COMPETITION ECONOMISTS GROUP

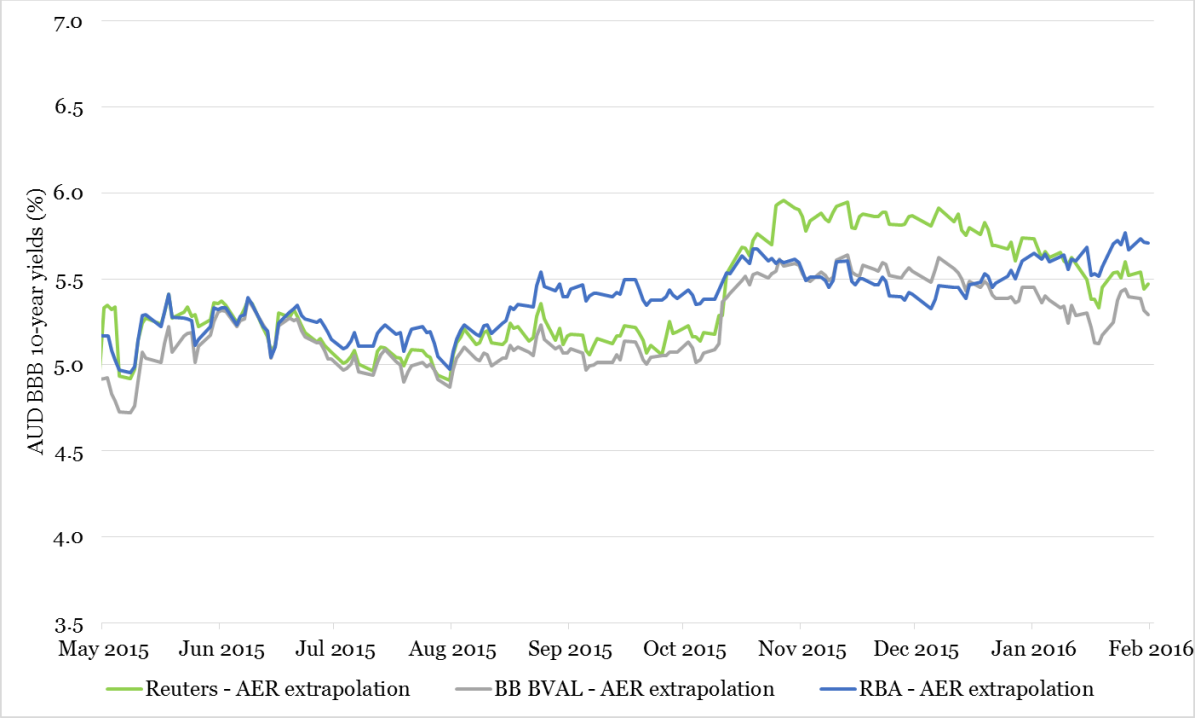
Memorandum

To:	Charlotte Coster – AusNet
From:	CEG – Asia Pacific
Date:	29 February 2016
Subject:	**Recent financial market conditions and the BVAL curve – updated to 19 February 2016**

1 Estimates of AUD BBB 10-year yields

1. The historical AUD BBB 10-year yields as estimated from the BVAL, RBA (AER extrapolation), and Reuters curves are shown in Figure 1. It can be seen that the RBA estimate has shown a general rise over AusNet's averaging period from 25 January 2016 to 19 February 2016, while the BVAL and Reuters estimates have shown a general decrease over the same period.

Figure 1: BVAL, RBA, and Reuters historical AUD BBB 10-year yields



Source: Bloomberg, RBA, Reuters, CEG analysis

2. The 10-year spreads to swap of the three sources as at 31 December 2015 as well as over the averaging period are shown in Table 1. The BVAL and Reuters estimates have both increased by a small percentage over this timeframe, while the RBA spread to swap has increased considerably by 24%.

Table 1: BVAL, RBA, and Reuters 10-year spread to swap

	BVAL	RBA-AER	Reuters
31 Dec 2015	2.54	2.37	2.82
25 Jan 2016 – 19 Feb 2016	2.64	2.92*	2.87
% change	4.0%	24.2%	1.6%

*Source: Bloomberg, RBA, Reuters, CEG analysis; *The RBA spread for the averaging period is a CEG estimate*

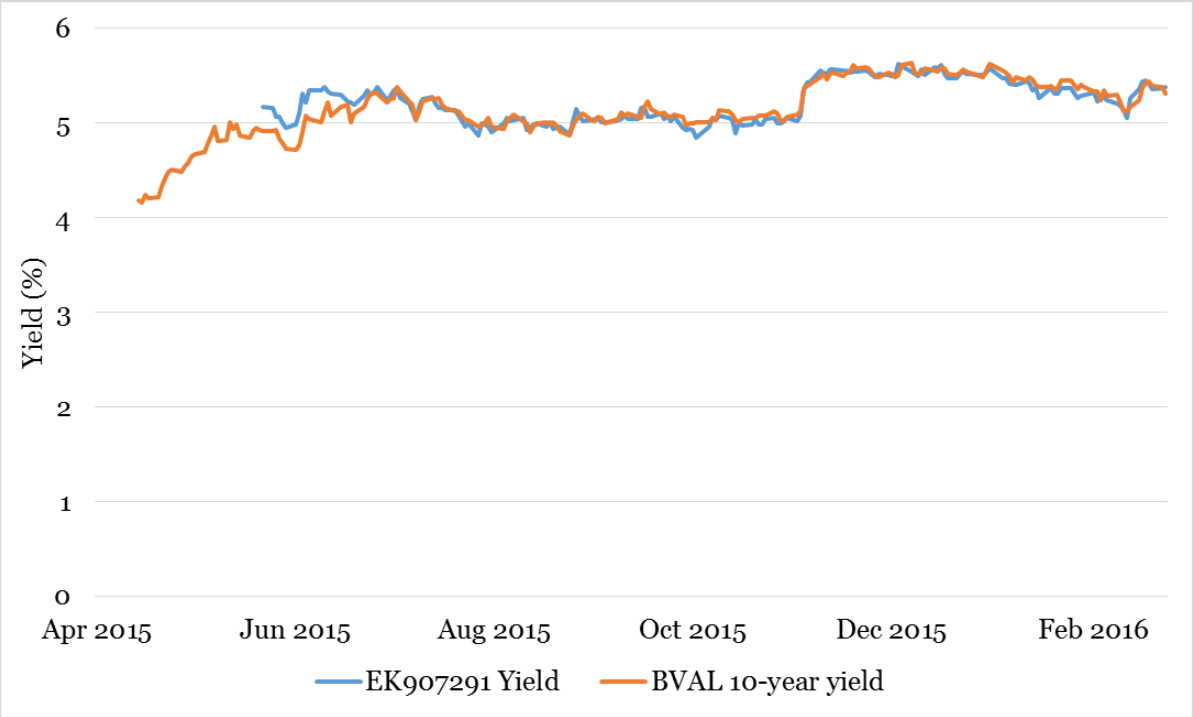
2 10 year BBB BVAL estimate is heavily dependent on the yield of a single bond

3. The bond sample used by Bloomberg to construct its BVAL curve has only one bond with more than 6.5 years to maturity. This is the Asciano bond (EK9072910), which has 9.2 years to maturity in January 2016. The next longest bond is a QANTAS bond (EK269091) with 6.2 years to maturity.

4. As set out in a recent report,[1] the Asciano bond appears to have a disproportionate influence on the BVAL estimate of the 10-year spread to swap. We have updated Figure 4 from that report (see Figure 2 below) and our conclusions remain unchanged.

[1] CEG, Criteria for assessing fair value curves, January 2016, see section 4.4.1, pp. 33-36.

Figure 2: Yields of the Asciano bond and the BVAL curve at 10 years (updated version of Figure 4 from our January 2016 report)



Source: Bloomberg.

5. The regression analysis in the appendix to this report reaches the same conclusion that flows from intuitive interpretation of Figure 2 above.

6. This heavy influence of a single bond is highly problematic since the resulting BVAL estimate of the cost of debt is likely to be influenced by factors specific to Asciano as opposed to overall changes in the benchmark return on debt.

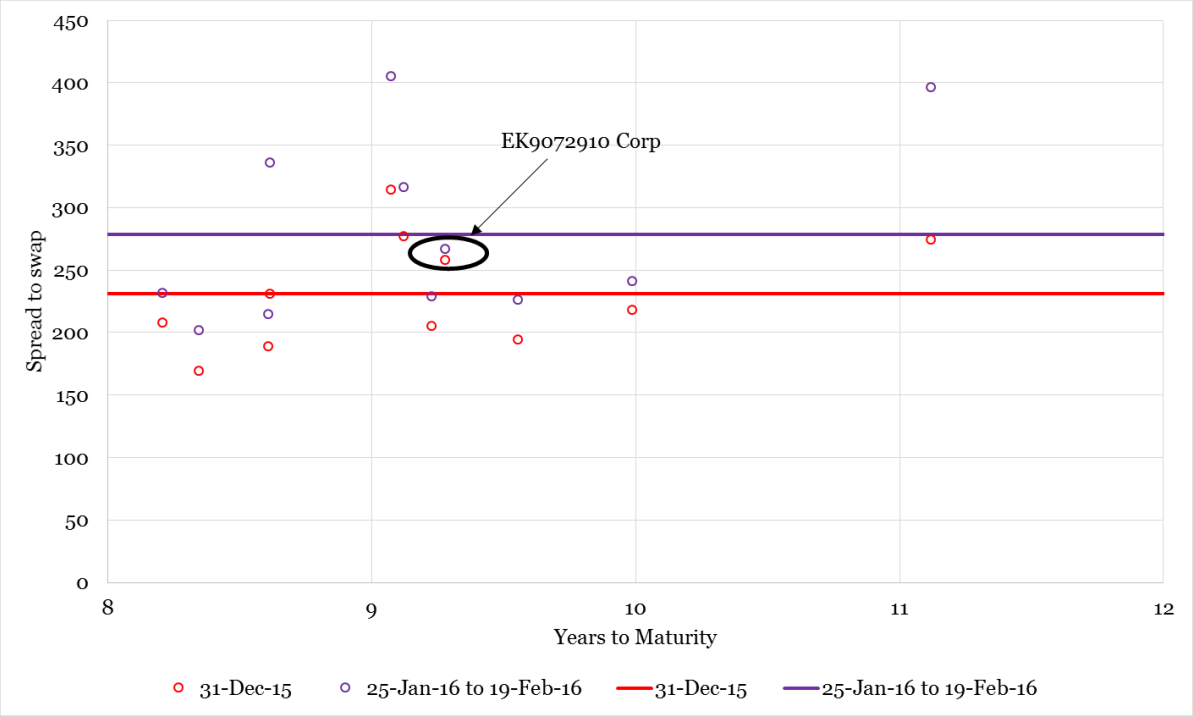
7. The BVAL bond selection criteria already results in a very small sample and one that, because it excludes bonds issued in foreign currency, does not represent the benchmark debt issuance practices of a BEE. A more robust estimate of debt market conditions can be had by looking at a sample of bonds that has more bonds with long residual tenors. For the purpose of this memo we examine the RBA sample.

3 Movements in BBB bond spreads and the BBB BVAL curve

8. The 10-year BVAL spread to swap estimate has remained largely stable despite a general rise in corporate bond yields over the last two months. A general measure of changes in debt market conditions can be had by examining a large sample of bonds

with the residual tenors of interest. For the purpose of this memo we examine the RBA sample.

Figure 3: Bonds in the RBA sample with 8-12 year residual maturities



Source: Bloomberg, RBA, CEG analysis

9. The eleven bonds in the RBA sample with 8-12 year residual maturities are shown in Figure 3.[2] With the exception of the Asciano bond, there was an increase in spreads to swap rates of at least 10% between 31 December 2016 and the averaging period, which should be expected to result in an increase in the estimate of the benchmark 10-year spread to swap. The lone exception in this regard is the Asciano bond indicated in the black oval. This bond only showed a 3.4% increase in spread to swap from 31 December 2015 to the AusNet averaging period, as compared to an average increase of 20.0% for these eleven bonds.

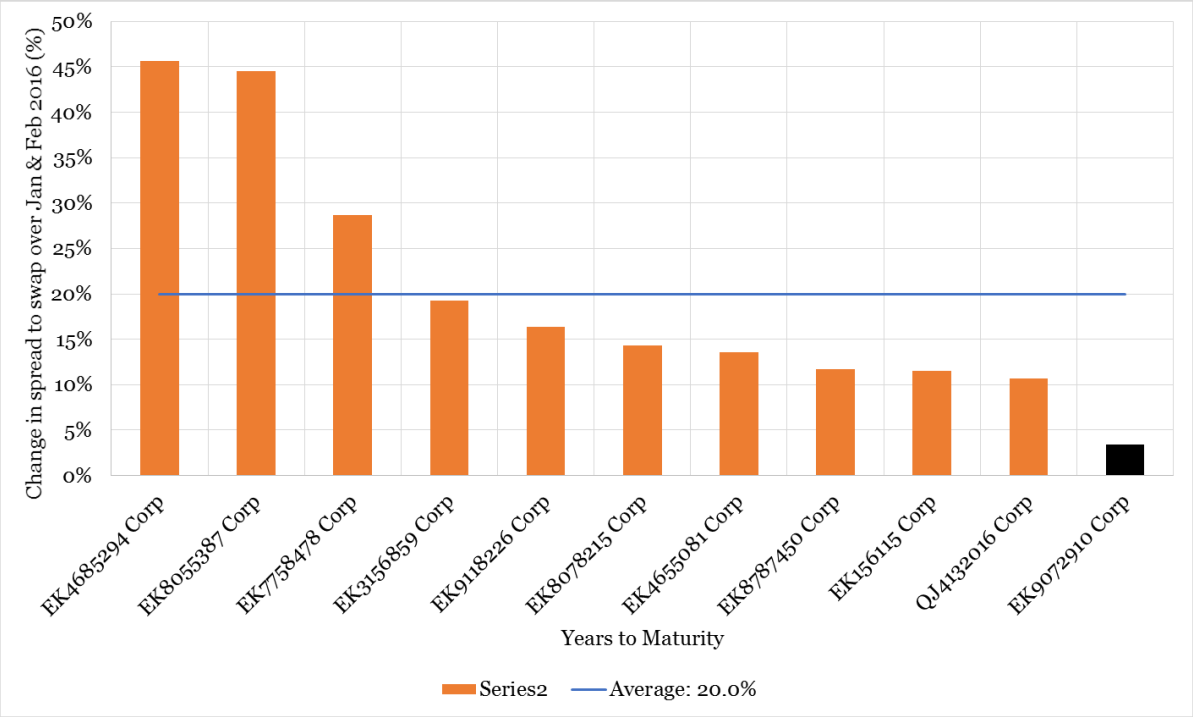
10. The simple average spreads of these 11 bonds over the averaging period is 278.93, compared to 230.92 as at 31 December 2015. This is illustrated in the chart by a constant line at each of these values.

11. A similar observation can be made based on the percentage change in spread to swap for the same 11 bonds, from 31 December 2015 to the AusNet averaging period. This is shown in Figure 4, where it can be seen that only the Asciano bond

[2] Both sets of observations are plotted according to their residual tenors as at 19 February 2016 for ease of comparison.

(highlighted in black) exhibits a small increasein spread to swap over the month, while the average change for all 11 bonds is 20% in percentage terms (or 48.0bp). This compares to an increase in the BVAL 10 year spread to swap of just 4.0% (or 10.0bp).

Figure 4: Percentage change in spread to swap – 31 December to averaging period



Source: Bloomberg, CEG analysis.

12. While the 29 February estimates of the RBA curve have not been published yet, we expect its 10-year estimate over the averaging period to be materially higher compared to its 31 December estimate.[3] This is because, unlike the BVAL curve, its estimate is based on a weighted average of the spreads to swap of several bonds, with the Asciano bond only having an individual weight of approximately 4%. The RBA curve is therefore able to accurately capture the recent general increase in bond yield observed in financial markets as compared to the BVAL curve, which appears to be heavily influenced by a single bond that happened to exhibit a decrease in spread to swap over the month.

3 While the RBA's weighted average approach based on the Gaussian kernel and issuing amounts will result in different numbers from the simple averages that we calculated, we can expect the RBA's 31 January 2015 estimate to be materially higher than its 31 December 2015 estimate, since bonds with residual maturities between 8 and 10 years will collectively have a very high weight on the 10-year estimate.

4 Conclusion

13. The BVAL bond selection criteria results in a sample containing only a single bond – issued by Asciano – with a residual maturity greater than 6.5 years. Moreover, the Bloomberg curve fitting methodology, while not transparent, clearly results in this bond having a disproportionate impact on the 10-year spread to swap estimate. In recent months the Asciano bond spread to swap has risen only marginally while the spread to swap on all other long term bonds have risen by at least 10% and on average.

14. On the other hand, a larger sample, such as the RBA's sample selection criteria, results in a larger number of bonds with longer residual maturities. This, means that, provided a sensible curve fitting technique is applied (which includes the RBA's use of a Gaussian kernel), the 10-year spread to swap estimate will not be unduly influenced by the spread to swap of a single bond, and is thus better able to capture the overall change in market conditions.

Appendix: Regression analysis

15. We have regressed the level of the BVAL 10 year estimated spread to swap against the spread to swap on the Asciano bond and the spread to swap on other bonds in other bonds in the BVAL sample within discrete maturity segments. Regression analysis shows that the only statistically significant determinant of the BVAL 10 year estimated spread to swap is the spread to swap on the Asciano bond – with a coefficient of around 1.0. When bonds with shorter maturity are added into the regression, the coefficients on these bonds are insignificant, implying they have no predictive power on the Bloomberg estimate of 10 year yield spread.

Figure 5: OLS: BVAL 10 year spread regressed on bond spreads

Maturity segment	Bloomberg 10 Year Spread Estimate			
9~10 year (only Asciano bond in this segment)	1.05***	0.82***	1.14***	1.3**
6~7 year		0.2	0.16	0.16
5~6 year			-0.4	-0.37
4~5 year				0.05
3~4 year				
2~3 year				
1~2 year				
<1 year				
Adj. R^2	0.93	0.93	0.98	0.98

Source: Bloomberg, CEG analysis. Period of analysis is from the week ending 22 May 2015 to 19 February 2016. Data is a weekly average of spreads and where more than one bond is in the maturity segment an average weighted by issue size is used. Significance levels signified by: ***>0.99, **>0.95.

16. We have also regressed the percentage change in the 10 year Bloomberg spread estimate on the percentage change in the spread of the Asciano bond and found that this variable has strong prediction power. The regression indicates when the spread of the Asciano bond increases by 1%, the Bloomberg 10 year estimate increases by 0.91%. Notably, bonds with 6 to 7 years to maturity also have statistically significant predication power on the percentage change in the Bloomberg estimated 10 year spread. However, somewhat counterintuitively, the relationship is statistically significantly negative. That is, when the spread on bonds with 6 to 7 years to maturity increases relative to the Asciano bond[4] Bloomberg estimates will decrease. We consider that the best explanation for this is that Bloomberg's methodology is trying to fit the curve through the spread of the Asciano bond. When the spread on bonds with less time to maturity than Asciano bond increases, and the spread of Asciano bond stays the same, the gradient between the shorter time to maturity bonds and Asciano bond becomes flatter. Given that the Asciano bond has a term to maturity of less than 10 years, Bloomberg must extrapolate out to 10 years. Consequently, the higher the yields on shorter dated bonds the flatter the fitted curve through the Asciano bond and the lower the extrapolated 10 year estimate.

Figure 6: OLS: %Change of BVAL 10 year spread regressed on %Change in Bond Spread OLS:

Maturity segment	% Change in Bloomberg 10 Year Spread Estimate			
9~10 year (only Asciano bond in this segment)	0.91***	1.16***	1.17	1.11
6~7 year		-0.29**	-0.19	-0.12
5~6 year			0.04	0.06
4~5 year				0.17
3~4 year				
2~3 year				
1~2 year				
<1 year				
Adj. R^2	0.43	0.51	0.17	0.08

Source: Bloomberg, CEG analysis. Period of analysis is from the week ending 22 May 2015 to 19 February 2016. Data is a weekly average of spreads and where more than one bond is in the maturity segment an average weighted by issue size is used. Significance levels signified by: ***>0.99, **>0.95.

17. This counterintuitive result illustrates precisely the problem with the sort of problem with the very small BVAL sample and a methodology that fits the curve through the single long term bond in the sample.

4 The coefficients in the regression estimates the relationship holding other things equal and the coefficient on the 6-7 year bonds can be interpreted as the impact that changes in spreads of these bonds have on the 10 year BVAL estimate conditional on the spread of Asciano bond staying constant.