AUSTRALIAN COMPETITION TRIBUNAL

Application by Jemena Gas Networks (NSW) Ltd (No 5) [2011] ACompT 10

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| Parties: | **JEMENA GAS NETWORKS (NSW) LTD****(ABN 87 003 004 322)** |
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| Tribunal: | **FINKELSTEIN J (PRESIDENT)****PROFESSOR D ROUND****MR R STEINWALL** |
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| IN THE AUSTRALIAN COMPETITION TRIBUNAL |  |
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| rE: | APPLICATION UNDER SECTION 245 OF THE NATIONAL GAS LAW FOR A REVIEW OF A FULL ACCESS ARRANGEMENT DECISION MADE BY THE AUSTRALIAN ENERGY REGULATOR PURSUANT TO RULE 64 OF THE NATIONAL GAS RULES |
| by: | JEMENA GAS NETWORKS (NSW) LTD (ABN 87 003 004 322)Applicant |

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| : | PROFESSOR D ROUNDmR R STEINWALL |
| DATE: | 9 june 2011 |
| PLACE: |  |

**REASONS FOR DECISION**

# Background

1. The application by Jemena Gas Networks (NSW) Ltd (JGN) to review the full access arrangement decision made by the Australian Energy Regulator (AER) in relation to the NSW gas distribution network raised several issues. Some were dealt with by the Tribunal in reasons published on 25 February 2011: see *Application by Jemena Gas Networks (NSW) Ltd (No 3)* [2011] ACompT 6. These reasons relate to JGN’s challenge regarding the debt risk premium to be allowed to JGN.

## National Gas Rules

1. The relevant rules are:
* Rule 72 (1)(g) – the access arrangement information for a full access arrangement proposal must include the proposed rate of return, the assumptions on which the rate of return is calculated and a demonstration of how it is calculated.
* Rule 87(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.
* Rule 87(2)(b) – in determining a rate of return on capital, 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.

## The present dispute

1. An input to the weighted average cost of capital formula is the cost of debt, which is calculated by reference to the debt risk premium and the nominal risk free rate. The debt risk premium is the margin above the risk free rate that investors in an efficient service provider business are likely to require to provide funding to that business. At issue is what group of companies’ bonds should be used as a benchmark from which to calculate the debt risk premium.

## The ActewAGL decision

1. The Tribunal considered the calculation of the debt risk premium in *Application by ActewAGL Distribution* [2010] ACompT 4 (*ActewAGL*). There it was accepted that in determining the debt risk premium it was appropriate to base that determination on the yield on corporate bonds which have been rated BBB+ by a recognised rating agency such as Standard and Poor’s or Moody’s.
2. There are two standard types of corporate bond. A fixed bond is one where the issuer (the borrower) makes fixed payments (coupons) to the bond holder (the lender) at periodic intervals. If the coupon varies with interest rates or some external measure the bond is known as a floating bond. The value of the bond affects the “face value” (ie price) of the bond.
3. Two commercial information service firms, Bloomberg and CBASpectrum, provided an estimate of the fair value curve for bonds of that credit rating. A fair value curve plots estimates of bond yields against terms to maturity. In addition, global financial service providers such as UBS publish rate sheets that set out the price and other information for specific corporate bonds.
4. Broadly speaking, the dispute in *ActewAGL* concerned how to apply the Bloomberg and CBASpectrum data sources to derive the debt risk premium.
5. The AER had applied a three step methodology. First, it selected a population of bonds that reflected as closely as possible the characteristics of the bonds that would be issued by the benchmark service provider – relevantly BBB+ fixed rate bonds with a maturity over two years. This selection produced a population of six bonds. Their terms to maturity at the averaging period were between 2.5 years and 6.5 years.
6. Second it considered whether any of these bonds should be excluded from the analysis on the basis that their yields were not representative of their credit rating. For example, yields on some bonds might reveal obvious anomalies. On this basis it excluded a Babcock and Brown Infrastructure (BBI) bond. The average observed yield for the BBI bond was 7.4% between June 2006 and December 2008, increasing to 12.4% between January 2009 and May 2010. The AER considered the change in yield to be statistically significant. The AER also considered that market developments in late 2008 and early 2009 (which included the suspension of trading in Babcock & Brown shares) were likely to affect the reliability of the observed yield of the BBI bond. The exclusion of the BBI bond left five bonds in the pool.
7. Finally the AER compared the observed yields of its chosen bond samples to the fair value curves of CBASpectrum, Bloomberg and a simple average of the two to determine which curve most closely aligned to the observed yields. The AER concluded that the CBASpectrum curve was the best fit with the observed yields of its selected bonds.
8. In *ActewAGL* the Tribunal rejected this approach. In the course of its reasons the Tribunal made a number of observations, including the following:
9. The five bonds selected by the AER did not provide a basis for comparison with the fair value curves because the number of bonds was too small and their maturities too short to be sufficiently representative of the yield on 10-year bonds: *ActewAGL* at [38] - [39];
10. It was unreasonable for the AER not to include floating rate bonds in its population: *ActewAGL* at [55];
11. Floating rate bonds ought to have been taken into account and treated equivalently to fixed rate bonds: *ActewAGL* at [58]; and
12. Even if it was reasonable not to include A- and BBB bonds in the population (because they were not representative of BBB+ bonds), it was unreasonable for the AER not to consider whether useful information could be obtained from taking these bonds into account without including them in the population: *ActewAGL* at [63].
13. The Tribunal acknowledged that the AER will likely need to rely on published fair value curves. If they differ significantly it may be necessary to chose which of them provides the best fit: *ActewAGL* at [75-76]. In the absence of a basis for distinguishing between them, the Tribunal considered it appropriate to average the yields of the two curves, provided that the curves relied on were widely used and respected by the market: *ActewAGL* at [78]

## An overview of the present dispute

1. In the present case, the AER applied broadly the same three step methodology that it applied in *ActewAGL*. It therefore accepts that its determination was in error. It now contends that, consistent with the *ActewAGL* decision, an average should be taken of the CBASpectrum and Bloomberg fair value curves.
2. JGN, on the other hand, argues that it is not appropriate simply to average the Bloomberg and CBASpectrum curves. It submits that, for a number of reasons, reliance should be placed solely on the Bloomberg fair value curve.

## Specifics of the present dispute

1. To better understand the nature of the dispute it is necessary to make some comments about ‘non-standard’ bonds, specifically callable bonds, bonds with ‘make whole’ provisions, and bonds with contracts that specify a coupon reset following a credit rating downgrade.
2. A callable bond is a bond with a call option. The call option gives the bond issuer the right to buy the bond back on specified dates prior to maturity. A callable bond benefits the issuer as it allows the issuer to better align the cost of its debt with the cost of debt prevailing in the market. If interest rates have declined since the bond was issued, the issuer will be able to refinance this debt at a lower rate of interest. Bondholders generally require a higher return for holding a bond with a call option because of the risk that the bond will be called. The higher return takes the form of a lower bond price and higher yield, compared to identical straight debt.
3. The price of a callable bond is linked to the probability of the call being exercised by the bond issuer. For example, if market interest rates have increased since the bond was issued; the price of the call option feature will be minimal as the bond issuer is unlikely to exercise the call as refinancing will be done at a higher interest rate.
4. A ‘make whole’ callable bond is one that compensates the bondholder if the bond is repaid earlier, for example on default, takeover or the bond being called. This benefits bondholders as they are compensated for the expected future cash flow even though the bond is repaid prior to maturity. If the correct interest rate is used in discounting expected cash flows, then a bond with a make whole call option should trade identically to straight debt. This is because a make whole feature ensures the bondholder is indifferent between holding the bond to maturity and accepting the proceeds of the call, all other things being equal.
5. Bonds may specify a coupon reset (the coupon would increase) in the event that the credit rating attached to the bond is downgraded. This benefits bondholders so they would be willing to pay a higher price for such a bond.
6. In summary, in normal market conditions: (1) bonds with call options trade at a price discount (higher yield) compared to other identical straight debt; (2) make whole callable bonds trade equally with identical straight debt; and (3) bonds with a coupon step-up in the event of rating downgrade trade at a price premium when compared with other identical straight debt.

### JGN’s arguments

1. JGN makes a number of points in support of the use of the Bloomberg fair value curve alone rather than an average of the Bloomberg and CBASpectrum curves. The most important are:
* There are difficulties with the adoption of the CBASpectrum fair value curve. First, CBASpectrum ceased publishing its fair value curve citing a lack of data, problems with reliability and confusion about how the curves can be used. Second, there are said to be problems with the extrapolation inherent in the CBASpectrum 10 year BBB+ curve. Third, the debt risk premium of 2.93% produced by the application of the AER methodology is anomalously low and amounted to a very significant decline since late 2009 and a divergence from the figure produced by using the Bloomberg curve.
* Other bonds should have been considered. These include the BBB+ floating rate bonds, the BBB and A- rated bonds (both fixed and floating).
* The BBI bond should not have been excluded from consideration having regard to information available to the AER which was not available at the time of the *ActewAGL* decision.

### AER’s arguments

1. The AER supports the use of an average of the CBASpectrum and Bloomberg fair value curves. In summary, its arguments in support of that approach are:
* In the context of improving market conditions for corporate borrowers, the debt risk premium for JGN’s 2010-2015 access arrangement should not be higher than the debt risk premium estimated in the ActewAGL’s 2010-2015 access arrangement.
* The CBASpectrum data aligns better with market conditions. For example, the AER refers to a report by Dr Tom Hird in September 2009 in support of the view that during the financial crisis, the CBASpectrum data better reflected market conditions than Bloomberg and behaved in a more predictable manner.
* Given the lack of information available concerning BBB+ rated bonds with a maturity of more than 5 years, the AER points to Dr Hird’s report in support of the proposition that the methodology employed by CBASpectrum which makes use of available information on all bonds, including those of other ratings, is an advantage compared with Bloomberg.
* An analysis undertaken in a PricewaterhouseCoopers report dated 19 March 2010 suggests that CBASpectrum’s fair value curve had a lower degree of error than Bloomberg.
* The only two regulated utilities in the bond data – issued by SP Ausnet and the APA Group - lie below the CBASpectrum fair value curve. They constitute the best available comparators for the benchmark firm.

### The Experts’ reports

1. JGN relied on two reports authored by Dr Hird. He has considerable experience in the economic and financial analysis of markets. In his December 2010 Report, Dr Hird analysed and compared the accuracy of the Bloomberg and CBASpectrum fair value curves. His analysis included absolute and squared error testing of the relevant bonds. This testing uses mathematical formulae to assess how closely each fair value curve represents the observed bond yields. What follows is a summary of Dr Hird’s December report:
* Dr Hird compared the absolute error and the sum of squared error tests for all BBB+ rated bonds with maturity greater than 4 years relative to the Bloomberg and the CBASpectrum fair value curves. He concluded that the Bloomberg fair value curve resulted in both the lowest absolute and squared error values. However there were only 5 BBB+ issuers of bonds with a maturity greater than four years. Dr Hird did not consider that any strong conclusion from this data was possible given the small number of independent observations that were available.
* Dr Hird plotted the Bloomberg BBB fair value curve and the CBASpectrum BBB+ fair value curve against the median estimated yield from UBS, Bloomberg and CBASpectrum for all bonds rated BBB to A- with a maturity greater than 4 years. He concluded that the CBASpectrum fair value estimate was materially lower than the majority of observations in this sample.
* Dr Hird compared the absolute error and the sum of squared error tests for all BBB to A- rated bonds with more than four years maturity relative to the Bloomberg and CBASpectrum fair value curves. He concluded that the Bloomberg fair value curve resulted in both the lowest absolute error and squared error values.
* Dr Hird compared the absolute error and the sum of squared error tests for all BBB to A- rated bonds issued by natural monopoly infrastructure companies relative to the Bloomberg and CBASpectrum fair value curves. He concluded that the Bloomberg fair value curve resulted in both the lowest absolute error and squared error values.
1. Dr Hird then repeated his analysis by excluding callable bonds and bonds where coupons are increased in the event of a credit rating downgrade. This was done both for the full population of bonds and for bonds issued by natural monopoly businesses. This analysis involved the following steps:
* Dr Hird plotted the full sample of bonds (other than bonds identified as callable by the AER, plus three bonds that were callable but either not identified as such by the AER or not identified at all by the AER). He also excluded a 7.5 year maturity A- bond issued by SPI and two 4.5 year BBB+ bonds issued by Wesfarmers because they had the non-standard feature of coupon resets. The result (Figure 10 in Dr Hird’s report) is reproduced below.

* Dr Hird compared the absolute error and the sum of squared error tests for all BBB to A- rated bonds excluding these non-standard bonds. He concluded that the Bloomberg fair value curve resulted in both the lowest absolute error and squared error values.
1. This analysis led Dr Hird to conclude that in all cases the Bloomberg fair value curve represents the best fit to the data. Indeed while he disagreed with excluding non-standard bonds, he noted that doing so strengthens the conclusion that the CBASpectrum curve underestimates available long term bond yields – with no bonds of maturity greater than 5 years having yields below the CBASpectrum curve.
2. The AER relied on reports from Associate Professor John Handley of the University of Melbourne and a report of Oakvale Capital Limited. Professor Handley has considerable experience in corporate finance and derivative security pricing. His report addresses the considerations involved in arriving at a judgment about the value of a bond, including relevant theories that inform that judgment.
3. Oakvale is an independent financial risk management firm. Oakvale’s report sets out some of the factors it considers when advising clients to invest in bonds, including the pricing and valuing of bonds.
4. In Professor Handley’s view, two considerations are paramount in estimating the cost of debt. First, the choice of which bonds should be included in a class is a matter of professional judgment. Second, the bonds within a class should be relevantly comparable. This has particular application to non-standard bonds.
5. Professor Handley said that in the case of non-standard bonds a decision must be made whether to exclude them, include them with an appropriate adjustment to take account of the non-standard features, or include them with no adjustment. When an adjustment is made Professor Handley acknowledged this would introduce ‘a second layer of uncertainty’. His preference, all things being equal, is to exclude callable bonds rather than adjust them. Given the paucity of data in this matter Professor Handley acknowledged they may need to be included provided they are appropriately adjusted.
6. Professor Handley noted that Dr Hird failed to adjust for the yield impact of the callable bonds included in the sample. According to Professor Handley, it was a question of judgment whether to include BBB and A- rated bonds. But he noted that the observed yield on these bonds made it difficult to determine what adjustment would be required to take account of different credit ratings.
7. He also considered that the inclusion of bonds with different credit ratings reduced the efficacy of any quantitative test such as the absolute error test and the squared error test because these tests implicitly give equal weighting to each bond in the sample, irrespective of credit rating.
8. Professor Handley addressed whether the cost of the debt should be set on the basis of the Bloomberg fair value curve or an average of the Bloomberg and CBASpectrum fair value curves.
9. In his opinion, it was necessary to make a choice between the Bloomberg fair value curve and the CBASpectrum fair value curve rather than choose between the Bloomberg fair value curve and an average of the Bloomberg and CBASpectrum fair value curves. He explained:

This view follows from the fact that the Bloomberg and the CBASpectrum fair value curves represent two independent alternatives to estimating the cost of debt for the benchmark firm and is consistent with the diagrams in both the AER submission and the CEG report, which show the observed yields on various sets of bonds relative to each of the fair value curves (but does not show the observed yields relative to an average of the Bloomberg and CBASpectrum fair value curves). Further, this is also consistent with the specific terms of reference considered by [the] CEG report [the Hird report] which includes:

‘Based on the set of bonds resulting from your responses to questions (i)–(iv) above, compare the accuracy of the Bloomberg and CBASpectrum fair value curves.’

1. Professor Handley said that the choice between the Bloomberg and CBASpectrum fair value curves should be based on a number of considerations. They include:
* A strictly comparable set of bonds should be used. In the current context that is a BBB+ standard bond.
* If bonds with non-standard features are to be included (in order to increase the sample size), then it is necessary to make appropriate adjustments to the observed yields to maturity to remove the effect of the non-standard features and thereby improve their comparability with BBB+ rated straight debt.
* In the case of callable bonds, the yield impact of the embedded call option should be taken into account and in the case of bonds with coupon resets, the yield impact of the reset feature should be taken into account, otherwise both types should be excluded from the analysis.
* The choice between which of the fair value curves provides a better fit to the sample of observed bond yields should be based on a number of criteria, subject to professional judgment. In particular, if the choice is supplemented by an absolute error test or a squared error test, then it should include a test of statistical significance.
* An absolute error test based on bonds of all maturities is preferred to a squared error test in order to give equal weight to each observed error.
1. Based on these considerations, Professor Handley considered that what is shown in Graph 10 in the AER submission is most informative. The graph shows all A-, BBB+ and BBB fixed and floating rate bonds plus a bond issued by APT. Graph 10 is reproduced below:

1. Professor Handley noted that the information in Graph 10 has the following limitations:
* It includes a number of bonds with coupon resets but without adjusting the observed yields-to-maturity.
* It includes the APT bond, based, however, on yields observed during its first 20 trading days in July 2010 – after the relevant averaging period.
* The A- and BBB rated bonds are included without adjusting for the difference in credit rating.
* Observed yields to maturity are compared with par yield curves (which describe the relationship between par yield and maturity).
1. Professor Handley considered that Figure 10 in the Hird December report (reproduced at [24]) provided valuable information. This figure is based on all bonds excluding non-standard bonds. But he pointed out that this graph also has its limitations:
* It excludes bonds with less than 4 years to maturity.
* It excludes the APT bond which is a 10 year BBB rated fixed rate bond of particular relevance.
* It is based on the median reported observed yields from three data sources – UBS, Bloomberg and CBASpectrum.
* The A- and BBB rated bonds are included without adjusting for the difference in credit rating. Professor Handley considers that BBB+ bonds should receive more weight than other bonds as the task is to estimate the cost of 10 year BBB+ rated debt.
* Observed yields to maturity are compared with par yield curves.
1. Professor Handley criticised Dr Hird’s report because the empirical analysis undertaken uses the median reported yields from UBS, Bloomberg and CBASpectrum. On the other hand the AER analysis is based solely on UBS data. Professor Handley preferred use of the UBS yields alone as this ensures consistency in observed yields.
2. Ultimately Professor Handley’s opinion was that neither the information in Graph 10 (AER submissions) nor that contained in Figure 10 (Dr Hird’s report) supports a clear choice for one fair value curve over the other.
3. In the AER’s view it follows that the fair value curves should be given equal weight and that the average fair value curve should be used to estimate the debt risk premium.
4. In February 2011 Dr Hird prepared a further report. The February Hird Report addressed issues raised by the AER, the Oakvale Report and the Handley Report. In particular, it addressed a number of criticisms raised by Professor Handley of Dr Hird’s empirical analysis.
5. Responding to the criticism that the December report uses median data from three sources, rather than UBS data alone, Dr Hird repeated his December analysis using only UBS yields. This included producing a re-worked Figure 10. It also included re-worked absolute and squared error tests using UBS data alone.
6. Dr Hird said that the criticism that equal weight is given to all bonds in the sample can be addressed by adjusting BBB and A- bond yields using the yield differences predicted by the CBASpectrum and Bloomberg fair value curves themselves. Even if the BBB bonds were to be excluded altogether, Dr Hird’s analysis demonstrates that the Bloomberg curve is a better fit for the remaining standard A- and BBB+ rated bonds.
7. Dr Hird responded to Professor Handley’s observation that the observed yields to maturity are compared with par yields. He said:

Handley states that the Bloomberg fair value curve is a par yield curve, and that observations which are expressed on a yield to maturity basis cannot be consistently compared to points on this curve. Even if accepted as fact, the average adjustment required to convert observed yield to maturity estimates into par yields would be so small that it would have a negligible effect on the selection of the best aligned fair value curve.

1. Ultimately Dr Hird’s analysis is that in all cases, the figures and absolute and squared error tests show that moving solely to UBS yields does not affect his conclusion that the Bloomberg fair value curve is a better fit for the data than the CBASpectrum fair value curve.
2. Following the hearing the Tribunal raised with the parties whether there were any accurate and recognised objective statistical tests that could be applied to determine whether the observed differences in the error tests performed by Dr Hird in the February Hird Report (that is, the absolute error and squared error tests) were statistically significant. The Tribunal also requested that if there were any such tests, details be provided and the tests be performed on the absolute error and squared error figures, using any two examples provided in Dr Hird’s February report, with each party selecting one example that was most favourable to its case.
3. In response, JGN submitted a further report from Dr Hird (the April 2011 Report) and the AER submitted a report from Professor Michael McKenzie of the University of Sydney, an economist who specialises in financial risk management.
4. In his report Dr Hird said that statistical testing such as that suggested by the Tribunal was unnecessary because he had included in his analysis all of the existing BBB to A- bonds, so that he had, in effect, assessed every bond in the relevant population and accordingly there could be no sampling error that must be accounted for in his analysis. Hypothetically though, were there to exist a larger population of bonds, Dr Hird said that statistical techniques could be employed to draw inferences about that wider population. This could be done by converting bond observations into binary data to determine whether the bond is closer to the CBASpectrum or Bloomberg values.
5. Having undertaken that test on four separate figures from his February report, Dr Hird concluded that one can be 99% confident that the Bloomberg curve provides a better fit to any underlying population of bond data.
6. Professor McKenzie said that a key consideration in applying any statistical technique is whether the models used by CBASpectrum and Bloomberg to derive the yield curves are ‘nested’ – that is, whether they can be reduced to the same specification to enable a relevant comparison. But, as it is not possible to look behind the CBASpectrum data and the Bloomberg data, he said it is not feasible to determine whether the models are nested and therefore what might be the appropriate statistical techniques to apply to differentiate between the accuracy or relevance of the two data series. Additional problems that make comparisons between the two series difficult include that the data is not normally distributed in the classic bell shape (thus leading to problems of deciding what are the appropriate statistical tests to use) and the sample size is too small.
7. For these reasons, Professor McKenzie believed that the standard suite of error tests and the binominal approach adopted in Dr Hird’s report will not produce statistically accurate results. Given the small number of BBB+ bonds on issue, he considered that those bonds should be considered as a sample, rather than as the whole population, as Dr Hird has claimed. He also noted that new bonds enter the market and existing bonds mature.
8. Accepting these limitations (and the likely unreliability of the output of any formal statistical testing) Professor McKenzie then tested the bond data. He concluded that there was no statistical evidence to suggest that one curve provided a superior fit to the data relative to the other.

## Tribunal’s conclusions

1. In *ActewAGL* the Tribunal identified three ways for the AER to distinguish between competing curves.
2. If there is sufficient available information, the AER could examine and compare the merits of the publishers’ methodologies and data sources, as it has in the past.
3. The AER could determine which curve has performed better in the past. This approach may not, however, be appropriate if there has been a material change in the bond market or in the methodologies or data sources used by the publishers.
4. The AER could, as it has done here, compare relevant observed yields against the published fair value curves and an average of these curves. This will require the AER to undertake the following process:
5. assemble a representative population of observed yields of sufficient number and term to maturity. It is difficult for the Tribunal to provide any hard and fast rule for determining whether a population is “representative”. A representative population would contain many bonds after the point at which the curves diverge. It should contain bonds with a term to maturity close to 10 years. The AER should include floating rate bonds and/or bonds with observations available from one or two sources in the population unless there is good reason to exclude them. The inclusion of these bonds may raise questions which the AER will need to address in the future, such as the weighting that should be given to them;
6. only exclude bonds where there are sufficient qualitative reasons to consider that they are not correctly classed as being part of the relevant population;
7. once a representative set of bonds has been chosen and refined in this way, select the fair value curve that most closely corresponds to the relevant set;
8. use any other available information, such as observed yields on other rated bonds, to check that the selected fair value curve remains likely to provide the best estimate.

If a representative set of bonds sufficient to determine a fair value curve cannot be ascertained, or if later checks throw doubt on the chosen fair value curve, then this method of distinguishing between the curves cannot be used.

If the AER cannot find a basis upon which to distinguish between the published curves, it is appropriate to average the yields provided by each curve, so long as the published curves are widely used and market respected.

(*ActewAGL* at [77]-[78])

1. In that case the Tribunal considered it appropriate to average the yields provided by the CBASpectrum and Bloomberg curves, because it had no satisfactory grounds on which to distinguish between the two curves. It has not adopted a ‘default’ position merely because comparison of the curves may be difficult or may (as Professor Handley alluded to) involve the exercise of difficult judgments.
2. Given the paucity of relevant BBB+ bonds, it is appropriate to have regard to bonds (fixed and floating) with other credit ratings. There is the issue of what weight should be given to those bonds. We do not agree that greater weight should be given to the BBB+ bonds merely because they match the task of estimating the cost of 10 year BBB+ debt. That would defeat the purpose of including bonds with other credit ratings in the sample.
3. As hinted at in *ActewAGL*, in choosing between different fair value curves, it is reasonable to exclude bonds with less than 4 years to maturity. This is because the Bloomberg and CBASpectrum curves mirror each other for such bonds and only depart when they estimate yields for longer dated bonds.
4. We do not agree with Professor Handley’s preferred approach to exclude non-standard bonds. Faced with a limited number of relevant bonds, it is appropriate to include bonds with non-standard features. That said, in including them it is necessary to make appropriate adjustments to remove the impact of the non-standard features. Although not likely to be considered as ideal, we think even Professor Handley would not object to this approach.
5. On the other hand, we do agree with Professor Handley’s criticism of the use of the median reported observed yields from three data sources – UBS, Bloomberg and CBASpectrum. As explained in the Oakvale Report, “the use of a market maker’s price sheet such as that provided by UBS is the most commonly used guide for pricing of bond instruments, whether fixed, floating or hybrid structures.” The Tribunal prefers the use of the UBS data alone. In any case, Dr Hird, in his February report, re-worked his analysis based exclusively on UBS data. Moving to UBS data alone did not cause him to change the conclusion he reached that the Bloomberg fair value curve provides a better fit for the data.
6. To calculate the debt risk premium that should be allowed to JGN there are two key variables – the group of corporate bonds that will serve as the reference group, and which of the two available fair value curves appear to provide the better estimated line of best fit to the observed values for these bonds in measuring the relationship between the yield to maturity and the time to maturity.
7. We do not – and likely never will – know the true relationship between these two variables. Instead, it must be estimated from the best data available. The fair value curves produced by Bloomberg and CBASpectrum each purport to provide this line of best fit. However, the basis of their construction is a matter of proprietary information that is not available to the AER or to the Tribunal.
8. To decide which fair value curve should be used to estimate the debt risk premium is therefore not an easy or uncontroversial task. We must resolve conflicting claims as to what should be measured, how it should be measured, and how the resulting figures should be interpreted.
9. In *ActewAGL* the Tribunal found that in the absence of an objective basis for distinguishing between two significantly different curves, “it is appropriate to average the yields provided by each curve [the Bloomberg and the CBASpectrum curves], *so long as the published curves are widely used and market respected*” [our emphasis]. The Tribunal’s reasons for this conclusion warrant careful consideration. An average is a blunt instrument unless careful thought is given to the individual components and whether each should be given the same consideration, or weight, in the calculation of the average. A simple unweighted average gives each component the same weight. This will not always be appropriate, especially where (as here) the two fair value curves differ considerably over the relevant periods to maturity.
10. We have noted that we do not know the basis for the construction of the two fair value curves. Their underlying models, which are proprietary information, may be such that for the purpose of estimating the debt risk premium, one is far more relevant than the other (and thus should be accorded a greater weight), even though they both contain pertinent information. That is, a simple arithmetic average, without more thought, may not give emphasis to the right components.
11. The Tribunal’s statement in *ActewAGL* that the published curves be widely used and market respected is critical. JGN argues that the CBASpectrum fair value curve should not be adopted in any way – by itself, or as a component in an average. This curve is no longer published, its originators giving as reasons for its discontinuance, what we think is a concession as to its unreliability. Besides, we re-iterate that in *ActewAGL* the Tribunal did not recommend averaging as a default procedure.
12. In addition, the Bloomberg and CBASpectrum curves show a substantial divergence after the point representing four years to maturity, with the latter curve lying below the former, with an increasing divergence as the time to maturity increases. That difference could not be explained by the parties. This is to be contrasted with the position up to the four year point where there was a high degree of correspondence between the two curves.
13. As the Tribunal said in *ActewAGL* at [77] it might be helpful to compare curves on the basis of their relative performance in the past. The AER relied on this argument for the inclusion of the CBASpectrum curve in an averaging curve. As the debt risk premium should be forward-looking, this approach is justifiable only if past conditions reasonably reflect the future period under consideration. It may well have been the case that the CBASpectrum curve performed well during the financial crisis of a few years ago, but those conditions are hardly reflective of current expectations of future market conditions.
14. The upshot of this is that use of the CBASpectrum curve, either by itself or in an average, could produce a commercially significant downward-biased estimate of the debt risk premium that should be allowed to JGN. This finding is reinforced when we look at the positions occupied by the two curves on the various figures and graphs that have been presented to the Tribunal.
15. But before reaching any conclusion we need to consider which class or classes of bonds should be included in the data which will be used to assess which fair value curve is more reliable. It is also necessary to decide what types of bonds to include – only standard bonds or some or all of the non-standard variants of bonds that are issued by different entities.
16. The problem is that in Australia there is relatively little corporate bond activity. There are only five issuers of BBB+ bonds in Australia with a maturity of greater than four years and this represents too small a population on which judgments can be made with any real confidence.
17. Five matters are of importance here:
* Whether the bonds of all corporate bond issuers should be included in the reference group, or are some issuers to be regarded as too different to warrant inclusion;
* What other bonds besides BBB+ bonds and what non-standard bonds could validly be included in the reference group;
* Whether BBB+ bonds should be given a greater weight (as already indicated in [55] we believe not, as this would defeat the purpose of including the other risk level bonds in the group), or what adjustments should be made to their observed yields in order to standardise their yields to a BBB+ equivalent value;
* Whether the group of bonds that are finally chosen can be regarded as a sample or whether it represents the whole population of bonds that are of relevance to the issue; and
* Whether certain bonds should be considered outliers and so should be disregarded.
1. Once those matters are determined, a sixth and critical issue then remains to be dealt with – what statistical tests can be employed to inform the choice between the two fair value curves with respect to how well they fit the corporate bond data.
2. By far the most extensive empirical evaluation of these questions was carried out by Dr Hird. Each test that he conducted, based on different groups of corporate bonds and with various adjustments made for non-standard bonds, produced the same conclusion – that the Bloomberg fair value curve was clearly superior to the CBASpectrum curve in terms of providing the best fit for the observed values of yield to maturity plotted against time to maturity. The Tribunal agrees that it would not be proper to exclude bonds with non-standard features so long as adjustments are applied to adjust their yields to allow for their non-standard features, and that the process should allow for the inclusion of BBB and A- bonds as well as BBB+ bonds.
3. One pertinent question raised during the hearing was whether the yields on infrastructure bonds issued by regulated natural monopoly-type infrastructure companies might be most relevant in determining which fair value curve is a better fit.
4. As far as the Tribunal understands, no standard BBB+ rated infrastructure bonds existed during the relevant period. However, even if there existed infrastructure bonds of other risk classes, the inclusion of only those differently rated bonds that are classified as infrastructure bonds would need to be carefully considered. The benchmark BBB+ rated bonds necessarily include bonds across all industry types. If we needed to expand the reference group to include differently rated bonds in order to estimate the benchmark, it would seem prima facie inconsistent to exclude bonds on the basis of them not exhibiting certain industry characteristics when the benchmark makes no such distinction.
5. The Tribunal is of the view that bonds should only be excluded from the sample on strong grounds (as stated in *ActewAGL*), and so classification of bonds by industry categories and the exclusion of bonds other than natural monopoly bonds is not a desirable approach.
6. Dr Hird’s conclusions as to the superiority of the Bloomberg curve were consistently the same, regardless of whether:
7. an absolute error test was used - in which the vertical difference between each observed yield to maturity plot point and the corresponding value yielded by the fair value curve for the corresponding time to maturity is calculated, and then summed over all the bonds being considered in the group; or
8. the squared error test was employed - in which each vertical difference is squared and then all such values are summed, a process which effectively gives greater weight to observations that are further away from the fair value curve.

This is persuasive, especially when it is considered that all the groups of bonds that Dr Hird considered yielded the same result, regardless of risk class, standard, or standard and non-standard bonds combined. It indicates that the Bloomberg fair value curve is superior to the CBASpectrum curve according to both statistical error tests, by always displaying a lower absolute and a lower squared error test value.

1. Moreover, we appreciate that in all the figures derived by Dr Hird, the very great majority of plot points lay above the CBASpectrum curve, which in all cases lay below the Bloomberg fair value curve. Even the line of best fit for the A- bonds only curve lies above the CBASpectrum curve and lies closer to the Bloomberg curve, which suggests that the latter curve provides a better fit and a more accurate measure of the relevant yield.
2. It is not wise, generally, to decide that a curve provides a good fit when it lies below the great proportion of the plot points to which it relates. As the Tribunal said in *ActewAGL* at [62-63]

62. Notwithstanding the AER’s rejection of the proposal to include BBB and A- bonds, the AER did consider what effect their inclusion in the population may have. The AER said that the observations showed no clear pattern. The Tribunal considers the AER’s analysis to be too superficial. In fact, the longer term A- bond yields were above the CBASpectrum curve, contrary to what would usually be expected. We also consider that the AER was wrong to conclude as it did (at 56) that “[g]iven that the observed yields do not reflect reasonable expectations it is difficult to compare the selected fair value curve to the observed yields.” The very fact that observed higher rated (A-) bond yields were higher than the CBASpectrum curve for lower rated (BBB+) bonds should have sent alarm signals calling for further analysis.

63. In the Tribunal’s view, if it were reasonable not to include A- and BBB bonds in the population (because they are not representative of BBB+ bonds), it was unreasonable for the AER not to consider whether useful information could be obtained from taking these bonds into account without including them in the population. That A- yields sat above BBB+ yields should have indicated to the AER that by use of its methodology it may not have selected the fair value curve most likely to provide the best estimate of the benchmark bond yield.

1. The next question, then, is whether the error tests proposed by Dr Hird should be regarded as applying to the population of bonds or to a sample from the relevant defined population. The Tribunal accepts that the 38 bonds included by Dr Hird in Figure 3 of his February 2011 report is a complete enumeration of all possible relevant bonds.
2. Accordingly, as his analysis was based on the entire relevant population of bonds, there is no need for formal tests of whether statistically significant differences exist between the absolute errors of the two fair value curves or of the squared errors from the two curves. By definition no sampling error exists when calculating population parameters from the entire data set representing the population, and when comparing two population parameters.
3. Despite this, were the bonds that were selected for inclusion in the various figures put forward by the AER and JGN to be considered as samples, there appear to exist no agreed standard statistical tests that could test for the significance of any differences in the two error statistics that have been observed between the two fair value curves.
4. However, Dr Hird did propose a simple test based on the binomial probability distribution that provided some support for the superiority of the Bloomberg fair value curve (on the assumption, which we reject, that the data are to be treated as sample data) in so far as its measured absolute and squared error values are concerned. His test indicated with a very high 99 percent confidence that the Bloomberg fair value curve was a better fit to the group of bonds being considered.
5. In *ActewAGL* averaging of rival fair value curves was undertaken because there was no clear basis to justify a preference for one curve over the other. Here, by way of contrast, Professor Handley was somewhat equivocal in his support for the CBASpectrum curve; Dr Hird meticulously evaluated different groupings of bonds and made many adjustments to allow for non-standard bond features, and his tests clearly pointed to the superiority of the Bloomberg curve over many different iterations; and the publishers of the CBASpectrum curve have stopped producing it, citing lack of relevance to the market.
6. In addition, Professor McKenzie based his critique of Dr Hird’s statistical assessments on the assumption that the data set being considered should be treated as sample data, a proposition that we have rejected.
7. We have discounted Professor McKenzie’s observation that the population will be changing as new bonds will enter the market and existing bonds will mature. This overlooks the fact that the AER must base its decision on the population identified as at the date of its determination, and not on some unknown future group of bonds that may or may not be different from the one existing on that date.
8. We therefore find that the appropriate curve from which the debt risk premium for JGN should be calculated is the Bloomberg fair value curve. The Bloomberg fair value curve is a much better fit than the CBASpectrum curve. The latter is so poor a fit to the data that it would not even be appropriate to consider averaging it with the Bloomberg curve.
9. The evaluation provided by Professor Handley supports in principle our determination. He stated that in his opinion the choice should be between the two curves, and not between one curve and an average of the two, and admitted, candidly, that the choice of which fair value curve provided the best fit to the observed values should be based on several criteria, all of which were “subject to professional judgment”.
10. In other words, he acknowledged that there is no one unambiguously correct way to determine the best curve on a priori grounds. The curves must be subjected to the ultimate test – that of the relevant data.
11. In the Tribunal’s view Figure 3 in Dr Hird’s February 2011 report, reproduced below, is the most complete or definitive representation of the relationship between yields to maturity and time to maturity for the relevant population of bonds.

1. This figure contains all the relevant BBB to A- bonds and has made all possible adjustments to each bond to allow for the impact on the observed yields of any non-standard features as identified in the reports tendered by the AER’s experts. By plotting the Bloomberg and CBASpectrum fair value curves on this graph, it is apparent which of the two curves provides the best fit.

## Other Matters

1. There is still one outstanding issue, namely, JGN’s complaint about AER’s decision on the value of imputation credits in the proposed rate of return.
2. The Tribunal is of the view that, in this regard, it should follow its recent decision in *Application by Energex Limited (Gamma) (No 5)* [2011] ACompT 9. It is vitally important that the Tribunal be consistent in its decision making unless special reasons exist which would warrant a departure from earlier cases. If any party is of a different opinion it should forthwith notify the Tribunal.

**Orders**

1. Subject to the imputation credits issue, JGN should within five days submit draft minutes of orders to give effect to these and the Tribunal’s previous reasons.

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| I certify that the preceding ninety three (93) numbered paragraphs are a true copy of the Reasons for Decision herein of the Tribunal. |

Associate:

Dated: 9 June 2011