column on the far right provides the debt premium measured relative to CGS after hedging the debt back into Australian dollars.

134. Based on the economic concept of uncovered interest parity, risk free interest rates denominated in one currency should offer the same expected return as risk free interest rates in another country after adjusting for expected movements in exchange rates between the two currencies. If this was not the case then there woud be arbitrage profits to be made by borrowing in one country and lending in another. On this basis, it is reasonable to ignore any differences in risk free rates between Australia and the US and focus solely on the credit spread in the US as the variable that companies would be considering when deciding whether to issue debt in the US or Australia. That is, the observed debt margin in the US will be very close to the debt margin that busiensses expect to pay relative to CGS assuming that they don't hedge foreign currency exposure.

135. Alternatively, one can also go through the exercise of examining what it would cost to hedge interest costs incurred in the US back into Australian dollars. Citipower has

done this and, unsurprisingly, this results in only a small incresae in the average debt margin. I say this is unsurprising because the possibility of such arbitrage profits drive the development of foreign currency hedging markets so uncovered interest rate parity should provide a close approximation to covered (ie, hedged) interest rate parity.

136. In what follows I focus on the more conservative spread to Treasuries measure of the debt premium in the abvoe table. This column demonstrates that, starting in December 2008, Australian corporations were isssuing debt into the US debt market at risk premia (even before annualisation) well in excess of the 3.09% determined in the AER draft decision. The lowest debt premium achieved by any of these issuers was by BHP Billiton which has a credit rating of A+ and with extremely low debt levels. The following commentary from the business pages of the Sydney Morning Herald on 5th February 2009 is relevant:

> *BHP Billiton boss, Marius Kloppers, delivered a half-year result yesterday that by anyone's standards would be considered disappointing. It contained more than the usual smattering of hot spots and under normal circumstances would have sent the share price into a tailspin.*
>
> *But Kloppers didn't appear particularly concerned and the share price response was fairly benign. He, unlike some other captains in the commodity industry, sleeps well at night.*
>
> *The simple explanation for this is that BHP Billiton has next to no debt - a gearing ratio of less than 10 per cent. Until a year ago this would be viewed with derision: a lazy balance sheet working at far less than its capacity.*
>
> *But in the new world there is no such thing as too little debt. What was once lazy is now safe and brimming with potential to pounce on cheap distressed assets that must be discarded by competitors with debt problems.*[37]

137. Similarly, other analysts commentary such as "BHP's ultra-low gearing must be the envy of blue chips around the world". [38]

138. In summary, around the AMI averaging period Australian companies were universally choosing to issue into foreign debt markets and the lowest debt premium observed for

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[37] The Age, *February 5, 2009,* Low debt burden ensures Kloppers sleeps well at night http://business.smh.com.au/business/low-debt-burden-ensures-kloppers-sleeps-well-at-night-20090204-7xwg.html

[38] Fat Prophets analyst Gavin Wendt as reported in the Courier Mail, August 13 2009. *BHP Billiton registers first profit fall since merger* http://www.news.com.au/couriermail/story/0,20797,25921570-3122,00.html

those issuers is 4.0% for BHP Billiton (which is A+ rated and has ultra low gearing at a time when '*there is no such thing as too little debt*'). In this context, I do not consider that it is reasonable to determine a benchmark debt premium for an Australian company with an assumed BBB+ credit rating and 60% gearing is less than 4.0%.

139. In my view, the evidence of Australian companies issuing debt into the US market proximate to the AMI averaging period supports a conservative estimate of the debt risk premium for a 60% geared BBB+ rated firm of 5.86% (the mean of post AMI period unhedged debt premia for Australian companies issuing debt into the US where those Australian companies had an average).

140. I note that Citipower has also examined the issues of debt into foreign markets during the AMI averaging period (but not by Australian businesses) with those interest costs hedged back into Australian dollars. I am told that the mean (median) premium on BBB+ debt during that period was 5.98% (6.21%) when hedged back into Australian dollars. Interestingly, I am told that four of these issues are for three US BBB+ rated energy utilities and they had a mean (median) risk premia of 6.56% and 6.83%. This confirms my view that a 5.86% estimated risk premium for the AMI averaging period based on observations from Australian companies issuing in the US post the AMI period is conservaitve.

5.3. Conclusion

141. The best available evidence of actual trades in BBB+ (and other) rated bonds proximate to the AMI averaging period confirms the analysis undertaken in prior periods (ie, the lead up to and during the AMI averaging period). Namely, the AER/Bloomberg BBB+ fair value curve significantly underestimates the market observed yields on BBB+ bonds (and even on higher rated bonds).

142. The Tabcorp bond is the best observation available of a traded BBB+ bond with a medium term maturity that is proximate to the AMI averaging period. Importantly, it is also an observation of the cost of debt *to an issuer* and therefore is desirable as a source of information on the benchmark rate (see criterion i at paragraph 50). The yield at issue on the Tabcorp bond issue can reasonably be viewed as an underestimate of the benchmark rate because the issue was a retail issue and, as such, incurred higher direct transaction costs in reaching retail customers with the pay-off for incurring these costs being lower interest costs paid by Tabcorp.

143. This observation provides a clear basis for believing that Bloomberg fair value estimates underestimate the benchmark rate.

144. Of course, the Tabcorp issue is only one observation for one bond. However, the AER/Bloomberg methodology is also effectively based on a single bond (as described

below, Santos drives the value of the Bloomberg BBB 8 year fair value). There is also no evidence that the Bloomberg Santos price reflects an actual trade of the bond as opposed to an estimate of its yield. In addition, the Bloomberg estimate for Santos is based on an estimate of the yield associated with a hypothetical trade in the secondary market and not the interest costs to the issuer (as is the case for the Tabcorp observation).

145. On this basis, to the extent that one was required to set the benchmark on the basis of a single observation it would be preferable for that observation to be based on the actual traded price for the Tabcorp new issue than on a Bloomberg estimate of the hypothetical secondary market traded price for Santos.

6. Alternative proxies for the benchmark 10 year BBB+ rate in the AMI averaging period

146. Based on the empirical evidence outlined above it is my opinion that the AER/Bloomberg BBB+ fair value curve is not a reliable estimator of benchmark BBB+ yields based on observations from the corporate bond market. This conclusion holds at every maturity level but is especially strong at longer maturities approaching 10 years.

147. I have also been asked to provide my opinion on alternative proxies for the 10 year BBB+ benchmark rate during the AMI averaging period. I describe and assess alternative proxies in the following sub-sections.

148. In my view there are really four options available to arrive at an estimate of the benchmark rate for 10 year BBB+ rated debt during the AMI averaging period. These options are:

- to use published fair value estimates from CBASpectrum and Bloomberg to arrive at an estimate (possibly by taking some sort of average of the two);
- to derive a bespoke estimate of the fair value of BBB+ bonds from Australian corporate bond yield estimates observed within the AMI averaging period;
- to take observations of actual trades in Australia from outside the AMI averaging period and use these as a basis for setting the benchmark rate within the AMI averaging period; or
- to take observations of actual trades from outside Australia (but within or proximate to the AMI averaging period) and use these as a basis for setting the Australian benchmark rate within the averaging period.

6.1. CBASpectrum fair value as an alternative to Bloomberg

149. I am only aware of two providers of fair value estimates for yields on Australian corporate debt – Bloomberg and CBASpectrum. Previously in this report I have restricted my discussion, consistent with my terms of reference, to the Bloomberg estimates. I now focus on the CBASpectrum estimates.

150. During the AMI averaging period CBASpectrum published a 10 year BBB+ fair value yield of 9.55% (annualised) giving rise to a DRP estimate of 4.92% (ie, a spread to 10 year CGS of 4.92%). This compares with the AER/Bloomberg 10 year fair value yield of 7.73% (DRP of 3.09%).

151. In contrast to the AER/Bloomberg fair value estimates, I find that the CBASpectrum estimates:

- behaved in the manner expected of a fair value estimate following the worsening of the global financial crisis. Specifically, rather than credit spreads staying relatively constant through September, October and November 2009 (as reported by Bloomberg), CBASpectrum estimated increasing credit spreads in the period leading up to the AMI averaging period – consistent with theory and published BBB yield estimates by the RBA;

- better fit the data for yield estimates during the AMI averaging period; and

- better described the yields observed on actual trades of BBB+ (and other rated) debt post the AMI averaging period.

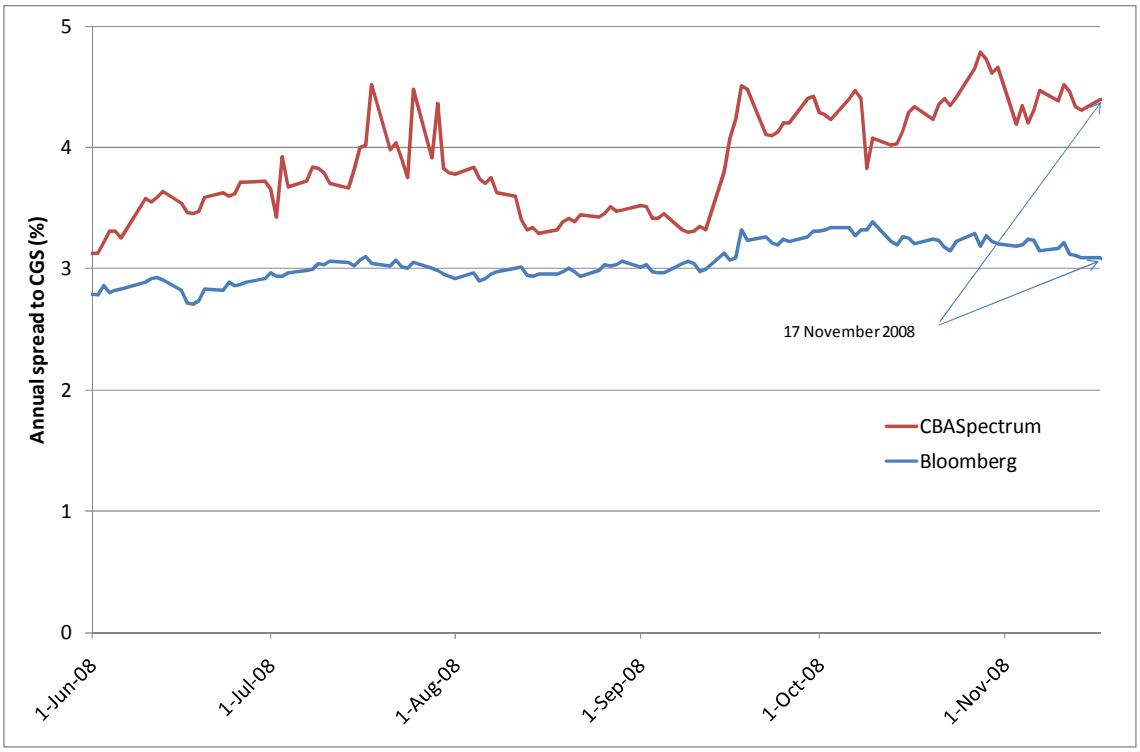
152. For these reasons I find the CBASpectrum BBB+ fair value estimate to be a more reliable proxy for the benchmark BBB+ rate during the AMI averaging period. I step through the evidence underlining each of the dot points in the following subsections.

6.1.1. Performance in the lead up to the AMI averaging period

153. As already described in section 3.1 above, it is my opinion that the only reasonable expectation is that, following the escalation of the financial crisis in September 2008, risk premiums on corporate debt, and especially relatively low rated BBB+ corporate debt, should have increased markedly.

154. Figure 9 below shows a recent history of debt risk premia over CGS estimated by CBASpectrum and Bloomberg for 10-year BBB+ bonds, using the AER's methodology.

Figure 9: CBASpectrum vs Bloomberg (AER) estimated spreads to CGS on 10-year BBB+ corporate bonds



Source: Bloomberg, RBA

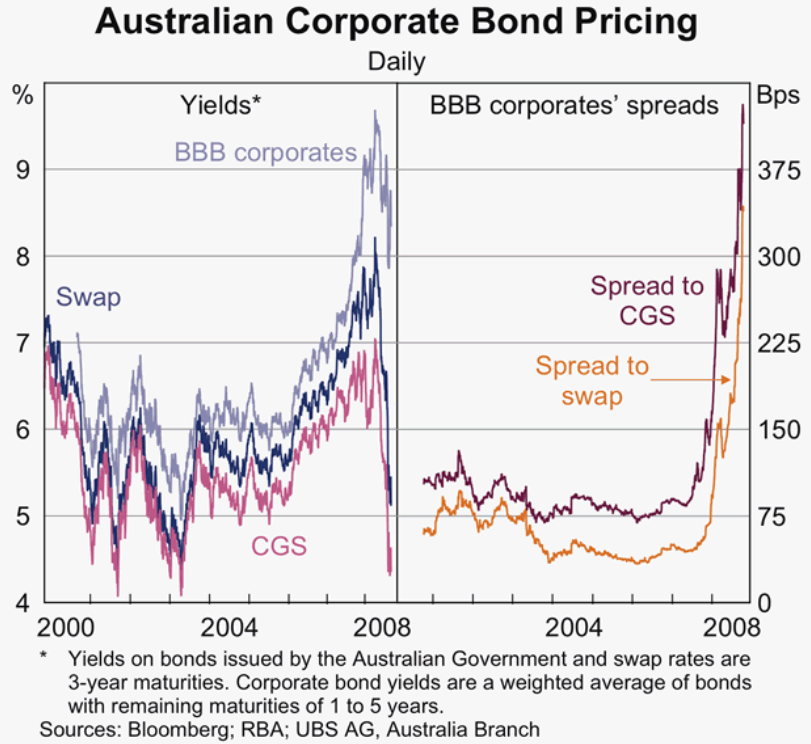
155. Unlike the debt premia estimates of Bloomberg, it can be seen that the debt premia estimates for CBASpectrum rose following the collapse of Lehman Brothers in September and the consequent escalation of the global financial crisis.

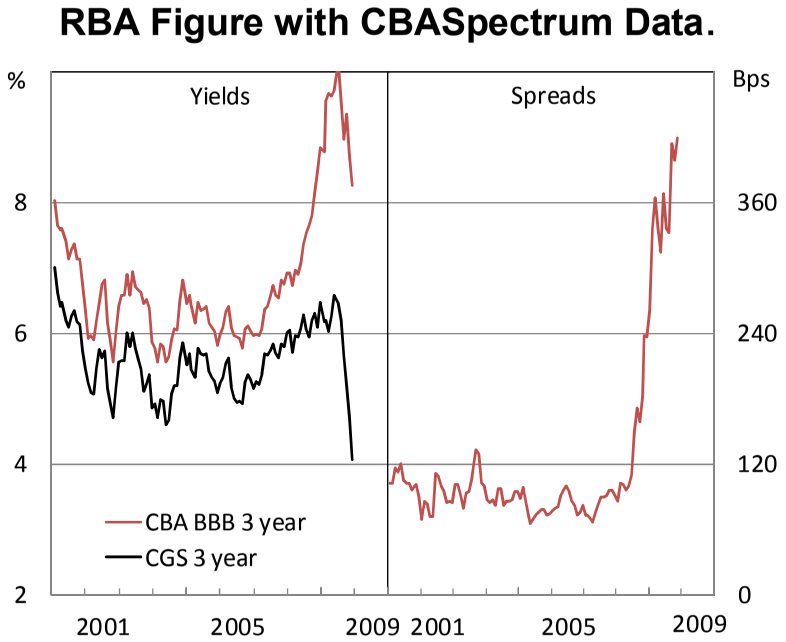
156. By the beginning of the AMI averaging period the CBASpectrum BBB+ estimated spreads to CGS were, at 4.39%, 1.30% higher than those estimated by Bloomberg.

157. The CBASpectrum estimated spread to CGS for 10 year BBB+ bonds on 17 November 2008 is also consistent with, although lower than, the RBA reported spread for BBB bonds with 1 to 5 years to maturity of 4.59% in November 2008 (as reported in Table 2 above).

158. As I did in section 3.2 for Bloomberg I now compare the RBA graph for moves in BBB spreads to CGS with the same graph derived using CBASpectrum fair value estimates for 3 year debt. A cursory examination of Figure 2 and Figure 10 will show that CBASpectrum BBB+ estimated yields and spreads behaved consistently with those published by the RBA while those published by Bloomberg did not.

Figure 10: Comparison of CBASpectrum corporate bonds spreads with RBA estimates



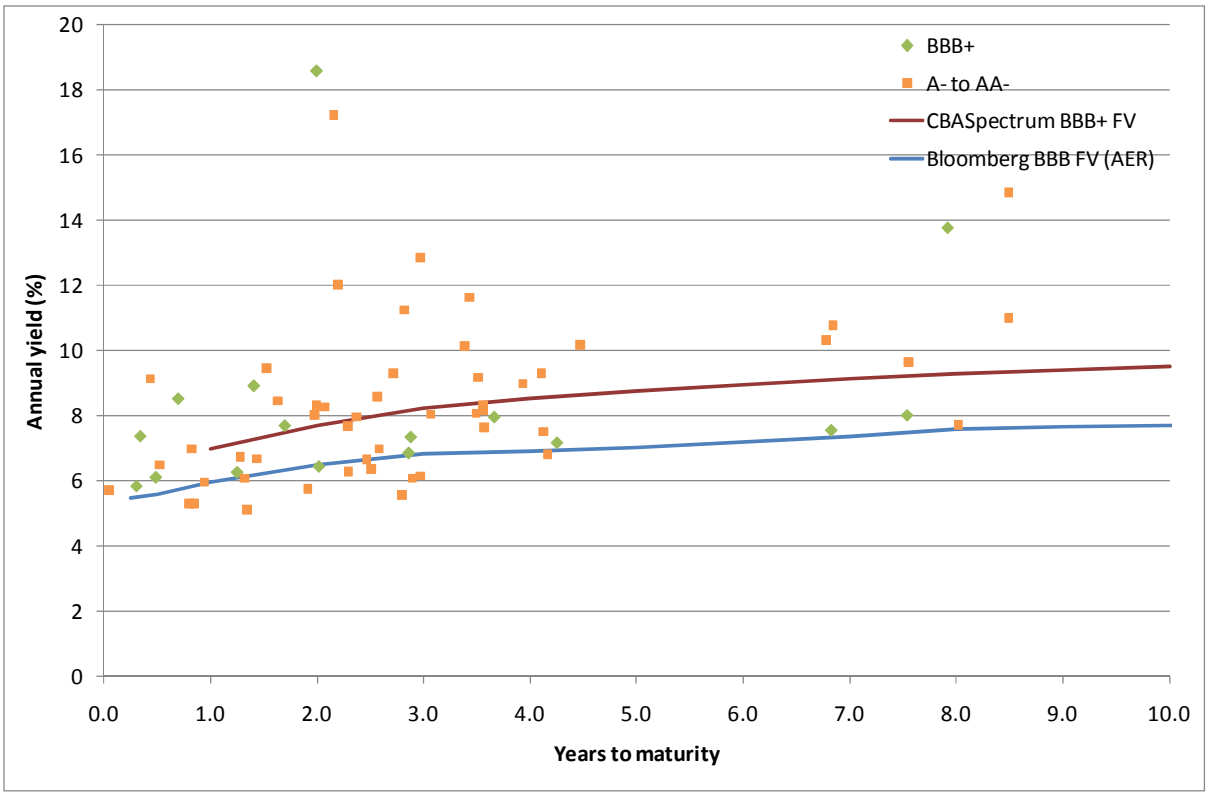


159. Specifically, note that the spread to CGS estimated by CBASpectrum continues to rise throughout the period as does the spread to CGS estimated by the RBA (recall that the Bloomberg spread to CGS ceases stops and 'flatlines' over the latter half of 2008).

6.1.2. Performance in explaining observed yields during the AMI averaging period

160. During the AMI averaging period the CBASpectrum BBB+ fair value curve provided a better fit to all of the estimated BBB+ to AA- yields. As should be the case, the CBASpectrum BBB+ fair value curve passes above a large number of the observations for A_ to AA+ issuers (including above 3.5 years to maturity). This can be seen in the below figure (which updates Figure 7 above by including the CBASpectrum fair value curve).

Figure 11: Average yield estimates for BBB+ to AA- rated fixed coupon bonds during AMI averaging period



6.1.3. Performance in explaining actual trades post the AMI averaging period

161. Table 7 and Table 8 below are the same as Table 4 and Table 5 except they now include the CBASpectrum estimate of the BBB+ fair value at the time of the Tabcorp/AMP debt issues and also include the relevant spread to 5 year CGS on that date.

Table 7: Tabcorp BBB+ issue vs Bloomberg/CBASpectrum

	24 March 2009	1 April 2009
Yields		
Tabcorp 5 year issue annualised	8.87%	8.89%
AER/Bloomberg 5 year BBB+ fair value estimated	7.68%	7.69%
CBASpectrum 5 year BBB+ fair value estimated	9.89%	10.19%
Spread to CGS		
5 year CGS yield	3.84%	3.90%
Tabcorp spread to CGS (5 years)	5.03%	4.99%
CBASpectrum BBB+ spread to CGS (5 years)	6.05	6.29%
AER/ Bloomberg BBB+ spread to CGS (5 years)	3.84%	3.79%

*Source: Bloomberg, CBASpectrum, RBA and CEG analysis.

Table 8: AMP Comparison A- issue vs Bloomberg/CBASpectrum

	11 March 2009
Yields	
AMP 5 year issue annualised	9.12%
AER/Bloomberg 5 year BBB+ fair value estimated	7.47%
CBASpectrum 5 year BBB+ fair value estimated	9.51%
Spreads to CGS	
5 year CGS	3.65%
AMP spread to CGS (5 years)	5.47%
CBASpectrum BBB+ spread to CGS (5 years)	5.86%
AER/Bloomberg BBB+ spread to CGS (5 years)	3.82%

*Source: Bloomberg, CBASpectrum and CEG analysis.

162. Notably, the spread to 5 year CGS on both of the Tabcorp and AMP bonds was in excess of 4.99% in March 2008. This is materially more than the predicted spread to CGS for a BBB bond based on the Bloomberg BBB fair value curve (of around 3.8%). Notably it is also substantially more than the 3.09% 10 year DRP allowed in the AMI draft decision. CBASpectrum estimated a BBB+ spread to CGS for these bonds that

163. Bloomberg underestimated these actual observations and CBASpectrum overestimated them (but by less than Bloomberg). On this basis alone some average of CBASpectrum and Bloomberg may present itself as reasonable. However, in my opinion this evidence supports a dominant weight being given to the adoption of CBASpectrum rather than Bloomberg fair value estimates because:

- CBASpectrum BBB+ was a better predictor of these observations on average than Bloomberg;
- The average credit rating for these observations is above BBB+ (given the AMP issue was rated A-); and
- The yield on Tabcorp and AMP issues is a downward biased estimate of the yield on a wholesale issue of such debt. As described in section 5.1.3 and Appendix A I conservatively estimate this downward bias at 0.5%.

164. It is also the case that CBASpectrum BBB+ fair value estimates are more consistent with other relevant information on the cost of debt during the AMI averaging period – such as the average observed yield estimates for corporate bonds during the AMI averaging period and the cost of issuing debt by Australian companies into the US dollar denominated debt market. I discuss these alternative proxies for the benchmark cost of debt below.

6.2. Adjusting actual trades back to the AMI averaging period

165. If one adjusts yields on actual trades post the AMI averaging period for changes in credit spreads back to the AMI averaging period then one can also arrive at an estimate of what the yield on those trades would have been had they occurred during the AMI averaging period. One could then use some form of estimate of the shape of the yield curve duirng the AMI averaging period to convert the observed yield for the individual bond into a yield on an otherwise equivalent 10 year maturity debt.

166. This is the approach that the Victorian businesses used to arrive at an estimate of the yield on the Tabcorp bond had it been issued during the AMI averaging period and had it had a maturity of 10 years (9.48%). This estimate is consistent with the CBASpectrum estimate (9.55%) but below an average yield estimates for all long dated BBB+ to AA- bonds. It also results in a spread to CGS of 4.84% - which is slightly higher than that estimated by the RBA for BBB bonds with 1 to 5 years to maturity (4.59% in November 2008 and 4.61% in December 2009)

167. In my view converting observed trades from outside the AMI period into equivalent yields inside the AMI period is a reliable approach to determining the benchmark rate in the AMI period given the paucity of traded data during the AMI averaging period. I

also note that the Victorian DB's estimate falls within a reasonable range given other available data.

168. I further note that the average spread to 5 year CGS for the Tabcorp and AMP issues was 5.16%. Even if one ignored the fact that one of these bonds was newly rated at more than BBB+ and both had shorter duration than 10 years, one would still need to believe that risk premiums were more than 2% lower in the AMI averaging period in order for these observations to be consistent with the 3.09% DRP in the AMI Draft Decision.

6.3. Taking an average of observed yields during the AMI averaging period

169. An alternative to using a fair value estimate published by Bloomberg and/or CBASpectrum is to take a simple average of the observations of risk premia estimates for issuers during the AMI averaging period. The table below provides three different measures of central tendency across the full sample of fixed coupon bonds (and fixed and floating rate bonds) I have collected.

Table 9: Average spread to CGS across all maturities

	BBB+	BBB to A-	BBB+ to AA-	BBB+ to AAA
Average premia on fixed bonds issued by an issuer				
Observations	15	39	68	130
Mean (%)	5.08	5.46	5.54	4.12
Median (%)	3.70	3.70	4.42	3.33
Trimmed mean(%)	4.23	4.54	4.57	3.34
Average premia on fixed and floating bonds issued by an issuer				
Observations	20	54	93	177
Mean(%)	5.42	6.71	5.77	4.29
Median(%)	3.91	4.27	4.38	3.30
Trimmed mean(%)	4.35	4.83	4.43	3.50

*Source: Bloomberg, UBS, AFMA, CBASpectrum, Reuters, and CEG analysis.

170. Restricting the analysis to BBB+ issuers alone gives rise to a mean spread to CGS for of 5.08% for fixed coupon issues (15 observations) and 5.42% for both fixed and floating issuers (20 observations). The median yield is 3.70% for fixed coupon bonds and 3.91% for fixed and floating issuers. The trimmed mean is the mean of only the interquartile observations (ie, the mean of observations excluding the highest and lowest yielding 25%). The trimmed mean is 4.23% (fixed only) and 4.35% (fixed and floating). The table also reports the same results when the credit rating criteria is changed.

171. The table below provides the same analysis but where the maturity profile of the bonds under consideration are restricted to be between 4 to 16 years (more in line with the requirement to estimate the interest cost on a 10 year bond). I primarily focus on the results of this table as most relevant. I note that there is substantial agreement between the two tables except for in relation to the BBB+ only samples. As I discuss below, this is explainable by virtue of the very small sample size for long dated BBB+ issuers.

Table 10: Average spread to CGS across maturities from 4 to 16 years

	BBB+	BBB to A-	BBB+ to AA-	BBB+ to AAA
Average premia on fixed bonds issued by an issuer				
Observations	4	11	21	51
Mean (%)	4.92	5.65	5.77	3.87
Median (%)	3.50	6.00	5.90	3.35
Trimmed mean(%)	4.21	5.09	5.34	3.67
Average premia on fixed and floating bonds issued by an issuer				
Observations	5	16	28	68
Mean (%)	4.80	5.17	5.67	4.00
Median (%)	3.50	5.00	5.63	3.50
Trimmed mean (%)	4.39	5.02	5.17	3.85

*Source: Bloomberg, UBS, AFMA, CBASpectrum, Reuters, and CEG analysis.

172. A number of observations can be made about these tables. Firstly the mean observation in all ratings categories presented is at 4.0% or above. That is, even when I examine the debt premia for 177 unique issuers rated from BBB+ all the way to AAA the mean observation is 4.29% (Table 9 above).

173. Secondly, when I restrict the sample to only BBB+ issuers with more than 4 years to maturity I effectively limit the number of issuers to only 5 (4 if I exclude floating rate bonds). This is an unreliably low sample size and I do not recommend its use. This is especially given that this sample has a lower average (however measured) than both:

- all issuers with a BBB+ to AA- rating; and
- all issuers of BBB+ bonds (ie, including shorter maturity BBB+ bonds);

174. Thirdly, including both BBB and A- bonds in the sample (ie, keeping the average credit rating at around BBB+) causes the average debt premium on longer dated bonds to rise universally above 5% (ie, irrespective of definition of average and also irrespective of whether floating rate notes are included). The sample sizes achieved are larger making the estimates more reliable.

175. Fourthly, including issuers rated up to AA- and excluding issuers rated less than BBB+ gives rise to a larger sample size (21 for fixed coupon bonds and 28 for both fixed and floating) and an average credit rating that is above BBB+. This gives rise to estimates of the average debt risk premia of between 5.17% and 5.90%.

176. Fifthly, it is only when I include AAA rated bonds in the sample that the average debt risk premia fall to 4.00% and less. However, even in this scenario the lowest estimate of the average debt risk premium is 3.35%. This is still above the 3.09 DRP estimated in the AMI draft decision even though the average issuer in this group has a rating above AA. This further supports the view that a DRP based on the Bloomberg BBB+ fair value curve is unreliable.

177. In my view, these observations support an estimate of the benchmark BBB+ DRP of at least 5.0% and up to 6.0% (defined by the range of measures of central tendency reported in the samples for BBB to A- issuers and BBB+ to AA- issuers in Table 10). The midpoint of this range is 5.5%.

178. I also note that the RBA publishes average spread to CGS for BBB rated bonds (albeit at 1 to 5 years maturity). As per Table 2 above these average 4.60% in November and December 2008.

6.3.1. Treatment of 'outliers'

179. I note that each of the measures described in the above tables involves a different measure of central tendency ("average") for the sample. None of these measures exclude observations but they do have the effect of giving different weight to the observations.

180. The mean gives every observation in the sample equal weight in a weighted average. The median adopts only one observation from the middle of the sample – but all observations play a role in determining which observation that is (ie, where the middle is). The trimmed mean gives all observations in the interquartile range equal weight – but with all other observations playing a role in determining what observations actually fall into the interquartile range (eg, adding an extra low observation into the bottom quartile will, even though that observation does not fall in the interquartile range, lower the trimmed mean by effectively pushing out the previously highest observation from the interquartile range and replacing it with a new observation that previously sat just below the interquartile range).

181. It is also possible to engage in an exercise that excludes some observations completely from the calculation on the basis that they are 'outliers'. This should be done if one has ascertained that the excluded observation is the result of measurement error (eg, a data entry error caused an extraneous "0" to be added) or it

can be definitively determined that the observation is not drawn from the population under consideration (eg, when sampling the length of worms one has accurately but inadvertently measured the length of a small snake rather than a worm).

182. Unless we have reason for believing that high and low yield estimates from individual banks are incorrect then we must accept these as accurate (or at least as accurate as the other observations). That is, we must accept that there is a real dispersion in the range of yields that exist in the market and this needs to be reflected in my analysis.

183. The second reason for excluding "outliers" is that the thing being measured is not the thing that we are interested in. In this context, one would have to conclude that some special characteristics of the bond in question make it irrelevant (ie, of zero informational content) to the task of estimating a benchmark BBB+ rate at 10 years. For example, I discussed in section 7.2 below how the Santos bond is unusual for a BBB+ bond in that Santos was effectively debt free during the AMI averaging period. One might be tempted to exclude Santos from the sample of relevant bonds on this basis.

184. However, I consider that this would be a mistake. While there are some characteristics of the Santos bond that make it unusual this will invariably be true for all bonds given the idiosyncratic nature of the financial position of different companies and the risks inherent in their sphere of operation. It is precisely these idiosyncratic risks that rating agencies such as Standard and Poor's attempt to encapsulate in the credit ratings they assign to these bonds. In my view, all observations are of value and no observations should be 'thrown out'. A low (high) observed yield for one bond relative to others does provide a basis for concluding the benchmark yield is lower (higher) than if that observation did not exist. Exactly how much lower (higher) may be a matter of debate but, in my view, any reasonable method must give the observation some weight.

185. An attempt to exclude from consideration a bond with a particular credit rating on the basis of special characteristics about that bond amounts to a *de facto* second guessing of the rating agency decisions. The fact that the AMI Order in Council directs one to have regard to the credit rating of a bond, rather than to an assessment of what that credit rating *should be* based on new research, would appear to support my view that such a second guessing exercise not be undertaken.

186. Nonetheless, I do report below the results of an estimation process which identifies potential outliers and then, without further inspection, I exclude these observations. I do this primarily for illustrative purposes to demonstrate the extreme example of what would be the case if one applied techniques commonly used for identifying outliers (ie, commonly used to identify unusual observations for further inspection) and then found that all such outliers should be completely excluded.

187. I have applied three tests to identify outliers for this purpose. They operate as follows:

- Chauvenet's test[39] defines a criterion based upon how far an observation diverges from the mean of the sample. The observation is determined to be an outlier if it lies outside a normally distributed confidence interval about the mean with a significance level of 1/(2n), where n is the number of observations in the sample;

- the "classic" outlier detection test[40] excludes those observations that lie further than two standard deviations from the mean. This is approximately equivalent, under the assumption that observations are drawn from a normal distribution, to excluding those observations where the null hypothesis that they are drawn from the same population can be rejected at the 5% level of significance using a two-tailed test;

- the "box plot" test[41] excludes observations that:

  - exceed the 75th percentile by 1.5 multiples of the interquartile range; and

  - lie below the 25th percentile by 1.5 multiples of the interquartile range.

188. I summarise in the table below the results of applying these tests to the yield data.

[39] Chauvenet, W. (1863) *A Manual of Spherical and Practical Astronomy:* Lippincott, Philadelphia.

[40] See, for example, Rand R. Wilcox, Basic Statistics: Understanding Conventional Methods and Modern Insights Wilcox Oxford University Press page 23

[41] Ibid, page 24

Table 11: Average spread to CGS excluding outliers

	BBB+	BBB to A-	BBB+ to AA-	BBB+ to AAA
All fixed and floating bonds				
Mean completely excluding outliers using "Chauvenet's test"	4.19	5.90	5.11	3.58
Mean completely excluding outliers using "Classic test"	4.19	5.90	4.62	3.43
Mean completely excluding outliers using "Boxplot test"	4.19	4.33	4.20	3.43
All fixed and floating bonds with maturity between 4 and 16 years				
Mean completely excluding outliers using "Chauvenet's test"	3.82	4.85	5.27	3.88
Mean completely excluding outliers using "Classic test"	4.80	4.85	5.27	3.63
Mean completely excluding outliers using "Boxplot test"	3.82	5.17	5.27	3.88

*Source: Bloomberg, UBS, AFMA, CBASpectrum, Reuters, and CEG analysis.

189. These results of this process do not alter my conclusion that the yield estimated during the AMI period support a range for the BBB+ benchmark DRP of between 5.0% and 6.0%. I note that, even when observations determined to be 'outliers' by these tests are given zero weight, the mean of the remaining samples are more often than not above 5.0% for the samples of BBB to A- and BBB+ to AA- issuers.

6.4. Using actual trades observed overseas during/proximate to the AMI averaging period

190. Given the absence of any known trades during the AMI averaging period an alternative approach would be to look to known trades that occurred during the AMI averaging period but in the US or European markets. I have already addressed the relevance of issues of debt by Australian (and foreign) companies in overseas debt markets proximate to the AMI averaging period (see section 5.2).

191. Based on the analysis set out therein consider that this supports an estimate of 5.86% (the mean of post AMI period unhedged debt premia for Australian companies issuing debt into the US where those Australian companies had an average).

6.5. Summary

192. Based on the analysis in this section I conclude that the following proxies for a benchmark BBB+ rate are more reliable than the AER/Bloomberg fair value derived estimate of 3.09%.

Table 12: Debt premia based on alternative proxies for the benchmark rate for BBB+ 10 year bonds during the AMI averaging period

Proxy	Implied DRP
Average of RBA estimated spreads to CGS for 3 year BBB bonds (November and December)	4.60%
CBASpectrum 10 year BBB+	4.92%
Tabcorp/AMP actual trade observed debt premia*	5.16%
Average of estimated yields during AMI period	5.50%
Actual trades in the US and other markets (including during the AMI period).	5.86%

*No adjustment made to AMI period.

7. Comparison of AER/Bloomberg and CBA Spectrum methodologies

193. Bloomberg and CBASpectrum are, to the best of my knowledge, the only data services that produce 'fair value' estimates for debt with a specific credit ratings and maturities for Australian corporate bonds. A 'fair value' estimate is an estimate of some form of 'average' or 'representative' yield for a bond of a specific credit rating and yield to maturity. In this sense an accurate or unbiased 'fair value' estimate can be equated with the concept of a 'benchmark yield' for a particular credit rating.

194. In previous sections I have examined the accuracy of the AER/Bloomberg and CBASpectrum BBB+ fair value estimates against various sources of independent evidence. As a result of this I have determined the CBASpectrum BBB+ fair value is a superior estimate of a benchmark yield for BBB+ rated bonds.

195. In this section I examine differences in the methodologies utilised by Bloomberg and CBASpectrum that might explain the different fair value estimates and explain why, in the market conditions prevailing during the AMI period, the CBASpectrum methodology gives rise to a superior estimate in my view.

196. The important conclusions from this section are that:

i. both Bloomberg and CBASpectrum exercise significant discretion in developing their fair value estimates. However, the nature and exercise of that discretion is not transparent and it is only possible to infer the methodology used and the rationale for this;

ii. nonetheless a clear inference can be drawn that Bloomberg relies solely on fitting its BBB fair value curve at long maturities to the single yield estimate for the Santos bond – this is the case before, during and after the AMI averaging period;

iii. there is good reason to believe that the characteristics of the Santos bond during the AMI averaging period meant this approach biased downward the Bloomberg BBB fair value curve at long maturities;

iv. Both Bloomberg and CBASpectrum fit fair value curves beyond the maturity that they appear to have yield estimates at that credit rating. The CBASpectrum methodology for doing so is to use yield estimates from other credit ratings and to impose a functional form on the shape of the fair value curve (or the credit spreads generated by that curve). I do not know the methodology used by Bloomberg;

v. In my view the methodology used by CBASpectrum is, in concept, an appropriate way with dealing with the paucity of data available at long maturities. I cannot express an opinion on the actual estimation techniques used by CBASpectrum to give effect to this concept as I do not have a full knowledge of them. I was previously critical of one aspect of the technique used by CBASpectrum in 2005 the effect of which was to bias down the CBASpectrum estimates at long maturities.[42] I understand that CBASpectrum has revised its techniques taking into account that specific criticism. I cannot express an opinion, at a conceptual or implementation level, of the Bloomberg methodology as I do not know what this is.

vi. A repeat of the 2005 methodology used by myself and Prof. Bruce Grundy to compare the accuracy of the Bloomberg and CBASpectrum fair value curves for long maturities would find that CBASpectrum was now significantly more accurate than Bloomberg.

197. An overall conclusion of the rest of this section is that methodology employed by both Bloomberg and CBASpectrum relies heavily on the discretion and judgement of each service. The proprietary nature of the models and lack of any published information explaining the basis for the exercise of discretion means that it is simply impossible to claim a full understanding of the methodology employed by either service. Of course, at any given time, it is possible to form an opinion about the accuracy of that discretion and judgment in the context of the NER requirements. However, precisely because it involves an exercise of judgement and discretion, it is not possible to compare this aspect of each service's methodology outside the context of a specific output from each service on a particular day.

7.1. Discretion is an important input into both Bloomberg and CBASpectrum fair value estimates

198. Bloomberg appears to mostly fit its fair value curve through a subset of the yield estimates provided to it for that credit rating category. However, Bloomberg uses discretion in:

- assigning a yield to a particular bond (it is not simply an average of yield estimates provided to it);
- deciding whether the yield assigned to the bond will actually be used in the curve fitting process; and

42 Hird and Grundy, NERA, *Critique of available estimates of the credit spread of corporate bonds*, May 2005.

- whether yields from bonds with other credit ratings will be used to determine the fair value curve (eg, yields on A rated bonds used to determine the yields on BBB rated bonds);

- what the curve fitting process will be (it is not simply a repeated application of a particular statistical technique that, say, minimises the sum of squared differences).

199. Much of this is obvious from an analysis of the fair value curves published by Bloomberg and the individual bond data published by Bloomberg. I undertake such an analysis in Appendix B. However, it is also clear from actual statements made by Bloomberg.

> *"Bloomberg Generic Price (BGN) is Bloomberg's market consensus price for corporate and government bond.* [sic] *Bloomberg Generic Prices are calculated by using prices contributed to Bloomberg and any other information that we consider relevant. Bloomberg does not make a market in any of the securities that we price. The actual methodology we use is proprietary and depends on the type of pricing and the markets involved. The goal of the pricing is to produce "consensus" pricing. To the extent that we are not comfortable that a bond can be assigned a consensus price at any time, we will mark it "not priced". We constantly and vigorously review the performance of the system and alter it as we determine necessary to achieve our goal."* [43]

200. Moreover, it appears from the following statements, provided to me by Citipower as a faithful representation of communication Citipower had with Bloomberg, that Bloomberg devolves the exercise of considerable discretion to individual analysts at the time the fair value curve is published.

> *"The absence of a BGN cannot always be taken to mean that the bond in question was not taken into consideration in curve creation."*
>
> *"The Bloomberg analyst has discretion to use approved alternate pricing to flesh out a curve when it is needed. Bloomberg could also use, depending on the reliability of the pricing source, a CBBT or a BCMP price to flesh out a curve."*
>
> *"Curves are fit as sets. If there are bonds on the curves in other ratings then Bloomberg may determine that they will keep a curve out longer than they have bonds, and monitor the shape and movement by that of the curves in other ratings."*

[43] Sourced from Bloomberg terminal on 26 May 2009.

"Analysts do have the discretion to refer to other curves in a 'set' (which might be other Australian dollar credit curves) to 'flesh out' a curve."

201. It is unclear what approval process that analyst must go through when using the discretion described above, what the analyst's physical location is (eg, Australia or the US) or whether the analyst has any specialist knowledge of the Australian corporate bond market.

202. CBASpectrum also uses discretion in its methodology for estimating fair value curves. CBASpectrum states:[44]

CBASpectrum is a cutting-edge relative-pricing tool developed for the Australian debt market. This paper aims to help clients understand the methods used to generate CBASpectrum's fair-value curves.

The original CBASpectrum model was developed by Ron Bewley, a former Professor of Econometrics at the University of New South Wales, and now the Head of Quantitative Research at the CBA. The Australian corporate bond market has grown significantly since the first CBASpectrum was released.

To accommodate a wider product range, and more variety of issuers, we have taken the opportunity to improve CBASpectrum. Under Ron's guidance, Simon Sando (a Senior Quantitative Analyst at CBA) enhanced the original credit spread model, and constructed new fair-value curves to broaden the application of CBASpectrum across the Australian debt market.

***Because the models used in CBASpectrum are proprietary in nature, this paper provides a flavour (rather than detailed discussion) for the techniques used to estimate fair-value curves**. …*

*Any basic model of the term structure of credit spreads begins with the premise that credit spreads depend on the time-to-maturity and the credit rating. Unlike commercial data providers, our fair-value indices are not simply interpolated estimates from a given rating category**. Instead, CBASpectrum's curves are derived from a system of credit rating equations. This methodology allows for more efficient estimates, especially given relatively sparse data on lower-rated corporate bonds.***

Building on these foundations, the new CBASpectrum corporate credit model offers a number of significant innovations. ***First, a more flexible functional form is used***

[44] Commonwealth Bank Credit Research, *What makes the new CBASpectrum tick?* 6 September 2006.

to model credit spreads (where credit spreads are defined as the spread-to-CGS). *This flexibility allows CBASpectrum to cope with a greater variety of credit spread term structures.*

Second, weaker assumptions are used to prevent credit rating curves from intersecting. *The benefit of weaker assumptions is that the new model allows for richer inter-rating dynamics. Third, industry-specific factors are modelled for four sectors - Financials (Banks), Financials (Property Trusts), Foreign Government-owned, and all other corporate sectors. Finally, S&P long-run default probabilities are used to supplement market pricing data when estimating default risk premia.*

203. The above description provides an in principle discussion of the methodology used by CBASpectrum. However, it nonetheless remains unclear:

- what bond yield data is used in to populate the estimation model and what the source of this data is;
- whether this data is manipulated in any way by CBASpectrum;
- what functional forms are actually used in the estimation process and what the estimation process is (eg, what does it minimise); and
- the extent to which any ad hoc adjustments are made to the outputs of the estimation model.

7.2. The AER methodology relies almost totally on the Bloomberg yield estimate for the Santos bond

204. The AER's proposed methodology is to estimate the yield to maturity for a 10 year BBB+ bond equal to:

AER 10 year BBB+ yield	=	Bloomberg 8 year BBB fair value	+	Bloomberg 10 year A fair value	-	Bloomberg 8 year A fair value

205. Consequently, the accuracy of the AER methodology depends entirely on:

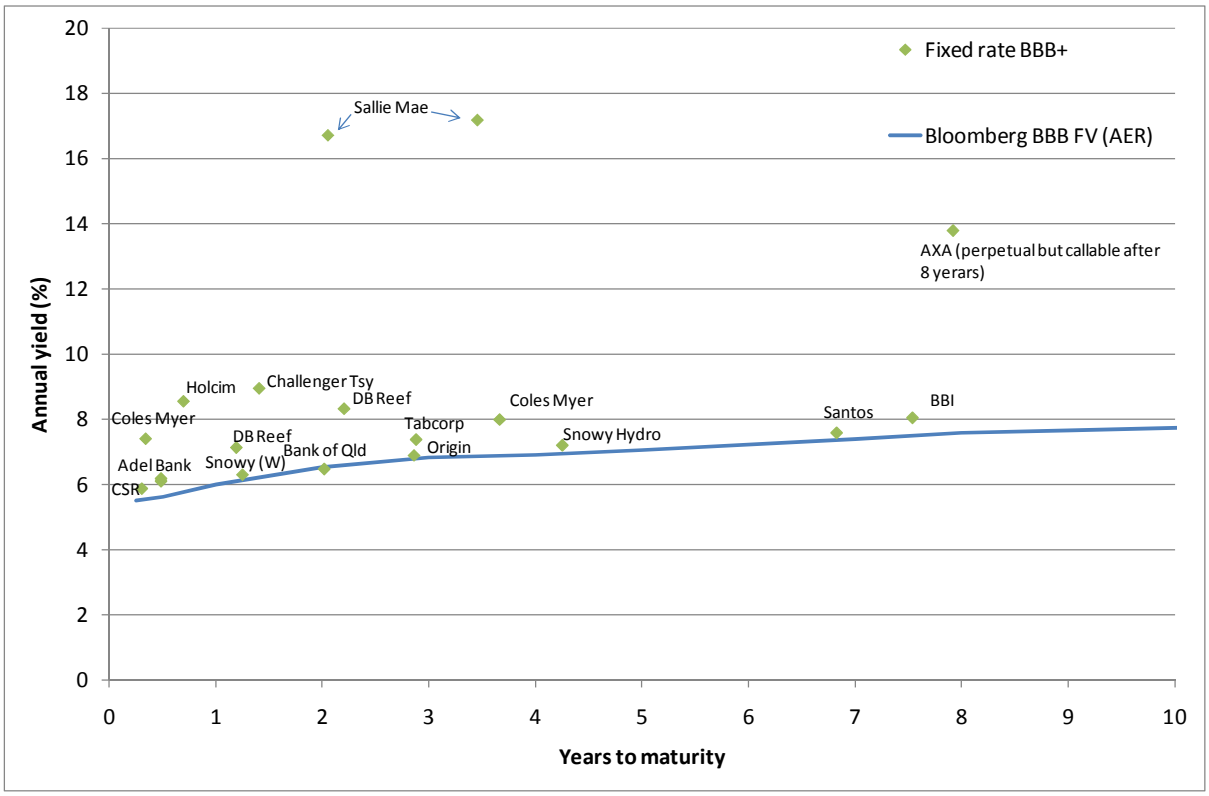
- The accuracy of the Bloomberg 8 year BBB fair value estimate as a proxy for the 8 year BBB+ benchmark yield envisioned under the NER;

- The accuracy of the Bloomberg A fair value curve between 8 and 10 years as a proxy for the shape of the BBB+ yield curve (for debt instruments envisioned under the NER).

206. However, given the nature of Bloomberg's methodology this more or less the same as adopting the yield on the Santos bond. This is because Bloomberg anchors its BBB fair value curve around the Santos observation (around 7 years to maturity during the AMI averaging period) and tends to draw a "flat" curve beyond 7 years (for both its BBB and A fair value curves). This means that the AER BBB+ fair value curve is essentially both flat and anchored to the Santos bond in the long maturity region.

207. That this is true can be seen by examining Figure 3 (reproduced below).

Figure 3 (Reproduced): Average yield estimates for BBB+ fixed coupon bonds during AMI averaging period



208. Bloomberg does not publish a BGN (consensus yield) for the Santos bond on any of the days during the AMI averaging period. However, over the AMI period the Bloomberg BBB fair value curve at the same maturity of the Santos bond has an

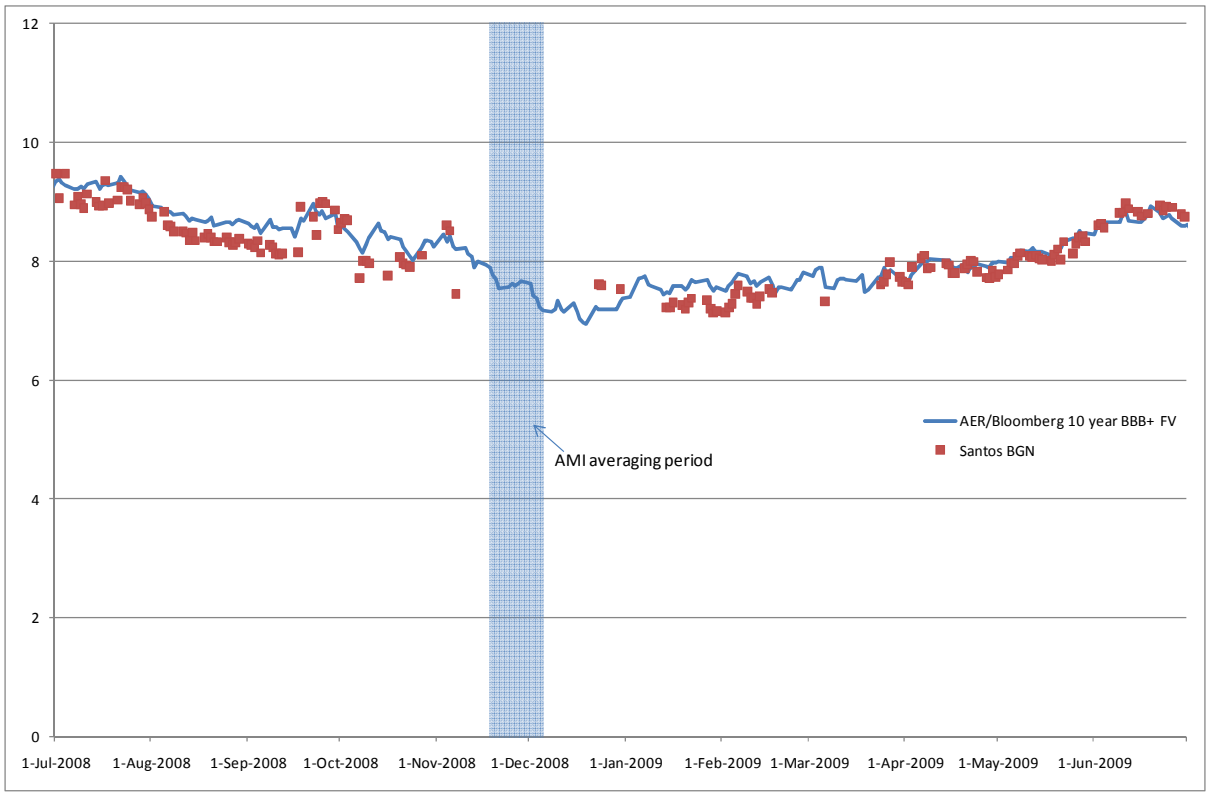
annualised value of 7.21%. This value is above two of the contributors to Bloomberg with pricing (ABNAmro and AFMA) and below two (Westpac and NAB Markets).

209. The mean of the contributor pricing for Santos over the AMI period is 7.72% which is 38bp more than the AER/Bloomberg fair value at the same maturity and is only 1bp less than the AER/Bloomberg estimate of the 10 year benchmark rate.

210. This is not a finding that is peculiar to the AMI averaging period. Over the 12 months from 1 July 2008 to 30 June 2009 the mean difference between the AER/Bloomberg 10 year BBB+ fair value estimate and the Santos BGN was only 14bp. Moreover, on only 6 of these days was it more than 35bp different to this mean.

211. This can be demonstrated by examining the below graph which plots a scatter diagram of the Santos BGN against the AER/Bloomberg BBB+ fair value curve.

Figure 12: Correlation between Santos BGN and Bloomberg/AER 10 year BBB+ fair value estimate



212. Clearly there is a strong dependency between the yield that Bloomberg assigns the Santos bond and the estimate of the 10 year BBB+ benchmark rate that is derived following the AER method. As already noted, Bloomberg did not assign a BGN to the Santos bond during the AMI averaging period but nonetheless the average yield estimated for Santos by the four contributors to Bloomberg (AFMA, NAB, Westpac and ABN Amro) was only 1bp different to the AER estimate of the 10 year BBB+ benchmark rate.

213. Of course, if the yield on the Santos bond were the best proxy for the benchmark BBB+ rate this would not be problematic. However, I consider that the opposite is true during the AMI averaging period, namely, that the Santos bond yield is strongly biased downwards proxy for the benchmark BBB+ rate.

214. Firstly, as demonstrated in Figure 8 above, the Santos bond has an estimated yield that is below most BBB bonds it also has a yield that is below most of the bonds with a rating of A- to AA-. This is despite the fact that it has a relatively long maturity date and one would expect, with an upward sloping yield curve, that such a bond to have a relatively low yield.

215. The explanation for this peculiarly low yield would appear to be at least partly explained by the fact that at the time Santos was effectively debt free. On 31 December 2008 Santos reported current assets (cash and cash equivalents plus other liquid assets) of $2.48bn which exceeded interest bearing loans and borrowing of $2.45bn.[45] Santos' cash and cash equivalents plus the value of swap contracts alone were reported at $1.95bn leaving net debt (interest bearing loans less $1.95bn) at only $0.51bn. On 31 December 2008 Santos equity market capitalisation was around 8.5bn.[46] This gives Santos a debt to market equity ratio of around 6% and a debt to total assets (equity plus debt) of around 5%. This very low level of debt, combined with a long maturity profile for the debt it had, would appear to have insulated Santos' from the events in credit markets at the time – a fact explicitly acknowledged by Santos.

> *We have been managing our debt conservatively, making sure we have no significant peaks in repayments and ensuring a long average term to maturity of nearly seven years. Less than 15% of gross debt matures in the next two years and greater than 25% matures beyond 10 years. The result is that we are in a strong position and are not facing a significant refinancing task in the difficult markets that are evident in the near term.*[47]

45 http://www.santos.com/library/Santos_Financial_Report_2008.pdf

46 Shares on issue of 584,812,875 multiplied by a closing price of $14.87. Convertible preference shares excluded.

47 Santos 2008 annual report, page 8.

216. This is reflected in a positive short term outlook from Standard and Poor's published on 17 December 2008 where S&P state:

> *The 'A-2' short-term rating on Santos is supported by the company's strong liquidity, underpinned by the cash proceeds from the Gladstone LNG sale (the initial payment of about US$2 billion was received in August 2008) and the stable nature of the company's contracted-gas cash flow. At Nov. 30, 2008, the company had cash and its equivalent of A$1,664 million, and A$80 million debt maturing in the next 12 months.*

217. It is reasonable to conclude that the very low levels of debt owed by Santos meant that it was not typical of a BBB+ rated firm – and certainly was not typical of the hypothetical benchmark 60% geared regulated utility. This is not a reason for excluding the yield on the Santos bond from calculations of a BBB+ benchmark rate. The Santos bond was BBB+ rated at the time and other factors would have entered into this long term credit rating (including expected increases in Santos' future capital expenditure and volatility in energy prices to which it is exposed).

218. However, the weight that should be given to the Santos bond yield must be proportional to the amount of the available information that the bond yield embodies. Given we have 26 yield observations for BBB+ to AA- bonds with more than 4 years to maturity then an approximate weight given to this observation might be about 4% (1/26) – as discussed in section 2.4.2. (This assumes we have no other evidence such as actual trades from outside the AMI period etc). By contrast, it appears that the AER/Bloomberg methodology is to give this observation 100% weight in determining the shape and level of the BBB+ fair value curve beyond 4 years maturity – as discussed in section 7. In this regard I also note that the Santos bond issue is only a very small size ($100m).

219. Notably, at a time when the Santos bond had a relatively low yield the ESCV rejected a proposal from Envestra to base its BBB+ fair value estimate on the Santos bond yield. The ESCV gave the same reason as I give here:

> *While Santos has the longest term to maturity of any bond in the sample, the fact that it is only one estimated value with no effective comparison (i.e. no equivalent bond of similar maturity to compare with), and as the methodology applied by Envestra to derive the ten year maturity adjustment is unknown, there are no grounds for weighting the Santos estimate to the extent advocated. Furthermore, the Santos corporate bond may be a special case in terms of its*

low yield with respect to its tenor, due to Santos facing greater cash flow volatility when compared to other BBB+ rated bonds.[48]

220. This is also consistent with the views expressed by the AER on page 120 of the AMI draft determination where it expressed the view that:

Furthermore, the AER considers that the benchmark corporate bond rate should be based on the observed yields of all bonds suitable for inclusion rather than a single bond.

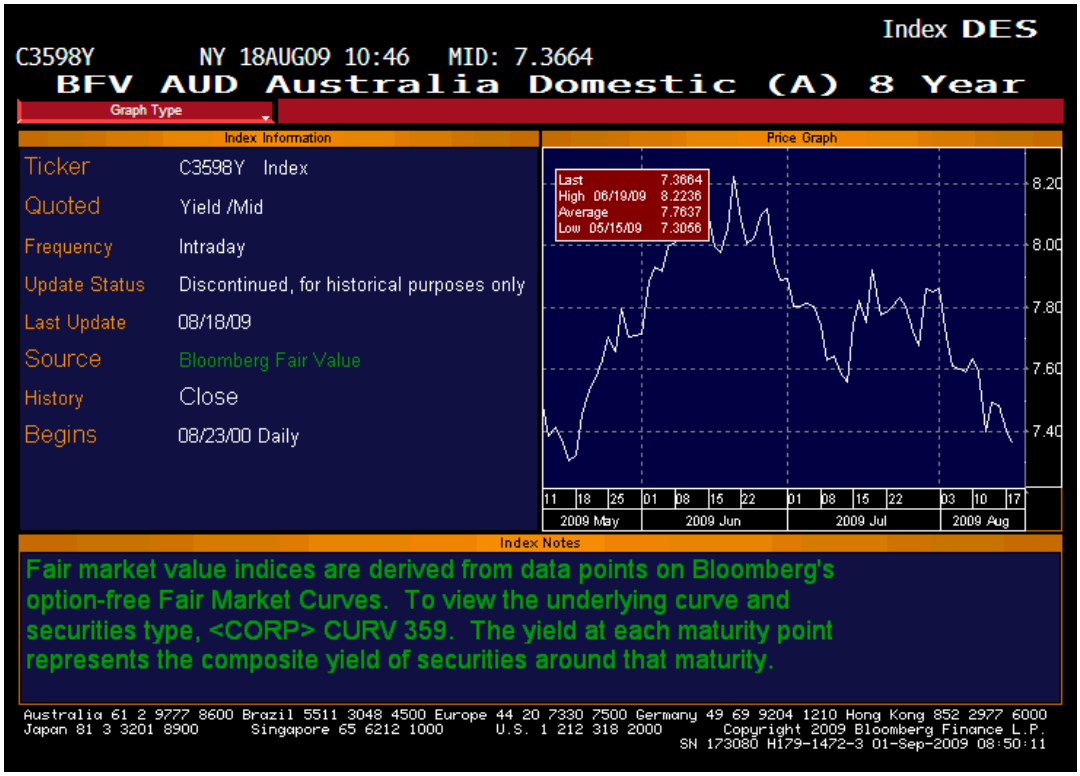
7.3. Lack of data, the Bloomberg method and the Santos bond

221. It appears to me that the Bloomberg method is such that it tries to fit its curve through specific data points. However, as the ESCV noted, there are *no equivalent bond of similar maturity to compare* the Santos bond with. I surmise that, in the absence of any other BBB bonds of a similar maturity, Bloomberg simply fits its BBB curve through its estimate of the Santos yield.

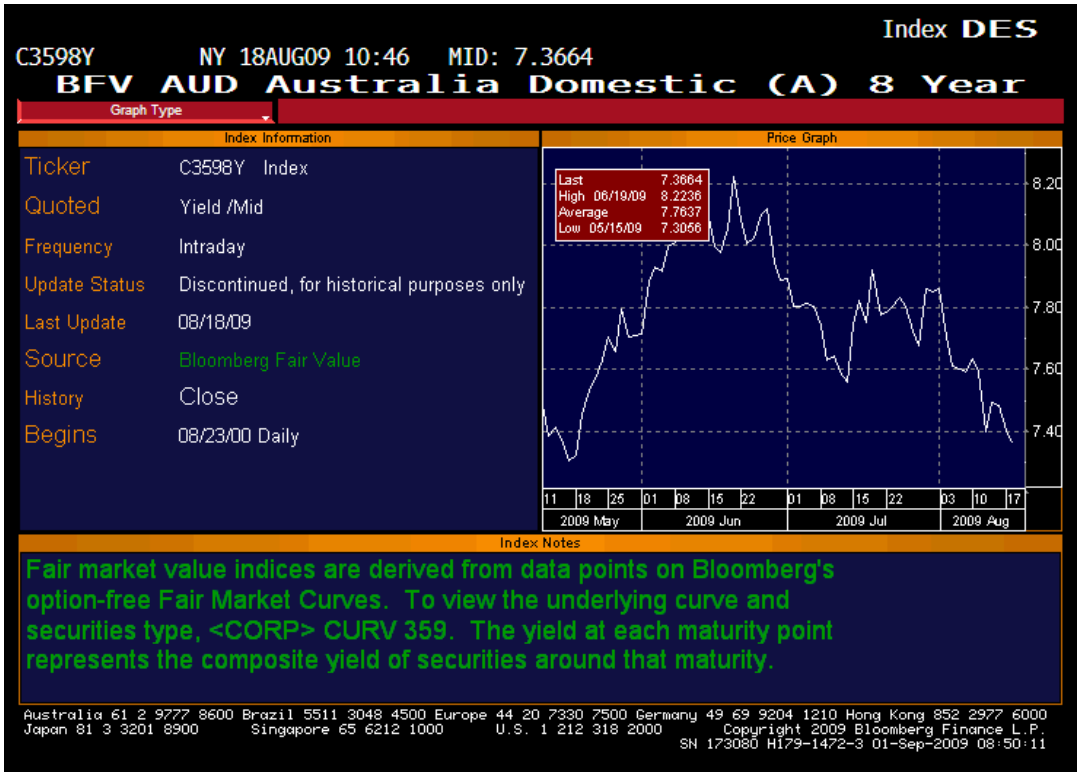
222. Notably, during the AMI Bloomberg was period publishing an 8 year BBB fair value estimate despite the longest dated BBB bond it was using to fit its curve being less than 7 years to maturity. Since the 18 August 2008 Bloomberg has stopped publishing an 8 year BBB fair value.

223. It is also the case that Bloomberg was publishing estimates of fair value for 8 to 10 year A rated bonds during the AMI averaging period. These were relied on by the AER to arrive at a 10 year BBB fair value. However, the longest dated A rated bond that Bloomberg was using to fit it's a rated curve was shorter maturity than the Santos bond. Bloomberg has since the 18 August 2008 ceased to publish the 8 and 10 year A rated fair value curve. The following screen shots from the Bloomberg terminal attest to this:

[48] Page 487 of the 2008 ESCV 2008-2012 Gas Access Arrangement Review, Final Decision.


Index DES
C3598Y NY 18AUG09 10:46 MID: 7.3664
BFV AUD Australia Domestic (A) 8 Year
Graph Type
Index Information
Ticker C3598Y Index
Quoted Yield /Mid
Frequency Intraday
Update Status Discontinued, for historical purposes only
Last Update 08/18/09
Source Bloomberg Fair Value
History Close
Begins 08/23/00 Daily
Price Graph
Last 7.3664
High 06/19/09 8.2236
Average 7.7637
Low 05/15/09 7.3056
8.20
8.00
7.80
7.60
7.40
11 18 25 01 08 15 22 01 08 15 22 03 10 17
2009 May 2009 Jun 2009 Jul 2009 Aug
Index Notes
Fair market value indices are derived from data points on Bloomberg's option-free Fair Market Curves. To view the underlying curve and securities type, <CORP> CURV 359. The yield at each maturity point represents the composite yield of securities around that maturity.
Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000
Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000
Copyright 2009 Bloomberg Finance L.P.
SN 173080 H179-1472-3 01-Sep-2009 08:50:11

224. I note that the decision to shorten the maturity of the A fair value curve by 3 years (from 10 to 7 years) cannot be explained by the maturity of bonds in the Bloomberg database reducing due to the passage of time since the AMI averaging period. Presumably whatever deficiencies Bloomberg now sees in the data required to estimate the A (and BBB) fair value curves at 8 years and beyond were also there at the time of the AMI averaging period.



7.4. CBASpectrum methodology and the Santos bond

225. I have had access to the detailed credit rating equations used by CBASpectrum in the past. Professor Bruce Grundy and I have described those equations in our 2005 paper for NERA referenced earlier in relation to the Bloomberg methodology.[49] In that paper we were critical of certain aspects of those equations which we regarded as resulting in a downward bias to long term and low rated fair value estimates. Since then, CBASpectrum has amended its methodology (as already described).

226. Notwithstanding the changes to CBASpectrum's equations it is clear from my inspection of the fair value curves currently reported by CBASpectrum that it continues to impose a broadly similar functional form on the data as was the case in 2005. I note that the source of the bias identified in the NERA report was not the functional form but rather the optimisation process for fitting that functional form to the data.

227. Nonetheless, as noted in the NERA 2005 report, in a data rich environment a potential weakness of the CBASpectrum methodology may be that the pre-conceived functional

[49] NERA, *Critique of available estimates of the credit spread of corporate bonds*, May 2005, page15.

form is not sufficiently flexible to represent the actual shape of the yield curve suggested by the data. On the other hand, this can be an advantage if these restrictions preserve characteristics of the fair value curve that are consistent with finance theory in the face of a paucity of available data.

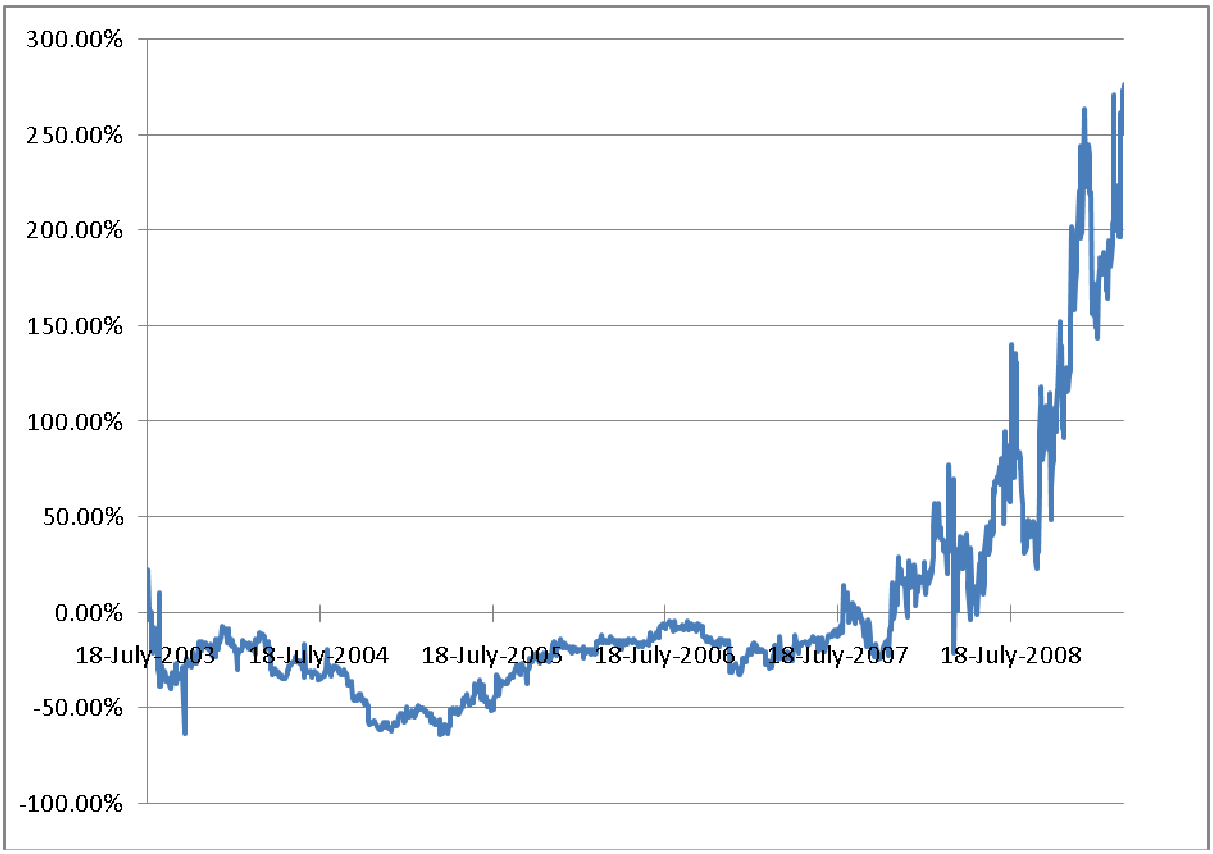
228. It is worth noting that the CBASpectrum's methodology simultaneously solves for the set of fair value curves that best fit all of the data used in its regressions – not just the BBB+ data. This means that the BBB+ curve will be informed by data for BBB+ bonds as well as data for bonds of other credit ratings. This is an attractive property of the methodology in the circumstances where there is a relative paucity of data (as was the case in the AMI averaging period). For example, imagine a scenario where there were only one BBB+ bond and 10 A rated bonds. With only one BBB+ observation it is impossible to draw a curve for that credit rating having regard only to that observation. However, the 10 observations for the A rated bonds can be used to infer a shape for both the A and BBB+ rated curve which does allow a curve to be drawn for the BBB+ rating.

229. When adopting this methodology CBASpectrum determines that the Santos bond is not typical of a BBB+ bond (ie, draws the BBB+ fair value curve above the Santos bond). This is consistent with the discussion above which similarly concluded that there was evidence to suggest that the Santos bond did not have a yield that is typical of a BBB+ bond with its maturity.

7.5. Conclusion

230. It is important to note at the outset that in 'normal' market conditions the differences between CBASpectrum fair value estimates and AER fair value estimates (based on Bloomberg fair value estimates) have been relatively small. It is only since the advent of the global financial crisis and, in particular, the collapse of Lehman Brothers in September 2008 that the differences have become large.

Figure 13: Absolute difference between CBASpectrum BBB+ yield and AER/Bloomberg BBB yield for 10 year maturity



231. Consistent with the above graph I note that the level of disagreement between the two methods is clearly somehow related to the advent of the global financial crisis.

232. Both CBASpectrum and Bloomberg:

- rely on proprietary methods and information; and
- engage in non-transparent exercises of discretion and judgement when developing their fair value curves.

233. Bloomberg's methodology appears set the Bloomberg fair value curve for each credit rating based solely on bonds with that credit rating (albeit with Bloomberg excluding a large number of these bonds from its analysis for reasons that are not transparent). By contrast, CBASpectrum uses data from all credit ratings and an assumed relationship between each of its fair value curves to simultaneously determine the shape and level of all of its fair value curves. This is an advantage of CBASpectrum's

fair value estimate in the current market circumstances with limited bond pricing due to illiquidity and few new issues into the Australian corporate bond market in recent years.

234. The AER's methodology is likely to give rise to a biased estimate because it relies very heavily on the estimated Santos bond yield and that yield does not appear to be typical of BBB+ bonds. Neither CBASpectrum nor Bloomberg services contain data relating to bonds with 10 years to maturity and a BBB+ credit rating. The AER/Bloomberg methodology attempts to bridge this impasse by assuming that a bond with a 10-year maturity will require approximately the same yield as the longest dated BBB+ bond used by Bloomberg (Santos). CBASpectrum moderates the shape and level of its BBB+ yield curve by reference to bond yields at other credit levels. Both of these approaches rely on the exercise of discretion in the face of a lack of data.

235. In this respect, Bloomberg's methodology, and by extension, the AER's methodology, currently relies almost exclusively on the observed yield of the Santos bond. In my view there is evidence that this bond is unrepresentative of long dated BBB+ bonds in general and, consequently, the AER's methodology will give rise to a biased estimate of a NER benchmark rate.

236. There are other reasons to consider that the AER's methodology for deriving a 10 year BBB estimate (from Bloomberg 8 year BBB, 10 year A and 8 year A fair value estimates) may be inferior to CBASpectrum's methodology in the AMI averaging period market conditions. This is because:

- Bloomberg's methodology works best where there are multiple bonds with similar maturity profiles within a given credit rating. This is not currently the case for BBB bonds in Australia with Bloomberg having only one pricing observation beyond 4 years (the Santos bond). By contrast, CBASpectrum's methodology uses information from all credit rating categories to simultaneously determine all credit rating fair value curves. This has the potential advantage of not relying solely on pricing for the limited set of BBB rated bonds to determine BBB rated fair value curves. (In periods with richer data sets it has the potential disadvantage of imposing a structure on term premia for a given credit rating that is inconsistent with the term structure implied by the bonds in that credit rating.)
- Bloomberg's exclusion of relatively low yielding BBB and A rated bonds from its curve construction may represent a desire by Bloomberg for its fair value curves to reflect the fair value for liquid corporate bonds - as opposed to fair value for the typical bond which in the current corporate bond market is not a liquid bond.
    - The above dot points is a reason why CBASpectrum methodology may be preferred to AER/Bloomberg in meeting criterion i listed at paragraph [50] above (given that illiquidity is currently typical on bonds in the Australian corporate bond market).

237. Based on the analysis of this section it is my view that CBASpectrum estimates of BBB+ 10 year fair value are to be preferred to the AER's estimates of BBB+ 10 year fair value (based on Bloomberg BBB and A fair value curves).

8. Conclusions

238. Based on the facts and analysis reported earlier in this report I consider that all of the available evidence suggests that the AER/Bloomberg BBB+ fair value curve is unreliable and downward biased as a proxy for determining a benchmark rate. On this basis I do not consider that sole reliance on this method can comply with the legislative requirements.

239. I conclude that the there are more reliable alternative proxies as set out in section 6. Adopting one, or a combination of these proxies, will result in a benchmark rate at least 1.5% higher than derived using the AER/Bloomberg BBB+ fair value curve.

Appendix A. Transaction costs in Tabcorp/AMP issue

240. Section 7.6 of the Tabcorp prospectus details the fees and expenses associated with the debt issue. These fees and expenses include:

- up to 1.5% of the total issue value in Arranger fees;
- up to 0.75% of the total issue value in fees to the 3 other Joint Lead Managers who are not Arrangers;
- fees of 2.0% on the total value of bonds allocated in the Broker Firm Offer;
- Out of pocket expenses. These include the expenses incurred by Joint Lead Managers (eg, legal expenses, transaction taxes, the cost of operating and staffing a 1300 information line Monday to Friday between 8.30am and 5.30pm).
- Fees paid to and expenses incurred by the Trustee (who holds the bonds on trust for the borrowers) (see section 7.5 of the prospectus).

241. Assuming that the maximum fees are paid to the Arrangers and other Joint Lead Managers then these alone would represent 2.25% of the amount raised. A payment of 2.25% of the total amount raised amortised at 8%[50] over the five years of the bonds life amounts to a 56bp per annum cost.

242. However, the estimate of 2.25% (56bp per annum) must be increased to reflect fees for placements through Broker Firm Offers and out of pocket expenses (such as legal expenses etc). If one assumes that only 25% of the debt is issued through Broker Firm Offers then this fee will still amount to 0.5% of the total value of the issues. This raises the total direct cost of the issue to 2.75%.

243. One must also add to this an estimate of other direct costs. The AER NSW distribution draft decision estimates this to be around $200,000 in total (including legal and roadshow costs, credit rating fees and other minor costs) which represents around 0.1% of a total issue value $200m. Reviewing the documentation for the Tabcorp issue and noting the use of a staffed information phone line it appears likely to us that the other out of pocket expenses are likely to be well in excess of that allowed in the draft decision. Nonetheless, adding 0.1% to 2.75% gives a total upfront cost of 2.85%.

[50] I conservatively assume a cost of capital of only 8%.

244. A 2.85% upfront cost means that for every $100 raised there is only $97.15 raised in net. A 2.85% upfront cost therefore translates to 2.93% of the net proceeds. Amortising 2.93% over 5 years at an 8% discount rate gives an annual debt raising cost of 0.73% pa. This is 0.65% lower than the AER's estimate of around 0.08% direct costs for a wholesale issue (based on wholesale issue into the US market).[51] If we add 0.65% to the Tabcorp issue yield we find that it is much closer to the CBASpectrum fair value estimate than the Bloomberg fair value estimate.

245. Section 7.4.1 of the AMP prospectus details the fees and expenses associated with the debt issue. These fees and expenses include an upfront fee of up to 2.35% of the total issue to Arrangers and Joint Lead Managers plus expenses incurred by the Joint Lead Managers and fees and expenses of the Trustee. Amortising 2.35% over five years at a discount rate of 8% is 59bp per annum. To this must be added other direct costs of issuing the debt.

246. On this basis I believe that a reasonable point estimate is that transaction costs incurred by AMP and Tabcorp were around 50bppa lower than allowed by the AER. Tabcorp and AMP would only rationally have incurred these lower costs if there was an advantage in terms of lower interest costs. Thus, the interest costs of these retail issues is an underestimate of the wholesale interest costs perceived by AMP and Tabcorp by likely more than 50bppa (ie, 0.5% pa).

[51] See page 187 of the AER 28 April 2009 Final Decision for NSW electricity distributors.

Appendix B. Discretion exercised in Bloomberg fair value estimation

B.1. Discretion used in estimating 'consensus' bond yields

247. Each day Bloomberg publishes a fair value corporate bond curve for each of the credit ratings AAA, AA, A and BBB. It also publishes the bonds and their estimated yields it had regard to when estimating that fair value curve. Bloomberg does not fully disclose how it determines which bonds are included and which bonds are excluded from the construction of the fair value curve. Rather, Bloomberg simply states in relation to the BBB fair value curve:[52]

> *"The curve is populated with Australian dollar denominated fixed-rate bonds issued by Australian companies. The bonds have ratings of BBB+, BBB, BBB- from S&P, Moody's Fitch and/or DBRS. The yield curve is built daily with bonds that have either Bloomberg Generic (BGN) prices, supplemental proprietary contributor prices or both. The bonds are subject to option-adjusted spread (OAS) analysis and the curve is adjusted to generate a best fit."*

248. It is not transparent what is meant by *supplemental proprietary contributor prices*. It would appear that Bloomberg's methodology allows for the possibility that it would use a specific pricing estimate (supplemental proprietary contributor prices) in preference to other pricing estimates or would rely solely on that specific pricing estimate when no other pricing estimates are available. However the source and nature of those estimates are not disclosed.

249. Similarly, the nature of the process for determining whether a bond has Bloomberg Generic Pricing (and what that Bloomberg Generic Price is) is determined using judgement and discretion exercised by Bloomberg. With respect to these prices Bloomberg states:[53]

> *"Bloomberg Generic Price (BGN) is Bloomberg's market consensus price for corporate and government bond.* [sic] *Bloomberg Generic Prices are calculated by using prices contributed to Bloomberg and any other information that we consider relevant. Bloomberg does not make a market in any of the securities that we price. The actual methodology we use is proprietary and depends on the type of pricing and the markets involved. The goal of the pricing is to produce "consensus" pricing. To the extent that we are not comfortable that a*

[52] This statement is made on the Bloomberg screen when it describes its bond prices.

[53] Sourced from Bloomberg terminal on 26 May 2009.

bond can be assigned a consensus price at any time, we will mark it "not priced". We constantly and vigorously review the performance of the system and alter it as we determine necessary to achieve our goal."

250. In summary, Bloomberg states that it uses discretion in arriving at what it considers are "consensus" bond yields and in determining whether a "consensus" bond yield exists.

B.2. Discretion used in excluding outliers

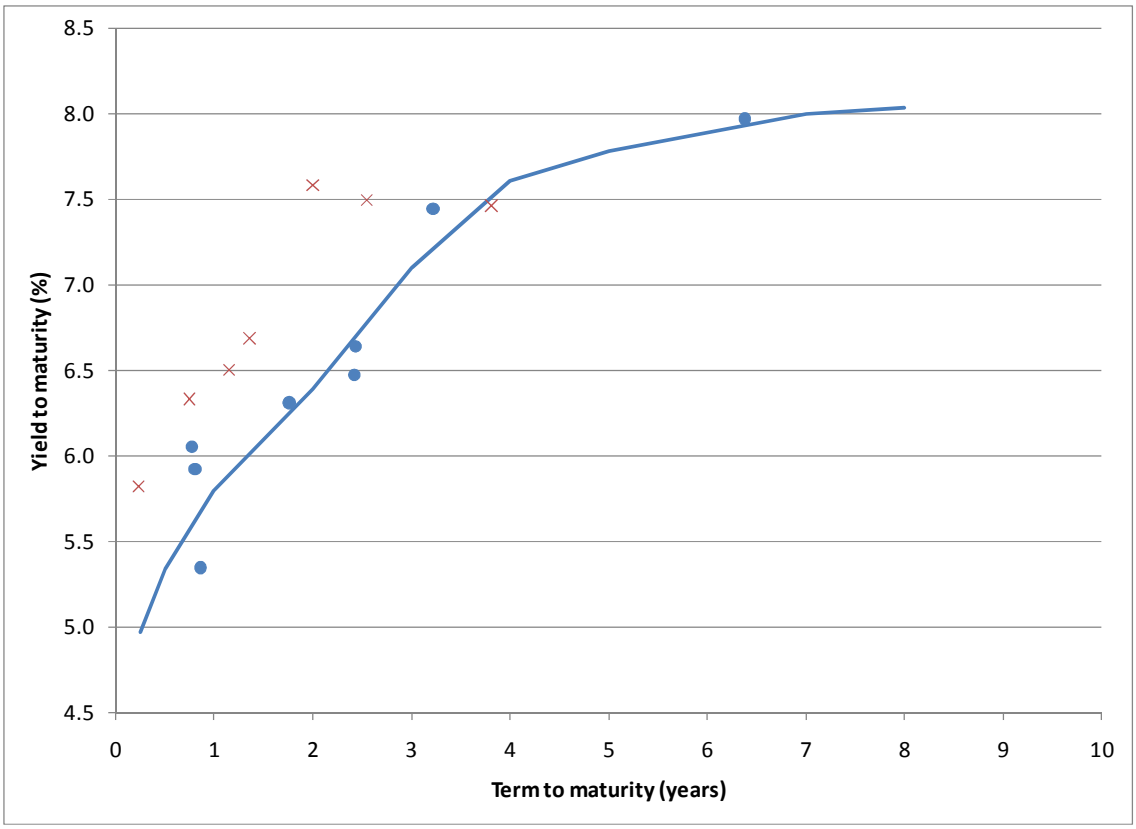
251. For prices that have Bloomberg Generic Pricing (BGN prices published by Bloomberg which Bloomberg regards as reflecting 'consensus pricing') Bloomberg appears to exercise further discretion in excluding 'outliers' from this sample when building its fair value curves. [54] I am unaware of the criteria Bloomberg applies when determining that a bond constitutes an outlier.

252. I illustrate the exercise of this discretion below. I do not have access to the bonds Bloomberg states it used to fit its curve during the AMI averaging period so I illustrate this point using data from a later period. Figure 14 below shows the Bloomberg fair value curve for BBB on 6 May 2009. Each dot in that figure represents the yield to maturity and the term to maturity of a particular bond for which there was BGN pricing on Bloomberg on that day.[55] However, only the blue dots represent the bonds that Bloomberg used to determine the fair value curve. The orange crosses represent bonds that were excluded by Bloomberg from the generation of that curve.

[54] See page 9 of a presentation by Michael Lee to the International Bond Market Conference 2007, Taipei. Available at http://taipeibond.gretai.org.tw/cv/Bloomberg%20Mr.%20Lee(panel%203-1).ppt.

[55] I have not shown two bonds that Bloomberg excludes from its BBB fair value estimation process on this graph. These two bonds each have yields of 18.6% (GPT) and 21.3% (Fairfax) and to show them would require a scale of the graph that would prevent closer examination of the area of interest around Bloomberg's BBB fair value curve.

Figure 14: Bloomberg BBB fair value curve and included/excluded bonds on 6th May 2009

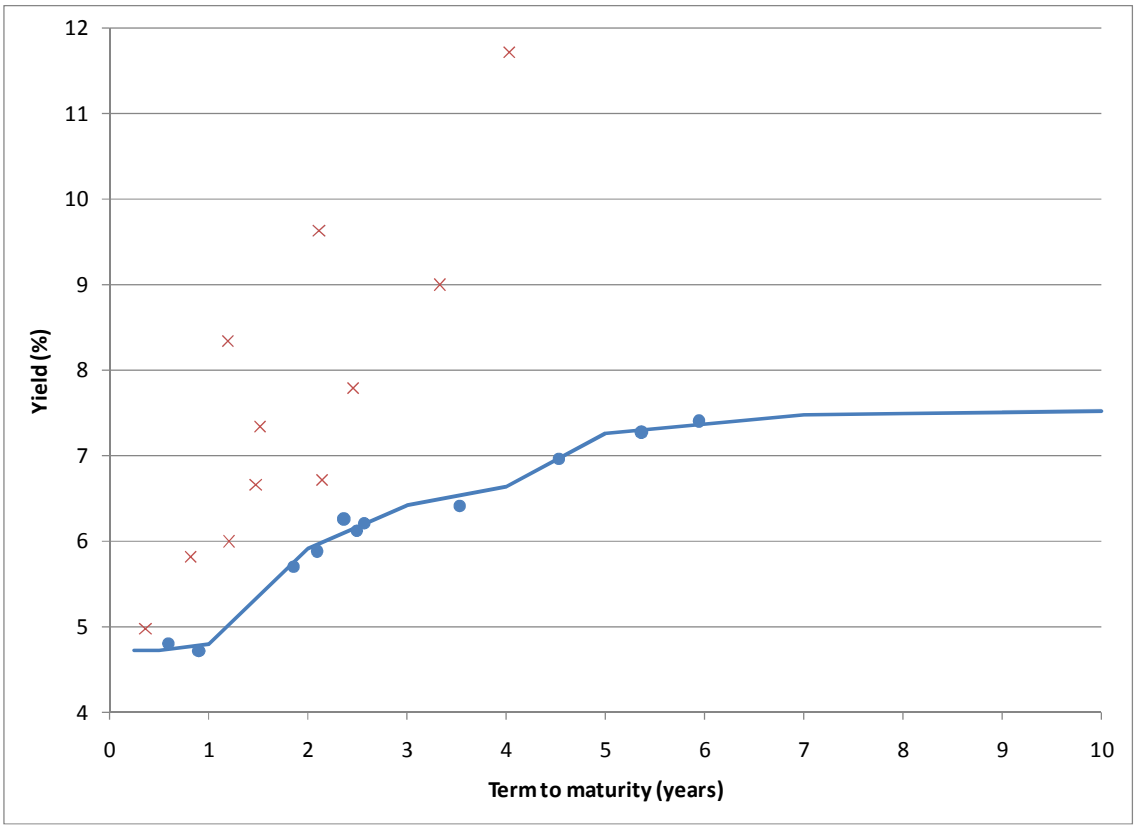


Source: Bloomberg

253. The above graph illustrates that seven bonds with pricing in the vicinity of the Bloomberg fair value curve have been excluded by Bloomberg. Of these, six have pricing that is above the Bloomberg fair value curve and one has pricing that is slightly below. It appears clear that the impact of including these bonds would have been to result in a lower fair value curve. Given that Bloomberg does not explain the reason for excluding these bonds it is not possible to assess the reasonableness of this exclusion (either in general or specifically in the context of whether the Bloomberg estimates are an appropriate input into the determination of the cost of debt under the NER).

254. Given the AER also uses the Bloomberg A fair value curve to determine its estimate of the cost of debt under the NER I provide a similarly formatted graph for Bloomberg's A fair value curve.

Figure 15: Bloomberg A fair value curve and included/excluded bonds on 6 May 2009



Source: Bloomberg

255. In this case all of the excluded bonds had lower yields. Had some or all of these bonds been included then it is reasonable to assume that the fair value curve for A would have been both lower and steeper than the actual fair value curve estimated by Bloomberg.

256. It is also relevant to note that Bloomberg's methodology may be such that it excludes illiquid bonds from its methodology. Specifically, a presentation by Bloomberg staff states:

"The availability of BGN price for a bond is an indication of good liquidity for that bond"[56]

257. In the circumstances of the AMI averaging period, where the RBA stated that the corporate bond market was illiquid, I consider that this would make the Bloomberg fair value curve a biased estimate of the 'average' or 'typical' cost of debt for BBB bonds. Bloomberg appears to only use bonds with Bloomberg Generic Pricing (BGN) to determine its fair value curve. However, the above quote implies that its BBB fair value curve is, in reality, a fair value curve for *liquid* BBB bonds. In ordinary circumstances where there is a relatively small liquidity premium then this may be less problematic. But in the current circumstance of a large number of illiquid corporate bonds, by focussing only on the most liquid bonds the Bloomberg methodology would give rise to a biased estimate of the true average cost of debt for bonds of any given credit rating.

B.3. Discretion used in fitting curves

258. Once Bloomberg has settled on a set of bonds used to generate its fair value curves Bloomberg uses further discretion to generate a 'best fit' to that data. The methodology employed by Bloomberg has been described in a 2005 NERA report which the AER has referenced as informing its understanding of the Bloomberg methodology in the context of its NSW electricity distribution decisions[57]. The NERA report (authored by myself and Professor Grundy of Melbourne University) describes the Bloomberg methodology as follows:

"For each credit rating, Bloomberg nominates a number of predetermined maturity points on the yield curve (3 and 6 months, 1, 2, 3 4, 5, 7, 8, 9, 10, 15, and 20 years – or fewer if there are limited long dated observations). Bloomberg then estimates the yields to maturity on the set of bonds that would both sell at par and have maturity dates exactly equal to the predetermined maturity points. The estimation procedure minimises the sum of squared deviations between actual observed yields and fair yields on bonds, assuming that the fair yields on bonds selling at par with maturity dates between two nominated maturity points are determined from a straight line joining the fair yields on the two immediately surrounding bonds with maturities equal to the predetermined maturity points.

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[56] See page 9 of a presentation by Michael Lee to the International Bond Market Conference 2007, Taipei. Available at http://taipeibond.gretai.org.tw/cv/Bloomberg%20Mr.%20Lee(panel%203-1).ppt . This presentation predates the global financial crisis and it is general in nature so we cannot know to what extent it reflects current practice.

57 Page 230 of NSW distribution determination 28 April 2009 references: NERA, *Critique of available estimates of the credit spread of corporate bonds*, May 2005.

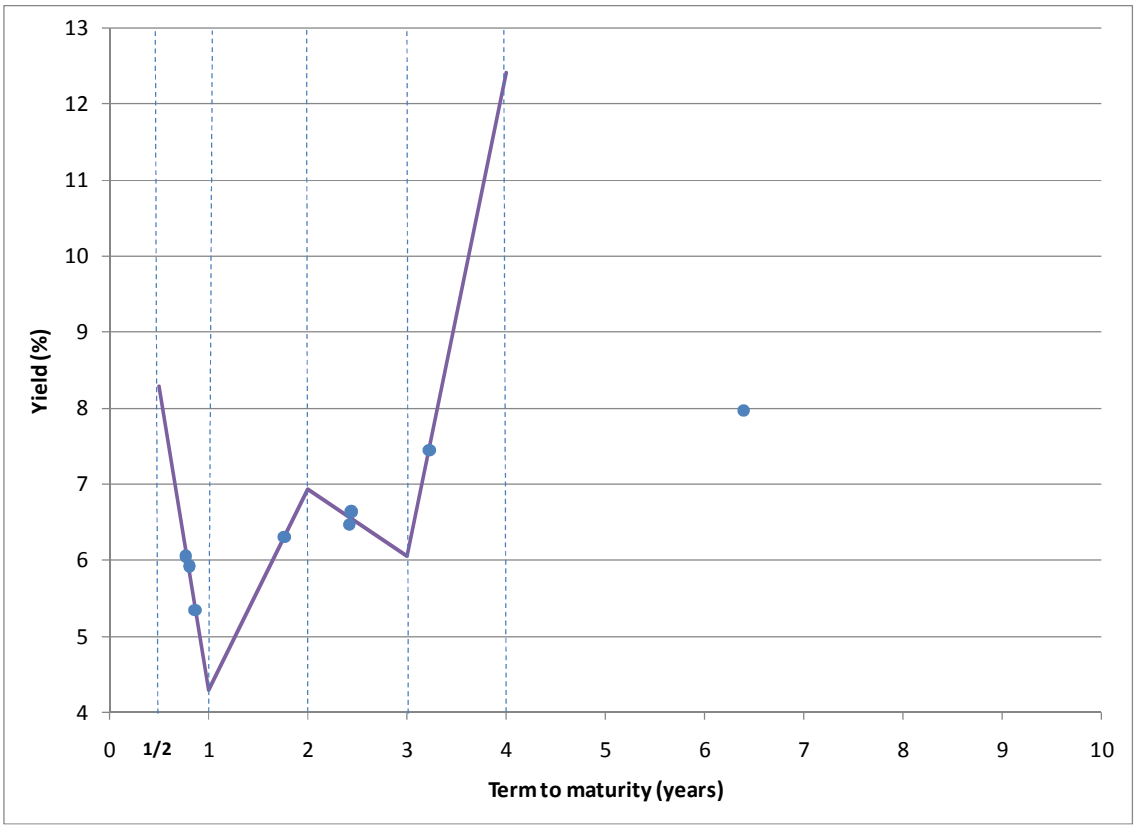
As such, there is no predetermined mathematical relationship (functional form) linking the values on the yield curve at each predetermined point."

259. This methodology has an important potential advantage in that it does not specify a particular shape for the yield curve (mathematical functional form). Rather, it lets the available data determine the shape of the yield curve. For example, the shape of the yield curve could be upward sloping in some maturities and downward sloping in other maturities if that was what the data actually showed to be the case.

260. However, this potential strength of the above methodology is a weakness in situations where there are only a small number of bonds being used to estimate the yield curve and where there is significant dispersion in the yields of those bonds. Specifically, the Bloomberg methodology described above will only give rise to a well defined yield curve when there are multiple bonds between each predetermined maturity point. When there are a limited number of bonds between each predetermined maturity date it will give a very poor estimate of the true yield curve for a *representative* bond of that credit rating. In the extreme, where there is one bond between each of the relevant maturity dates then the above methodology will be able to perfectly fit all the data points but will do so by taking on a lowly unrealistic shape to the yield curve.

261. This is demonstrated in the below figure which shows the outcome of using this methodology on 6 May 2009 to derive the best fit between the bonds identified by Bloomberg as underlying its BBB fair value curve.

Figure 16: Fair value BBB curve based on 2005 NERA description of Bloomberg methodology using data from 6 May 2009



Source: NERA, Bloomberg, CEG analysis

262. The reason the fitted curve takes the above 'zig-zag' shape is that there are insufficient observations of bonds between any given predetermined maturities such that the best fit is given by extreme slopes between those predetermined maturities – with those extreme slopes going 'un-penalised' because they can simply be reversed to fit the next data point. The bonds and yields in the above figure are is described in Table 13 below.

Table 13: Bonds and yields underlying the Bloomberg BBB Fair value curve on 6 May 2009

	Years to maturity	Yield to maturity
Bank of Queensland	0.77	6.052
Snowy Hydro	0.81	5.924
Fosters Group	0.86	5.347
Dexus Property	1.76	6.309
Origin	2.42	6.473
Tabcorp	2.44	6.639
Wesfarmers	3.22	7.445
Santos	6.38	7.968

263. As Table 13 shows, the first three bonds in the Bloomberg sample have a maturity between 0.5 years and 1.0 years. Of these three bonds, the shortest maturity bond (Bank of Queensland) has the lowest yield, the middle maturity bond (Snowy) has a lower yield and the longest maturity bond (Fosters) has a significantly lower yield still. Also, despite having significantly different yields the term to maturity for each bond are actually very close – all are within seven weeks of each other. As a consequence, the straight line that best fits the data between the predetermined maturity of a half year and the predetermined maturity of one year has a significantly negative slope (starting at a low yield of 8.3% at a maturity of one half of a year and ending at 4.3% at a maturity of one year).

264. Between one and two years to maturity there is only one bond (Dexus Property Group) which has a yield of 6.3%. Naturally, with only one point between one and two years it is possible to draw a line that directly passes through this point (which clearly minimises the sum of squared differences). Given the yield at 1 year to maturity has been estimated to be 4.3%, fitting a 6.3% yield at 1.76 years to maturity requires a steep upward slope between one and two years. To fit the next two points (Origin and Tabcorp) between two and three years (which are very close together) a downward slope is required. To fit the next point (Wesfarmers is only one bond with maturity between three and four years) it is necessary to impose a significantly upward sloping line (which can obviously fit the single data point between three and four years).

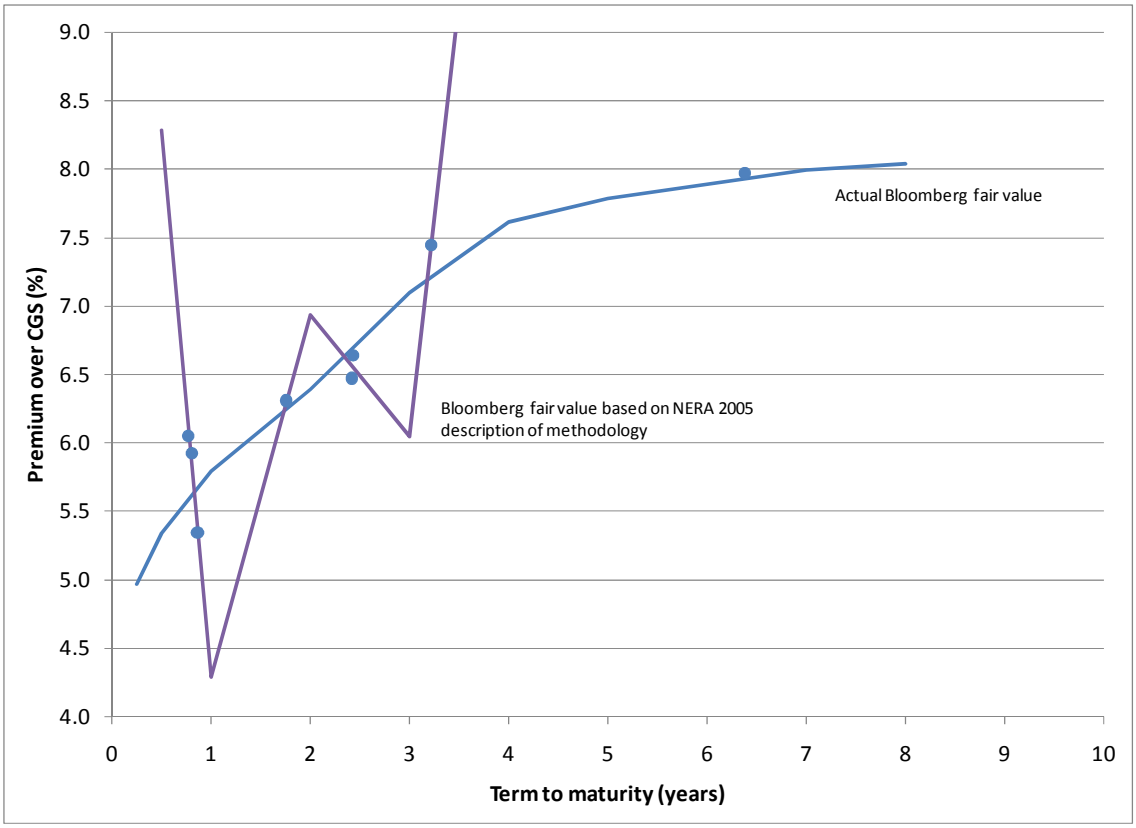
265. This is the unique set of straight lines between the Bloomberg predetermined maturities that best fits the underlying data points (ie, minimises the sum of squared differences). The final data point (Santos at 6.38 years to maturity) could be fitted by an infinite number of straight lines. This point is the only data point with a maturity of more than 4.0 years. Given Bloomberg has predetermined maturity points at five and seven years one could draw any straight line between four and five years maturity and

still be able to draw another straight line between five and seven years to exactly cross through the Santos observation.

266. As the above discussion demonstrates, application of the methodology described by NERA in 2005 results in an extremely unusual "fair value" curve – one that falls and rises dramatically at different maturity levels. This would not be the case if there were more bonds between each predetermined maturity level. The key point to note here is that when there are a limited number of bonds for which Bloomberg publishes BGN yields and where there is a dispersion in those yields the above methodology gives rise to shapes for the fair value curve that, despite fitting the data almost perfectly, are inconsistent with any theoretical prior beliefs about what the shape of BBB+ yield curve would be. I am unaware of any theoretical basis for expecting a yield curve to behave in the manner consistent with the application of the methodology described in the NERA report.

267. I assume that Bloomberg also finds the above outcomes undesirable as its fair value curves do not reflect the above shape. The difference between the actual Bloomberg fair value curve on 6 May 2009 and the above curve (derived according to the methodology described in the NERA 2005 report) is demonstrated in the below graph (the scale of this graph has been reduced to enable some further observations about the Bloomberg actual methodology on 6 May 2009)

Figure 17: Actual vs NERA Bloomberg BBB fair value on 6 May 2009



Source: Bloomberg, CEG analysis

268. Bloomberg can only achieve the more standard shape to its yield curve by imposing restrictions other than that the fair value curve simply be the best fit of the underlying data. In my view it is appropriate to impose restrictions that prevent the shape of the estimated fair value curve from being materially inconsistent with the properties predicted by both finance theory and/or empirical studies. This is especially true when there is a paucity of the underlying data. Clearly, the shape of the actual Bloomberg yield curve is a more credible description than the curve implied by a strict reading of the methodology reported by NERA of how yield to maturity changes with maturity for BBB rated bonds.

269. It is unclear what the further restrictions are that Bloomberg is imposing but a number of observations are possible:

- Bloomberg extends the curve beyond the points where it has BGN yields. In particular, the longest dated bond underlying the Bloomberg curve on 6 May 2009 was the Santos bond with 6.38 years to maturity. Yet Bloomberg reports fair value

for both seven and eight years maturity – despite not having any BBB bond data to support a view on how fair value should move beyond seven years;

- The same is true at the low maturity end. Bloomberg has no data points with maturity shorter than one half of a year but still reports a fair value at one quarter of a year maturity.

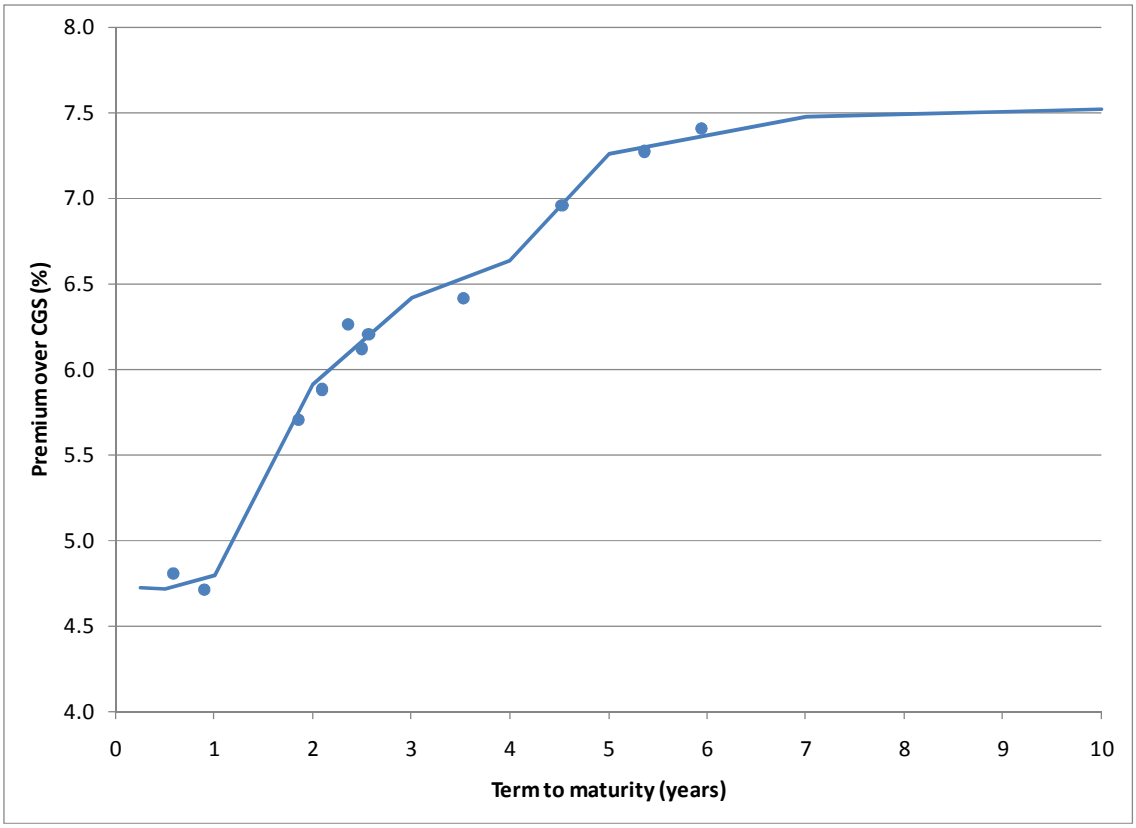
- Bloomberg uses its discretion to impose a nearly flat shape of the BBB fair value yield curve beyond seven years (as I shall discuss this is actually flatter than the CGS yield curve in that region – implying that credit risk falls with increases in maturity); and
- Bloomberg essentially fits the fair value curve at the long end to the single observation of the Santos data point (at 6.38 years to maturity).

270. The last dot point above is important as it suggests that, in the absence of other BBB+ bonds of similar maturity, Bloomberg's methodology is not sufficiently nuanced to enable it to distinguish between a 'typical' BBB+ fair value at that maturity and the Santos BBB+ bond yield.

271. Alternatively, it could be that Bloomberg has consciously decided that the Santos bond is 'typical' and it is only because of this conscious decision that it fits the fair value curve to this point. However, I do not find this a credible alternative explanation because Bloomberg's fair value curves always closely approximate any single observation used to build the curve. The only time Bloomberg's methodology does not do this is when there are multiple observations with similar maturity but different yields (ie, the only time that Bloomberg's fair value yields do not fit to the underlying data is when it is impossible to do so). It is clear that once a bond is included by Bloomberg in its sample to build the curve then it is treated 'as if' it is typical. It follows that a single observation will drive the shape of the curve unless there are other observations in the sample with a close maturity. Of course, this would not be problematic if there were a large number of bonds at all maturities. However, in the current circumstances it means that the estimated Santos bond yield entirely drives the Bloomberg BBB fair value estimate beyond 6 years.

272. It is also relevant to examine the Bloomberg estimation of the fair value for the A credit rating as this curve is also used by the AER to determine its estimate of BBB+ 10 year fair value. The following figure summarises the Bloomberg A rated fair value curve and the underlying data points Bloomberg reports that the curve is based on (ie, after removal of 'outliers').

Figure 18: Bloomberg A fair value on 6 May 2009



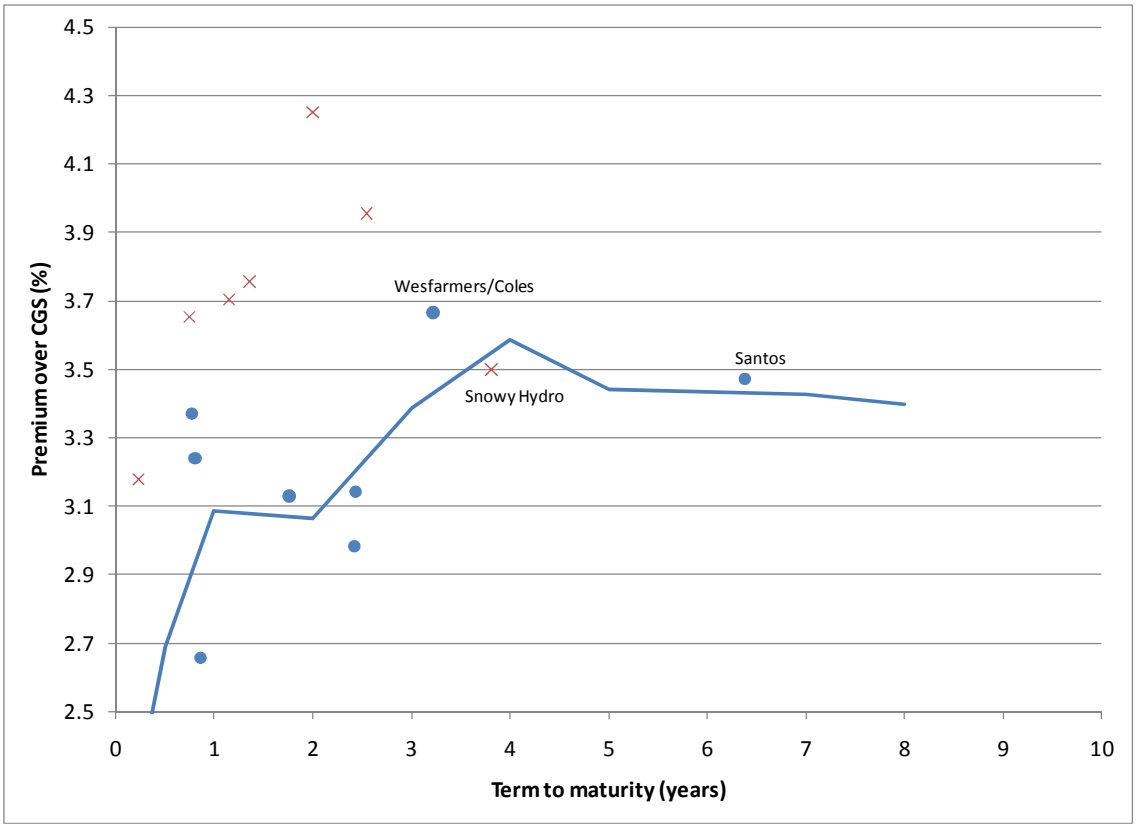
Source: Bloomberg

273. The same sort of observations can be made about the exercise of discretion in Bloomberg developing this curve. For example:

- Bloomberg extends the curve beyond the points where it has data. In particular, the longest dated bond underlying the Bloomberg curve on 6 May 2009 was a Telstra bond of 5.94 years to maturity. Yet Bloomberg reports fair value for both seven, eight, nine and ten years – despite not having any A rated bond data to support a view on how fair value should move beyond six years. The same is true at the low maturity end. Bloomberg has no data points with maturity shorter than one half of a year but still reports a fair value at one quarter of a year maturity.
- Bloomberg uses its discretion to impose a nearly flat shape of the A fair value yield curve beyond seven years.

274. The declining spread to CGS implicit in the Bloomberg long term fair value curves is illustrated in the below figures (which have the same coding for bonds used to build the fair value curve and bonds not used to build that curve).

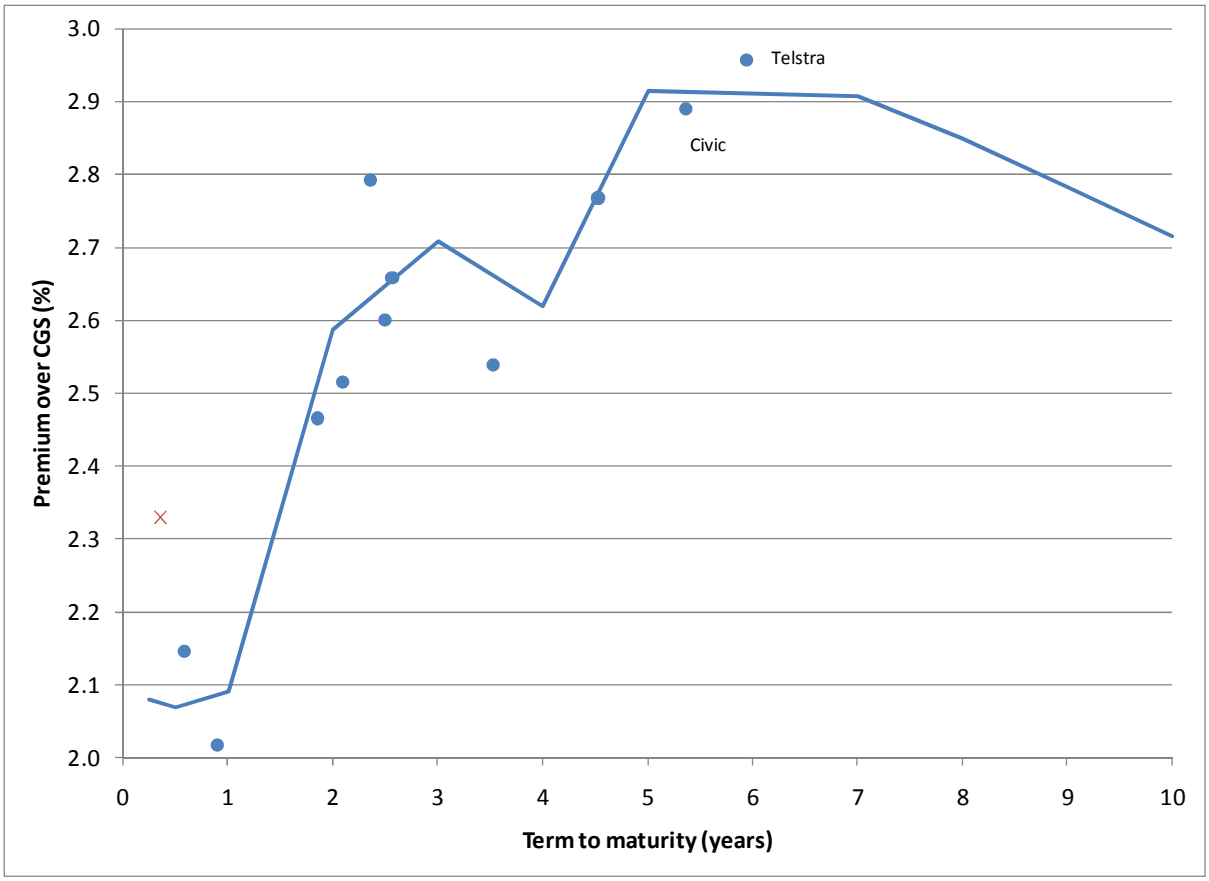
Figure 19: Bloomberg BBB fair value spread to CGS on 6 May 2009



Source: Bloomberg

275. As can be seen Bloomberg's fair value BBB curve is associated with a relatively steep increase in implied credit risk (spread to CGS) where Bloomberg has the most data (ie, zero to four years). However, beyond four years, Bloomberg imposes a reduction in credit spreads as maturity increases. This appears to be purely driven by an attempt to fit the fair value curve to the Santos observation at 6.38 years to maturity. However, even between 7 and 8 years where Bloomberg has no data it still imposes a declining spread to CGS as maturity increases.

Figure 20: Bloomberg A fair value spread to CGS on 6 May 2009



Source: Bloomberg

276. Once more, Bloomberg's fair value A curve is associated with a relatively steep increase in implied credit risk (spread to CGS) where Bloomberg has the most data (ie, zero to six years). However, beyond six years, Bloomberg imposes a reduction in credit spreads as maturity increases. This is most steep between 7 and 10 years despite Bloomberg having no data between 7 and 10 years.

Summary of conclusions

i) Bloomberg uses discretion and a proprietary approach in arriving at its pricing for individual bonds. The effect of the exercise of this discretion on its estimated pricing for individual bonds is unknown;

ii) Bloomberg appears to limit the construction of its fair value curves to rely heavily on information contained in bond prices within that credit rating and only peripherally to information contained in bonds in other credit ratings. This can be advantageous where that bond pricing data is plentiful. However, in the current market circumstances when bond pricing data is scarce it can be problematic.

iii) Bloomberg uses discretion in determining which of these bonds it will use to determine the fair value curves. The basis for this discretion in unknown. The effect of this discretion in recent history appears to be to reduce estimated fair value curves.

iv) To the extent that this reflects a Bloomberg policy of estimating fair value curves for liquid corporate bonds then it is likely to make the Bloomberg fair value curves an inappropriate proxy for the NER benchmark corporate bond rate in a market where most corporate bonds are illiquid.

v) Bloomberg uses discretion in the construction of the fair value curves (both within periods it has data and beyond the periods for which it has data). The effect of this discretion is to reduce the estimated fair value spread to CGS for long dated bonds. It is unclear what basis Bloomberg might have for assuming that this is appropriate.