Discussion Paper

Measuring the Debt Risk Premium: A Bond-Yield Approach

1 December 2010

Economic Regulation Authority
WESTERN AUSTRALIA

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1 Introduction

1. The Economic Regulation Authority (**the Authority**) is the independent economic regulator for Western Australia. The Authority aims to maintain a competitive, efficient and fair commercial environment in the gas, electricity, water and rail industries for the long term benefit of Western Australians.

2. In its decisions on proposed revisions on access arrangements for regulated rail, electricity, and gas pipeline businesses, the Authority is required to ensure that the rate of return on capital is commensurate with the prevailing conditions in the market for funds and the risks involved in providing the regulated services (referred to as reference services).

3. For example, Rule 87 of the National Gas Rules (**NGR**) guides the Authority's decisions on the rate of return.

> *87 Rate of return*
>
> *(1) The rate of return on capital is to be commensurate with prevailing conditions in the market for funds and the risks involved in providing reference services.*
>
> *(2) In determining a rate of return on capital:*
>
> *(a) it will be assumed that the service provider:*
>
> *(i) meets benchmark levels of efficiency; and*
>
> *(ii) uses a financing structure that meets benchmark standards as to gearing and other financial parameters for a going concern and reflects in other respects best practice; and*
>
> *(b) a well accepted approach that incorporates the cost of equity and debt, such as the Weighted Average Cost of Capital, is to be used; and a well accepted financial model, such as the Capital Asset Pricing Model, is to be used.*

4. Rule 87 of the NGR does not specify a method for estimating the debt risk premium,[1] which is one component of the rate of return. The Authority exercises its discretion to ensure that the debt risk premium is set in accordance with the principles of Rule 87.

5. It is noted that similar rules and processes apply in the electricity and rail industries.

6. The Authority's method for estimating the debt risk premium, as well as the nominal risk free rate, has in the past assumed the borrowing term is 10 years. A 10-year term has been consistently adopted by all Australian regulators in the energy sector since the Australian Competition Tribunal's (**Tribunal**) 2003 GasNet decision.[2]

7. In its previous decisions, the Authority relied on the estimates of 10-year fair yield curves derived by Bloomberg and CBASpectrum. However, Bloomberg has in recent times progressively shortened its estimates of fair yields across credit ratings for Australian corporate bonds. Additionally, in September 2010, CBASpectrum ceased publishing its estimates of the fair yield curves across all credit ratings for

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1 The debt risk premium (also referred to as the debt margin) is a margin above the risk free rate reflecting the risk in provision of debt finance to the regulated activity.

2 Australian Competition Tribunal, *Application by GasNet Australia (Operations) Pty Ltd [2003] ACompT 6*, 23 December 2003, paragraph 48, page 18.

Australian corporate bonds. This means that the method of calculating the debt risk premium that was applied in the Authority's August 2010 Draft Decision on WA Gas Network's (**WAGN**) proposed access arrangement, which used CBASpectrum data, is no longer available.

8. Since the WAGN Draft Decision there have also been developments in the Australian regulatory environment regarding the approach to estimating the debt risk premium.

- The Australian Competition Tribunal's decision in the ActewAGL appeal in September 2010.
- The Australian Energy Regulator's (**AER**) Final Decision on the Victorian electricity Distribution Network Service Providers (**DNSPs**) in October 2010.
- The Independent Pricing and Regulatory Tribunal of New South Wales' (**IPART**) Discussion Paper on "Developing the approach to estimating the debt margin" in November 2010.

9. These developments, which have informed the Authority's consideration of the method that should be used to calculate the debt risk premium, will be discussed below.

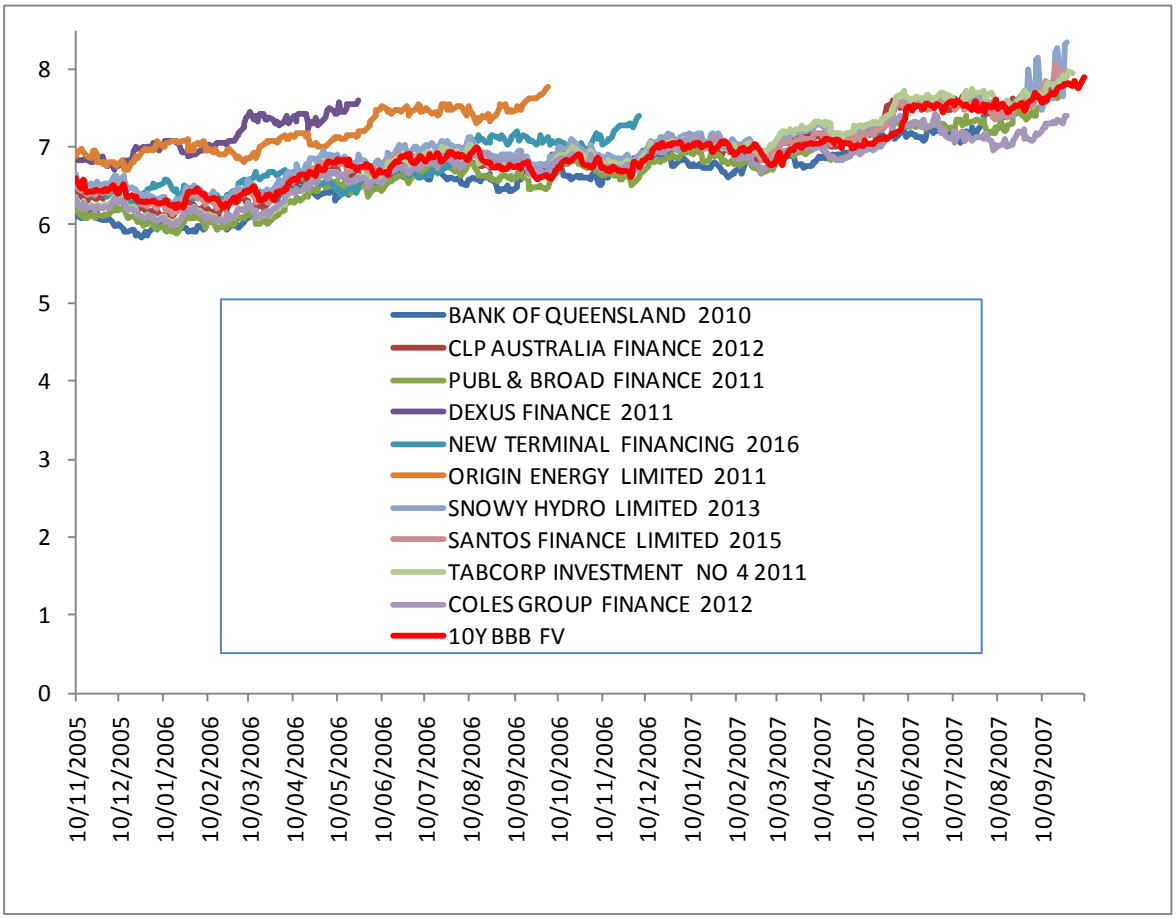
10. The purpose of this paper is to seek feedback on the Authority's proposed future method for calculating the debt risk premium in its regulatory roles, and also when undertaking inquiries referred to the Authority by the State Government.

11. The Authority has two gas pipeline decisions in the near future: the Final Decision on WAGN's revised access arrangement and the Draft Decision on the Dampier Bunbury Pipeline's revised access arrangement. The Authority is also about to issue the Draft Report for the inquiry into the Funding Arrangements of Horizon Power. Subject to the Authority's consideration of feedback on this discussion paper, it is the intention of the Authority to use this proposed method for these decisions or recommendations.

2 The Estimates of Bloomberg's Fair Yield Curves

12. Australian regulators have historically had regard to Bloomberg's estimates of fair yield curves to estimate the debt risk premium for their regulatory decisions. Prior to the Global Financial Crisis, which started in 2008, an estimate of the fair yield curve for 10-year BBB Australian corporate bonds was consistent with observed yields for Australian corporate bonds (of the same rating) trading in the market at that time. This consistency is illustrated in Figure 1 below using estimates of the fair yield curve for 10-year BBB Australian corporate bonds from 10 November 2005 to 9 October 2007.

Figure 1. Bloomberg's 10-year BBB Fair Yield Curve and Observed yields for BBB/BBB+ Australian corporate bonds, 10 November 2005 – 9 October 2007



Source: Bloomberg

13. Since the cessation of Bloomberg's estimate of the 10-year BBB fair yield curve, on 9 October 2007, some Australian regulators, including the Authority and the AER, have extrapolated to a 10-year term from Bloomberg's estimate of the 8-year BBB fair yield curve. The extrapolation was based on the assumption that the yield spreads between $10Y\ A - 8Y\ A$ is equal to that of $10Y\ BBB - 8Y\ BBB$:

$$10Y\ BBB = 8Y\ BBB + (10Y\ A - 8Y\ A)$$

14. The above extrapolation was not possible after 18 August 2009 when Bloomberg ceased providing estimates of 8-year BBB fair yield curve, and 10-year and 8-year A fair yield curves.

15. The Authority, as well as the AER, then analysed the appropriateness of using other fair yield curves from Bloomberg to extrapolate to a 10-year BBB fair yield curve. Both regulators came to the conclusion that the difference between the 10-year and 7-year AAA fair yields should be added to the 7-year BBB fair yield to gain an estimate of the 10-year BBB fair yield.

$$10Y\ BBB = 7Y\ BBB + (10Y\ AAA - 7Y\ AAA)$$

16. However, on 22 June 2010 Bloomberg again shortened its estimates of fair yield curves for Australian corporate bonds by ceasing to publish its estimates for both 10-year and 7-year AAA fair yield curves.

17. The duration of Bloomberg's fair yield curves are now well below the 10-year time period which Australian regulators have traditionally used for setting the debt risk premium and risk free rate.

18. It is understood that Bloomberg is currently deriving estimates of the fair yield curves for the credit ratings and terms to maturity shown in Table 1 below. Bloomberg estimates the fair yield curves for 5-year terms across all credit ratings. For the credit ratings of A and BBB, Bloomberg also estimates the fair yield curves for 7-year terms to maturity, although there are no estimates for 6-year fair yield curves.

Table 1. List of fair yield curves from Bloomberg as at 18 November 2010

	Credit rating	Maturity (M=Month; Y=Year)
1	AUD Australia AAA[3]	3M, 6M, 1Y, 2Y, 3Y, 4Y, and 5Y
2	AUD Australia AA[4]	3M, 6M, 1Y, 2Y, 3Y, 4Y, and 5Y
3	AUD Australia A[5]	3M, 6M, 1Y, 2Y, 3Y, 4Y, 5Y, and 7Y
4	AUD Australia BBB[6]	3M, 6M, 1Y, 2Y, 3Y, 4Y, 5Y, and 7Y

Source: Bloomberg

19. A major concern is that, since the bond market is thinner[7] than in the past, Bloomberg's estimate of the 7-year BBB fair yield curve is substantially different from the observed bond yields in the Australian bond market, as illustrated in Figure 2. This illustration is for the period when data on yield for the 7-year BBB is most recently available - after the cessation of the Bloomberg's estimate of 8-year BBB on 18 August 2009 until the end of October 2010. Since the method used by Bloomberg to derive its fair yield curves is not released to the public, the Authority is unable to understand and verify this difference.

3 Bloomberg ceased publishing its estimates of the fair yield curves for AAA 7Y, 8Y, 9Y, 10Y, and 15Y on 22 June 2010; and for AAA 20Y on the 30 June 2005.

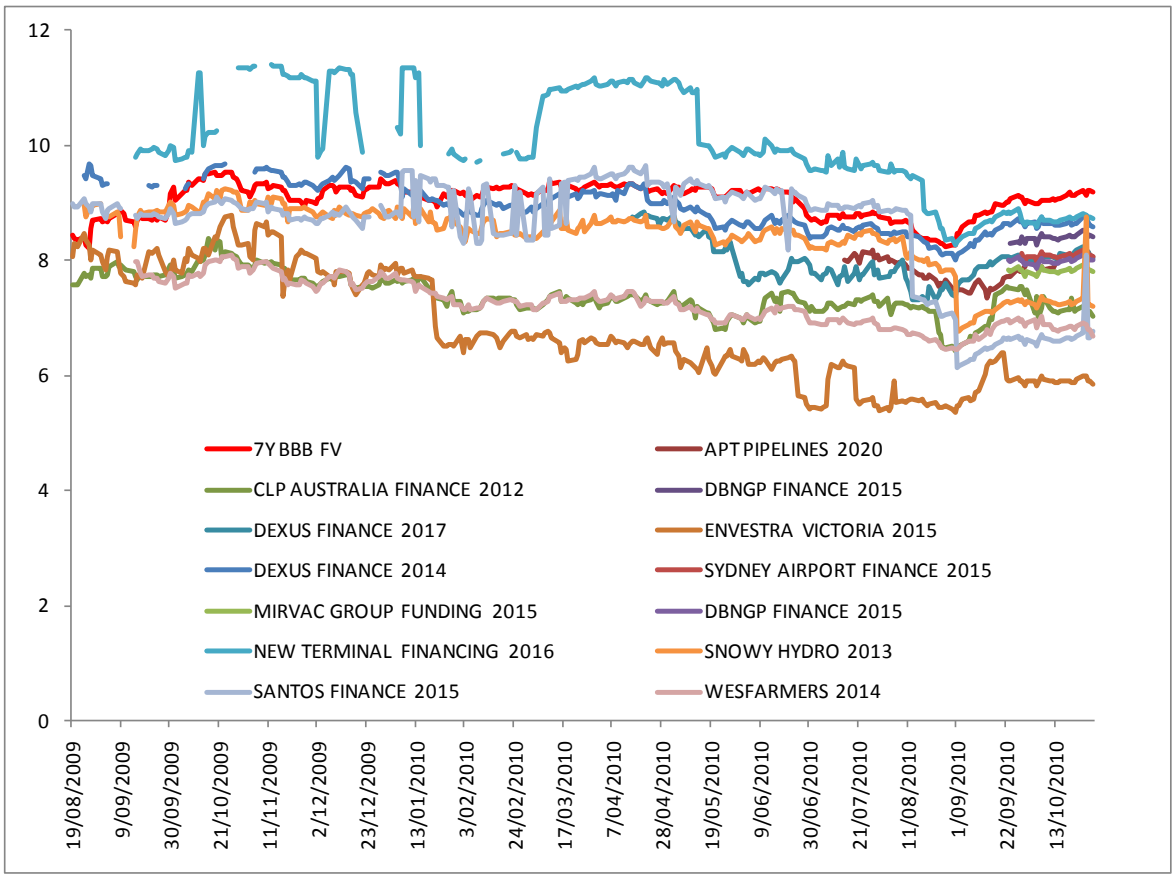
4 Bloomberg ceased publishing its estimates of the fair yield curves for AA 7Y on 18 August 2009; and for AA 8Y on 19 June 2006.

5 Bloomberg ceased publishing its estimates of the fair yield curves for A 8Y, 9Y, and 10Y on 18 August 2009.

6 Bloomberg ceased publishing its estimates of the fair yield curves for BBB 8Y on 18 August 2009; for BBB 9Y, and 10Y on 9 October 2007; and for BBB 15Y on 14 March 2002.

7 This means that the volumes traded in the market are lower than desirable for the derivation of average values.

Figure 2. Bloomberg's 7-year BBB Fair Yield Curve and Observed yields for BBB/BBB+ Australian corporate bonds, 19 August 2009 – 31 October 2010



Source: Bloomberg

3 The Australian Competition Tribunal's Decision on the ActewAGL Matter in 2010

20. Regulators have historically used a 10-year term for estimation of the debt risk premium. However, the Authority notes that the Australian Competition Tribunal, in its recent decision for the ActewAGL gas network in September 2010, commented that:

> "The reason a 10 year bond was originally chosen was because, in the past, many firms favoured long term debt, albeit that it came at a higher cost, because it reduced refinancing or roll-over risks. The high rate was then hedged via interest rate swaps. That may no longer be the position. If not, the AER may need to reconsider its approach in light of more current strategies of firms in the relevant regulated industry. Further, **there seems to be little point in attempting to estimate the yield on a bond which is not commonly issued**" [emphasis added].[8]

21. The Authority notes that current bond market conditions are significantly different from those in the past. The Australian bond market is very illiquid for long-term bonds with terms to maturity of 5 years and above, with insufficient numbers of bonds traded in the market to generate reliable industry-wide estimates. This is the

[8] Australian Competition Tribunal, *Application by ActewAGL Distribution [2010] ACompT 4*, 17 September 2010.

reason why CBASpectrum decided to cease publishing its estimates of the fair yield curves for Australian corporate bonds.[9] Similarly, Bloomberg has shortened the duration of bonds in which their fair yield curves are derived across different credit ratings.

4 The AER's Method

22. In its recent Final Decision on the Victorian electricity distribution businesses in October 2010,[10] the AER adopted a new approach to estimating the debt risk premium. In this approach, the debt risk premium is derived as the weighted average of the Australian Pipeline Trust (**APT**) bond, which is assigned a 25 per cent weight, and an extrapolation of the Bloomberg 7-year BBB fair yield curve to 10-years, which is assigned a 75 per cent weight. The Bloomberg 7-year BBB fair yield curve is extrapolated to a 10-year BBB fair yield curve using the spread between 10-year AAA and 7-year AAA Australian corporate bonds in June 2010 – the last month Bloomberg produced these two AAA fair yield curves. The rationale for the AER's new approach is summarised below.

23. First, the AER considered the APT bond (APT is the financing arm of APA Group, a gas transmission and distribution network service provider). This 10-year BBB rated bond was issued by the APT in July 2010. The AER is of the view that, prima facie, the APT bond represents a useful benchmark corporate bond rate because it reflects a 10-year maturity, and provides an acceptable proxy for the BBB+ credit rating. The AER considered that the nature of the investments and markets by the APA Group provide a close match to those of electricity network service providers.

24. Second, the AER considered the reliability of independent estimates of fair yields by Bloomberg, together with the uncertainty surrounding the APT bond as a single observation. The AER is of the view that it is appropriate to use the yields derived from the Bloomberg 7-year BBB fair yield and the spread between the 10-year and 7-year AAA fair yields to extrapolate to a 10-year term. The AER considered that this 10-year fair yield estimate should be used together with the APT bond, to estimate the debt risk premium for its Final Decision on Victorian electricity DNSPs.

25. Third, the AER is of the view that more weight should be given to the Bloomberg's fair yield curve than the APT bond. The AER considers that Bloomberg accurately represents yields on shorter rated BBB bonds (e.g. 7 years). On the other hand, the yield on the APT bond reflects a directly observed yield for one specific 10-year BBB bond, notwithstanding that it may be reflective of the efficient cost of debt for regulated network service providers. Accordingly, the AER considered that a 75 per cent weighting for Bloomberg and a 25 per cent weighting for APT is appropriate to reflect a reasonable and practical approach in setting the debt risk premium.

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9 In its announcement, CBASpectrum states that: "Sparse and heterogenic data have always made it difficult to produce a broad range of reliable credit curves in Australia. CBASpectrum has sought to overcome this problem in the past through the use of a number of econometric variables and assumptions that take account of additional information such as implied default rates, sector composition, historical relativities and spread performance of other rating bands. However, disparity of the data has increased and many of these relationships have changed over the past few years, meaning that reliability of the models designed to indicate where various credits should trade has receded. Users have also tended to confuse these fair value estimates with alternative models estimating where generic credit curves have actually traded and used the data for purposes other than relative value analysis".

10 Australian Energy Regulator, October 2010, Victorian electricity distribution network service providers: Distribution determination 2011 – 2015, pages 472-584.

26. It should be noted that the 10-year and 7-year AAA fair yields are no longer provided by Bloomberg. The Authority notes the AER's recently revised approach in its Final Decision on Victorian electricity DNSPs, relying on the use of 10-year and 7-year AAA fair yield curves (which are no longer available), will be increasingly unrelated to the prevailing conditions in the market for funds.

5 IPART's Proposed Method

27. IPART recently released its discussion paper seeking comments from stakeholders on its proposed method to estimate the debt margin (or debt risk premium). Three key points from the IPART's paper are summarised below:

- the data source;
- the statistical approach; and
- the term to maturity.

28. First, IPART considers the data source. IPART is of the view that the Australian and US bond markets appear to be the most appropriate markets for its regulatory decisions. In addition, IPART notes that the Bloomberg fair yield curve may be suitable if it is used together with other data sources.

29. Second, IPART discusses its statistical approach. IPART's view is that using the median of the sample of bonds tends to be more appropriate than using upper, lower and midpoint values, which was its previous approach.

30. Third, IPART considers the term to maturity. IPART indicated that it is considering shortening the term to maturity of bonds which are used to derive the debt risk premium, from 10 years to the term that matches the regulatory period.

31. IPART has not yet decided on the method to be used to calculate the debt risk premium for its future regulatory decisions. However, the above three factors appear to be the most important considerations for IPART.

6 The Authority's Intended Approach

32. After careful consideration of the Tribunal's decision on the ActewAGL matter in September 2010, the most recent AER's Final Decision on Victorian electricity DNSPs in October 2010, and IPART's discussion paper on debt margin in November 2010, the Authority considers that:

- extrapolation to a 10-year term based on estimates of the fair yield curves available from Bloomberg is problematic because it could add significant inaccuracy in and inconsistency across regulatory decisions;
- the lack of observable bonds with terms to maturity of 10 years warrants a broader sample of bonds with varying terms for deriving the debt risk premium; and
- the 10-year BBB APT bond is a relevant benchmark but should not be the only benchmark in determining a debt risk premium commensurate with the prevailing conditions in the market for funds and the risks involved in providing reference services.

33. The Authority proposes to discontinue the previous practice of basing the debt risk premium on a 10-year corporate bond using Bloomberg's extrapolated data but rather to base the debt risk premium on:

- a sample of bond yields of varying terms to maturity; and
- a sample excluding the Bloomberg's yield curves.

34. The Authority favours the use of the bond-yield approach, which relies on bond yields observed directly from the Australian financial market. The Authority is not persuaded that bond markets in other countries should be used to inform this analysis. The Authority has consistently used data from the Australian financial market to estimate the WACC parameters. As such, foreign investors are only recognised to the extent that they invest in the domestic market. This means that the weighting given to foreign investors should be based on their domestic level of wealth and not on their global level of wealth. Under this framework, the aggregate amount of wealth is that amount invested in the domestic market portfolio. Wealth invested outside of the domestic market is outside the model and, as such, plays no role in the pricing of domestic assets.[11]

35. Australian financial data has been consistently used by Australian regulators to estimate the debt risk premium as well as other WACC parameters. As such, the Authority does not intend to depart from this current practice.

6.1 Consistency versus Market Relevance

36. Given the current condition of the Australian bond market, the Authority notes that most Australian corporate bonds currently traded in the market have a maturity term well below 10 years. The Authority has considered the trade-off between:

- consistency between the debt risk premium and other WACC parameters, such as the nominal risk free rate and expected inflation, in terms of a 10-year term; and
- how well the estimates of the debt risk premium are commensurate with prevailing conditions in the market for funds and the risks involved in providing reference services ("market relevance").

37. The Authority is of the view that the market relevance of the estimates of the debt risk premium should carry more weight than the requirement of consistency with other WACC parameters. The reasons for this are twofold.

38. First, attempting to maintain consistency with other WACC parameters is likely to have reduced the level of market relevance, and this relevance is likely to be further compromised in the future.

39. In this regard, there is an inherent instability in the process of extrapolating from Bloomberg's 7-year BBB to the 10-year BBB fair yield curve. The current approach by the AER is to use the spread between the 10-year AAA and 7-year AAA fair yields. It is noted that Bloomberg ceased publishing fair yield curves for both 10-year AAA and 7-year AAA fair yield curves on 22 June 2010. Additionally, the use of 10-year and 7-year AAA fair yield curves for Australian corporate bonds will become increasingly outdated if used for future regulatory decisions. In the current

[11] Handley, J. April 2009, *Further comments on the valuation of imputation credits,* Report prepared for the AER, 15 April 2009, page 17.

financial environment, the Authority considers that it is possible that Bloomberg will continue to shorten its estimates of fair yield curves. As such, errors from the extrapolation approach may become even larger in the future.

40. Second, moving away from the 10-year term provides for a larger sample of Australian corporate bonds to be considered, which should improve the estimate of the debt risk premium. This is because any measure that relies on a small sample of data points will be less reliable than one based on a larger sample.

41. This view is further supported by the fact that individual Australian corporate bonds are often not traded daily in the Australian financial market. The daily bond prices provided by Bloomberg do not necessarily reflect executed trades in the market on the day. For some days when there are not enough trades in the market, the daily bond pricing from Bloomberg is only an approximate market value of the bond.

42. As such, a large sample of data will provide a more reliable estimate of the debt risk premium for a benchmark firm. This is also consistent with the Tribunal's view, in its decision for the ActewAGL gas network in September 2010, that the current market does not have sufficient number of long term bonds to determine fair yields.[12]

43. In summary, the Authority considers that there are sufficient reasons to depart from the 10-year term adopted in previous regulatory decisions on the debt risk premium:

- First, there is a significant deviation between Bloomberg's estimate of the 7-year BBB fair yield curve and observed yields from Australian corporate bonds traded in the financial market;
- Second, Bloomberg's estimation of 10-year and 7-year AAA fair yield curves for Australian corporate bonds ceased in June 2010. The use of 10-year and 7-year AAA fair yield curves for the Australian corporate bonds will become increasingly outdated if used for future regulatory decisions.
- Third, Bloomberg has progressively shortened its estimates of the fair yield curves across credit ratings for Australian corporate bonds. The Authority considers that it is likely that Bloomberg will again shorten its estimates of fair yield curves in the future. Using the 7-year BBB fair yield curve in deriving the debt risk premium is problematic because this approach is subject to uncertain data being available from Bloomberg.
- Fourth, Bloomberg's method to estimate the fair yield curves is not disclosed to the public. As such, its estimates cannot be replicated. Using estimates of Bloomberg's estimates of fair yield curves lacks transparency.
- Fifth, CBASpectrum has recently decided to cease publishing its estimates of fair yield curves for Australian corporate bonds across all credit ratings,

6.2 The Establishment of a Benchmark Sample of Australian Corporate Bonds

44. The Authority is of the view that each bond included in the sample of Australian corporate bonds used to derive the debt risk premium for regulated businesses should ideally satisfy three criteria. The security should ideally:

[12] Australian Competition Tribunal, *Application by ActewAGL Distribution [2010] ACompT 4*, 17 September 2010, paragraph 72.

1. have the same Standard and Poor's credit rating as the regulated businesses (BBB/BBB+ in this case because a credit rating of BBB+ is generally adopted by regulators for regulated businesses).

   The Authority believes that it is currently appropriate to include all Australian corporate bonds within the BBB band credit rating in the sample. This also reflects a conservative approach taken by the Authority in selecting the bonds in the sample. The Authority is aware that Bloomberg has used all BBB-/BBB/BBB+, known as "BBB band", to estimate the fair yield curve for the so-called BBB fair yield curve. As such, bonds with credit rating of BBB- are also included in the sample of the bonds. However, the inclusion of bonds with BBB- credit rating would need to be subject to review over time.

2. be in the same industry (the regulated utility sector); and

3. have a maturity of two years or longer to ensure that there are sufficient bonds in the sample for the analysis. This criterion has been used by the AER and IPART.

45. It would be ideal to derive a sample of Australian corporate bonds that meet all three of the desirable criteria above. However, given the current state of the Australian bond market, practical (i.e. less restrictive) criteria are necessary to select a sample of the Australian corporate bonds to estimate the debt risk premium.

46. In particular, the Authority notes that there are only five bonds issued by the Australian energy sector which are currently traded in the financial market. The Authority examined the actual term of debt portfolios of the energy businesses as shown in Table 2 below.

Table 2 List of Australian corporate bonds issued by the energy sector in November 2010[13]

Name of business	S&P Credit rating	Maturity	Years to maturity
APT	BBB	22 July 2022	9.72
Santos	BBB+	23 Sep 2015	4.89
Snowy Hydro	BBB+	25 Feb 2013	2.32
Envestra Victoria	BBB-	14 Oct 2015	4.95
DBNGP	BBB-	29 Sep 2015	4.91
Sample average years to maturity			5.36

Source: Bloomberg and Economic Regulation Authority's analysis

47. The lack of liquidity in the market for corporate bonds, particularly for bonds approaching 10 year terms, suggests that the method of estimating the debt risk premium using a 10-year term is increasingly problematic.

[13] In a current sample of Australian corporate bonds as at 31 October 2010, only 5 bonds were issued by the energy sector. However, the inclusion of both Santos and Snowy Hydro bonds in the regulated energy sector is questionable.

48. Accordingly, the Authority proposes to adopt the following approach to determine the sample of Australian corporate bonds to be used to estimate the debt risk premium, using the "search" function from Bloomberg:

- credit rating of BBB-/BBB/BBB+ by Standard & Poor's;
- time to maturity of 2 years or longer;
- bonds issued in Australia by Australian entities and denominated in Australian dollars;
- inclusion of both fixed bonds[14] and floating bonds;[15] and
- inclusion of both Bullet and Callable/ Putable redemptions.[16]

49. The Authority notes that bonds issued by individual companies change over time, as does the credit rating of the company. As a result, the sample of the Australian corporate bonds will be frequently updated as soon as any new bond is issued which satisfies the criteria set out above. In addition, it is noted that only bonds in the sample which are currently traded (i.e. data on fair yields available from Bloomberg) in the averaging period are included in the sample of bonds used to derive the debt risk premium.

6.3 A Method to Estimate the Debt Risk Premium from a Benchmark Sample of the Australian Corporate Bonds

50. Since bonds in the sample exhibit different characteristics, such as different industries and different terms until maturity, consideration needs to be given as to whether weights should be applied to each bond to reflect their relative importance in the sample. The weighting approaches that could be adopted are:

- a simple average (or equally weighted average);
- a "number-of-years-until-maturity" approach (in which bonds with more years to maturity are given greater weight than bonds with fewer years to maturity);
- an "amount-issued" approach (where more weight is given to bonds issued in greater amounts); and
- an approach where the median[17] of a sample is used. For a sample with an odd number of observations, the median value is the value of the single

[14] This is a long term bond that pays a fixed rate of interest (a coupon rate) over its life.

[15] This is a bond whose interest payment fluctuates in step with the market interest rates, or some other external measure. Price of floating rate bonds remains relatively stable because neither a capital gain nor capital loss occurs as market interest rates go up or down. Technically, the coupons are linked to the bank bill swap rate (BBSW) (it could also be linked to another index, such as LIBOR), but this is highly correlated with the RBA's cash rate. As such, as interest rates rise, the bondholders in floaters will be compensated with a higher coupon rate.

[16] A callable (putable) bond includes a provision in a bond contract that give the issuer (the bondholder) the right to redeem the bonds under specified terms prior to the normal maturity date. This is in contrast to a standard bond that is not able to be redeemed prior to maturity. A callable (putable) bond therefore has a higher (lower) yield relative to a standard bond, since there is a possibility that the bond will be redeemed by the issuer (bondholder) if market interest rates fall (rise).

[17] The median of a sample of observations is the numeric value which separates the higher half of a sample from the lower half when observations from the sample are arranged from the lowest value to the highest value.

middle observation from the sample. If there is an even number of observations in the sample, then the median is calculated as the average of the two middle values.

51. The weighted average of yields (WAY) is defined as:

$$\text{WAY} = \sum_{i=1}^{n} w_i \overline{Y}_i;$$

where:

- n is the number of bonds in the sample;
- w_i is the weight assigned to bond i in the sample $\left(w_i = {K_i}/{K} \right)$;
- K and K_i are the total value issued (or years to maturity) and value issued (or years to maturity) of each bond, respectively, to which the weight for each bond is calculated; and
- $\overline{Y}_i$ is the average of the fair yields for bond i in the averaging period.

6.4 An Application of the Intended Method as at 31 October 2010

52. The Authority has derived the sample of Australian corporate bonds currently traded in the Australian financial market, using the approach as discussed above, from Bloomberg data services as at 31 October 2010. This sample is summarised in Table 3 below.

Table 3. The list of BBB-/BBB/BBB+ Australian Corporate Bonds

No.	Name of business	Bloomberg ticker	Coupon	Maturity	Main industry
1	APT PIPELINES	E1325336 Corp	7.75	22/07/2020	Electric transmission[18]
2	BBI DBCT FINANCE PTY	EF461870 Corp	6.25	9/06/2016	Diversified Financial Services
3	BANK OF QUEENSLAND LTD	EH390789 Corp	10.75	4/06/2018	Commercial Banks Non-US
4	CLP AUSTRALIA	EF167960 Corp	6.25	16/11/2012	Finance commercial
5	DBNGP FINANCE CO PTY	EI414656 Corp	8.25	29/09/2015	Gas transportation
6	DEXUS FINANCE	EI223256 Corp	8.75	21/04/2017	Mortgage
7	ENVESTRA VICTORIA PTY LT	EC866427 Corp	6.25	14/10/2015	Gas distribution
8	LEIGHTON FINANCE	EH911249 Corp	9.5	28/07/2014	Diversified financial service
9	SYDNEY AIRPORT FINANCE	EI308853 Corp	8	6/07/2015	Finance-Other Services
10	MIRVAC GROUP FUNDING LTD	EI195249 Corp	8.25	15/03/2015	Real Estate Oper/Development
11	MIRVAC GROUP FINANCE LTD	EI414696 Corp	8	16/09/2016	Real Estate Oper/Development
12	NEW TERMINAL FIN	EF641357 Corp	6.25	20/09/2016	Special Purpose entity
13	SNOWY HYDRO LTD	EC870795 Corp	6.5	25/02/2013	Energy - alternate sources
14	SANTOS FINANCE	EF102609 Corp	6.25	23/09/2015	Oil Comp-Exploration & Production
15	WESFARMERS LTD	EH964875 Corp	8.25	11/09/2014	Retail-Misc/Diversified

Source: Bloomberg

[18] This is a classification from Bloomberg. APT pipelines are generally classified as a business in a gas industry.

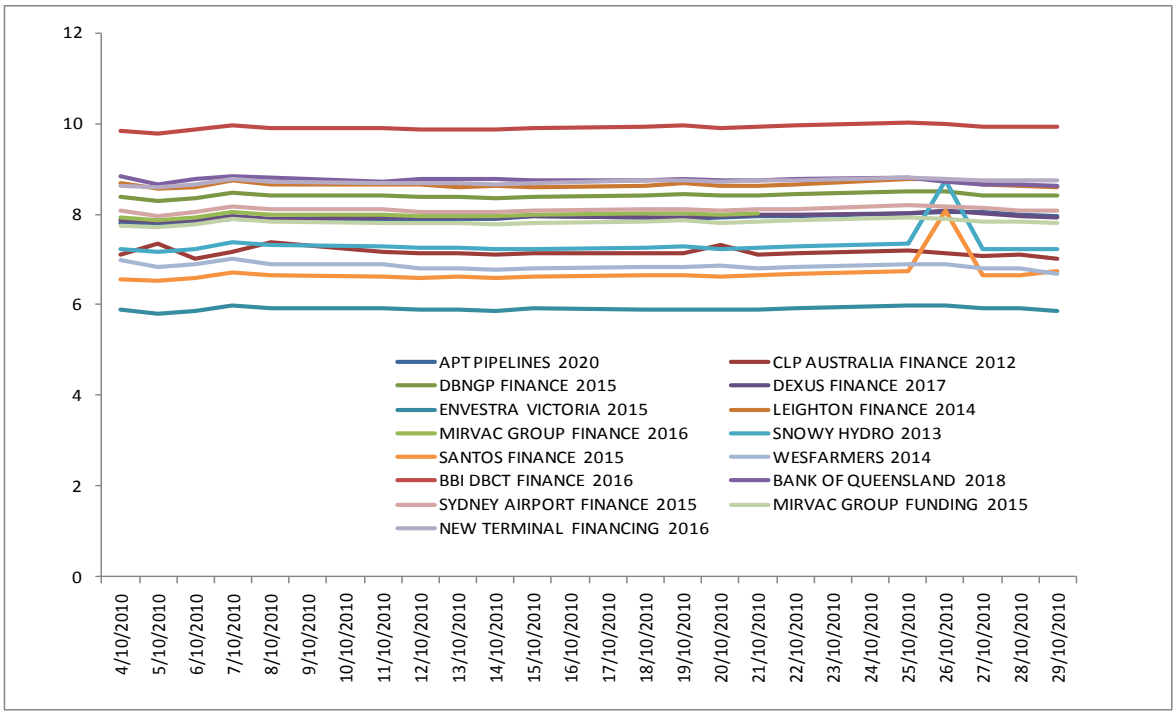
53. Given that the current market for bonds in Australia is relatively thin at present, the Authority makes the following observations:

- When the credit rating of BBB-/BBB/BBB+ is targeted, 15 bonds satisfy Criterion 1 (the same credit rating) and Criterion 3 (maturity of two years and longer), but not Criterion 2 (the same industry as the regulated business).
- When the industry-based criterion is targeted, together with Criterion 3, only a few bonds are found (e.g. APT Pipelines, Snowy Hydro, and Santos).

54. Based on the above analyses, and to provide a broad sample, the Authority considers that it is appropriate to include all bonds which satisfy Criteria 1 and 3 in the sample of bonds.

55. The yields for the 20-trading days period, from 4th October to 29th October 2010, for the above 15 bonds are shown in Figure 3 below.

Figure 3. Yields for BBB-/BBB/BBB+ Australian Corporate Bonds, Oct 2010



Source: Bloomberg

56. Using the above averaging methods (see paragraph 50), the debt risk premium for a benchmark firm is shown in Table 4 below.

Table 4. The debt risk premium for the 20-trading days average to 31 October 2010 (per cent) for a sample of 15 Australian corporate bonds

Simple average	Years-until-maturity weighted average	Amount-issued weighted average	Median approach
2.775	2.885	2.768	2.837

Source: Authority calculations

57. The Authority could adopt the highest of the above four estimates, which is 2.885 per cent in this example, as the debt risk premium for a BBB+ rated company for the

20-trading day period to 31 October 2010. This would reflect a conservative position. Similarly, the Authority views this approach as conservative because:

- the sample of 15 bonds observed from the market includes bonds with the feature of "Callable" redemption which, in principle, require a higher yield to compensate bondholders. The bonds issued by the Bank of Queensland Ltd and BBI DBCT Finance Pty are callable bonds. It is unlikely that there will be bonds with the feature of "putable" redemption issued in the Australian bond market in the foreseeable future;
- the sample of Australian corporate bonds includes BBB and BBB- bonds which, in principle, have higher yields in comparison with BBB+ credit rating bonds for regulated business; and
- the regulated businesses have access to bank finance with a lower cost of borrowing in comparison with bond yields.

6.5 Concluding Remarks

58. The Authority intends to adopt this revised method for estimating the debt risk premium subject to consideration of feedback on this Discussion paper from interested parties. The Authority is of the view that the above approach has the following desirable features.

59. First, the Authority considers that the setting of certain criteria to select a sample of Australian corporate bonds from an independent financial services provider (Bloomberg) is an unbiased approach. The number of suitable bonds included in the sample may differ from time to time, as the number of bonds that are issued will depend on the condition of the financial market.

60. Second, the intended method is stable because there would generally be a sufficient number of Australian corporate bonds trading in the market. The method is also stable because it no longer depends on uncertain data available from Bloomberg's estimates of fair yield curves for Australian corporate bonds

61. Third, using extrapolation to derive the 10-year estimate, which increasingly depends on bonds with shorter terms to maturity than 10 years and with different credit ratings, exhibits an inherent impracticability and has reduced market relevance as an appropriate benchmark. As such, the Authority is of the view that using a sample of the bonds – an unbiased process which provides a reliable and practical estimate of the debt risk premium for the regulated businesses – is preferable.

62. Fourth, the Authority aims to deliver regulatory decisions which are transparent and replicable. The Bloomberg data used to derive the sample of reference bonds will be kept and stakeholders would be able to replicate the estimates as long as they have access to the Bloomberg data.

7 Questions for interested parties

The Authority seeks comments from interested parties on the following issues:

1. Is the Authority's proposed approach of estimating the debt risk premium likely to better reflect the prevailing conditions in the market for funds than the use of current Bloomberg's estimates of fair yield curves?
2. Is the use of a benchmark sample of Australian corporate bonds with a term shorter than 10 years likely to better reflect the prevailing conditions in the market for funds than the use of Bloomberg's estimates of fair yield curves to derive a 10-year term?
3. Is the Authority's proposed approach to the selection of Australian corporate bonds appropriate?
4. Which method for calculating the weighted average of observed yields from the sample should be used?
5. Are there any relevant sources of information that the Authority has not considered in this discussion paper with regard to estimating the debt risk premium?