AusNet Gas Services Pty Ltd

Gas Access Arrangement Review 2018–2022

Appendix 9E: Historic Reports on Return of Debt

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Debt staggering of Australian businesses

Dr. Tom Hird

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1 Executive Summary

1. This report surveys three measures that quantify the extent of debt staggering carried out by Australian firms.

1.1.1 Measure 1: Range statistic

2. The range is defined as the difference between the largest and smallest values in the sample. When applied to debt staggering, calculating the range involves determining the number of years between the debts with the longest and shortest time to maturity.

3. The main benefit of the range as a measure of debt staggering is its simplicity, which makes it a useful starting point as a measure of spread.

1.1.2 Measure 2: Weighted Mean Absolute Deviation (WMAD)

4. Mean absolute deviation (MAD) is a commonly used statistical measure of the amount of spread in a sample. MAD is based on the concept of absolute deviations, whereby an observation's absolute deviation from the mean refers to its absolute distance from the mean of the entire sample.

5. If the sample contains observations that are far from the mean, it would indicate that the sample data is fairly spread out. The converse is true for samples with observations near the mean, which indicates that the sample has low spread. An intuitive measure of spread would thus be to obtain the mean of the absolute deviations (MAD) for all observations in the sample.

6. For example, a firm that had evenly spaced debt maturity from 0 to 10 years (or n to n+10 years) would have a MAD of 2.5 years. By contrast, a firm that had evenly spaced debt maturity from 0 to 5 years (or n to n+5 years) would have a MAD of 1.25 years

7. MAD can be further modified by placing higher weight on debts with larger amounts outstanding. Instead of obtaining the mean of the absolute deviations for all observations in the sample, the absolute deviations are weighted according to the amount of debt outstanding, which results in the weighted mean absolute deviation (WMAD) measure. With this modification, larger debts will have more influence on the measure and vice versa.

8. The formal definitions of MAD and WMAD are shown below:

$$MAD = \frac{\sum_{i=1}^{n} |x_i - \bar{x}|}{n}, \quad WMAD = \frac{\sum_{i=1}^{n} w_i |x_i - \bar{x}_w|}{\sum_{i=1}^{n} w_i},$$

1.1.3 Measure 3: Sum of Squared Percentage Debt (SSD)

9. An approach similar to the Herfindahl–Hirschman Index (HHI) can also be used to measure debt staggering. As described in Section 97, HHI measures the concentration of an industry based on the sum of squared market share percentages of its firms. When there are many small firms in the industry with low market shares, HHI returns a small value approaching 1, which suggests that the industry is highly competitive. If the industry is a monopoly, HHI returns a value of 10,000.

10. Similarly, the relative individual sizes of a firm's debts can provide information on the extent of debt staggering utilised by the firm. A firm that splits its total debt amount to several small debts has a more staggered debt structure than one that only has a few large debts. Taking the sum of squared percentages of individual debts relative to the firm's total amount of debt outstanding thus provides a measure of how much staggering the firm has used.

11. The formula for sum of squared percentage debt (SSD) is shown below:

$$SSD = \sum_{i=1}^{n} \left(\frac{Amount\ outstanding\ for\ debt_i}{Total\ debt\ outstanding\ for\ the\ firm} \times 100\% \right)$$

1.2 Empirical evidence of debt staggering

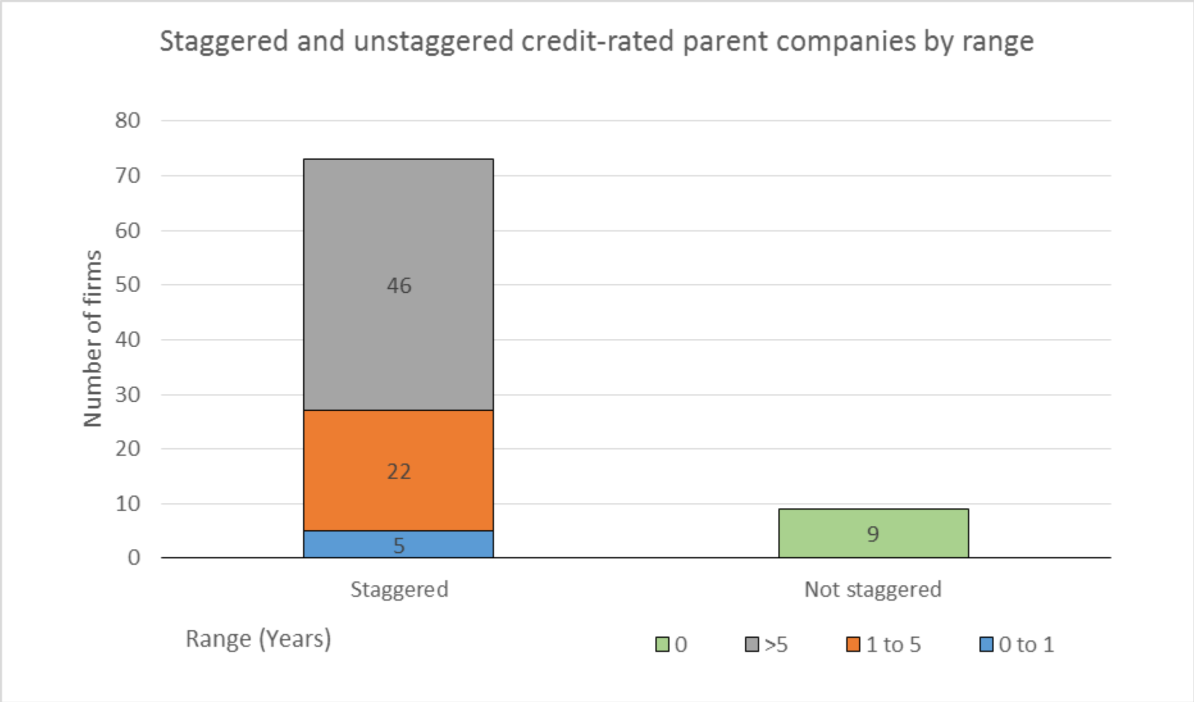
1.2.1 Range statistic

12. Of the 82 parent companies in our sample that have issued at least one credit-rated debt, 9 do not stagger their debts, while the remaining 73 do. This comparison can be seen in Figure 1.

13. Figure 105 shows a histogram of the range statistics for the 73 parent companies in our subsample that do stagger their debt. As seen in Figure 2, only 37% of the companies with credit ratings have a range of 5 years or less. In contrast 70% of the companies in the full sample have a range of 5 years or less.[1]

[1] See Figure 99.

Figure 1: Staggered and unstaggered parent companies with credit ratings, measured using the range statistic



14. It is important to note that a primary reason for staggering debt is to avoid a situation where a large amount of debt is falling due in the immediate future (e.g., in the next 12 months). A firm might have a zero range but still have no debt falling due for 5 years is its only debt outstanding matures in 5 years. Such a firm may not have staggered debt but it does have the opportunity to raise new debt prior to the existing debt coming due. In this sense, it has the 'option to stagger' its debt.

15. Of the 9 firms that have only one debt issuance four of these have sub investment grade credit ratings. Of the 5 remaining firms with investment grade credit ratings the average remaining maturity of their single debt issuance is 6.9 years (and the shortest is 3 years). These firms clearly have an 'option to stagger' prior to maturity in order to reduce refinance risk.

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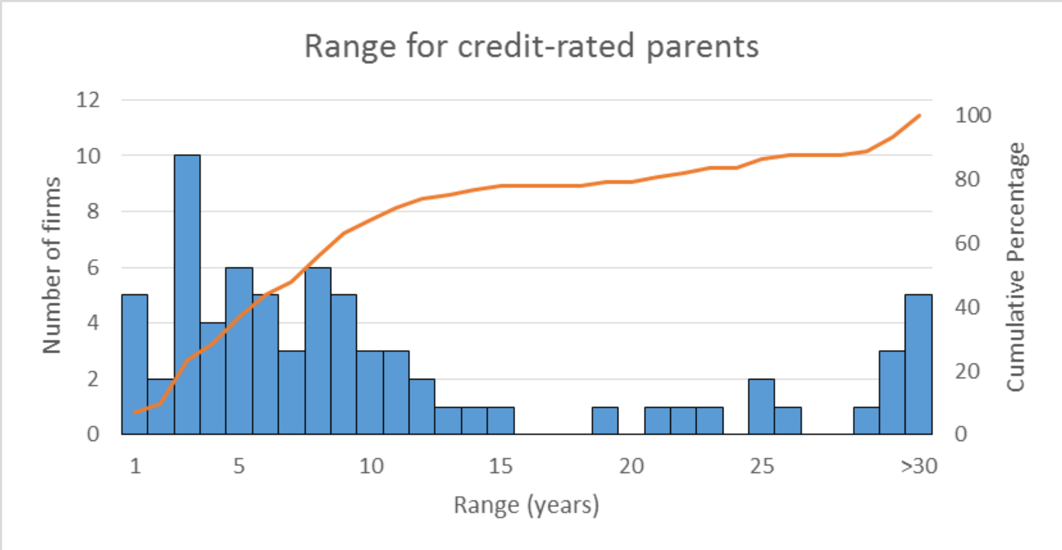
Figure 2: Distribution of the range statistic for parent companies with credit ratings and staggered debt



1.2.2 Weighted mean absolute deviation

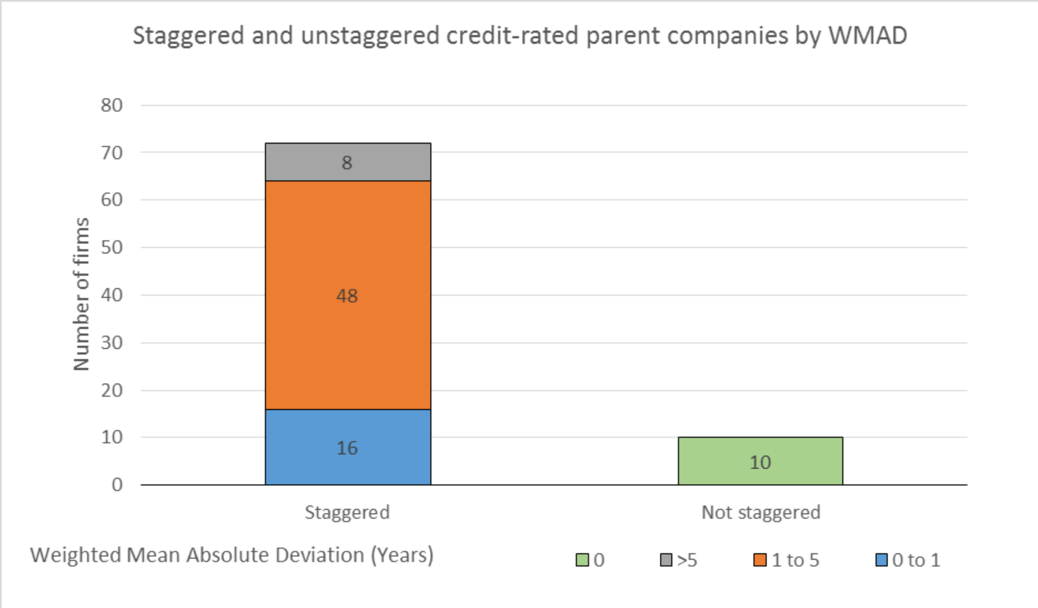
16. Of the 82 parent companies with credit ratings, 10 are identified by WMAD as not having staggered their debt while the remaining 72 are identified as having done so. This comparison is shown below in Figure 3.[2]

17. Figure 4 shows a histogram of the WMAD for the 62 parent companies in our subsample that stagger their debt. As seen in Figure 4, only 40% of companies in the sample of firms that have credit ratings have a WMAD of 1.5 years or less. In contrast, the percentage of companies in the full sample (including firms without credit ratings) with WMAD of 1.5 years or less in the full sample is much higher at 70%.[3]

[2] WMAD (and SSD) identify one additional company, Boral Ltd, as having unstaggered debt. This arises because Boral Ltd has two debts – a bond with A$ 157.78 m outstanding, and a revolver loan of amount A$ 500 m, but $0 outstanding. The range statistic takes the revolver loan into account, but the WMAD and SSD both assign no weight to it, which leads these two measures to conclude that no debt staggering occurred in this case.

[3] See Figure 101.

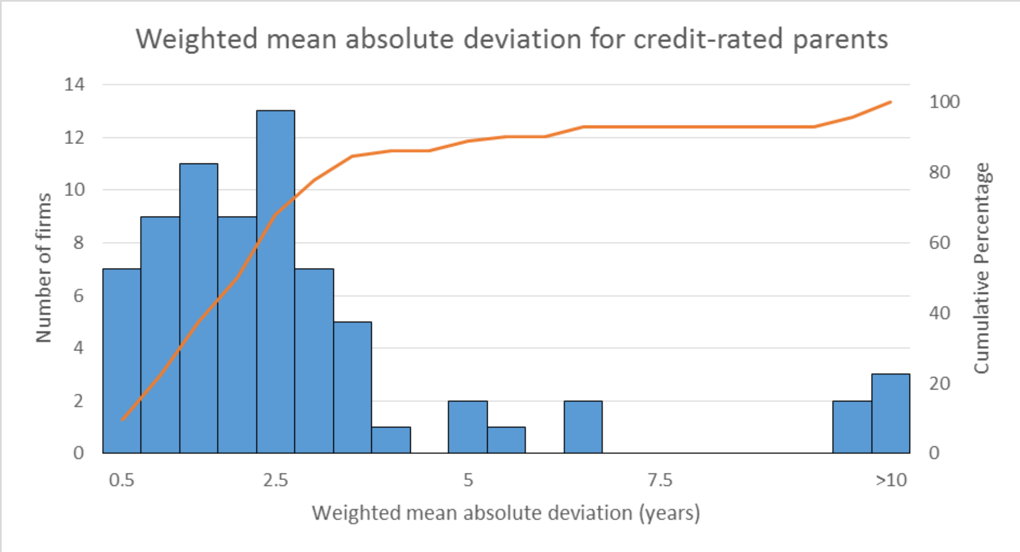
Figure 3: Staggered and unstaggered parent companies with credit ratings, measured using the Weighted Mean Absolute Deviation statistic



18. Once more it is important to note that, of the 9 firms – excluding Boral Ltd's unique case as pointed out in Footnote 2 above – that have only one debt issuance (i.e., have a zero WMAD and therefore do 'not stagger' their debt according to this definition), four of these have sub investment grade credit ratings and the average remaining maturity of the single debt issuance for the other 5 firms is 6.9 years.

19. 56 out of the 82 firms with credit ratings have WMAD score of greater than 1.0 – consistent with spreading debt over a maturity period of more than 4 years. Moreover, the firms that have WMADs of less than 1.0 tend to not have any debt falling due in the immediate future. For these firms, the mean and median periods for the shortest maturity debt are 3.1 and 2.3 years respectively.

Figure 4: Distribution of the Weighted Mean Absolute Deviation statistic for parent companies with credit ratings and staggered debt



1.2.3 Sum of squared percentage debt

20. Within the subsample of 82 parent companies with credit ratings, SSD identifies 10 parent companies as not having staggered their debt, and 72 parent companies as having done so. This comparison can be seen in Figure 5.

21. Of the 72 parent companies in the subsample identified as having staggered debt, 31 had high debt staggering (SSD below 2000), 27 had medium debt staggering (SSD between 2000 and 4000), and 14 had low debt staggering (SSD above 4000). This is shown in Figure 6.[4]

22. SSD also identifies the subsample of parent companies with credit ratings as having more staggered debts than the full sample. In particular, the subsample with credit ratings have a higher proportion of companies with staggered debts. Of these, the proportion of companies with high and medium debt staggering in the subsample are both higher than their counterparts in the full sample.[5]

[4] See Section 5.2 and Section 11.1.3 for the definitions we used to classify high, medium, and low levels of debt staggering.

[5] See Figure 103.

Figure 5: Staggered and unstaggered parent companies with credit ratings, measured using the Sum of Squared Percentage Deviation statistic

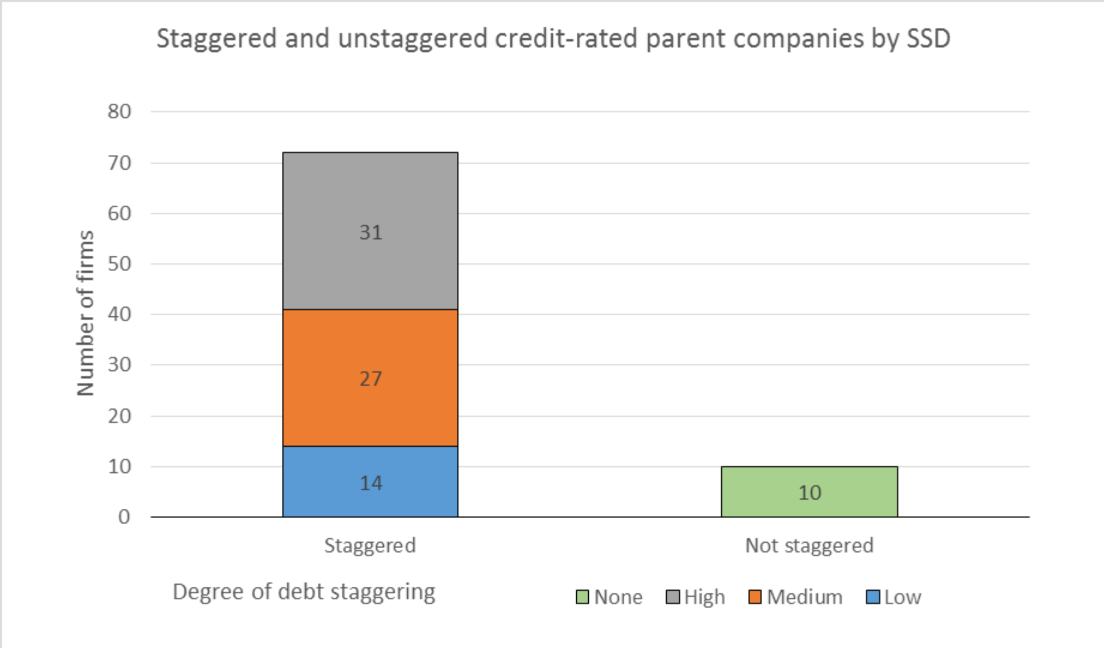
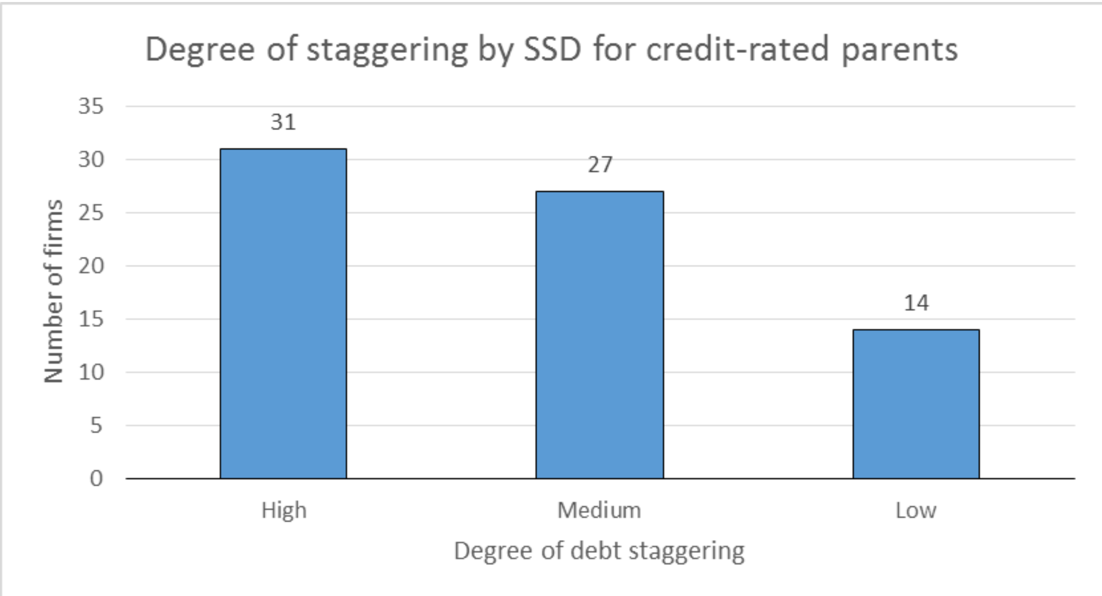


Figure 6: Degree of debt staggering by parent companies with credit ratings, as measured by the Sum of Squared Percentage Debt statistic



1.3 Conclusion

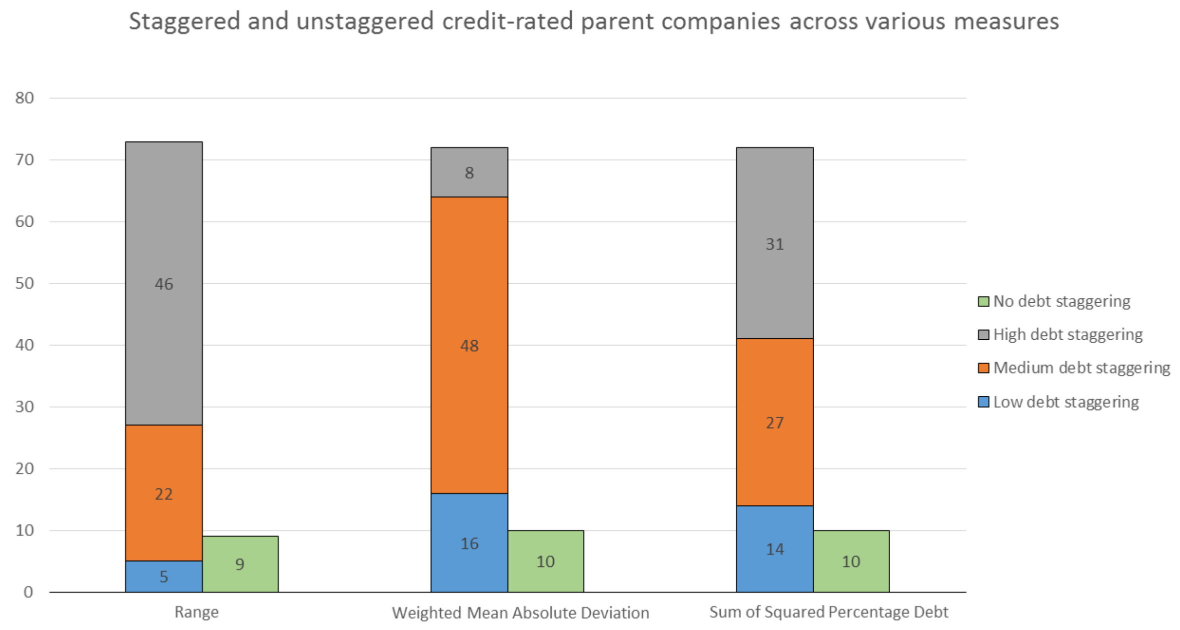
23. This survey makes clear that it is the standard practice of Australian firms with credit ratings to stagger their debt issuance.

24. Only 9 out of the 82 firms with credit ratings have as single debt issuance (i.e., no staggering of maturity). Four of these have sub investment grade credit ratings. Of the 5 remaining firms with investment grade credit ratings the average remaining maturity of their single debt issuance is 6.9 years (and the shortest is 3 years).

25. 72 out of the 82 firms with credit ratings practice debt staggering, as identified by a WMAD score of greater than 0. 56 out of these 72 firms have WMAD score of greater than 1.0 – consistent with spreading debt over a maturity period of more than 4 years. Moreover, the firms that have WMADs of less than 1.0 tend to not have any debt falling due in the immediate future. For these firms, the mean and median periods for the shortest maturity debt are 3.1 and 2.3 years respectively.

26. The distribution of companies with high, medium, low, and no debt staggering as assessed by each of the three measures is shown in Figure 7.[6]

Figure 7: Staggered and unstaggered credit-rated parent companies as assessed by the three measures



[6] As with Figure 1 and Figure 3, high, medium, and low debt staggering for the range and weighted mean absolute deviation refer to values of >5, 1-5, and <1 year respectively.

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2 Introduction

27. My name is Thomas Nicholas Hird and I am a founding director of CEG Asia Pacific (**CEG**) and head of its Melbourne office. I have a Ph.D. in Economics from Monash University and am an Honorary Fellow of its economics faculty. I have more than 20 years of experience in the economic analysis of markets and in the provision of expert advice in regulatory, litigation and policy contexts. I have provided expert testimony before courts and in numerous regulatory forums.

28. We have been invited by DBP to provide an expert empirical assessment of how firms in the economy at large finance their debt, with a focus on whether or not they stagger their debt. The focus is not on firms in the regulated energy sector, for which several reports are already available, but rather for firms outside this sector.

29. DBP is also interested in assessing the debt financing structures for different types of firms, such as those:

- In different sectors of the economy;
- With different fixed cost levels (that is, firms with large and small asset bases), and;
- In industries with differing levels of competitiveness (for example, industries with more or less competitors or higher or lower Herfindahl-Hirschman Indices).

30. The specific issue we have been asked to address is set out below.

> *We require an expert empirical assessment of how firms in the economy at large finance their debt, with a focus in particular on whether or not they stagger their debt. The focus is not on firms in the regulated energy sector, for which several reports are already available, but rather for firms outside this sector.*

2.1 Structure of this report

31. We address the above issues in the remainder of this report, which is structured as follows:

- **Section 3** provides an overview of the methodology used to select the sample of bonds and loans from Bloomberg's database, and provides a brief description of the data processing issues that were encountered with the sample.
- **Section 4** contains descriptive statistics on the debts included in our sample. In particular, the section considers the distribution of the amount and type of debt outstanding, year of debt issuance, year of debt maturity, and considers the debt staggering carried out by two parent companies in the sample.

- **Section 5** presents the descriptive statistics for debts issued by each of the 12 industry sectors represented in our sample, and classifies them into high, medium, and low competitiveness according to the Herfindahl-Hirschman Index (HHI).
- **Sections 6 to 7** describe the approach used to classify the parent companies within our sample according to their fixed cost levels and debt-to-equity ratios respectively. Specifically, the parent companies were divided into two groups according to whether they were above or below the median for each variable.
- **Section 8** describes the measure used to identify the credit ratings of the parent companies in the sample, and shows the distribution of debts across each credit rating.
- **Sections 9** presents the empirical evidence regarding the term of debt at the date of issue for different subsamples. The distribution of the term of debt, as well as the weighted and simple averages, are shown for firms in different industry sectors, with high or low fixed cost levels and debt-to-equity ratios, and for different credit ratings.
- **Section 10** presents the empirical evidence of the year of debt issuance and year of debt maturity for the same list of subsamples studied in **Section 9**.
- **Section 11** defines three measures used to quantify the extent of debt staggering by parent companies – range, weighted mean absolute deviation (WMAD), and sum of squared percentage debt (SSD)
- **Appendix A** shows the distributions of the year of debt issuance and year of debt maturity for the 82 parent companies in the sample that had issued at least one credit-rated debt. The weighted and simple average debt term and time to maturity of the debts issued by those parent companies are also shown.

32. I acknowledge that I have read, understood and complied with the Federal Court of Australia's *Practice Note CM 7, Expert Witnesses in Proceedings in the Federal Court of Australia*. . No matters of significance that I regard as relevant have to our knowledge been withheld.

Thomas Nicholas Hird

23 December 2014

3 Sample selection and data processing

3.1 Sample selection

33. The sample was obtained by searching Bloomberg's database for active corporate bonds and loans, and consolidating all duplicate bonds. Since this study focuses on how businesses in Australia structure their debt, we therefore limited the search to debts that categorised Australia as the associated country of risk. This mirrors the approach that the Economic Regulation Authority in Western Australia used to identify Australian bonds.[7]

34. Bloomberg considers four factors when determining an issuer's country of risk. These factors, in order of importance, are as follows:

    - Management location (usually defined by the country of domicile);
    - Country of primary listing;
    - Country of revenue; and
    - Reporting currency of the issuer.

35. We also investigated constructing the sample according to the debt issuer's country of domicile, but found that the country of risk approach was most appropriate for this study because the former method left out debts that were issued by foreign subsidiaries of Australian firms. Such debts are clearly relevant to this study because they are likely to have an impact on the respective parent company's risk profile and would therefore influence their debt-structuring and debt-staggering decisions. As such, we concluded that the country of risk approach produced the most suitable sample for this study.

36. The search was conducted on 20 October 2014. Out of the 304,969 active bonds and loans listed on Bloomberg on that date, 4697 listed Australia as the country of risk, and were thus included in our sample. These consisted of 3171 bonds and 1526 loans issued by 747 issuing companies. In turn, these issuers were traced to 619 ultimate parent companies.

3.2 Initial data processing

37. The following data for the debts in our sample required some initial data processing before analysis could be carried out:

    - Issue date and maturity;

[7] Economic Regulation Authority, 'Draft Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution System', 14 October 2014, p. 206.

- Amount outstanding;
- Industry classification;
- Industry competitiveness;
- Fixed cost levels;
- Debt-to-equity ratio; and
- Credit rating.

3.2.1 Issue date and maturity

38. The maturity of each debt is used to determine its time to maturity in years as at 20 October 2014. The time to maturity is in turn used to calculate the weighted average time to maturity of various subsamples in this study, with the amount of debt outstanding being used as weights.

39. In addition, the sample contains 25 perpetual bonds, which do not have an explicit maturity date. These bonds are not included in our subsequent analysis since the respective issuers have the option of not repaying the principal amounts on these bonds.

3.2.2 Amount outstanding

40. We used Bloomberg's data on the amount of debt outstanding whenever it was available. If there was no information available on the amount of debt outstanding, we employed a conservative approach and assumed that the entire debt remained outstanding.

41. This is particularly significant with revolver loans, which involve loan agreements whereby the borrower can repay and redraw varying loan amounts up to an agreed maximum, which results in sparse data on the actual amount of debt remaining. Where relevant, the charts displayed in subsequent sections will distinguish between the amount of debt outstanding and the amount that remains available in a revolver loan.

42. We also converted all foreign-denominated debts to their Australian-dollar equivalents using the end-of-day exchange rate on the issue date of the debt. If the issue date fell on a weekend, we used the end-of-day exchange rate on the Friday of that week. While this approach produces a fairly accurate currency conversion for most debts, it should be noted that the conversion will be less precise when applied to revolver loans and callable debts since the relevant currency exchange rate in these cases may differ from the exchange rate on the issue date.

3.2.3 Industry classification

43. Each debt in the sample was classified according to the Bloomberg Industry Classification System (BICS). The BICS sets out three levels of classifications: industry sector, industry group, and industry subgroup.

44. The three levels of BICS classifications are available on the debt, the issuer, and the parent company. The industry classification of the issuer is generally most relevant for our analysis since it most closely reflects the underlying corporate context of the debt for comparison across industries.

45. For example, the bond issued by Ausdrill Ltd on 9 Nov 2012 with maturity on 1 Nov 2019 is classified under the finance industrial sector, since the offering memorandum states that the proceeds of the offering were to be used for repaying a previous loan. The issuer itself, however, is in the basic materials industry sector, and the bond should thus be considered in that context when making comparisons to debts issued by other businesses in the same industry.

46. The issuers in the sample fall into 12 industry sectors, 65 industry groups, and 189 industry subgroups. These are set out in Section 5.

3.2.4 Industry competitiveness

47. The formula for the Herfindahl-Hirschman Index (HHI), a commonly used measure for determining the competitiveness of industry sectors, requires data on the market shares of all firms in the sector of interest.

48. Since Bloomberg does not keep track of the domestic market shares of firms within Australian industry sectors, we applied an alternative approach to determining domestic market share based on the proportion of an individual issuer's sales revenue relative to the total sales revenue of all issuers within our sample that also belong to the same industry sector. Our approach is described in Section 5.

49. Out of the 12 industry sectors in our sample, there was insufficient revenue data on Bloomberg for three of them (funds, government, and diversified). Of the remaining nine sectors, two were classified as sectors with high competitiveness, while four and three sectors were classified as having medium and low competitiveness respectively.

3.2.5 Fixed cost levels

50. In considering the debt financing structures of firms with different fixed cost levels, it is necessary to obtain historical data on fixed cost levels in Australian dollars as at the issue date of the debt as opposed to current values. This is because the fixed cost levels of many of the firms in our sample have grown substantially between the issue date and the current time period. It would thus be inaccurate to classify a firm

as having high fixed costs if its fixed costs were substantially lower as at the issue date of the debt.

51. Bloomberg stores data on the reported net fixed assets (property, plant, and equipment) of debt issuers and parent companies, defined as the value of gross fixed assets less accumulated depreciation.

52. In turn, fixed assets are defined as:

> *"Those assets of a permanent nature required for the normal conduct of a business, and which will not normally be converted into cash during the ensuring [sic] fiscal period."*

53. Since companies do not frequently report the values of their net fixed assets, we obtained the historical values of net fixed assets as at 31 December on the year of debt issue. This approach yielded the most data on net fixed assets from Bloomberg, although no data was available for historical values in 2005, 2006, and 2011.

54. Our analysis focuses on the fixed cost levels of the parent company and not the issuer since the debt financing structure of the former provides a better reflection of the extent of debt staggering being carried out. For example, a parent company with several subsidiaries that each issued one debt maturing in different years has clearly staggered its debt – a decision that would not be apparent if the analysis focused on the debt financing structure of the individual issuers.

55. One problem with the above approach is that analysing the debt financing structure of parent companies occasionally leads to nonsensical results with state-owned subsidiaries because Bloomberg sometimes lists the whole country as the ultimate parent of the issuer. In such cases, we traced the corporate hierarchy of each issuer to identify the parent level at which the decision-making on debt financing was likely to be made. Our findings on this issue are further elaborated on in Section 6.

3.2.6 Debt-to-equity ratio

56. Bloomberg provides data on two debt-to-equity ratios: total-debt-to-common-equity and total-debt-to-total-equity. The key financial data in these ratios are defined as follows:

- Total debt: Sum of short-term and long-term borrowings
- Total equity: Sum of common equity, minority interest, and preferred equity
- Total common equity: Sum of share capital, share premium, and retained earnings

57. The total-debt-to-total-equity ratio is more suitable for our analysis since it more accurately reflects the extent of gearing by the borrower, which could influence their decision-making regarding debt staggering.

58. As with our approach to fixed cost levels, our analysis focuses on the debt-to-equity ratio of the parent company unless the ultimate parent company identified by Bloomberg is clearly inappropriate. We also used historical debt-to-equity ratio data as at the issue date, which most closely reflects the conditions facing the parent company at the time of issue. This approach led to the same issue whereby Bloomberg does not have historical data for 2005, 2006, and 2011.

3.2.7 Credit rating

59. Bloomberg tracks debt ratings from three credit rating agencies: Standard & Poor's (S&P), Moody's, and Fitch. We selected Standard & Poor's ratings for our analysis since they are commonly used in practice, having been referred to by the Reserve Bank of Australia and the Economic Regulation Authority in Western Australia.[8,9]

60. Of the various credit ratings provided by S&P, the Long Term Local Currency Issuer Credit Rating was selected for use in this study because it yielded the most number of credit ratings for our sample and is also a more suitable consideration for the structuring of long term debt. This rating is defined as the rating assigned to the "long term obligations of the issuer if repaid in the local currency of the issuer".

61. Out of the 4697 debts in our sample, 2724 received credit ratings, which ranged from AA+ to B-. The credit rating breakdown of the debts in the sample are set out in Section 8.

3.2.8 Summary of data to be used

62. Table 1 summarises the initial data processing applied to the data obtained from Bloomberg.

[8] Reserve Bank of Australia, 'New Measures of Australian Corporate Credit Spreads', *Bulletin*, December quarter 2013, p. 25.

[9] Economic Regulation Authority, 'Draft Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution System', 14 October 2014, p. 206.

Table 1: Summary of data obtained from Bloomberg

	Data	Reason
Industry competitiveness	HHI of issuer's industry sector	More closely reflects the industry associated with the debt
Fixed cost levels	Parent company's historical net fixed assets if reasonable	Debt staggering reflects the risk management approach of the parent company
Debt-to-equity ratio	Parent company's total debt to total equity ratio if reasonable	Debt staggering reflects the risk management approach of the parent company
Credit rating	S&P long term local currency issuer credit rating	Matches the long-term considerations related to debt staggering and yields the most ratings in the sample data

3.2.9 Weighted average and simple average

63. The main statistics used for comparing the debt term and time to maturity across subsamples are the weighted average and simple average of the variable of interest. The weighted average is weighted according to the amount of debt outstanding, which means that larger debts will have more influence on it.

64. The difference between the weighted average and simple average provides some information on the distribution of the variable of interest. For instance, in the case of debt term at issuance, a weighted average that exceeds the simple average generally suggests that the subsample contains long-term debts with larger outstanding amounts and short-term debts with smaller outstanding amounts.

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4 Sample descriptive statistics

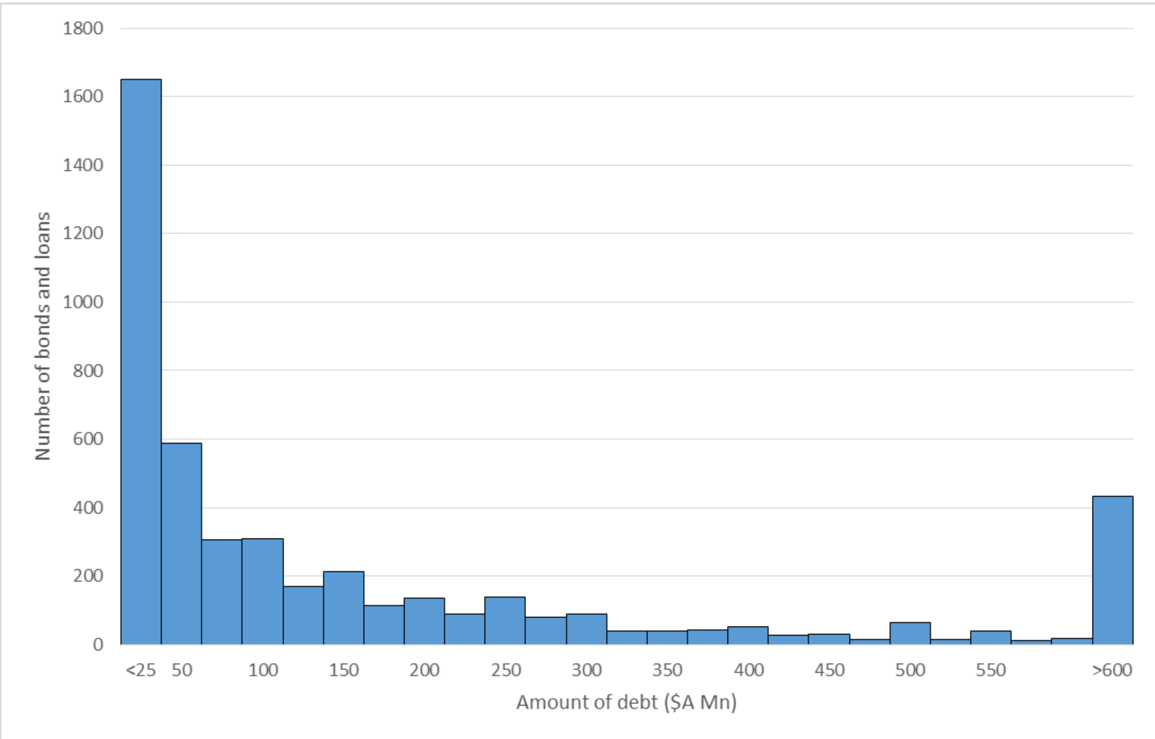
65. This section contains descriptive statistics for our full sample. More detailed analysis of various subsamples can be found in the subsequent sections.

4.1 Amount of debt outstanding

66. The total amount of debt outstanding across all 4697 debts is A$ 988,491 million. The mean amount outstanding per debt is A$ 210 million, while the median amount is A$ 57 million and the mode is A$ 10 million. Excluding perpetual bonds, the minimum loan is A$ 0.15 million and the maximum loan is A$ 5284 million.

67. Figure 8 shows a histogram of the number of debts against outstanding debt amounts at A$ 25 million increments. The histogram shows that the distribution of outstanding debt amounts is positively skewed with decreasing frequency of outstanding debt from the peak at the category of debt with less than A$ 25 million outstanding. An interesting observation is that the debt frequencies appear to be alternating across the categories, with the ones corresponding to multiples of A$ 50 million usually being more frequent than their adjacent categories.

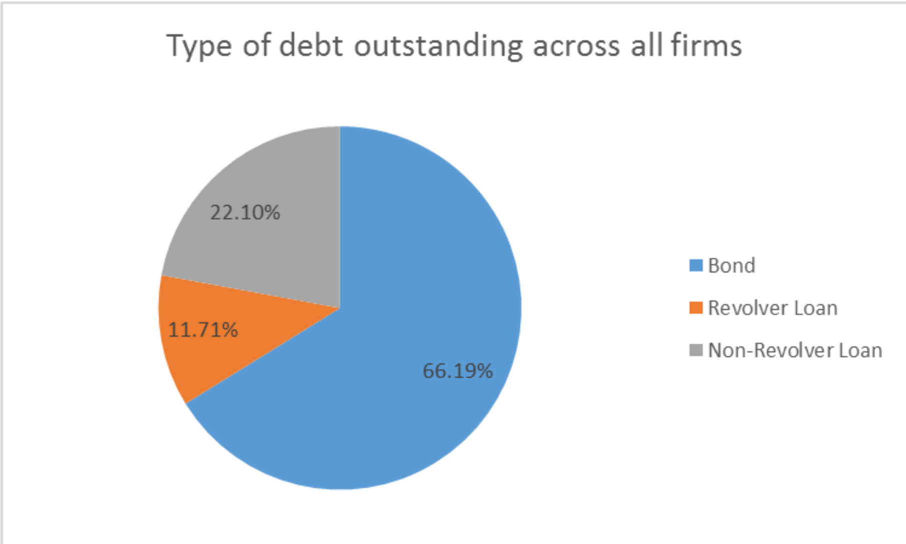
Figure 8: Histogram of number of debts against amounts outstanding



4.2 Type of debt outstanding

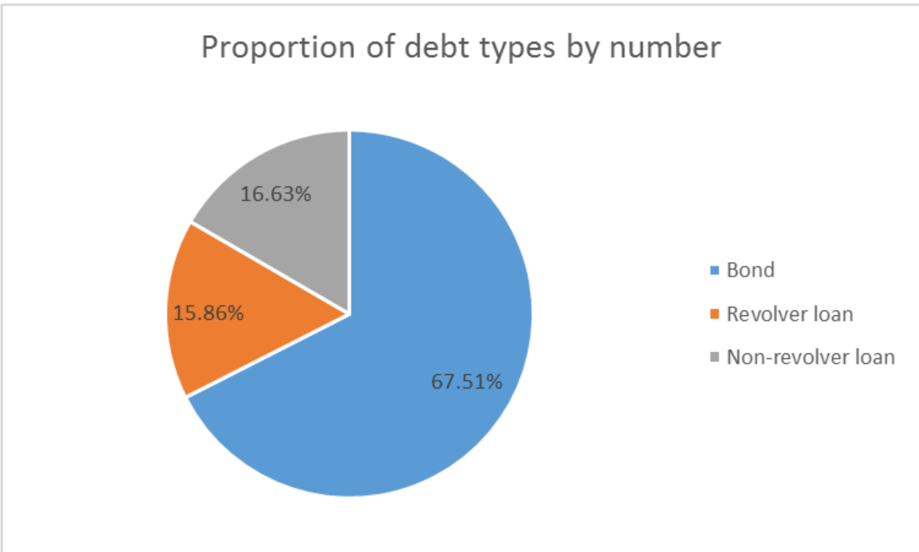
68. About 66% of the amount of debt outstanding in our sample is in the form of bonds, while the remaining 34% are in the form of bank loans. Of these, 12% of the total amount of debt outstanding is in the form of revolver loans and 22% is in the form of non-revolver loans. This split is illustrated in Figure 9.

Figure 9: Type of debt outstanding across all firms in the sample



69. In terms of the number of debts issued, 68% of the debts in our sample are in the form of bonds, 16% are revolver loans, and 17% are non-revolver loans. Figure 10 shows these proportions of the number of debts outstanding for each type.

Figure 10: Proportion of each debt type by number



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70. The numerical values behind Figure 9 and Figure 10 are set out in Table 2, as well as the total amount of debt outstanding for each of the three types.

Table 2: Amount and number of each debt type

	Bond	Revolver Loan	Non-revolver Loan	Total
Amount of debt (AUD millions)	654,078.5	116,015.8	218,396.6	988,490.9
Percentage	66.19%	11.71%	22.10%	100.00%
Number of debts	3171	745	781	4697
Percentage	67.51%	15.86%	16.63%	100.00%

**Values in A$ Millions*

4.3 Year of debt issuance

71. Majority of the outstanding debt in the sample was issued in recent years, with the percentage of debt issued generally increasing from 2008 onwards. Outstanding debt issued in the last three calendar years make up 67% of all debt outstanding in our sample (21%, 23%, and 23% in 2012, 2013, and 2014 respectively).

72. The fact that the amount of debt outstanding has increased for debts issued in more recent calendar years is expected, since most of the short-term debts issued in earlier years would have been cleared, and would thus not appear in our search for active bonds and loans, leading to the observed reduction in outstanding debt for those years.

73. The year of debt issuance for each of the three types of outstanding debt is shown in Figure 11, along with the percentages of outstanding debt. The amount of debt outstanding against each year of issuance is shown in Table 3.

Figure 11: Year of debt issuance across all firms

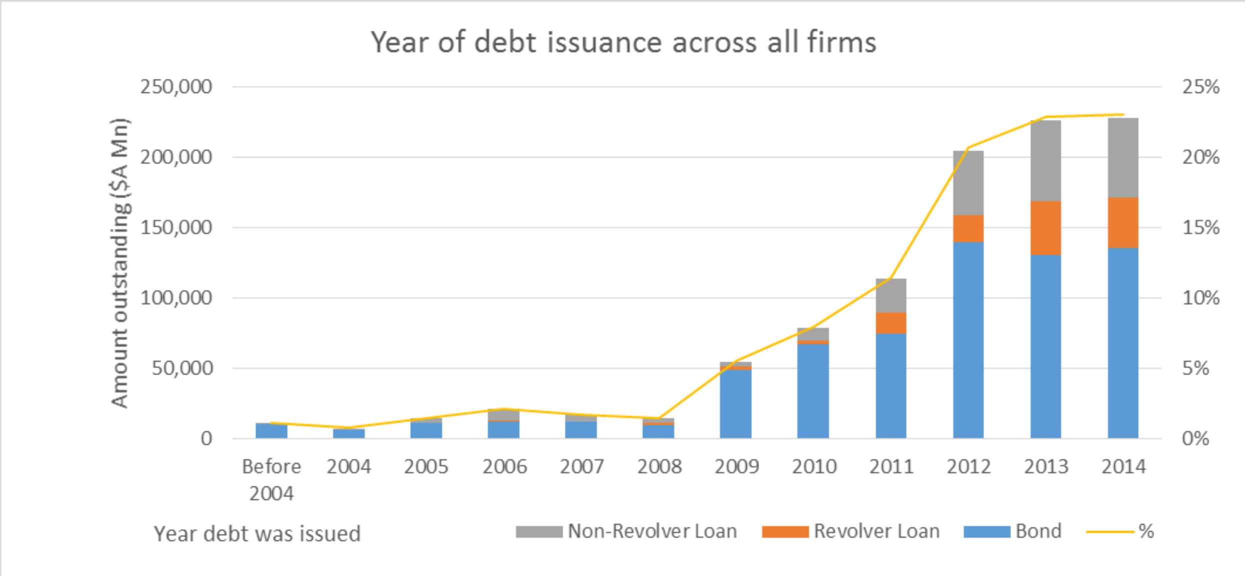


Table 3: Year of debt issuance for all debts in the sample

Issue Year	Bond	Revolver Loan	Non-Revolver Loan	Total Loan	Amount Outstanding	%
Before 2004	9,934.3	7.1	565.9	573.0	10,507.3	1.1%
2004	6,291.8	5.6	783.0	788.5	7,080.4	0.7%
2005	10,730.1	0.0	3,471.4	3,471.4	14,201.5	1.4%
2006	12,084.5	247.4	8,416.2	8,663.7	20,748.2	2.1%
2007	11,351.7	451.0	4,608.9	5,059.9	16,411.5	1.7%
2008	9,465.9	1,096.8	3,449.0	4,545.8	14,011.7	1.4%
2009	48,088.9	2,823.8	3,759.5	6,583.3	54,672.2	5.5%
2010	66,987.2	2,664.1	9,127.7	11,791.7	78,779.0	8.0%
2011	74,459.6	14,756.9	24,259.9	39,016.8	113,476.5	11.5%
2012	139,266.0	19,223.8	46,190.5	65,414.3	204,680.3	20.7%
2013	130,438.3	38,341.7	57,172.0	95,513.7	225,952.1	22.9%
2014	134,980.0	36,397.7	56,592.5	92,990.2	227,970.3	23.1%
Total	**654,078.5**	**116,015.8**	**218,396.6**	**334,412.4**	**988,490.9**	**100.0%**

**Values in A$ Millions*

4.4 Debt term

74. Most of the debts in our sample are in the form of short-term debts. 63% of the amount of outstanding debt in our sample was issued with a term of 6 years or less,

while 94% of the outstanding debt in our sample was issued with a term of 16 years or less.

75. This is illustrated in Figure 12, which shows the amount of debt outstanding for various debt terms in years, along with their corresponding percentages. The figure shows that the distribution of debt terms is positively skewed, and that the proportion of debt in the form of bonds greatly increases for debt terms of 10 years or more. However, an exception occurs at the 15-16 year category, which has A$ 27,800 million of debt outstanding in the form of non-revolver loans. Of these, A$ 17,820 million is attributed to Ichthys LNG Pty Ltd, which issued all of their 14 bonds in December 2012 and January 2013, with maturities in December 2028.

76. Table 4 shows the amount of outstanding debt for various debt terms, as well as their corresponding percentages and cumulative percentages.

Figure 12: Debt term at issuance across all firms

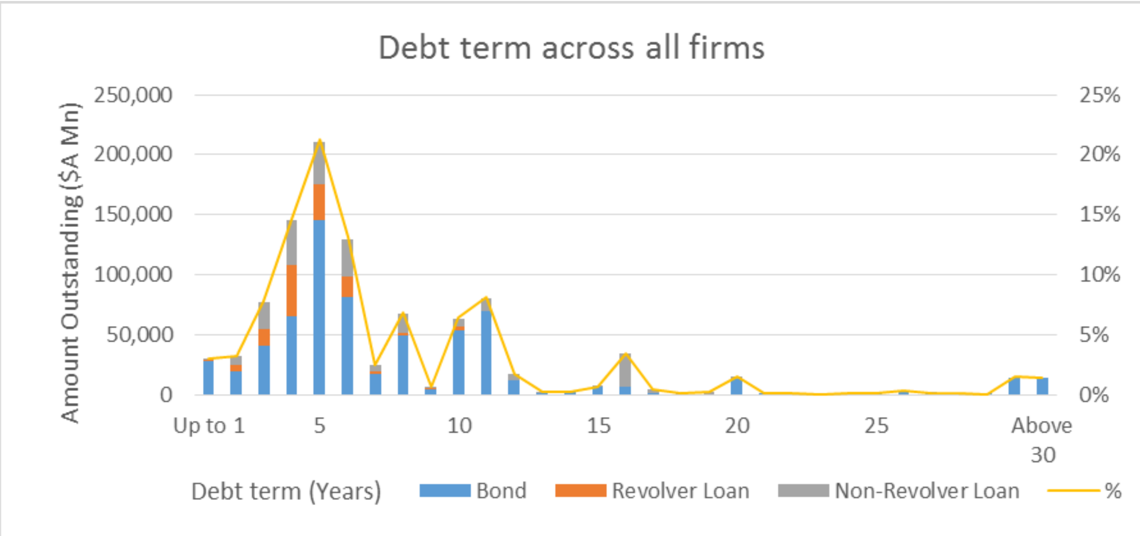


Table 4: Debt term at issuance for the whole sample

Debt Term (Yrs)	Bond	Revolver Loan	Non-Revolver Loan	Total Loan	Amount Outstanding	%	Cumulative Percentage
Up to 1	28,217.6	997.0	738.8	1,735.8	29,953.5	3.0%	3.0%
2	19,502.1	4,615.8	7,861.4	12,477.1	31,979.3	3.2%	6.3%
3	40,997.9	13,274.7	22,994.3	36,269.0	77,266.9	7.8%	14.1%
4	65,223.2	42,854.8	37,190.5	80,045.3	145,268.4	14.7%	28.8%
5	145,760.5	29,502.9	35,086.1	64,589.0	210,349.5	21.3%	50.1%
6	81,275.2	17,548.1	30,912.0	48,460.1	129,735.3	13.1%	63.2%
7	17,594.1	1,676.5	5,532.8	7,209.3	24,803.4	2.5%	65.7%

8	49,517.9	1,571.3	16,579.7	18,151.0	67,668.9	6.8%	72.5%
9	4,127.2	1,209.3	1,301.5	2,510.8	6,638.0	0.7%	73.2%
10	53,616.3	2,551.9	7,356.7	9,908.6	63,524.9	6.4%	79.6%
11	69,549.8	20.0	11,000.6	11,020.6	80,570.4	8.2%	87.8%
12	11,605.2	167.1	5,031.2	5,198.3	16,803.5	1.7%	89.5%
13	1,550.2	0.0	564.4	564.4	2,114.6	0.2%	89.7%
14	2,423.0	5.6	0.0	5.6	2,428.6	0.2%	89.9%
15	5,968.5	0.0	206.0	206.0	6,174.5	0.6%	90.6%
16	6,523.0	21.0	27,800.0	27,821.0	34,344.0	3.5%	94.0%
17	868.8	0.0	2,984.1	2,984.1	3,852.9	0.4%	94.4%
18	158.0	0.0	716.1	716.1	874.1	0.1%	94.5%
19	514.0	0.0	1,484.8	1,484.8	1,998.8	0.2%	94.7%
20	12,384.9	0.0	2,255.0	2,255.0	14,639.9	1.5%	96.2%
21	1,452.5	0.0	0.0	0.0	1,452.5	0.1%	96.4%
22	493.8	0.0	176.2	176.2	670.0	0.1%	96.4%
23	132.6	0.0	300.9	300.9	433.5	0.0%	96.5%
24	417.9	0.0	214.0	214.0	631.9	0.1%	96.5%
25	1,444.0	0.0	0.0	0.0	1,444.0	0.1%	96.7%
26	2,787.7	0.0	0.0	0.0	2,787.7	0.3%	97.0%
27	635.2	0.0	109.4	109.4	744.6	0.1%	97.0%
28	1,018.8	0.0	0.0	0.0	1,018.8	0.1%	97.1%
29	335.4	0.0	0.0	0.0	335.4	0.0%	97.2%
30	14,420.4	0.0	0.0	0.0	14,420.4	1.5%	98.6%
Above 30	13,562.9	0.0	0.0	0.0	13,562.9	1.4%	100.0%
Total	**654,078.5**	**116,015.8**	**218,396.6**	**334,412.4**	**988,490.9**	**100.0%**	

**Numbers in AUD millions*

77. The simple average debt term of all the debts in our sample is 8.7 years. When weighted according to the amount of debt outstanding, the weighted average debt term in our sample is 7.3 years.

78. The weighted average and simple average debt terms for each of the three types of debt are shown in Table 5. The table shows that the weighted average and simple average debt terms are considerably higher for bonds. This is to be expected because, as shown in Figure 12, bonds make up a substantially higher proportion of long-term debt as compared to short-term debt. On the other hand, the weighted average and simple average debt terms for revolver loans are the lowest of the three types because, as shown in Table 4, no revolver loans have a debt term exceeding 16 years.

Table 5: Average debt term at issuance for different debt types

	Bond	Revolver Loan	Non-revolver Loan	Overall
Weighted average debt term (Years)	7.91	4.15	7.08	7.28
Simple average debt term (Years)	10.62	3.98	5.58	8.69

4.5 Debt maturity

79. As identified in Section 4.4, 63% of the outstanding debts in our sample were issued with a debt term of 6 years or less. This observation also affects the observed debt maturities in our sample, with 75% of all outstanding debt maturing in 2019 or earlier, while 91% of all outstanding debt matures in 2024 or earlier.

80. Figure 13 shows the amount and percentage of debt maturing in each calendar year for all outstanding debt in our sample. The figure shows that the distribution of debt maturity is positively skewed with the mode at 2015. Similar to our observations in Section 4.4 regarding debt terms, it can be seen that the proportion of outstanding debt in the form of bonds increases considerably for maturity years 2020 and onwards with an exception at 2028. For the latter, a disproportionate amount is in the form of non-revolver loans and can be attributed to the same 14 bonds issued by Ichthys LNG Pty Ltd with maturities in December 2028.

81. Table 6 shows the numerical values for outstanding debt maturing in each year, as well as their corresponding percentages and cumulative percentages. The table shows that a small amount of debt has maturity dates listed before 2014, which refer to overdue debts that continue to remain active past their maturity dates.

Figure 13: Year of debt maturity across all firms

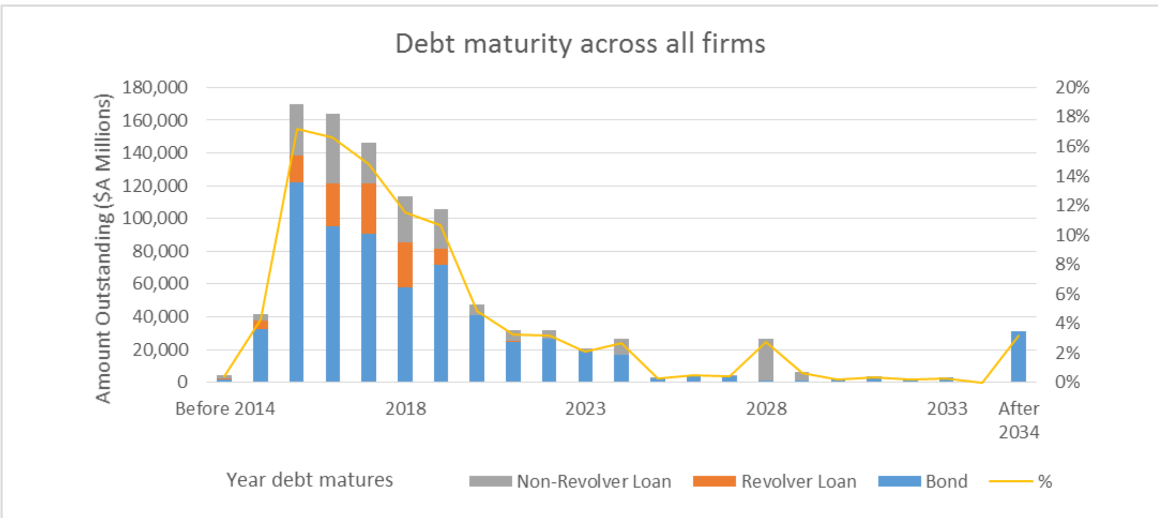


Table 6: Year of debt maturity across all firms

Maturity Year	Bond	Revolver Loan	Non-Revolver Loan	Total Loan	Amount Outstanding	%	Cumulative Percentage
Before 2014	1,943.8	320.6	1,976.7	2,297.3	4,241.1	0.4%	0.4%
2014	32,272.0	5,073.2	4,390.1	9,463.4	41,735.4	4.2%	4.7%
2015	122,136.3	15,977.5	31,494.3	47,471.8	169,608.1	17.2%	21.8%
2016	95,227.4	25,873.9	42,920.0	68,793.9	164,021.3	16.6%	38.4%
2017	90,854.9	30,591.8	25,014.9	55,606.7	146,461.5	14.8%	53.2%
2018	58,230.2	27,396.2	28,162.6	55,558.9	113,789.1	11.5%	64.7%
2019	71,441.1	10,058.2	24,159.2	34,217.4	105,658.4	10.7%	75.4%
2020	40,927.1	299.9	6,398.9	6,698.8	47,625.9	4.8%	80.2%
2021	24,754.4	403.5	6,593.7	6,997.2	31,751.7	3.2%	83.4%
2022	26,668.6	21.0	4,778.6	4,799.6	31,468.2	3.2%	86.6%
2023	19,363.1	0.0	994.8	994.8	20,357.9	2.1%	88.7%
2024	16,948.4	0.0	9,423.5	9,423.5	26,371.9	2.7%	91.4%
2025	2,391.8	0.0	222.5	222.5	2,614.3	0.3%	91.6%
2026	3,951.1	0.0	435.4	435.4	4,386.5	0.4%	92.1%
2027	3,723.3	0.0	214.0	214.0	3,937.3	0.4%	92.5%
2028	1,331.0	0.0	25,449.6	25,449.6	26,780.6	2.7%	95.2%
2029	988.6	0.0	5,097.7	5,097.7	6,086.4	0.6%	95.8%
2030	2,024.1	0.0	173.3	173.3	2,197.4	0.2%	96.0%
2031	3,079.2	0.0	396.8	396.8	3,476.1	0.4%	96.4%
2032	1,864.4	0.0	100.0	100.0	1,964.4	0.2%	96.6%
2033	2,728.3	0.0	0.0	0.0	2,728.3	0.3%	96.8%
2034	48.1	0.0	0.0	0.0	48.1	0.0%	96.8%
After 2034	31,181.0	0.0	0.0	0.0	31,181.0	3.2%	100.0%
Total	**654,078.5**	**116,015.8**	**218,396.6**	**334,412.4**	**988,490.9**	**100.0%**	

**Numbers in AUD millions*

Table 7: Average time to maturity for different debt types

	Bond	Revolver Loan	Non-revolver Loan	Overall
Weighted average time to maturity	5.04	2.55	4.81	4.69
Simple average time to maturity	6.61	2.17	3.16	5.38

82. Figure 14 shows the distribution of the weighted average debt maturities for the 619 parent companies in our sample, while Figure 15 shows their corresponding simple average debt maturities. Both figures also display the cumulative percentages for the variable of interest.

83. Both charts show positively-skewed distributions with modes at the 2-3 year category. In both charts, it can be seen that a small number of firms have average maturities below zero due to overdue debts. Approximately 85% of firms have a weighted average debt maturity up to 5 years, with a similar figure applying to the simple average debt maturity.

Figure 14: Weighted average debt maturity for all parent companies

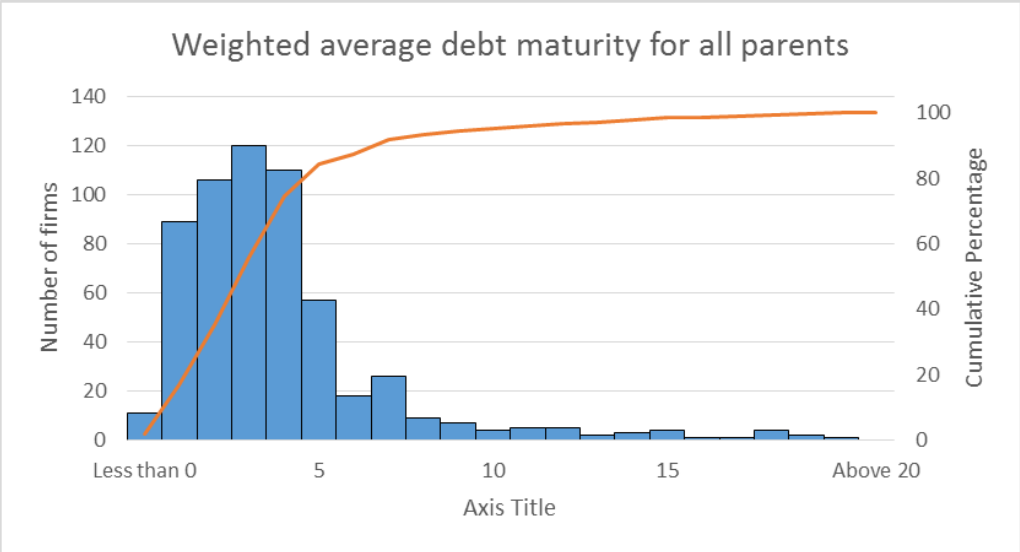
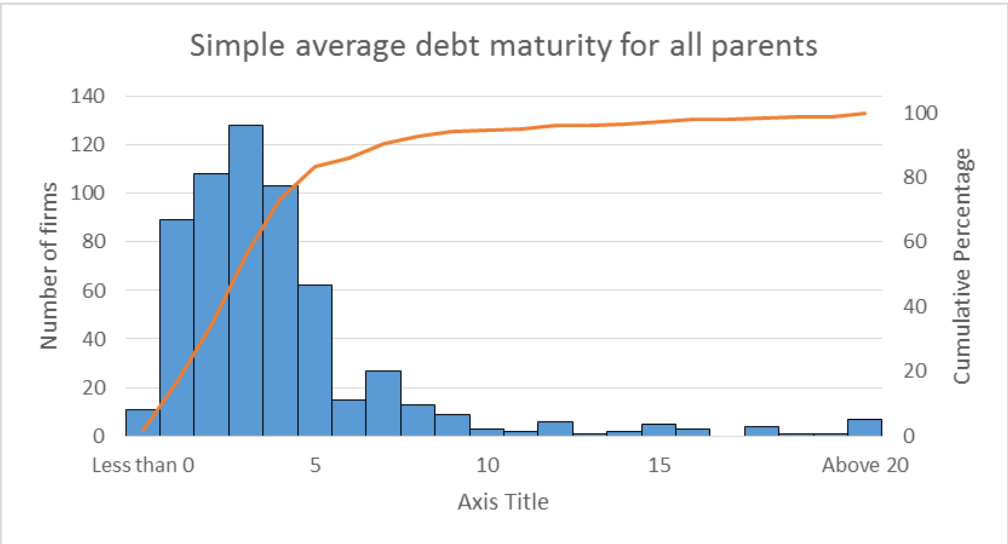


Figure 15: Simple average debt maturity for all parent companies



4.6 Debt staggering

84. Debt staggering refers to the structuring of debt by a firm, such that its various debts have different maturity dates, as opposed to having all of the debts being due at the same time.

85. This subsection shows the years of debt issuance and years of debt maturity for two example firms: Qantas Airways Ltd and Sun Group Finance Pty Ltd. The charts for the former show that the year of debt issuance and year of debt maturity are both staggered. The charts for the latter show that all five of the firm's debts were issued in 2014, but the firm nevertheless elected to stagger its debts by having two of its debts due in 2016, another two due in 2017, and one due in 2020. Both firms staggered their debts even when the types of debt were taken into account, since each debt type was due in different years. The corresponding data for the full list of all 82 parent companies in our sample that issued at least one debt with a Long Term Local Currency Issuer Credit Rating can be found in the Appendix.

86. Section 11 contains further analysis on how debt staggering can be quantified and introduces three statistical measures that can be used to compare debt staggering across parent companies.

4.6.1 Qantas Airways Ltd

87. Figure 16 shows the year of debt issuance for debts issued by Qantas Airways Ltd, while Figure 17 shows the year of debt maturity for those debts. The weighted average and simple average debt term and time to maturity for said debts are listed in Table 8. The list of debts issued by Qantas Airways Ltd, as well as the outstanding amounts and years to maturity, are listed in Table 9.

Figure 16: Year of debt issuance for Qantas Airways Ltd

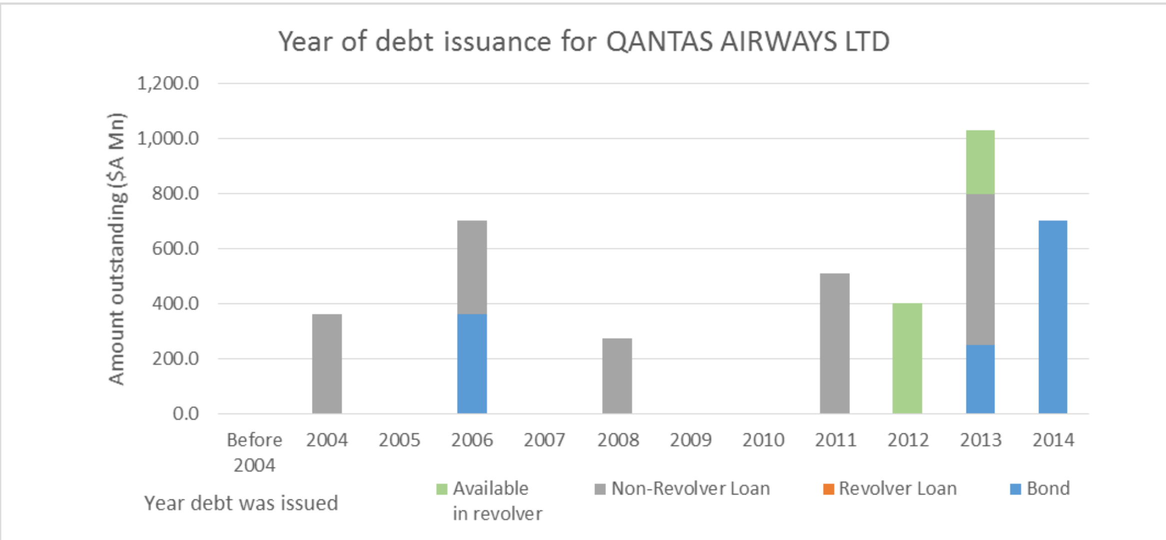


Figure 17: Debt maturity of QANTAS AIRWAYS LTD

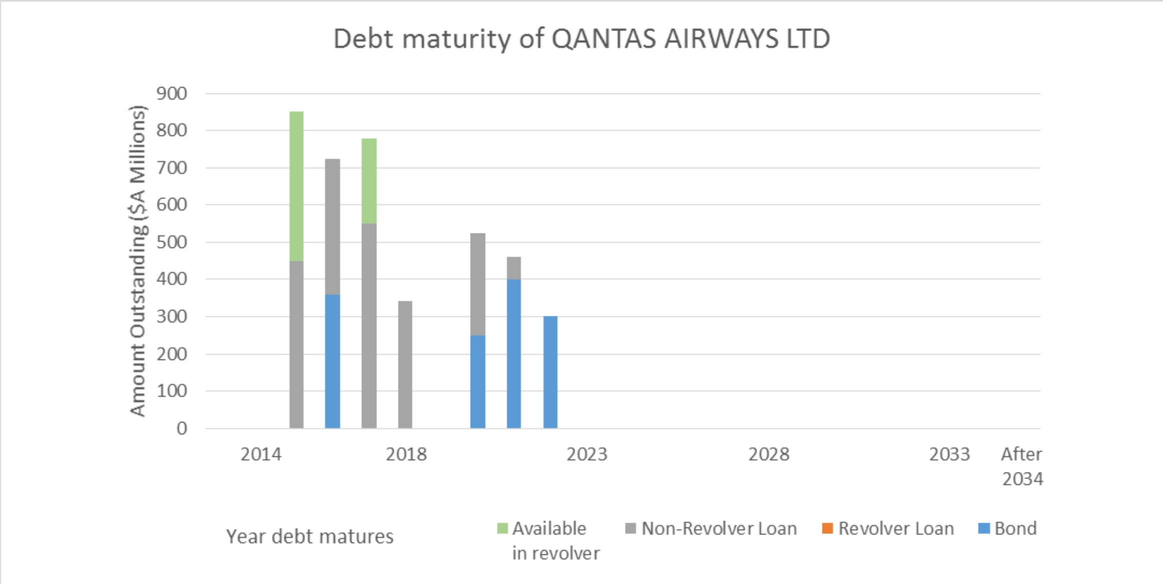


Table 8: Average debt term and time to maturity for Qantas Airways Ltd

	Bond	Revolver Loan	Non-revolver Loan	Overall
Number of debt	4	2	6	12
Amount outstanding	1,310.29	0.00	2,040.40	3,350.68
Weighted average debt term	8.06	N/A	8.02	8.04
Simple average debt term	8.01	3.51	27.02	7.76
Weighted average time to maturity	5.22	N/A	2.65	3.66
Simple average time to maturity	5.31	1.72	10.32	3.77

Table 9: List of debts issued by Qantas Airways Ltd

Index	Parent company	Type	Outstanding Amount	Time to maturity
1	QANTAS AIRWAYS LTD	Bond	400.00	6.64
2	QANTAS AIRWAYS LTD	Bond	250.00	5.52
3	QANTAS AIRWAYS LTD	Bond	300.00	7.58
4	QANTAS AIRWAYS LTD	Bond	360.29	1.49
5	QANTAS AIRWAYS LTD	Non-revolver loan	362.95	1.66
6	QANTAS AIRWAYS LTD	Non-revolver loan	550.00	2.48
7	QANTAS AIRWAYS LTD	Revolver loan	0.00*	0.96
8	QANTAS AIRWAYS LTD	Revolver loan	0.00*	2.48
9	QANTAS AIRWAYS LTD	Non-revolver loan	61.57	6.56

10	QANTAS AIRWAYS LTD	Non-revolver loan	274.88	6.00
11	QANTAS AIRWAYS LTD	Non-revolver loan	341.00	3.43
12	QANTAS AIRWAYS LTD	Non-revolver loan	450.00	0.49

**There is A$400 million and A$230 million available in revolver loans 7 and 8 respectively*

4.6.2 Sun Group Finance Pty Ltd

88. Figure 18 shows the year of debt issuance for debts issued by Sun Group Finance Pty Ltd, while Figure 19 shows the year of debt maturity for those debts. The weighted average and simple average debt term and time to maturity for said debts are listed in Table 11. The list of debts issued by Sun Group Finance Pty Ltd, as well as the outstanding amounts and years to maturity, are listed in Table 10.

Table 10: Average debt term and time to maturity for Sun Group Finance Pty Ltd

	Bond	Revolver loan	Non-revolver loan	Overall
Number	0	2	3	5
Amount Outstanding ($A Mn)	0.00	400.00	2,500.00	2,900.00
Weighted average debt term	N/A	2.90	3.16	3.13
Simple average debt term	N/A	2.47	4.95	2.97
Weighted average time to maturity	N/A	2.64	2.90	2.86
Simple average time to maturity	N/A	2.20	4.55	2.70

Figure 18: Year of debt issuance for Sun Group Finance Pty Ltd

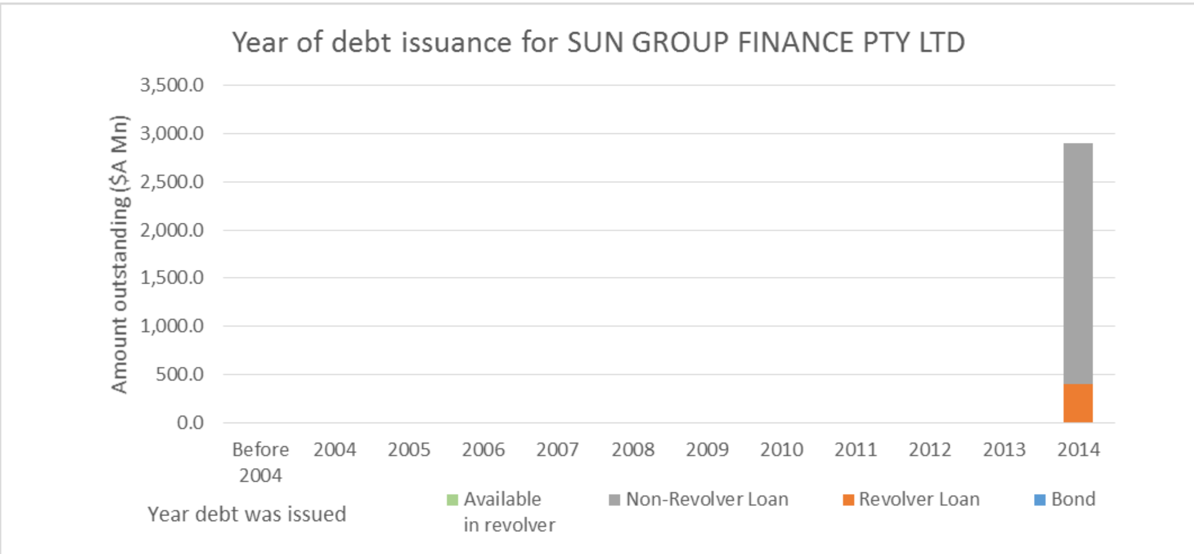


Figure 19: Debt maturity of Sun Group Finance Pty Ltd

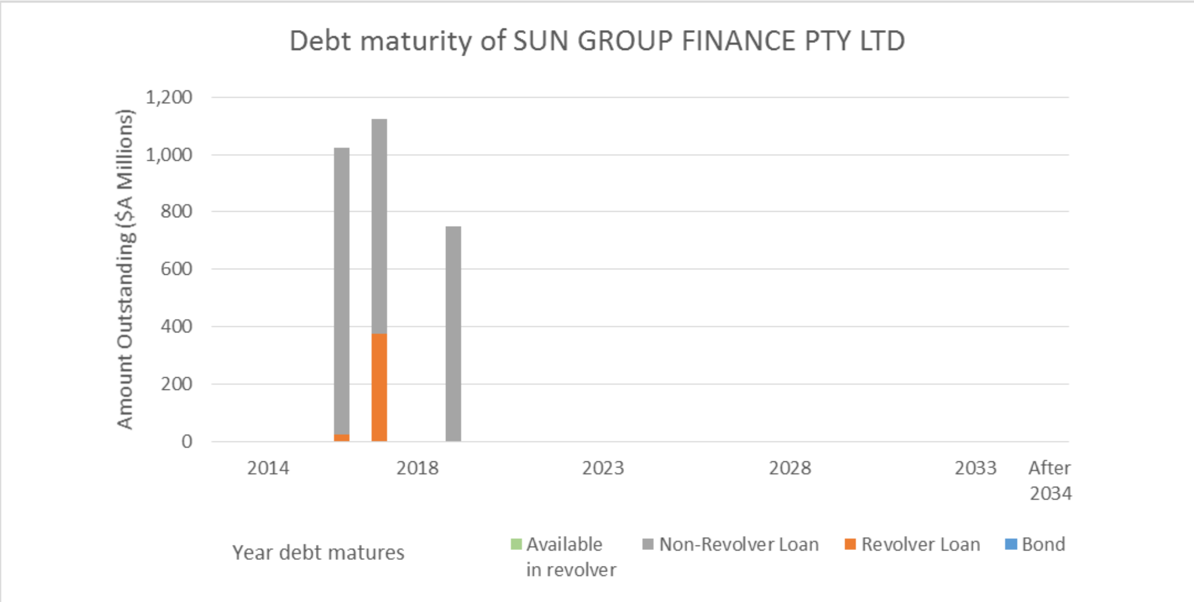


Table 11: Average debt term and time to maturity for Sun Group Finance Pty Ltd

	Bond	Revolver loan	Non-revolver loan	Overall
Number	0	2	3	5
Amount Outstanding ($A Mn)	0.00	400.00	2,500.00	2,900.00
Weighted average debt term	N/A	2.90	3.16	3.13
Simple average debt term	N/A	2.47	4.95	2.97
Weighted average time to maturity	N/A	2.64	2.90	2.86
Simple average time to maturity	N/A	2.20	4.55	2.70

Table 12: List of debts issued by Sun Group Finance Pty Ltd

Index	Parent company	Type	Outstanding Amount	Time to maturity
1	SUN GROUP FINANCE PTY LTD	Non-revolver loan	750.00	2.70
2	SUN GROUP FINANCE PTY LTD	Non-revolver loan	750.00	4.70
3	SUN GROUP FINANCE PTY LTD	Revolver loan	375.00	2.70
4	SUN GROUP FINANCE PTY LTD	Non-revolver loan	1,000.00	1.70
5	SUN GROUP FINANCE PTY LTD	Revolver loan	25.00	1.70

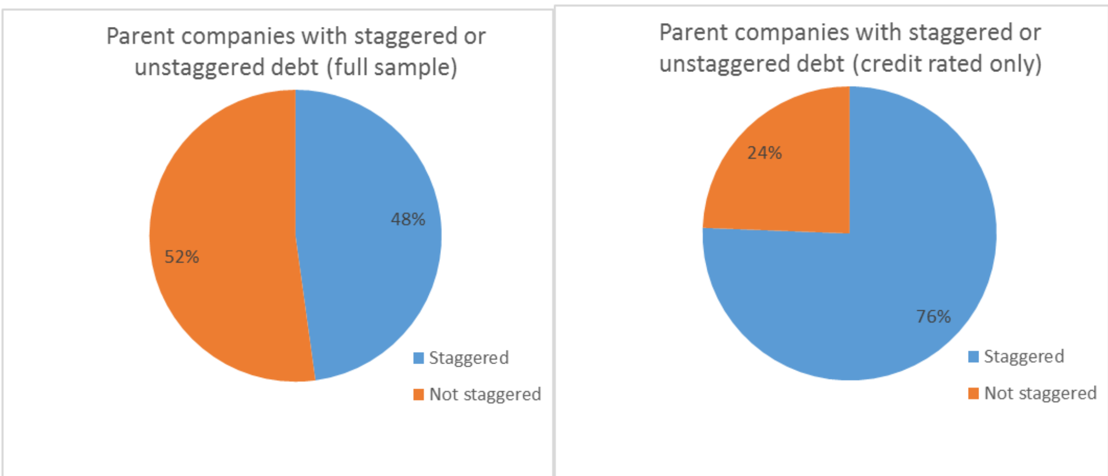
4.6.3 Debt staggering by parent companies

89. Of the 619 parent companies in our sample, 323 (52%) had all of their debts due at the same time, while 296 (48%) used some form of debt staggering. Among the 82 parent companies in our sample that issued at least one debt with a credit rating, however, only 20 (24%) had all of their debts due at the same time, while the remaining 62 (76%) had their debts staggered to varying extents. This is illustrated in Figure 20 below. This suggests that debt staggering is an important element of a debt management strategy for businesses seeking to raise debt of a kind that requires a credit rating (generally public debt raising).

90. It is also important to note that a primary reason for staggering debt is to avoid a situation where a large amount of debt is falling due in the immediate future (e.g., in the next 12 months) which creates refinance risk. In this context, a firm might have zero debt staggering but still have no debt falling due for 5 years if its only debt outstanding matures beyond 5 years. Such a firm may not have staggered debt but it does have the opportunity to raise new debt prior to the existing debt coming due. In this sense, it has the 'option to stagger' its debt.

91. Of the 9 firms with credit ratings and that have only one debt issuance (i.e., do 'not stagger' their debt), four of these have sub investment grade credit ratings and the average remaining maturity of the single debt issuance for the other 5 firms is 6.9 years (giving those businesses the opportunity to issue more debt well in advance of their existing debt falling due). A detailed description of the statistics that we used to measure debt staggering can be found in Section 11.

Figure 20: Parent companies with staggered or unstaggered debts



COMPETITION ECONOMISTS GROUP

5 Industry sectors and competitiveness

5.1 Industry classification

92. The issuers in the sample fall into 12 industry sectors, 65 industry groups, and 189 industry subgroups. Our analysis is restricted to the sectorial level since most of the industry groups and industry subgroups contain very few issuer companies, such that analyses at these levels are unlikely to yield useful information above studying the firms individually.

5.1.1 Amount of debt outstanding

93. The financial sector has the largest amount of debt outstanding at A$ 596,832 million, not including amounts still available in revolver loans. This represents 60% of the total amount of debt outstanding in our sample. In comparison, the sector with the second largest amount of debt outstanding, basic materials, only has A$ 76,655.3 million outstanding, which represents 8% of all outstanding debt. The other four sectors with at least 5% share of total outstanding debt are consumer non-cyclical, industrial, energy, and utilities.

94. The allocation of outstanding debt and relative percentages across industry sectors are shown in Figure 21 and Figure 22 respectively.

Figure 21: Amount of debt outstanding by industry sector

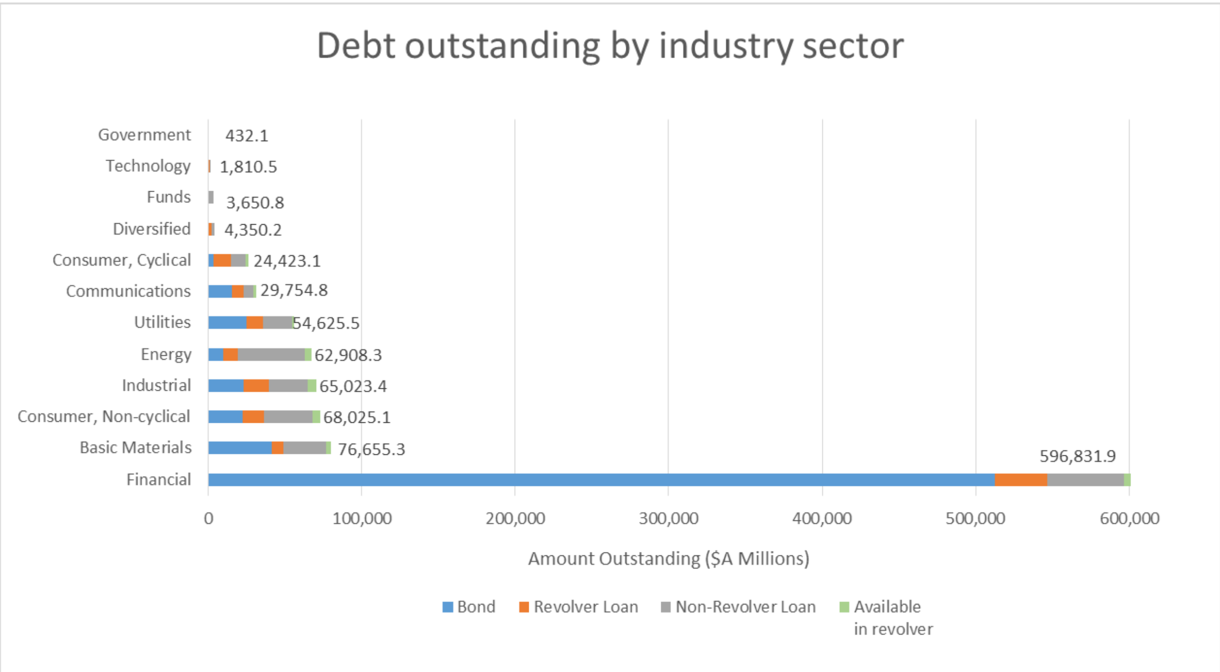
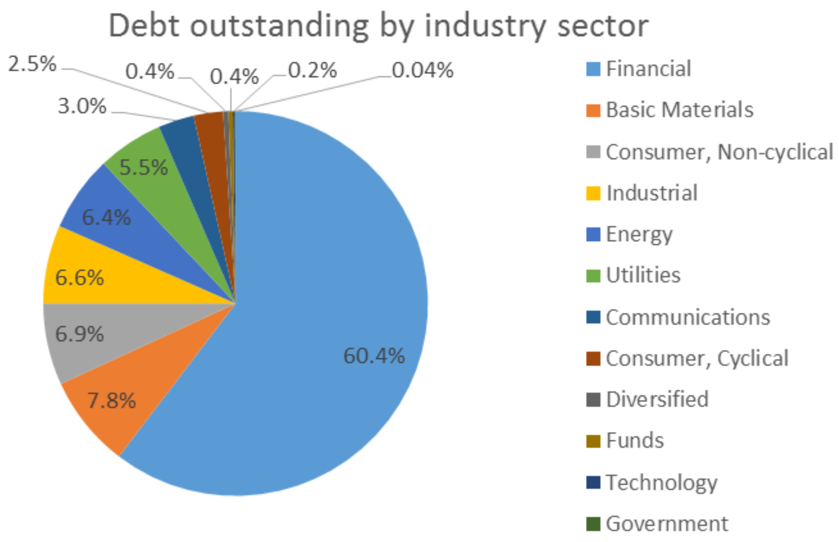


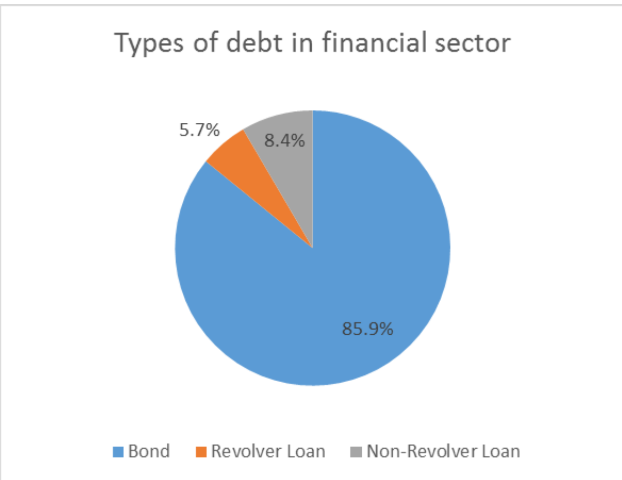
Figure 22: Proportion of debt outstanding by industry sector

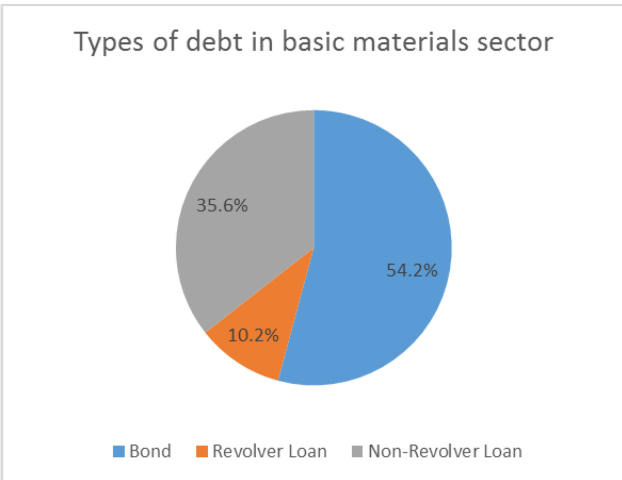


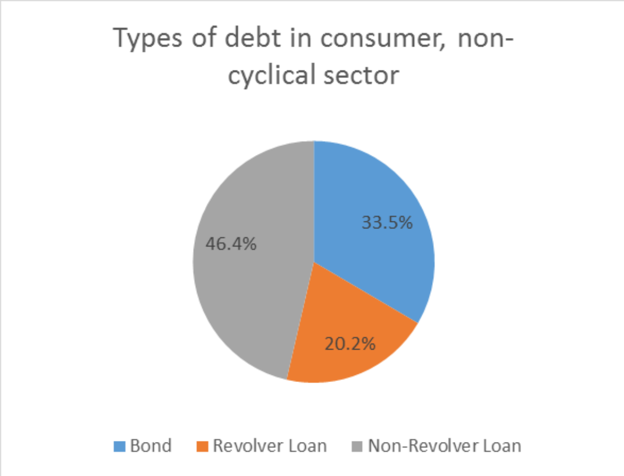
5.1.2 Type of debt outstanding

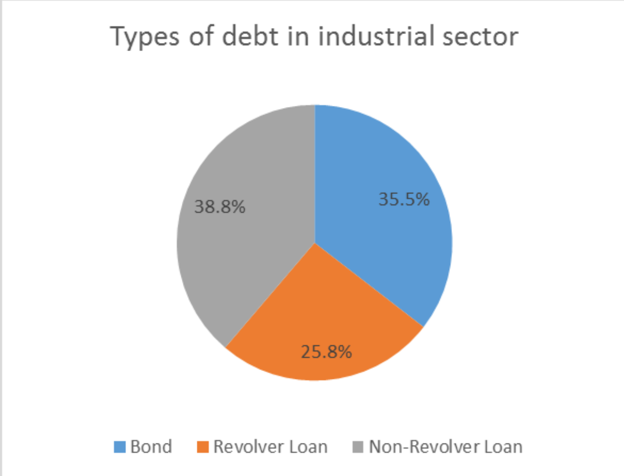
95. The next set of figures contain pie charts that break down the three types of debt in each of the twelve industry sectors. It can be seen that bonds form the largest type of debt in the financial, basic materials, utilities, and communications sector. Revolver loans form the largest type of debt in the consumer cyclical, diversified, and technology sectors. Non-revolver loans are largest in consumer non-cyclical, industrial, energy, funds, and government sectors.

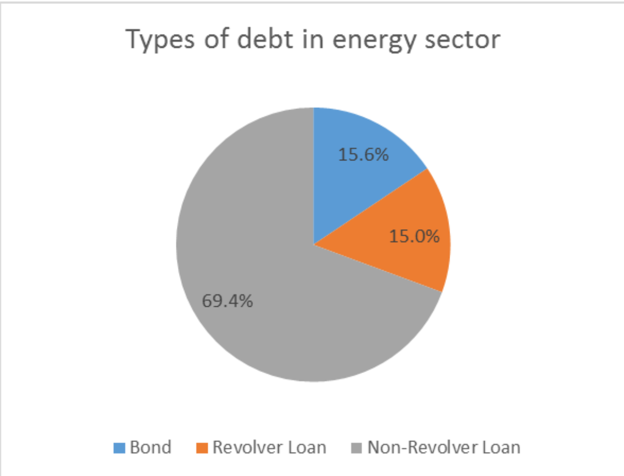
96. The amount of debt outstanding for each of the three types of debt in each industry sector, along with the corresponding percentages, are listed in Table 13.

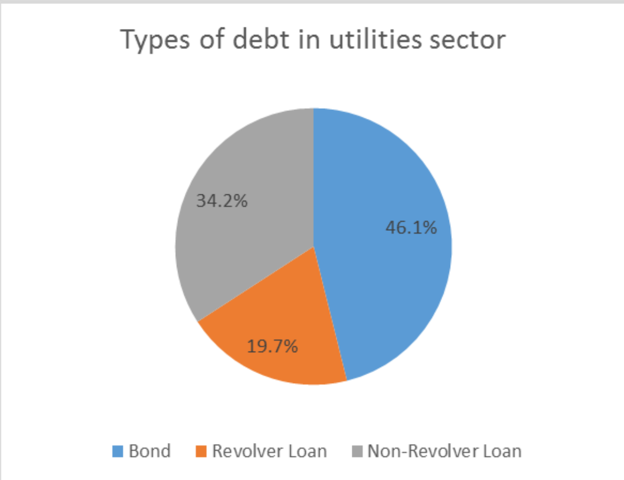


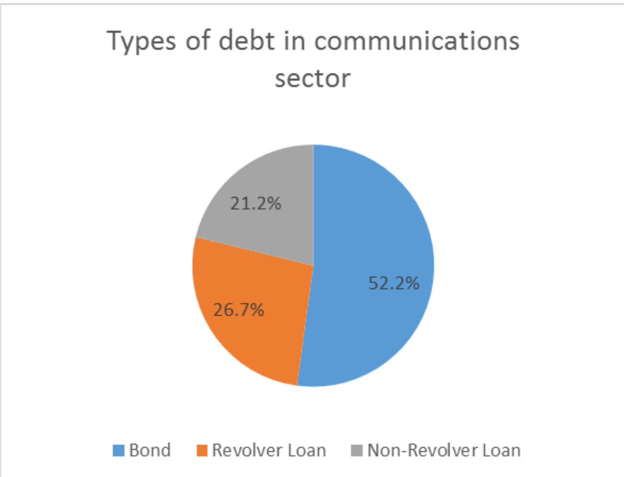


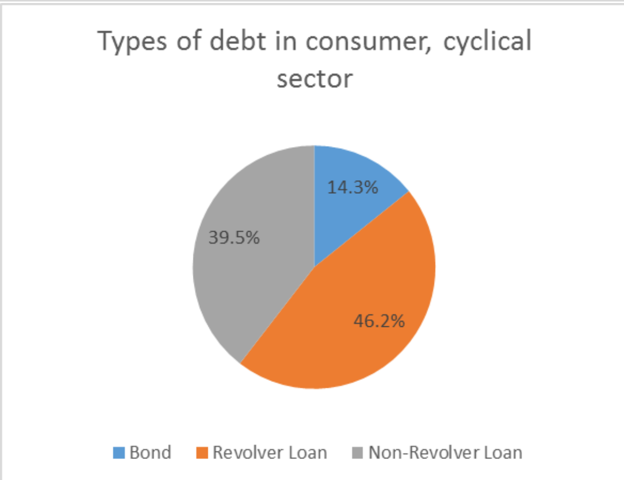

Types of debt in consumer, non-cyclical sector
33.5%
20.2%
46.4%
Bond
Revolver Loan
Non-Revolver Loan

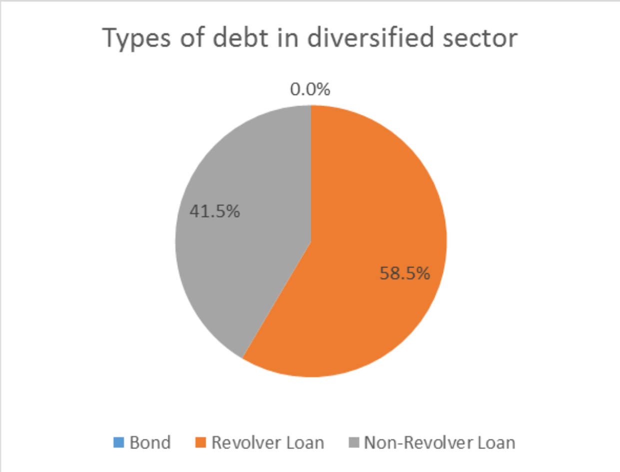

Types of debt in industrial sector
35.5%
25.8%
38.8%
Bond
Revolver Loan
Non-Revolver Loan

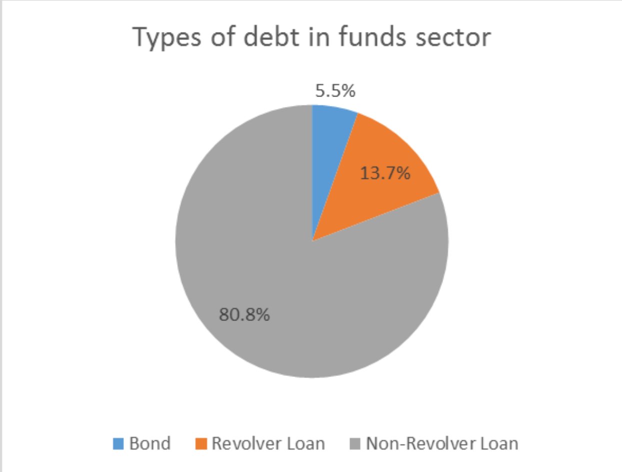

Types of debt in energy sector
15.6%
15.0%
69.4%
Bond
Revolver Loan
Non-Revolver Loan

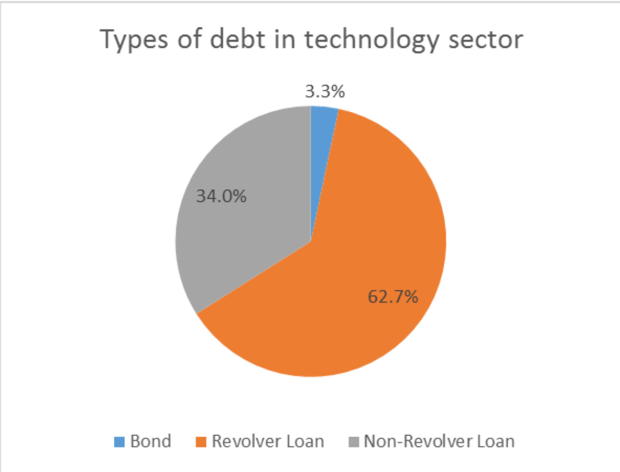

Types of debt in utilities sector
46.1%
19.7%
34.2%
Bond
Revolver Loan
Non-Revolver Loan


Types of debt in communications sector
52.2%
26.7%
21.2%
Bond
Revolver Loan
Non-Revolver Loan


Types of debt in consumer, cyclical sector
14.3%
46.2%
39.5%
Bond
Revolver Loan
Non-Revolver Loan


Types of debt in diversified sector
0.0%
41.5%
58.5%
Bond
Revolver Loan
Non-Revolver Loan


Types of debt in funds sector
5.5%
13.7%
80.8%
Bond
Revolver Loan
Non-Revolver Loan


Types of debt in technology sector
3.3%
34.0%
62.7%
Bond
Revolver Loan
Non-Revolver Loan

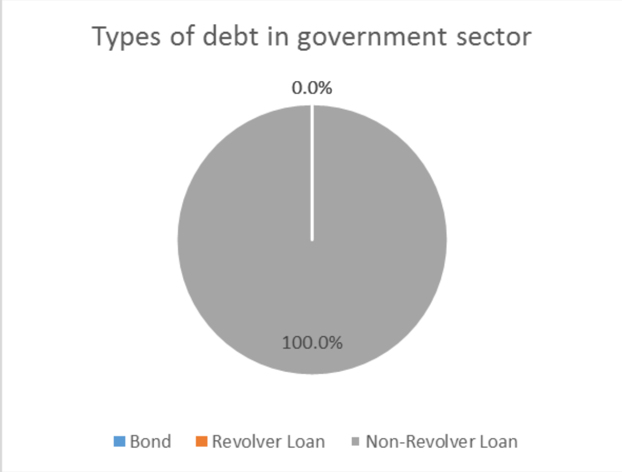

Types of debt in government sector
0.0%
100.0%
Bond
Revolver Loan
Non-Revolver Loan

Table 13: Term of debt at issuance by industry sector

Debt Term (Yrs)	Bond	Revolver Loan	Non-Revolver Loan	Total Loan	Amount Outstanding	%
Basic Materials	41,537.7	7,843.8	27,273.8	35,117.6	29,953.5	3.0%
Communications	15,522.9	7,929.8	6,302.1	14,231.9	31,979.3	3.2%
Consumer, Cyclical	3,481.6	11,287.7	9,653.8	20,941.5	77,266.9	7.8%
Consumer, Non-cyclical	22,761.3	13,717.4	31,546.3	45,263.8	145,268.4	14.7%
Diversified	0.0	2,544.5	1,805.6	4,350.2	210,349.5	21.3%
Energy	9,823.5	9,443.8	43,641.1	53,084.8	129,735.3	13.1%
Financial	512,435.6	34,076.7	50,319.6	84,396.3	24,803.4	2.5%
Funds	200.0	500.0	2,950.8	3,450.8	67,668.9	6.8%
Government	0.0	0.0	432.1	432.1	6,638.0	0.7%
Industrial	23,065.3	16,760.4	25,197.8	41,958.2	63,524.9	6.4%
Technology	60.0	1,135.5	615.0	1,750.5	80,570.4	8.2%
Utilities	25,190.7	10,776.2	18,658.5	29,434.7	16,803.5	1.7%
Total	**654,078.5**	**116,015.8**	**218,396.6**	**334,412.4**	**988,490.9**	**100.0%**

97. It should not be assumed that bank debt is always short term, or even shorter term than bonds. For example, the Energy sector has a high proportion of non-revolver loans but an average term of debt issuance of 13 years.

5.2 Industry competitiveness and the Herfindahl-Hirschman Index (HHI)

98. A competitive market is one that contains a large number of small firms with low market power selling undifferentiated products. In a competitive market, it is difficult for individual firms to raise their prices since buyers can easily switch their purchases from one firm to any of the other competitors.

99. Industries that feature a few firms with individually-high market shares tend to be less competitive because it is relatively more difficult for buyers to shift their purchases to other competitors, thus allowing these firms to influence market prices. The market shares of the firms in an industry can thus serve as an indicator of how competitive that industry is.

100. HHI assesses the competitiveness of an industry by measuring the sum of squared market shares (in percentages) of the firms in that industry. It ranges from a value of 1 to 10000, with a lower HHI representing a more competitive market. When there is only one firm in the industry, its squared market share is $100^2 = 10000$. When there are infinitely many small firms in the industry, their squared market shares will sum to the lowest value of 1.

101. Bloomberg does not keep track of the market shares of firms in Australian industries. As such, we derived estimates of the HHI for the industry sectors in our sample using an in-sample approach as follows:

   i. Obtain the sales revenue of all firms in the sample.

   ii. Sum the sales revenues of all firms in the same industry sector to obtain the total market size of each sector.

   iii. Divide the sales revenue of each firm by the amount obtained in Step ii, which yields the market share of the firm.

   iv. Take the sum of squared market shares of firms in the same industry sector calculated in Step iii, which results in the estimated HHI.

102. The problem with the above approach is that it fails to capture the market shares of firms outside the sample, which usually results in an overestimation of HHI. As such, the industry sectors are likely to be more competitive than we estimate them to be. In addition, these HHI estimates should not be applied to other studies since they are highly sample-dependent.

103. The formula used for calculating HHI is shown in Equation 1:

Equation 1

$$HHI = \sum_{i=1}^{n} \left(\frac{Sales\ revenue\ of\ firm\ i}{Total\ sales\ revenue\ of\ all\ firms\ in\ sector} \times 100\% \right)$$

104. Bloomberg supplies revenue data based on the issuing firm’s total operating revenue less adjustments to gross sales. These adjustments consist of returns, discounts, allowances, excise taxes, insurance charges, sales taxes, and value added taxes. The total revenue for each industry sector is shown in Figure 23, with the proportions of revenue in each sector being illustrated in Figure 24.

Figure 23: Total revenue by industry sector

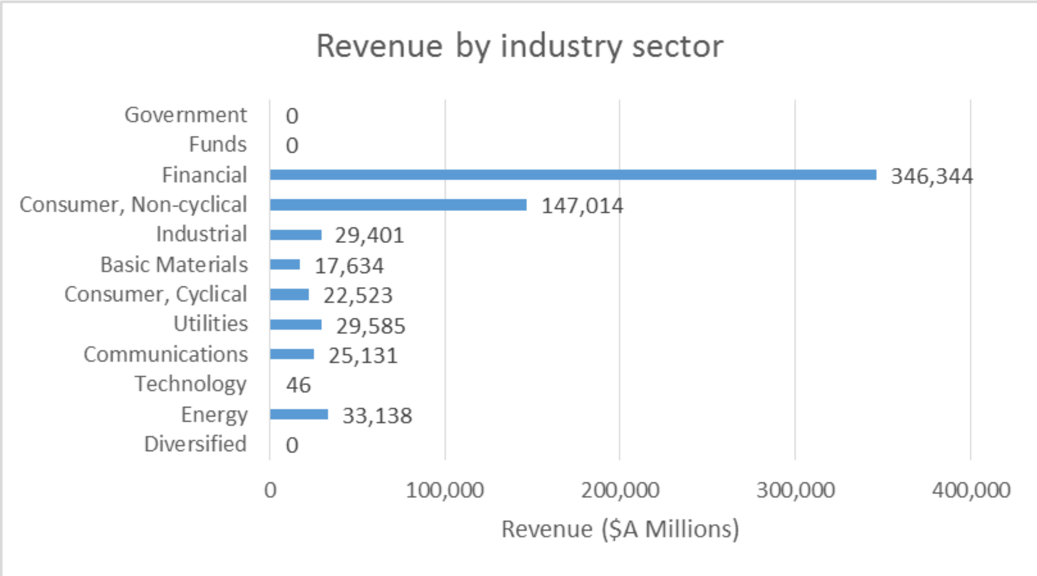
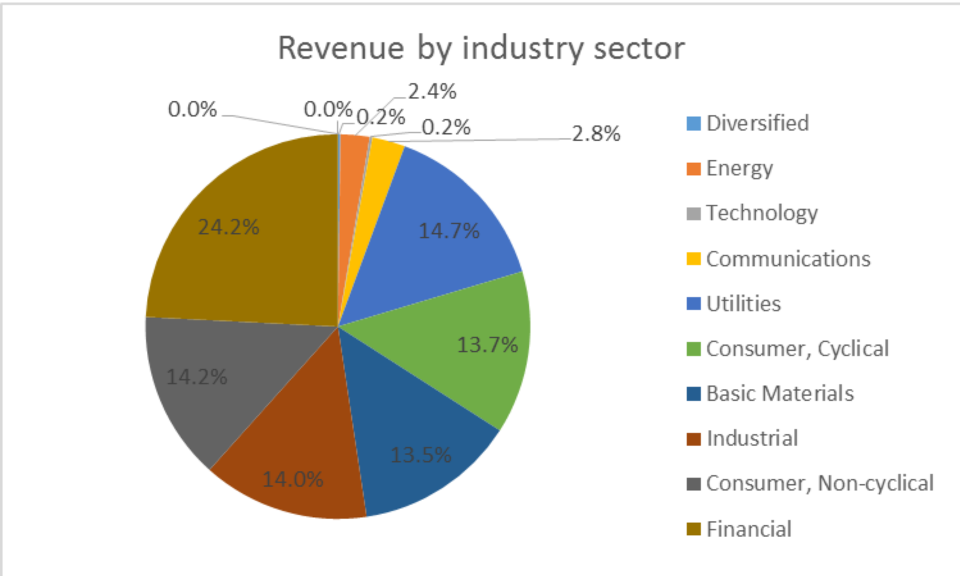


Figure 24: Proportion of revenue by industry sector



105. Figure 25 shows the estimated HHI for all twelve industry sectors, while Table 14 shows the total revenue, number of firms, and HHI for the sectors. We classified each sector into high, medium, and low in terms of competitiveness based on their HHI estimates. Sectors with HHI below 2000 were classified as high competitiveness, while sectors with HHI between 2000 and 4000 were classified as medium competitiveness, and sectors with HHI above 4000 were classified as low competitiveness.

Figure 25: HHI by industry sector

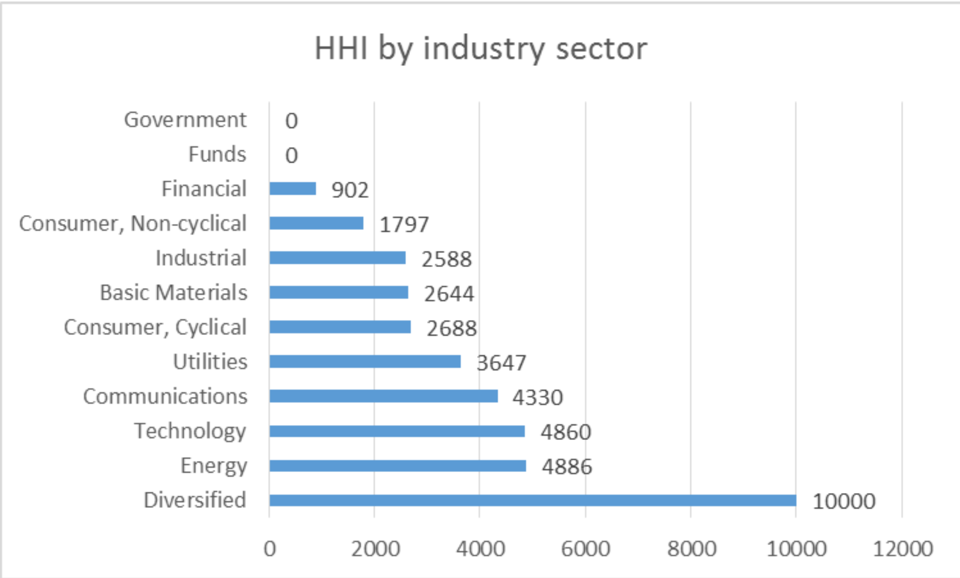


Table 14: HHI and industry competitiveness

Industry sector	Total Revenue (A$ Mn)	Number of Firms	HHI	Competition
Funds	0	0	0	-/-
Government	0	0	0	-/-
Financial	357,005	61	902	High
Consumer, Non-cyclical	208,920	44	1,797	High
Industrial	206,650	43	2,588	Medium
Basic Materials	199,534	43	2,644	Medium
Consumer, Cyclical	202,163	29	2,688	Medium
Utilities	217,172	15	3,647	Medium
Communications	40,865	15	4,330	Low
Technology	3,346	4	4,860	Low
Energy	36,030	21	4,886	Low
Diversified	3,060	1	10,000	-/-
Total	**1,474,747**	**276**		

5.3 Conclusions on industry competitiveness

106. As shown in Table 14, the funds, government, and diversified sectors were omitted due to insufficient revenue data. The financial sector and consumer non-cyclical sector were classified as high competition. The industrial, basic materials, consumer cyclical, and utilities sectors were classified as medium competition. The communications, technology, and energy sectors were classified as having low competition.

107. The analysis on term of debt at issuance, year of issuance, and time to maturity for the twelve industry sectors is in Section 9 to Section 10.

6 Fixed cost levels

108. As mentioned in Section 3.2.5, we obtained historical data on the net fixed assets of the parent companies in our sample as at 31 December on the issue year of the debt, converted to Australian dollar values. This particular date was chosen because it generally produced the most data on net fixed assets, most likely because a large number of firms in our sample report their net fixed assets at the end of the calendar year.

109. Focusing on the fixed cost levels of parent companies sometimes led to nonsensical results, especially with state-owned issuers, since Bloomberg sometimes listed whole countries as the ultimate parent company of the issuer. When this occurred, we traced the corporate hierarchy of each issuer to identify the parent level at which the decision-making on debt financing was likely to be made.

110. The issuers that had the above problem are listed in Table 15, along with their respective chain of parent companies. The companies that were selected for obtaining fixed cost levels are underlined and highlighted in yellow.

Table 15: Corporate hierarchy of state-owned issuers

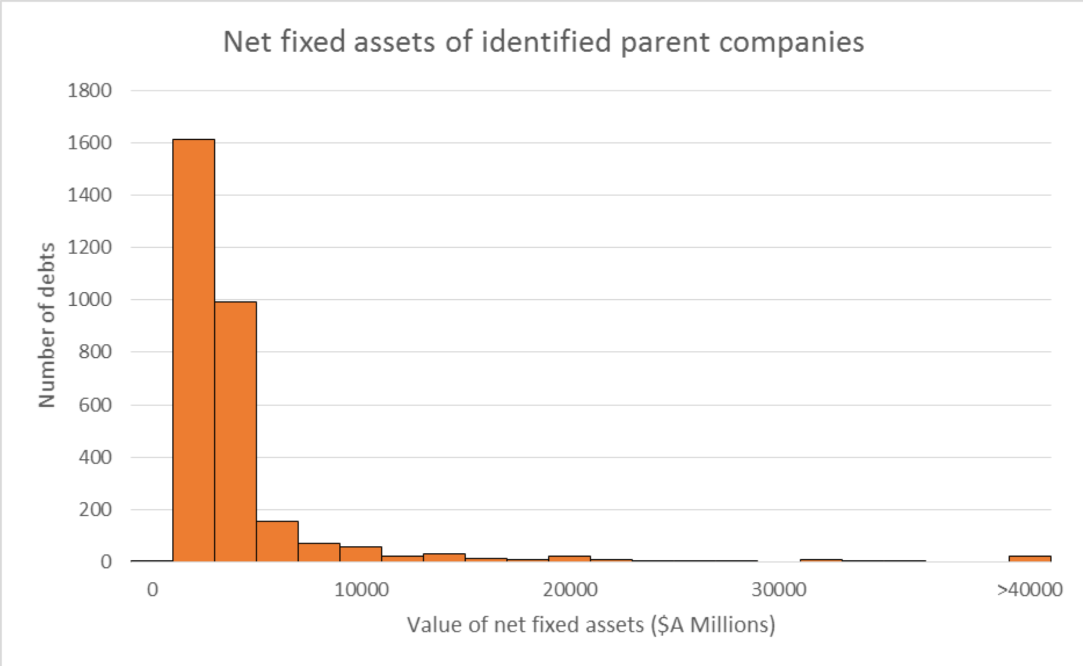
Issuer	Level 1 parent	Level 2 parent	Level 3 parent	Ultimate parent
Broadcast Australia Finance Pty Ltd	Frequency Infrastructure Holdings	Canada Pension Plan		Government of Canada
SGSP Australia Assets Pty Ltd	State Grid International Development	State Grid Corp of China	State-owned Assets Supervision	People's Republic of China
Jemena Ltd	SGSP Australia Assets Pty Ltd	State Grid International Development	State Grid Corp of China	People's Republic of China
China Minmetals Corp	State-owned Assets Supervision	People's Republic of China Ministry of Finance		People's Republic of China
Musselroe Wind Farm Pte Ltd	Guohua Energy Investment Co Ltd	Shenhua Group Corp Ltd	State-owned Assets Supervision	People's Republic of China
Qenos Pty Ltd	China National Bluestar Group	China National Chemical Corp	State-owned Assets Supervision	People's Republic of China
MMG Ltd	China Minmetals Corp	State-owned Assets Supervision	People's Republic of China Ministry of Finance	People's Republic of China
Sino Iron Pty Ltd	CITIC Pacific Mining Management	CITIC Ltd	CITIC Group Corp	People's Republic of China
Baosteel Resources Australia P	Baosteel Resources International Co Ltd	Shanghai Baosteel Group Corp	State-owned Assets Supervision	People's Republic of China

Optus Finance Pty Ltd	Singtel Optus Pty Ltd	Singapore Telecom Australia Inc	Singtel Australia Investment Ltd	Republic of Singapore
Olam Orchards Australia Pty Lt	Olam International Ltd	Temasek Holdings Pte Ltd		Republic of Singapore
Australian Rail Track Corp Ltd				Commonwealth of Australia
QIC Finance Shopping Center Fund	QIC Retail Pty Ltd	QIC Ltd		State of Queensland Australia
Gullen Range Wind Farm	Beijing Jingneng Clean Energy Co Ltd (Hong Kong)	Beijing Energy Investment Holdings Co Ltd	Beijing State-owned Assets Operation	Municipality of Beijing China
Bright Food Group Operations Pty Ltd	Bright Food Group Co Ltd (China)	SASAC of Shanghai Municipality		Municipality of Shanghai China
Tourism Asset Holdings Ltd	Abu Dhabi Investment Authority			Emirate of Abu Dhabi United Arab Emirates
Nextgen Networks Pty Ltd				Ontario Teachers' Pension Plan

111. Of the 4697 debts in our sample, 3035 had data on the value of net fixed assets of their identified parent companies, consisting of 2381 bonds, 412 revolver loans, and 242 non-revolver loans.

112. The minimum value of net fixed assets is 0, while the maximum is A$ 115,437 million. The mean is A$ 3,480 million and the median is A$ 1,952 million. The distribution of net fixed assets for the identified parent companies associated with the debts in our sample is shown in Figure 26.

Figure 26: Histogram of net fixed assets amounts



113. In order to analyse the debt financing structures of firms with different fixed cost levels, we separated the sample into two subsamples: debts with associated net fixed asset values up to and including the median (A$ 1,952 million), and debts with net fixed asset values above the median.

114. One implication of our approach is that debts issued by the same parent company at different times could in turn be classified under different subsamples if the company's net fixed asset value was below the median at one issue date and above the median at another. This is especially the case for companies that issued debts many years apart and had substantial changes in their asset bases. This is not necessarily a problem, however, since the change in the company's asset base is also likely to influence the company's decision-making process regarding debt financing, which is the precisely the effect that the analysis is attempting to capture.

115. The analysis on term of debt at issuance, year of issuance, and time to maturity for the low and high fixed cost subsamples are shown in Section 9.2 and Section 10.2 respectively.

COMPETITION
ECONOMISTS
GROUP

7 Debt-to-equity ratio

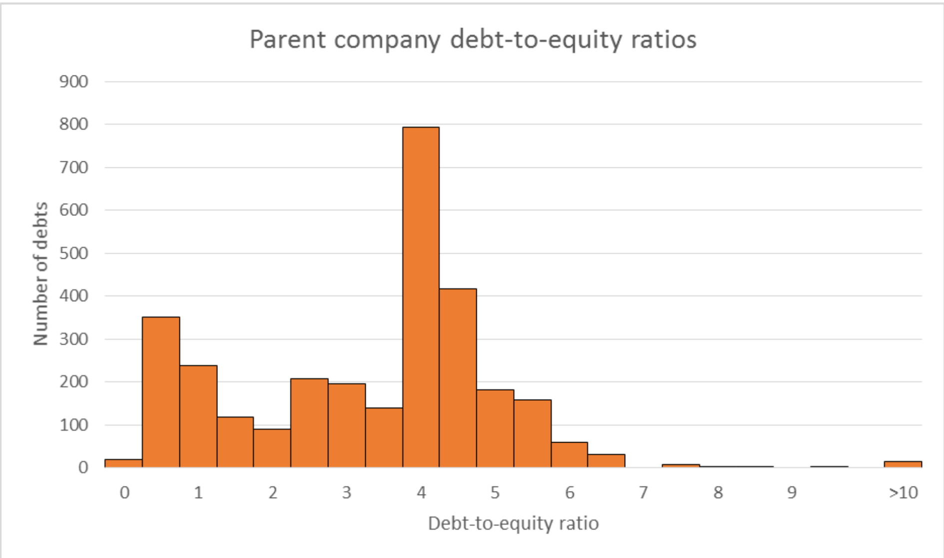
116. Our approach to obtaining data on debt-to-equity ratios is similar to the method used to obtain data on fixed cost levels in Section 6. Specifically, we obtained historical values on the debt-to-equity ratio of parent companies as at 31 December of the year of debt issue. For the state-owned issuers listed in Table 15, we obtained data for the same companies highlighted in yellow.

117. As mentioned in section 3.2.6, we used data from Bloomberg on the total-debt-to-total-equity ratio instead of total-debt-to-common-equity since the former is a more accurate reflection of the extent of gearing by the borrower.

118. Of the 4697 debts in our sample, 3028 had data on the value of net fixed assets of their identified parent companies, consisting of 2373 bonds, 412 revolver loans, and 243 non-revolver loans.

119. The minimum total-debt-to-total-equity ratio in the sample is 0, while the maximum is 3000%. The mean is 310% and the median is 370%. The distribution of the total-debt-to-total-equity ratios for the identified parent companies associated with the debts in our sample is shown in Figure 27.

Figure 27: Parent company debt-to-equity ratios



120. Similar to the analytical approach applied to fixed cost levels as set out in Section 6, the sample was separated into two subsamples: debts with associated total-debt-to-total equity ratio up to and including the median (3.68), and debts with total-debt-to-total equity ratio above the median. The analysis on term of debt at issuance, year of issuance, and time to maturity for the two subsamples divided according to debt-to-equity ratio is shown in Section 9.3 and Section 10.3.

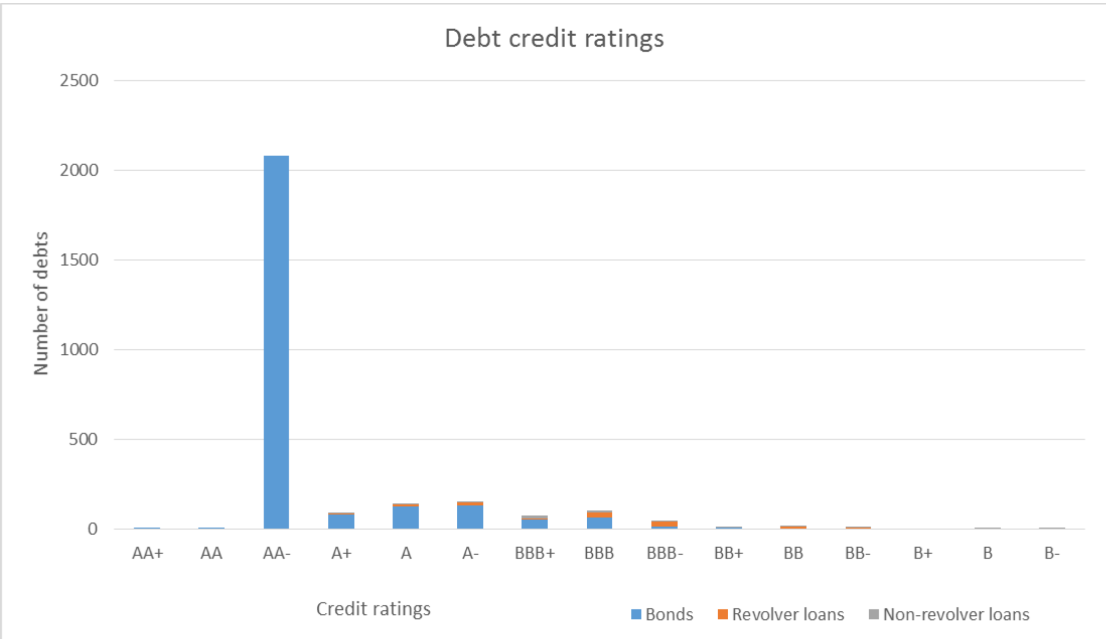
8 Credit ratings

121. As set out in Section 3.2.7, we referred to the S&P credit ratings since they are commonly used in practice. Of these, we selected the S&P Long Term Local Currency Issuer Credit Rating because it yielded the most number of ratings for our sample and is most relevant for the structuring of long-term debt.

122. Out of the 4697 debts in our sample, 2724 received credit ratings, comprising of 2548 bonds, 117 revolver loans, and 59 non-revolver loans. The credit ratings range from AA+ to B-, as shown in the upper half of Table 16, which provides the breakdown of the three debt types for each credit rating band. The distribution of the number of debt for each credit rating is shown in Figure 28, and repeated for clarity in Figure 29 with all debts rated AA- excluded. It is observed that the vast majority of higher-rated debt is in the form of bonds, while the proportion of loans increases for the lower credit ratings. This might suggest that firms with better credit standing are more likely to issue bonds than loans.

123. Since a number of the credit rating grade only show results for a small number of debts, our analysis is carried out for debts in terms of "broad credit ratings", such that the three grades of each credit letter are consolidated. The number of debts at each consolidated credit letter is shown in the bottom half of Table 16.

Figure 28: S&P long-term local currency issuer credit ratings



124. AA- bonds are dominated by issuance from the four major Australian banks. Excluding these bonds, as is done in the next figure, allows one to focus on the distribution of debts across other businesses.

Figure 29 S&P long-term local currency issuer credit ratings (AA-excluded)

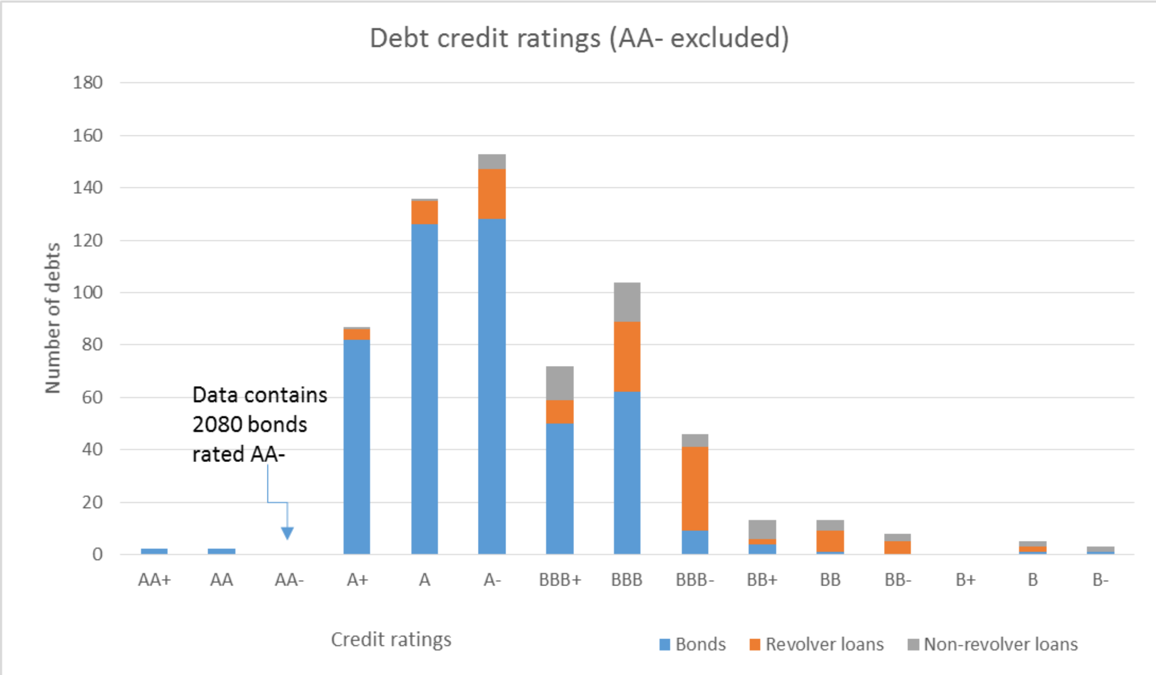


Table 16: S&P long-term local currency issuer credit ratings

	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	Total
Bonds	2	2	2080	82	126	128	50	62	9	4	1	0	0	1	1	2548
Rev loan	0	0	0	4	9	19	9	27	32	2	8	5	0	2	0	117
Non-rev	0	0	0	1	1	6	13	15	5	7	4	3	0	2	2	59
Total	2	2	2080	87	136	153	72	104	46	13	13	8	0	5	3	2724
Bonds		2084			336			121			5			2		2548
Rev loan		0			32			68			15			2		117
Non-rev		0			8			33			14			4		59
Total		2084			376			222			34			8		2724

Source: Bloomberg, CEG analysis

125. The analysis on term of debt at issuance, year of issuance, and time to maturity for the broad credit ratings are shown in Section 9.4 and Section 10.4.

9 Term of debt at issuance

126. This section presents the empirical evidence regarding the term of debt at the date of issue for different subsamples. Section 9.1 investigates the term of debt at issuance for different industry sectors with different levels of competitiveness.

127. Section 9.2 compares the term of debt at issuance for the subsamples with parent company net fixed assets up to and including the median as compared to the subsample with net fixed assets above the median.

128. Section 9.3 considers the term of debt at issuance for the subsample in which the parent company has a debt-to-equity ratio up to and including the median, as compared to the subsample with a debt-to-equity ratio above the median.

129. Section 9.4 assesses how the term of debt at issuance differs across broad credit ratings.

9.1 Term of debt and industry competitiveness

130. Table 14 in Section 97 classified the 12 industry sectors in the sample into high, medium, and low competition categories. The weighted average debt term and simple average debt term for these sectors are shown below in Table 17.

131. Debts issued by firms in the technology sector have the lowest weighted average and simple average debt terms at 4.36 years and 3.78 years respectively. Debts issued by firms in the government sector have the highest weighted average and simple average debt terms at 14.28 years and 9.92 years respectively.

132. The difference between the weighted average and simple average debt terms is largest for the energy sector, at 4.45 years. The fact that the weighted average debt term for that sector is significantly larger than the corresponding simple average debt term suggests that the energy sector is more likely to issue larger long-term debts and smaller short-term debts.

133. In contrast, the financial sector's weighted average debt term of 6.30 years is 3.49 years less than its simple average debt term of 9.79 years, which suggests that the short-term debts issued by the financial sector likely to be for larger amounts, while their long-term debts are likely to be smaller.

134. The debt term at issuance charts and average debt terms for all 12 sectors in the sample are shown in Section 9.1.1 to 9.1.4.

Table 17: Average debt terms by industry sector

Industry sector	Weighted average debt term	Simple average debt term	Competitiveness/concentration[10]
Financial	6.30	9.79	High
Consumer, non-cyclical	6.21	6.07	
Industrial	6.68	5.72	Medium
Basic materials	9.79	6.53	
Consumer, cyclical	6.75	4.87	
Utilities	10.46	8.27	
Communications	7.17	7.58	Low
Technology	4.36	3.78	
Energy	13.01	8.56	
Funds	6.18	3.54	Unclassified
Government	14.28	9.92	
Diversified	5.55	4.37	

Source: Bloomberg, CEG analysis

135. There does not appear to be a strong relationship between industry concentration and weighted average debt term. This may reflect the fact that other industry specific influences are more important and/or that our relatively broad measures of industry do not capture differences in the level of concentration across sub markets within those industries.

[10] Classified according to HHI as shown in Table 14.

9.1.1 Sectors with high level of competition

9.1.1.1 Financial

Figure 30: Debt term at issuance for all debts issued by companies in the financial sector

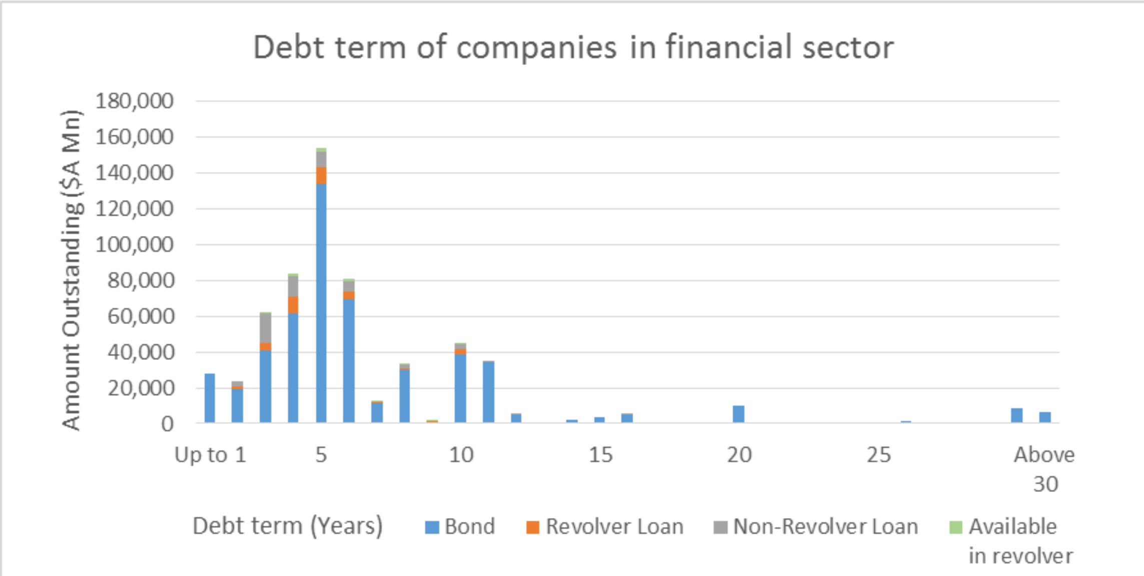


Table 18: Average debt terms for all debts issued by companies in the financial sector

	Bond	Revolver loan	Non-revolver loan	Overall
Number	2771	179	160	3110
Amount Outstanding ($A Mn)	512,435.61	34,076.66	50,319.63	596,831.89
Weighted average debt term	6.65	4.55	3.98	6.30
Simple average debt term	10.48	4.12	3.73	9.79

9.1.1.2 *Consumer, non-cyclical*

Figure 31: Debt term at issuance for all debts issued by companies in the consumer, non-cyclical sector

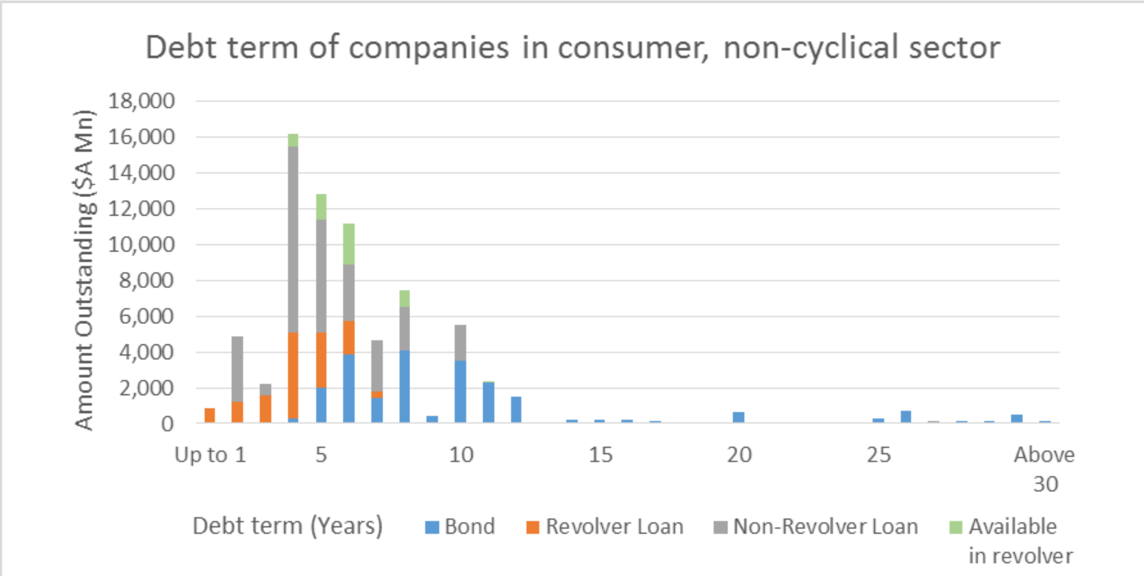


Table 19: Average debt terms for all debts issued by companies in the consumer, non-cyclical sector

	Bond	Revolver loan	Non-revolver loan	Overall
Number	86	126	119	331
Amount Outstanding ($A Mn)	22,761.31	13,717.44	31,546.31	68,025.06
Weighted average debt term	9.87	3.55	4.74	6.21
Simple average debt term	11.49	3.75	4.36	6.07

9.1.2 Sectors with medium level of competition

9.1.2.1 Industrial

Figure 32: Debt term at issuance for all debts issued by companies in the industrial sector

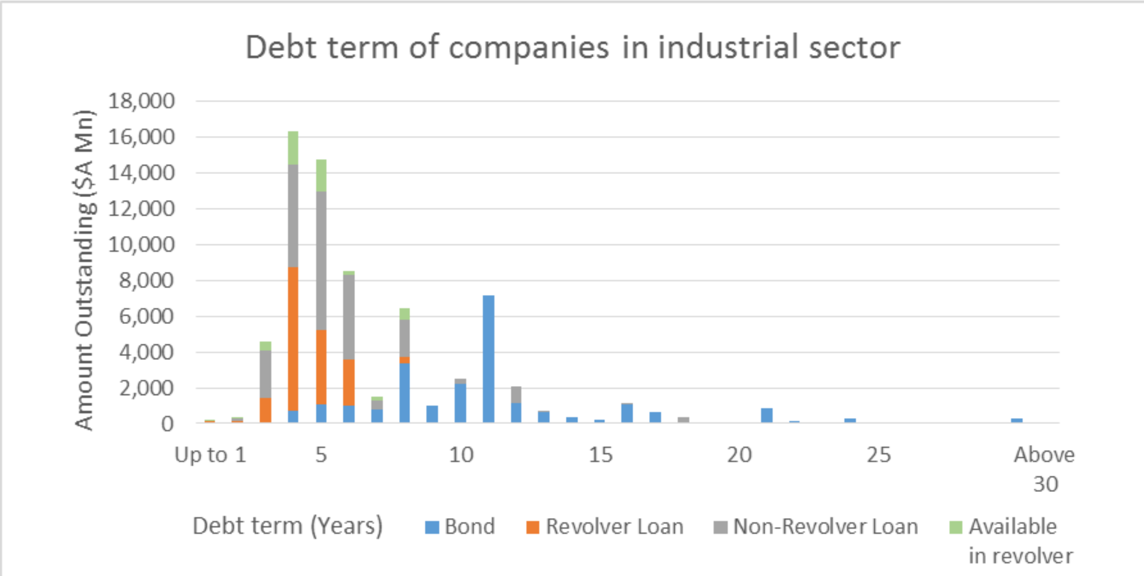


Table 20: Average debt terms for all debts issued by companies in the industrial sector

	Bond	Revolver loan	Non-revolver loan	Overall
Number	77	131	127	335
Amount Outstanding ($A Mn)	23,065.25	16,760.40	25,197.76	65,023.41
Weighted average debt term	10.41	3.91	5.12	6.68
Simple average debt term	10.86	3.71	4.52	5.72

9.1.2.2 Basic Materials

Figure 33: Debt term at issuance for all debts issued by companies in the basic materials sector

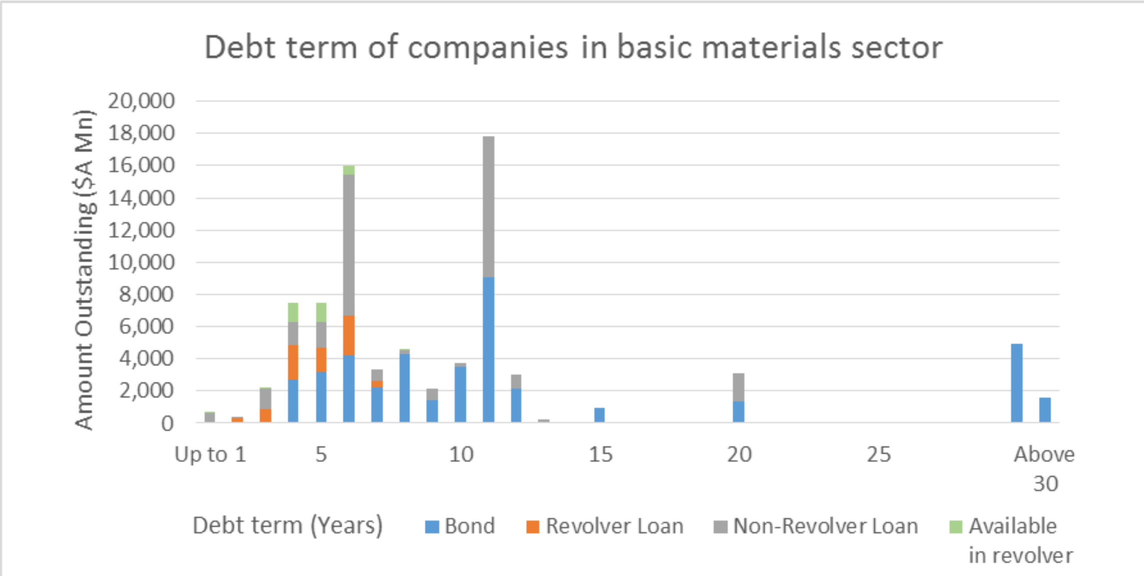


Table 21: Average debt terms for all debts issued by companies in the basic materials sector

	Bond	Revolver loan	Non-revolver loan	Overall
Number	61	60	88	209
Amount Outstanding ($A Mn)	41,537.67	7,843.85	27,273.80	76,655.31
Weighted average debt term	11.91	4.26	8.15	9.79
Simple average debt term	10.60	4.02	7.95	6.53

9.1.2.3 Consumer, Cyclical

Figure 34: Debt term at issuance for all debts issued by companies in the consumer, cyclical sector

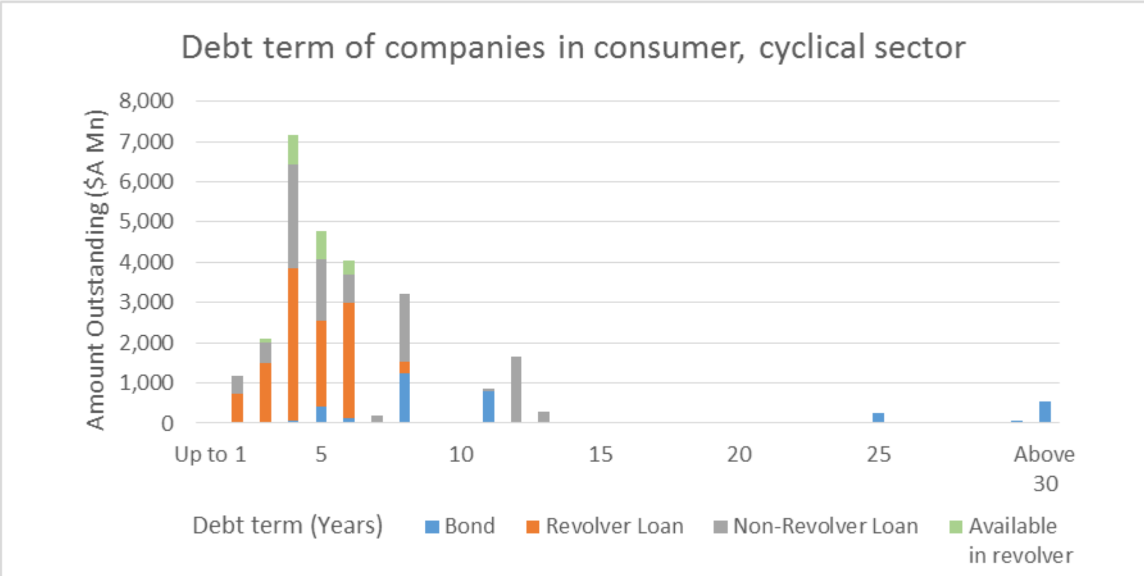


Table 22: Average debt terms for all debts issued by companies in the consumer, cyclical sector

	Bond	Revolver loan	Non-revolver loan	Overall
Number	15	98	65	178
Amount Outstanding ($A Mn)	3,481.55	11,287.71	9,653.82	24,423.07
Weighted average debt term	17.22	3.95	6.24	6.75
Simple average debt term	12.91	3.88	2.99	4.87

9.1.2.4 Utilities

Figure 35: Debt term at issuance for all debts issued by companies in the utilities sector

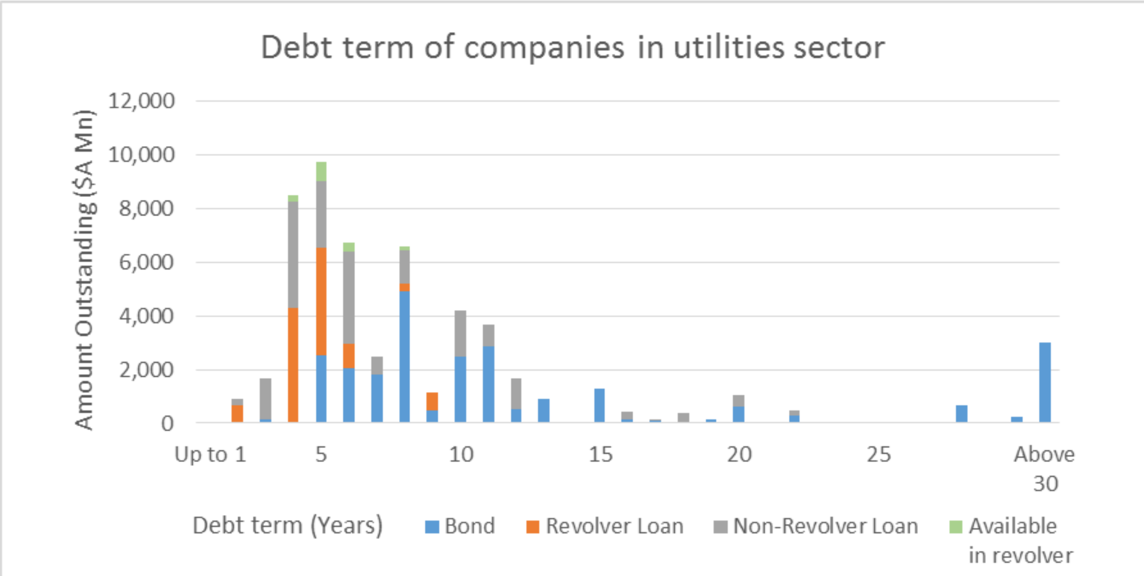


Table 23: Average debt terms for all debts issued by companies in the utilities sector

	Bond	Revolver loan	Non-revolver loan	Overall
Number	76	43	91	210
Amount Outstanding ($A Mn)	25,190.74	10,776.21	18,658.52	54,625.46
Weighted average debt term	15.76	4.60	6.69	10.46
Simple average debt term	12.51	4.50	13.78	8.27

9.1.3 Sectors with low level of competition

9.1.3.1 Communications

Figure 36: Debt term at issuance for all debts issued by companies in the communications sector

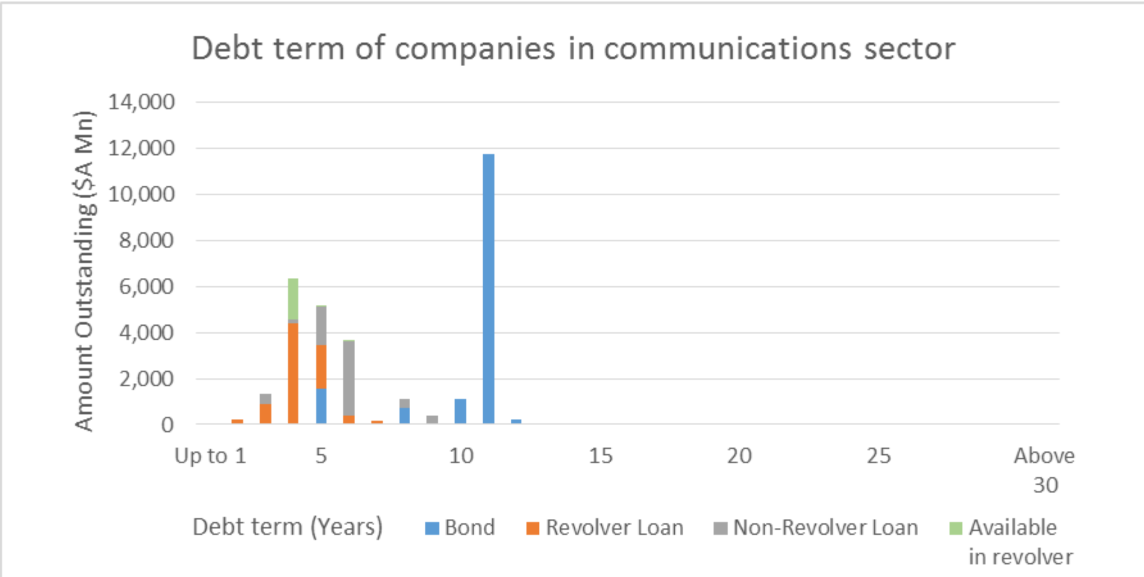


Table 24: Average debt terms for all debts issued by companies in the communications sector

	Bond	Revolver loan	Non-revolver loan	Overall
Number	46	44	25	115
Amount Outstanding ($A Mn)	15,522.87	7,929.83	6,302.07	29,754.76
Weighted average debt term	9.72	3.82	5.09	7.17
Simple average debt term	12.52	3.91	2.82	7.58

9.1.3.2 Technology

Figure 37: Debt term at issuance for all debts issued by companies in the technology sector

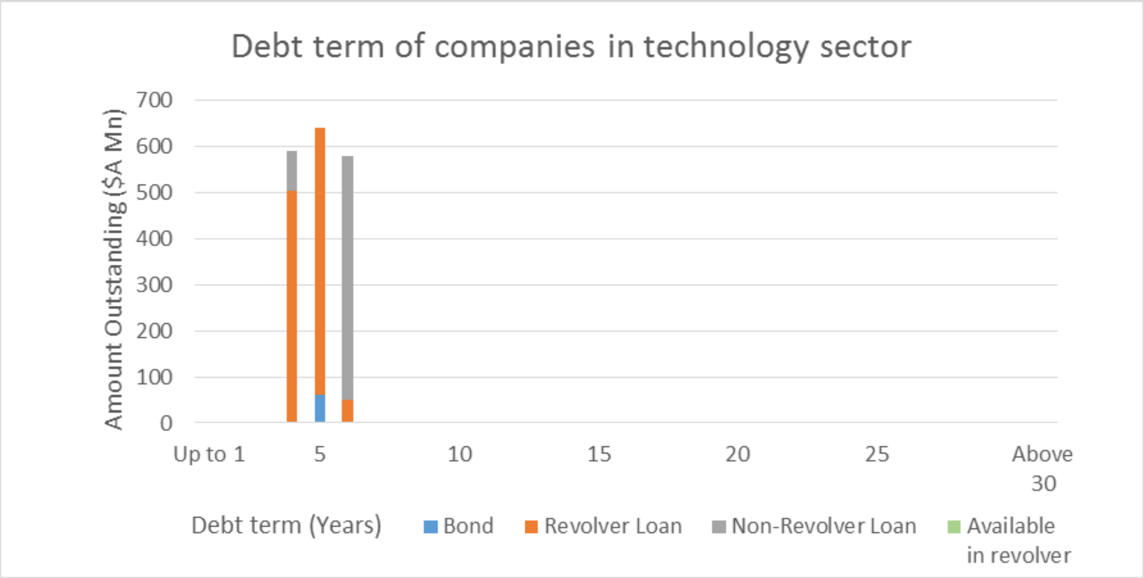
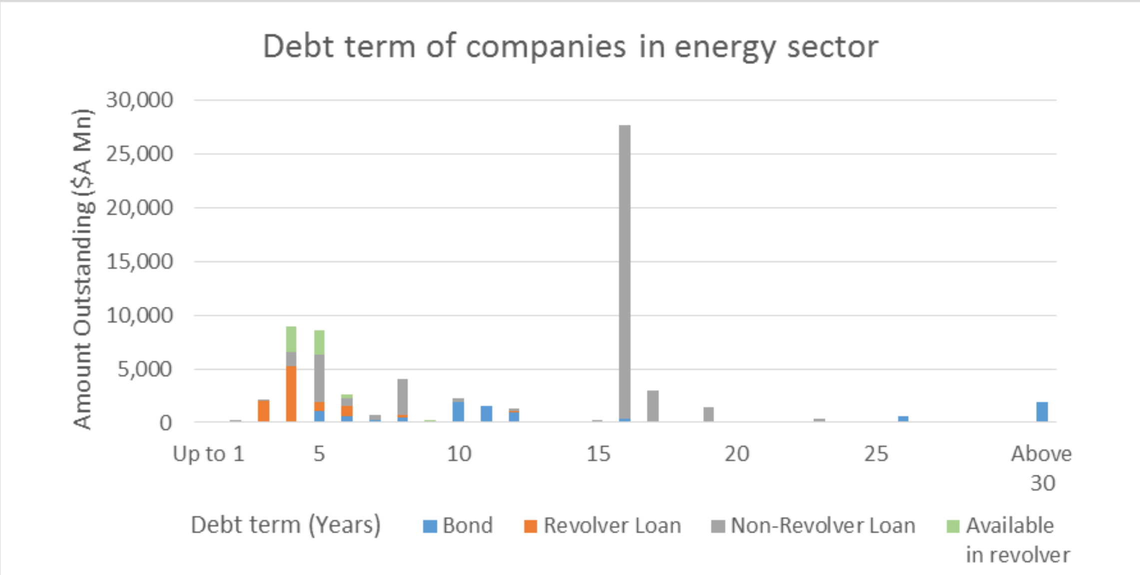


Table 25: Average debt terms for all debts issued by companies in the technology sector

	Bond	Revolver loan	Non-revolver loan	Overall
Number	1	6	6	13
Amount Outstanding ($A Mn)	60.00	1,135.46	615.00	1,810.46
Weighted average debt term	5.00	4.06	4.86	4.36
Simple average debt term	5.00	3.52	3.83	3.78

9.1.3.3 Energy

Figure 38: Debt term at issuance for all debts issued by companies in the energy sector[11]



136. There is a large spike (A$ 27.6bn) at 15-16 years. This appears to be a popular maturity of debt issuance and is comprised of 28 debt issuances. This includes large issuance by Ichthys LNG Pty Ltd (parent company Inpex Corp), with a total outstanding amount of A$ 16.6bn. The remaining 11 bn is spread across a number of other firms.

Table 26: Average debt terms for all debts issued by companies in the energy sector

	Bond	Revolver loan	Non-revolver loan	Overall
Number	37	43	86	166
Amount Outstanding ($A Mn)	9,823.48	9,443.77	43,641.07	62,908.32
Weighted average debt term	19.88	3.91	13.43	13.01
Simple average debt term	12.36	4.88	17.52	8.56

[11] Part of the large spike (A$ 27,660.73 Mn) at 15-16 years can be attributed to 14 non-revolver loans issued by Ichthys LNG Pty Ltd (parent company Inpex Corp), with a total outstanding amount of A$ 16.6m. Ichthys LNG Pty Ltd did not issue any other debts aside from these. Notwithstanding these, however, the remaining amount of A$ 11,034.41 m remains relatively large compared to other time periods, and may simply be an anomaly.

9.1.4 Unclassified sectors

9.1.4.1 Funds

Figure 39: Debt term at issuance for all debts issued by companies in the funds sector

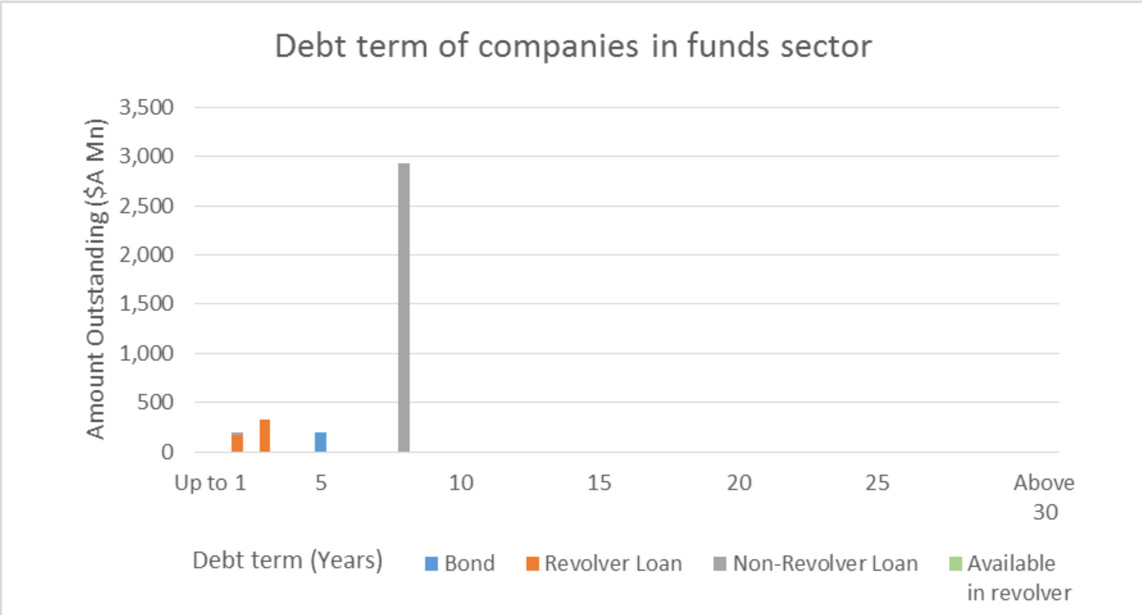


Table 27: Average debt terms for all debts issued by companies in the funds sector

	Bond	Revolver loan	Non-revolver loan	Overall
Number	1	4	3	8
Amount Outstanding ($A Mn)	200.00	500.00	2,950.85	3,650.85
Weighted average debt term	5.00	2.00	6.96	6.18
Simple average debt term	5.00	2.00	3.83	3.54

9.1.4.2 Government

Figure 40: Debt term at issuance for all debts issued by companies in the government sector

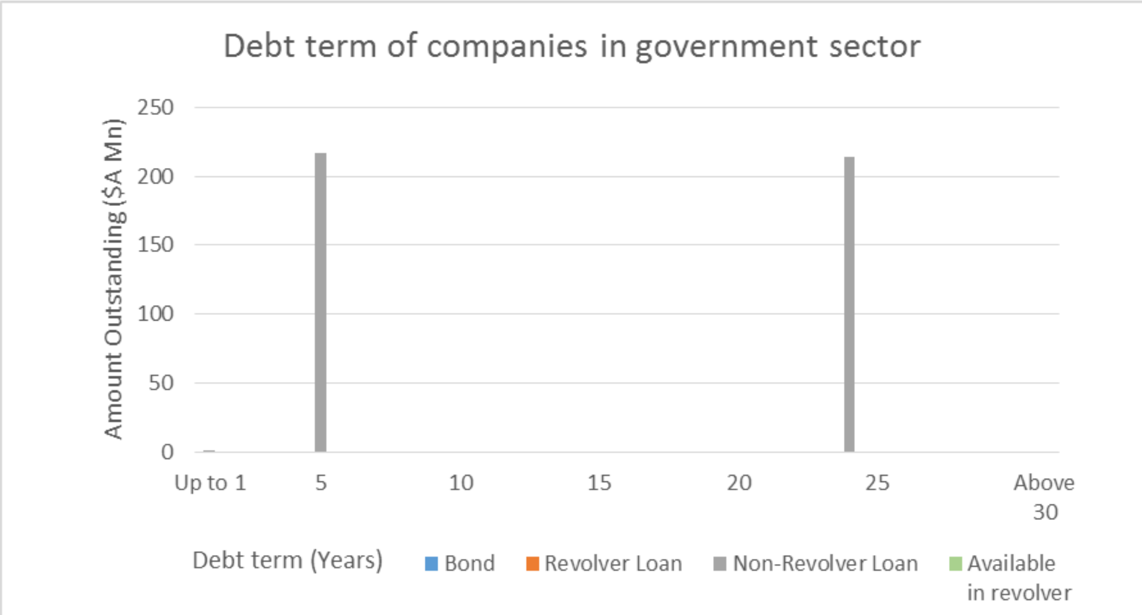


Table 28: Average debt terms for all debts issued by companies in the government sector

	Bond	Revolver loan	Non-revolver loan	Overall
Number	0	0	3	3
Amount Outstanding ($A Mn)	0.00	0.00	432.09	432.09
Weighted average debt term	N/A	N/A	14.28	14.28
Simple average debt term	N/A	N/A	N/A	9.92

9.1.4.3 Diversified

Figure 41: Debt term at issuance for all debts issued by companies in the diversified sector

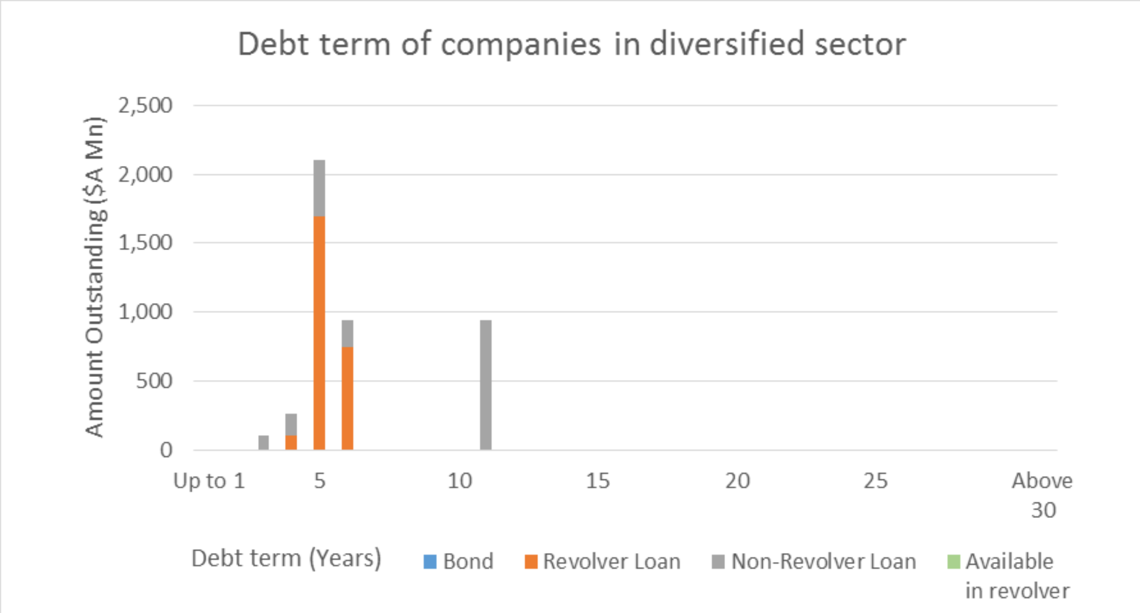


Table 29: Average debt terms for all debts issued by companies in the diversified sector

	Bond	Revolver loan	Non-revolver loan	Overall
Number	0	11	8	19
Amount Outstanding ($A Mn)	0.00	2,544.51	1,805.65	4,350.16
Weighted average debt term	N/A	4.45	7.10	5.55
Simple average debt term	N/A	4.27	3.28	4.37

9.2 Term of debt and fixed cost levels

137. The sample is divided into two subsamples according to the amount of net fixed assets held by the parent company: (1) asset levels up to and including the median; and (2) asset levels above the median ($A 1,952 million). The weighted average debt term and simple average debt term for both groups are shown below in Table 30.

138. The weighted average and simple average debt term for debts where the parent company has net fixed assets up to and including the median are 5.68 years and 7.71 years respectively. The weighted average debt term for the subsample where the parent company has net fixed assets above the median is 7.41 years, while the simple average is 9.43 years. Sections 9.2.1 and 0 show the term of debt charts and average debt terms for both groups.

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Table 30: Average debt terms for different fixed cost levels

Fixed cost levels	Weighted average debt term	Simple average debt term
≤ Median ($A 1,952 Mn)	5.68	7.71
> Median ($A 1,952 Mn)	7.41	9.43

9.2.1 Fixed cost levels up to and including the median

Figure 42: Debt term at issuance for debts issued by companies with net fixed assets up to and including the median

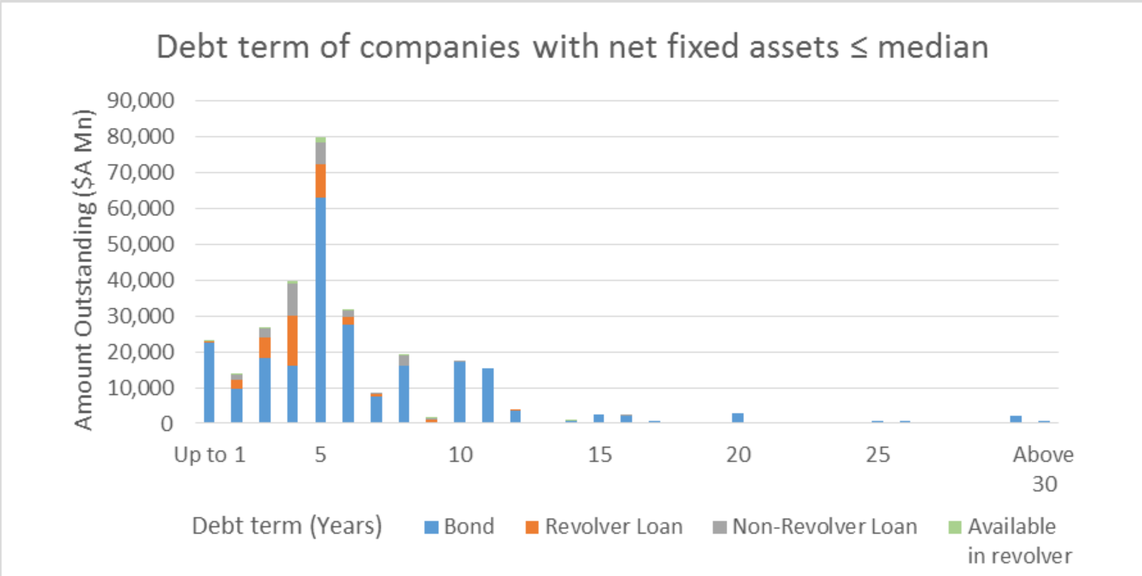

Table 31: Average debt terms at issuance for debt issued by companies with net fixed assets up to and including the median

	Bond	Revolver loan	Non-revolver loan	Overall
Number	1085	286	148	1519
Amount Outstanding ($A Mn)	232,209.32	35,264.86	23,552.14	291,026.31
Weighted average debt term	6.12	3.80	4.22	5.68
Simple average debt term	9.27	3.70	2.07	7.71

9.2.2 Fixed cost levels above the median

Figure 43: Debt term at issuance for debts issued by companies with net fixed assets above the median

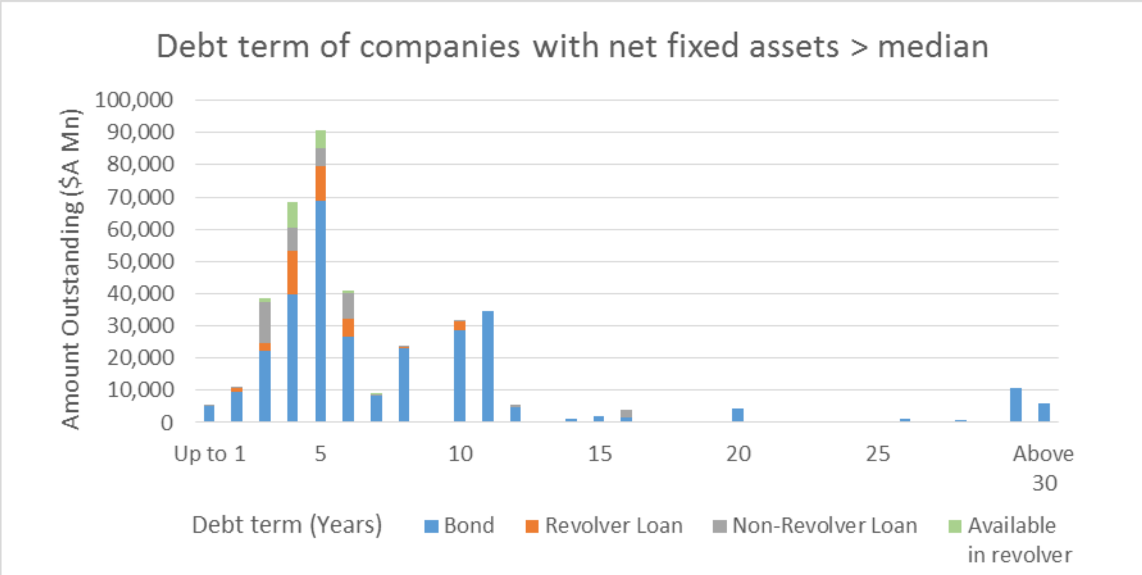

Table 32: Average debt terms at issuance for debt issued by companies with net fixed assets above the median

	Bond	Revolver loan	Non-revolver loan	Overall
Number	1296	126	94	1516
Amount Outstanding ($A Mn)	300,046.73	36,926.65	39,603.97	376,577.35
Weighted average debt term	8.10	4.54	4.86	7.41
Simple average debt term	10.26	4.23	3.69	9.43

9.3 Term of debt and debt-to-equity ratios

139. In order to compare debt terms for different debt-to-equity ratios, the sample is subdivided into two, according to whether the parent company's debt-to-equity ratio is up to and including the sample median (368.4%), or whether the debt-to-equity ratio is above the sample median. The weighted average debt term and simple average debt term for both groups are shown below in Table 33.

140. The weighted average and simple average debt term for debts issued by parent companies with debt-to-equity ratios up to and including the median is 7.04 years and 7.42 years respectively. The weighted average debt term for the subsample where the parent company has a debt-to-equity ratio above the median is 6.19 years, while the simple average is 9.84 years. Sections 9.3.1 and 0 show the term of debt charts and average debt terms for both groups.

Table 33: Average debt terms for different debt-to-equity ratios

Debt-to-equity ratio	Weighted average debt term	Simple average debt term
≤ Median (368.4%)	7.04	7.42
> Median (368.4%)	6.19	9.84

9.3.1 Debt-to-equity ratio up to and including the median

Figure 44: Debt term at issuance for debts issued by companies with debt-to-equity ratios up to and including the median

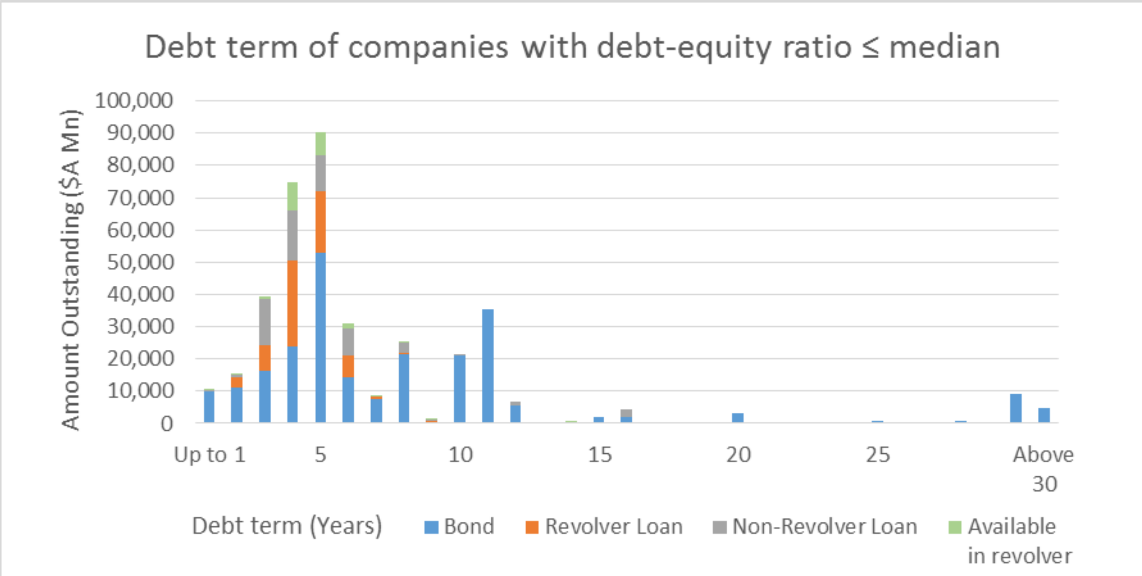

Table 34: Average debt terms at issuance for debt issued by companies with debt-to-equity ratios up to and including the median

	Bond	Revolver loan	Non-revolver loan	Overall
Number	972	396	218	1586
Amount Outstanding ($A Mn)	244,549.05	66,539.78	58,553.83	369,642.66
Weighted average debt term	8.45	3.97	4.65	7.04
Simple average debt term	9.55	3.86	2.43	7.42

9.3.2 Debt-to-equity ratio above the median

Figure 45: Debt term at issuance for debts issued by companies with debt-to-equity ratios above the median

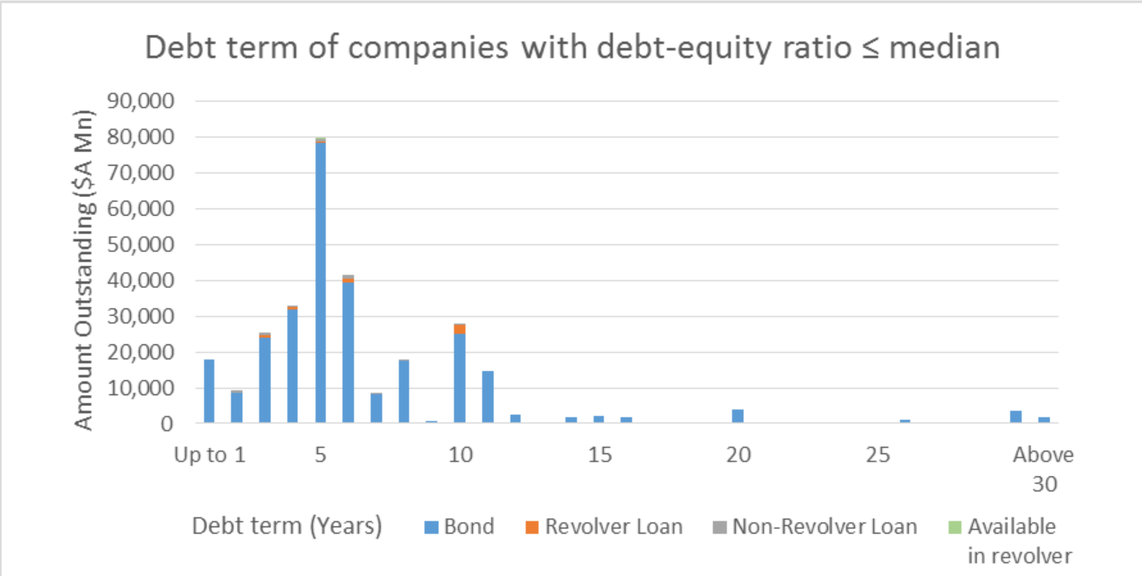

Table 35: Average debt terms at issuance for debt issued by companies with debt-to-equity ratios above the median

	Bond	Revolver loan	Non-revolver loan	Overall
Number	1401	16	25	1442
Amount Outstanding ($A Mn)	285,714.81	4,871.73	4,842.28	295,428.82
Weighted average debt term	6.21	6.91	4.26	6.19
Simple average debt term	10.01	3.92	6.12	9.84

9.4 Term of debt and credit ratings

141. We assess the term of debt at issuance across credit ratings by comparing the weighted average and simple average debt terms for each of the "broad" credit ratings from AA to B, as well as for debts with no credit rating. As mentioned in Section 3.2.7, the credit rating measure we applied was the S&P Long Term Local Currency Issuer Credit Rating. The weighted average debt term and simple average debt term for each broad crediting rating are shown below in Table 36.

142. Among the debts with credit ratings, those with broad BBB ratings have the highest weighted average debt term of 7.58 years, while those with broad AA ratings have the highest simple average debt term of 11.06 years. Broad B rated debts have the lowest weighted average and simple average debt terms at 3.96 and 3.99 years respectively. Furthermore, the averages for broad BB and broad B debts appear to

be considerably lower than the higher-rated debts. Sections 9.4.1 to 9.4.6 show the term of debt charts and average debt terms for the various broad credit ratings.

Table 36: Average debt terms for different broad credit ratings

Broad credit rating	Weighted average debt term	Simple average debt term
AA	6.75	11.06
A	7.30	7.74
BBB	7.58	7.53
BB	5.80	5.21
B	3.96	3.99
No credit rating	7.73	6.57

9.4.1 Debt term of broad AA rated debt

Figure 46: Debt term at issuance for debts issued by companies with broad AA credit ratings

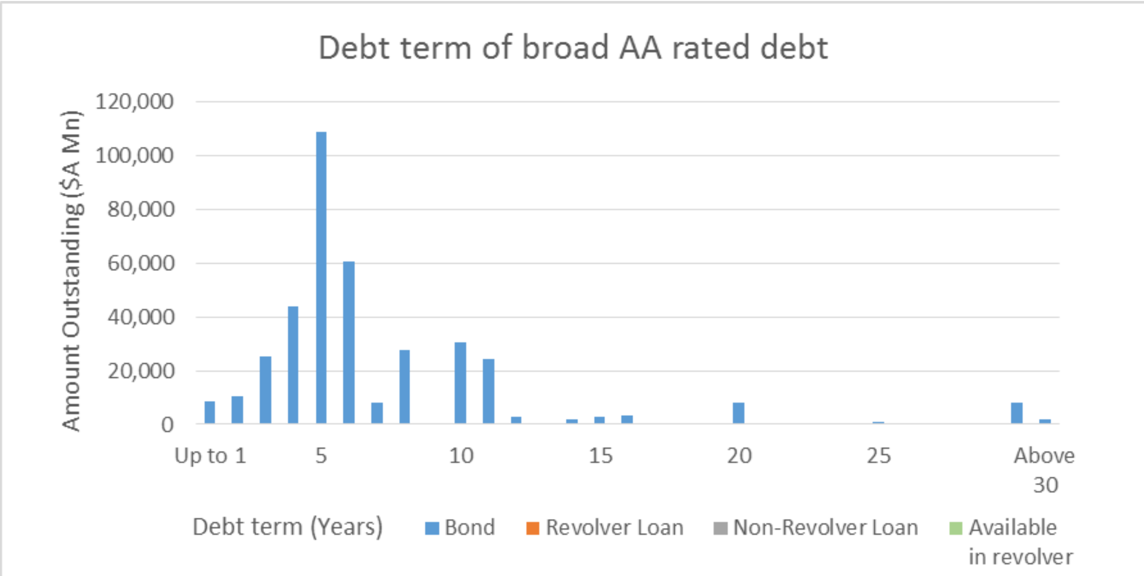

Table 37: Average debt term at issuance for debts issued by companies with broad AA credit ratings

	Bond	Revolver loan	Non-revolver loan	Overall
Number	2084	0	0	2084
Amount Outstanding ($A Mn)	380,761.98	0.00	0.00	380,761.98
Weighted average debt term	6.75	N/A	N/A	6.75
Simple average debt term	11.06	N/A	N/A	11.06

9.4.2 Debt term of broad A rated debt

Figure 47: Debt term at issuance for debts issued by companies with broad A credit ratings

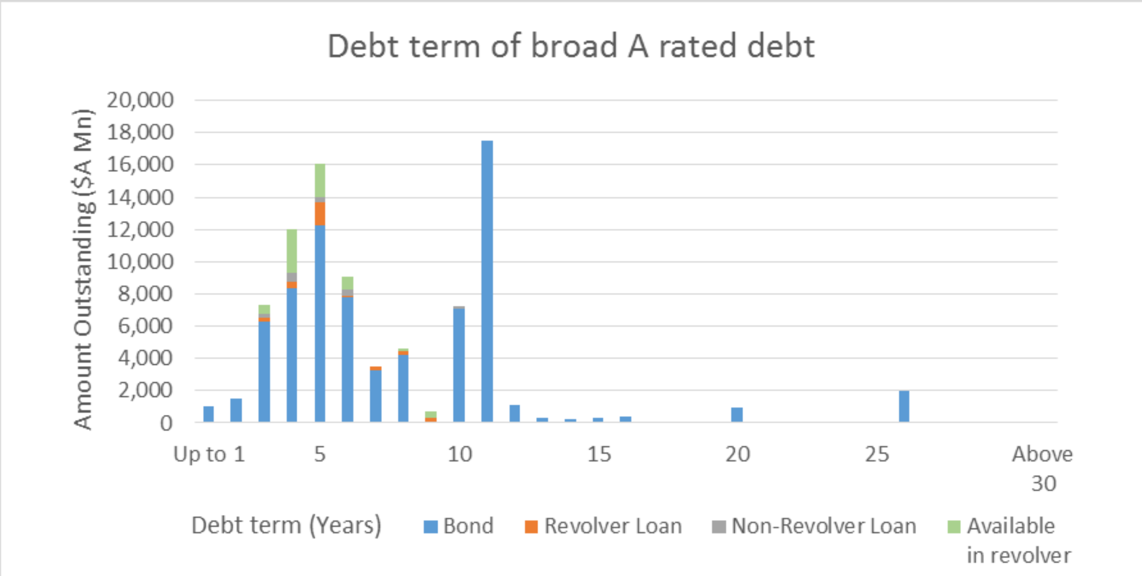

Table 38: Average debt term at issuance for debts issued by companies with broad A credit ratings

	Bond	Revolver loan	Non-revolver loan	Overall
Number	336	32	8	376
Amount Outstanding ($A Mn)	74,849.68	2,880.50	1,588.97	79,319.15
Weighted average debt term	7.43	5.17	4.77	7.30
Simple average debt term	8.05	5.10	1.29	7.74

9.4.3 Debt term of broad BBB rated debt

Figure 48: Debt term at issuance for debts issued by companies with broad BBB credit ratings

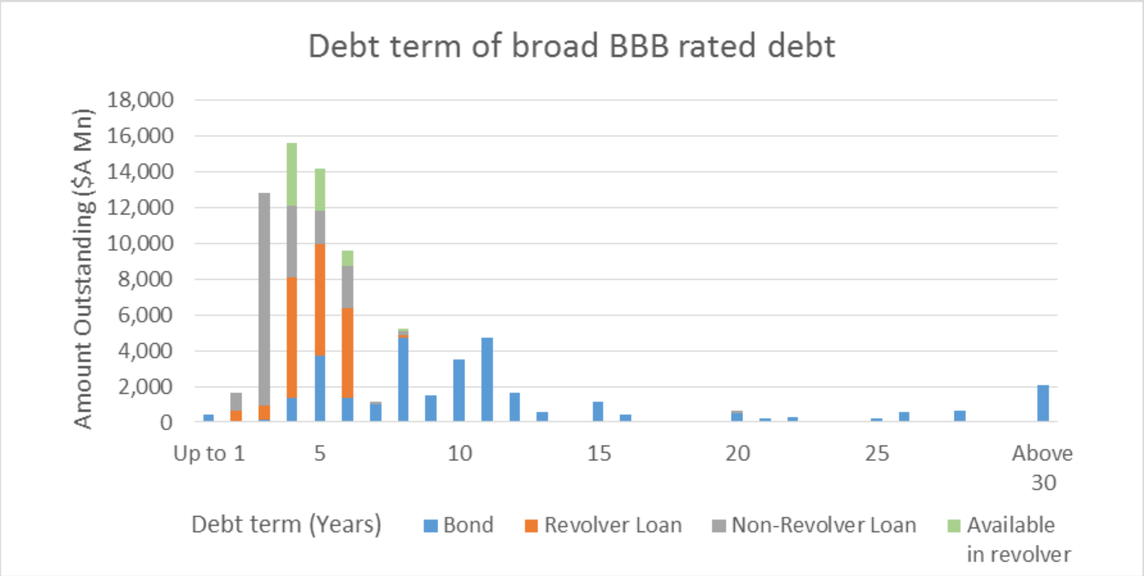

Table 39: Average debt term at issuance for debts issued by companies with broad BBB credit ratings

	Bond	Revolver loan	Non-revolver loan	Overall
Number	121	68	33	222
Amount Outstanding ($A Mn)	30,698.95	19,551.13	21,676.64	71,926.72
Weighted average debt term	12.82	4.31	3.10	7.58
Simple average debt term	10.20	4.19	2.24	7.53

9.4.4 Debt term of broad BB rated debt

Figure 49: Debt term at issuance for debts issued by companies with broad BB credit ratings

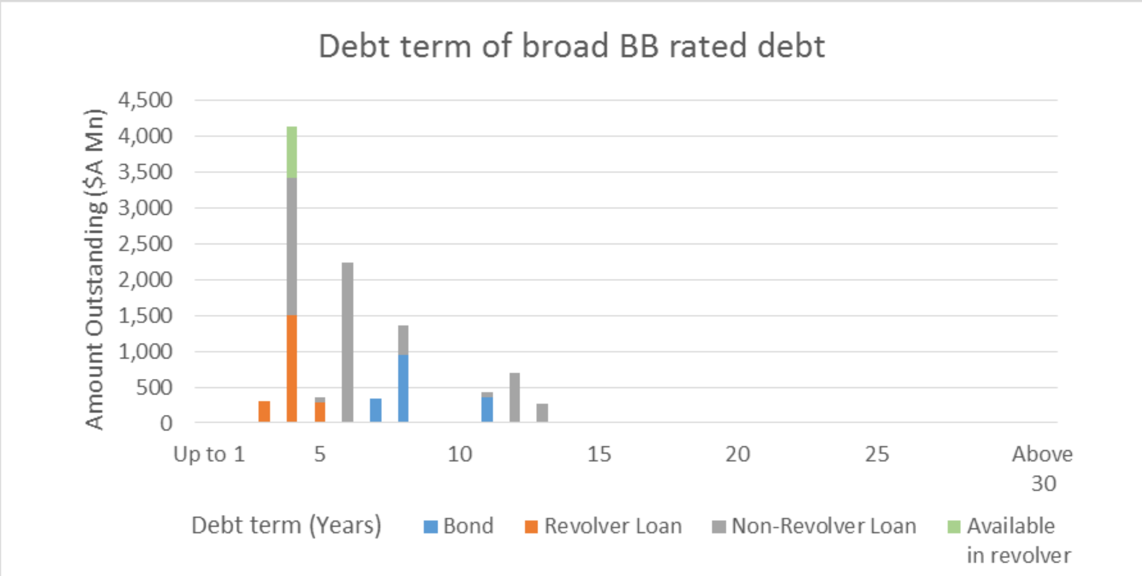

Table 40: Average debt term at issuance for debts issued by companies with broad BB credit ratings

	Bond	Revolver loan	Non-revolver loan	Overall
Number	5	15	14	34
Amount Outstanding ($A Mn)	1,657.51	2,100.55	5,667.47	9,425.53
Weighted average debt term	7.63	3.49	6.13	5.80
Simple average debt term	7.61	3.45	5.82	5.21

9.4.5 Debt term of broad B rated debt

Figure 50: Debt term at issuance for debts issued by companies with broad B credit ratings

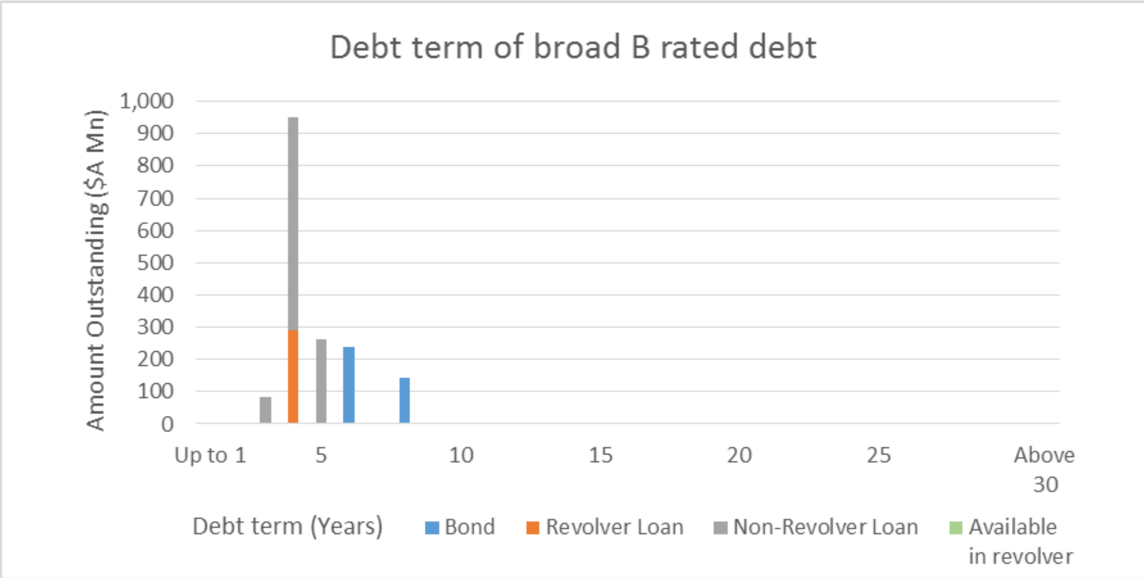

Table 41: Average debt term at issuance for debts issued by companies with broad B credit ratings

	Bond	Revolver loan	Non-revolver loan	Overall
Number	2	2	4	8
Amount Outstanding ($A Mn)	380.81	290.00	1,005.36	1,676.18
Weighted average debt term	5.80	3.03	3.53	3.96
Simple average debt term	6.06	3.03	6.86	3.99

9.4.6 Debt term of debt with no credit rating

Figure 51: Debt term at issuance for debts issued by companies with no credit rating

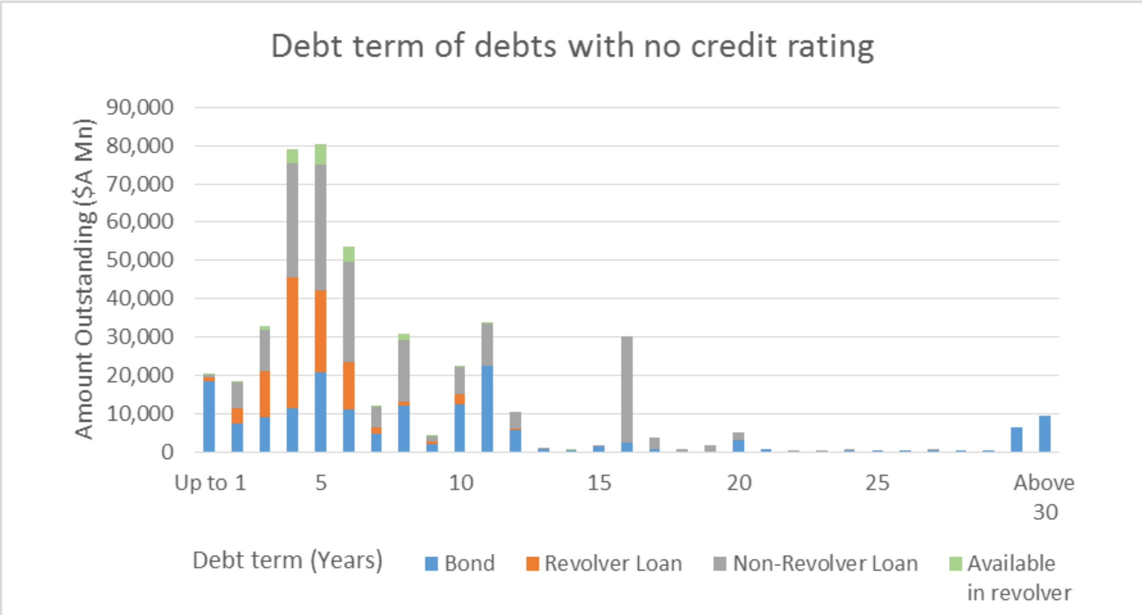

Table 42: Average debt term at issuance for debts issued by companies with no credit rating

	Bond	Revolver loan	Non-revolver loan	Overall
Number	623	628	722	1973
Amount Outstanding ($A Mn)	165,729.53	91,193.65	188,458.12	445,381.30
Weighted average debt term	9.88	4.10	7.61	7.73
Simple average debt term	10.67	3.92	6.15	6.57

10 Debt issuance and debt maturity

143. This section presents the empirical evidence regarding the year of debt issuance and time to maturity for different subsamples. Section 10.1 investigates the term of debt at issuance for different industry sectors with different levels of competitiveness.

144. Section 10.2 compares year of debt issuance and time to maturity for the subsamples with parent company net fixed assets up to and including the median as compared to the subsample with net fixed assets above the median.

145. Section 10.3 considers the year of debt issuance and time to maturity for the subsample in which the parent company has a debt-to-equity ratio up to and including the median, as compared to the subsample with a debt-to-equity ratio above the median.

146. Section 10.4 assesses how the term of debt at issuance differs across broad credit ratings.

10.1 Debt maturity and industry competitiveness

147. As was done in Section 9.1, we refer again to Table 14 in Section 97, which classified the 12 industry sectors in the sample into high, medium, and low competition categories. The weighted average and simple average time to maturity for all 12 sectors are shown in Table 43.

148. Similar to the results for term of debt at issuance shown in Section 9.1, debts issued by firms in the technology sector have the lowest weighted average and simple average time to maturity at 2.81 years and 1.96 years respectively. Unlike the term of debt results in Section 9.1, however, debts issued by the government sector do not have the highest weighted average and simple average time to maturity. Instead, debts issued by the energy and financial sectors have the highest weighted average and simple average time to maturity at 10.28 years and 6.24 years respectively.

149. It was mentioned in Section 3.2.9 that the difference between the weighted average and simple average provides some information on the distribution of the underlying variable of interest, whereby a higher weighted average indicates that larger debts occur at longer timeframes and vice-versa. By comparing the weighted averages and simple averages in both Table 17 and Table 43, it can be seen that sectors with higher weighted average term of debt than their corresponding simple average term of debt usually exhibit the same pattern with regard to time to maturity. The single exception to is the communications sector, which had a simple average debt term 0.41 years longer than the weighted average, and a simple average time to maturity 0.71 years shorter than the weighted average.

150. Table 43 further shows that debts issued by the energy sector exhibit the largest difference between weighted average and simple average time to maturity, at 5.01 years. Furthermore, only the financial sector has a simple average time to maturity that is larger than its weighted average time to maturity, at 6.24 years and 3.86 years respectively, which indicates that it has several small debts due in the long-term horizon, and a small number of large debts due in the short-term.

151. Sections 10.1.1 to 10.1.4 show the year of debt issuance and year of debt maturity charts for all 12 sectors, as well as the tables containing averages for each debt type.

Table 43: Average time to maturity by industry sector

	Weighted average time to maturity	Simple average time to maturity
Financial	3.86	6.24
Consumer, non-cyclical	3.25	3.24
Industrial	4.07	3.19
Basic materials	7.04	3.98
Consumer, cyclical	4.51	2.91
Utilities	7.17	4.84
Communications	3.98	3.27
Technology	2.81	1.96
Energy	10.28	5.27
Funds	4.94	2.42
Government	8.65	5.93
Diversified	3.45	2.61

10.1.1 Sectors with high level of competition

10.1.1.1 Financial

Figure 52: Year of debt issuance for all debts issued by companies in the financial sector

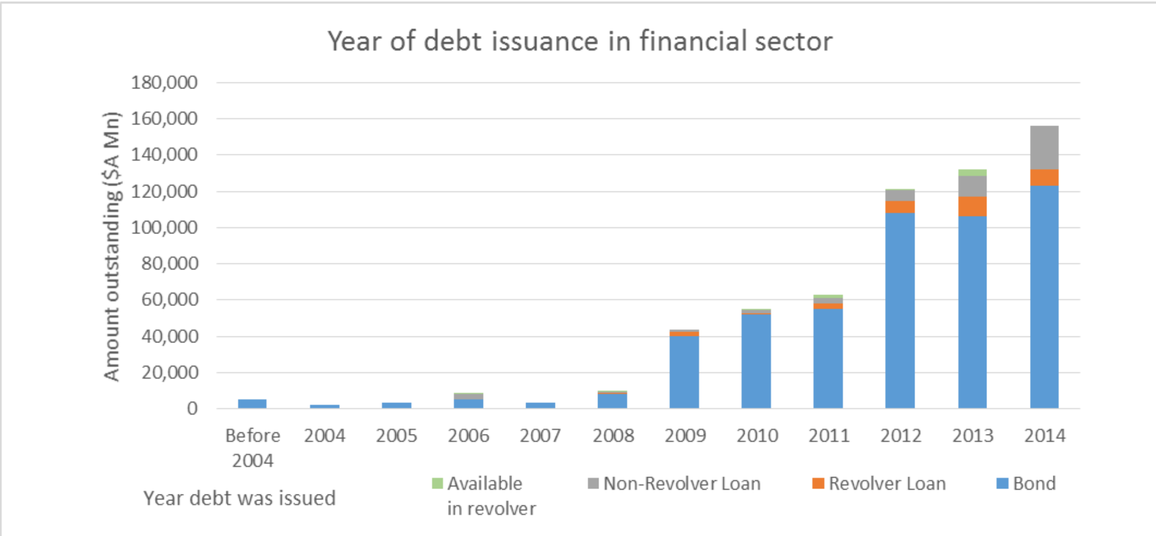

Figure 53: Year of debt maturity for all debts issued by companies in the financial sector

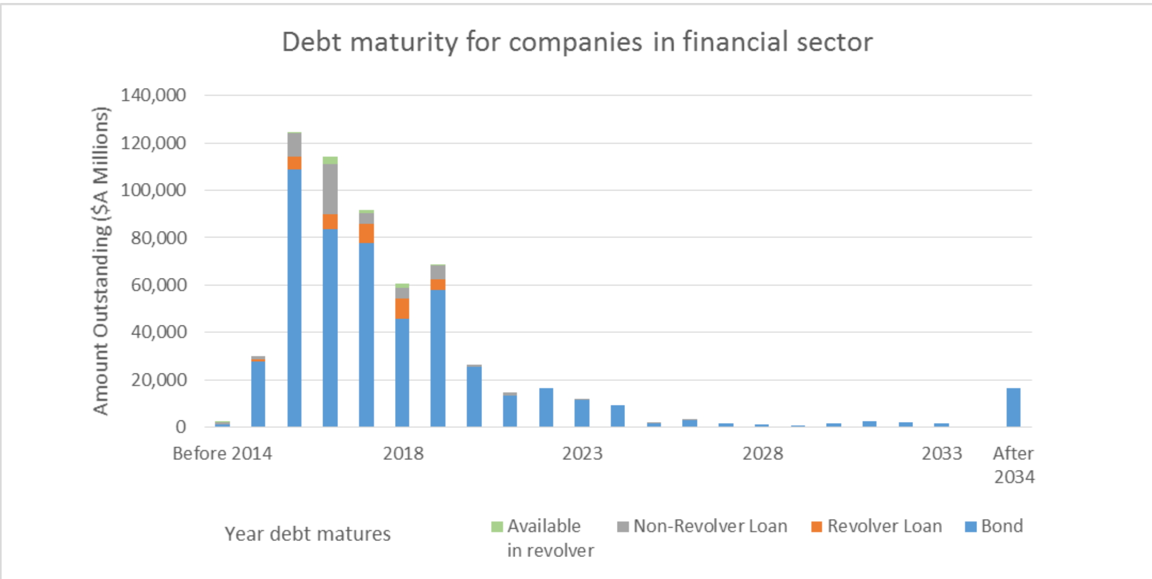

Table 44: Average time to maturity for all debts issued by companies in the financial sector

	Bond	Revolver loan	Non-revolver loan	Overall
Number	2771	179	160	3110
Amount Outstanding ($A Mn)	512,435.61	34,076.66	50,319.63	596,831.89
Weighted average time to maturity	4.10	2.73	2.27	3.86
Simple average time to maturity	6.65	2.38	1.98	6.24

10.1.1.2 Consumer, non-cyclical

Figure 54: Year of debt issuance for all debts issued by companies in the consumer, non-cyclical sector

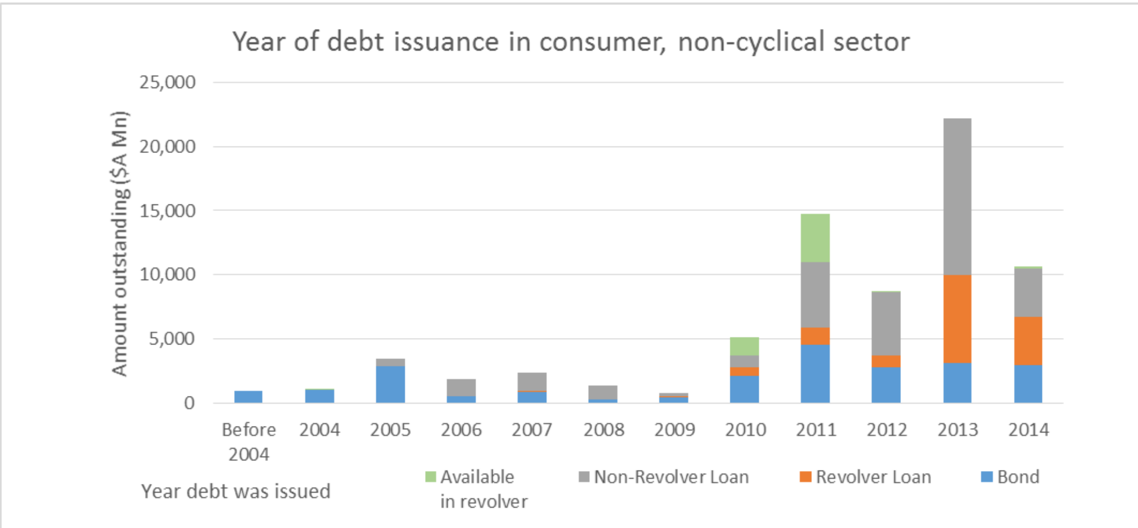

Figure 55: Year of debt maturity for all debts issued by companies in the consumer, non-cyclical sector

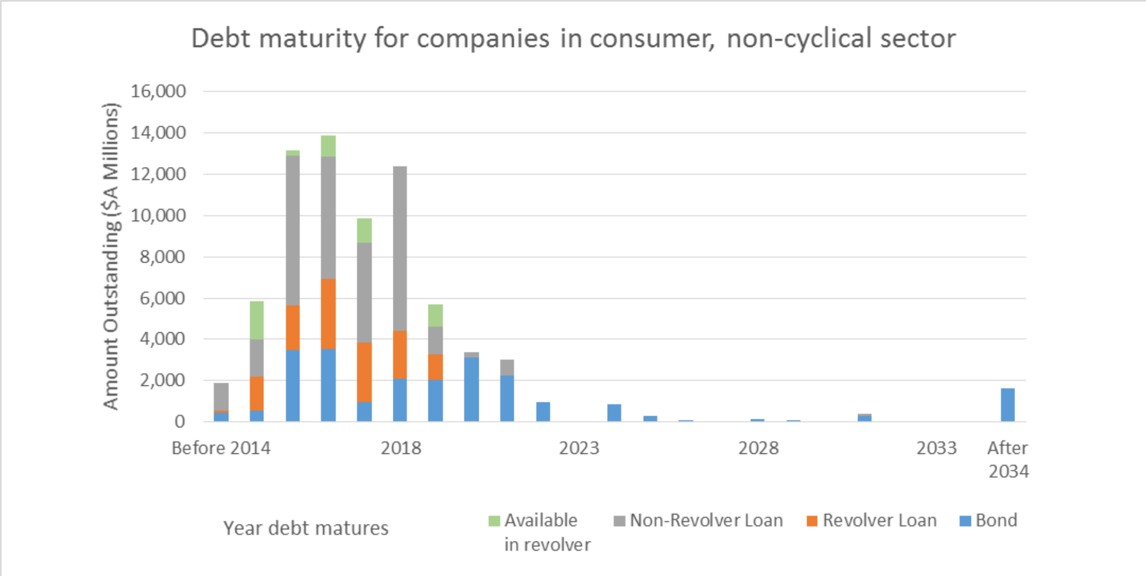

Table 45: Average time to maturity for all debts issued by companies in the non-cyclical sector

	Bond	Revolver loan	Non-revolver loan	Overall
Number	86	126	119	331
Amount Outstanding ($A Mn)	22,761.31	13,717.44	31,546.31	68,025.06
Weighted average time to maturity	5.42	2.12	2.16	3.25
Simple average time to maturity	6.24	1.95	2.24	3.24

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10.1.2 Sectors with medium level of competition

10.1.2.1 Industrial

Figure 56: Year of debt issuance for all debts issued by companies in the industrial sector

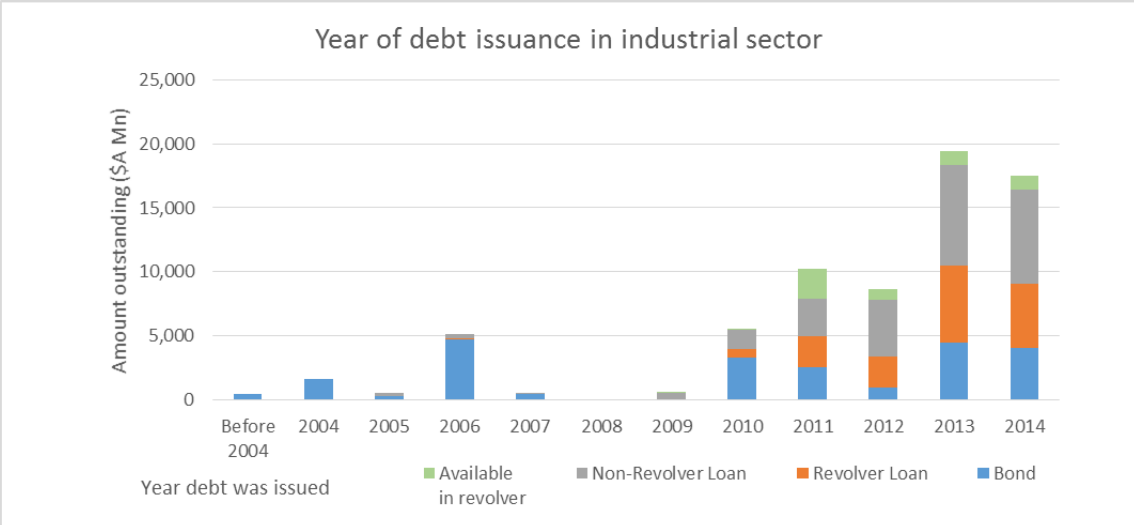

Figure 57: Year of debt maturity for all debts issued by companies in the industrial sector

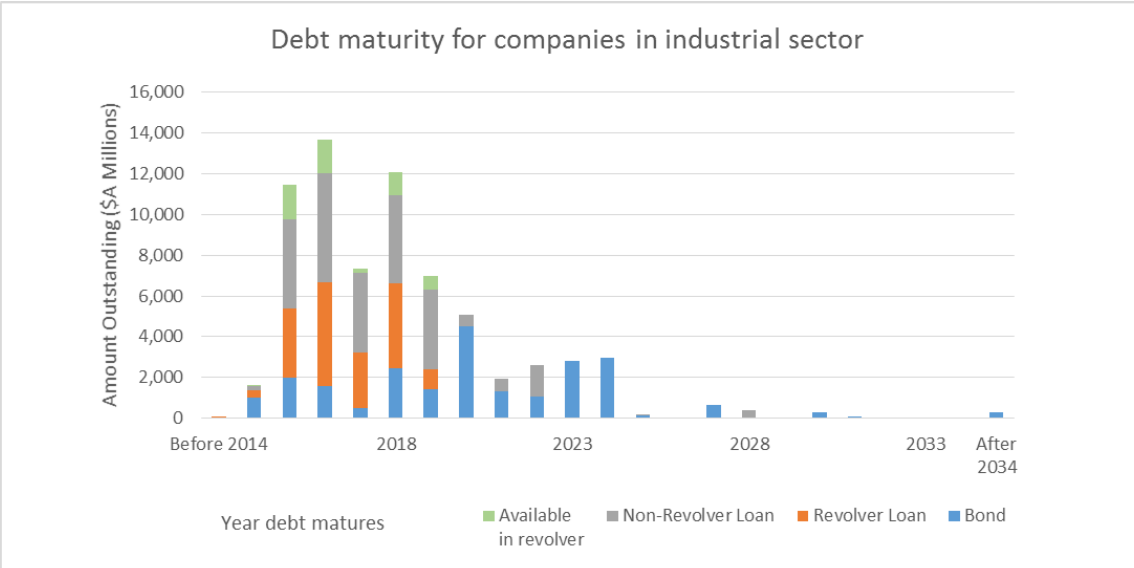

Table 46: Average time to maturity for all debts issued by companies in the industrial sector

	Bond	Revolver loan	Non-revolver loan	Overall
Number	77	131	127	335
Amount Outstanding ($A Mn)	23,065.25	16,760.40	25,197.76	65,023.41
Weighted average time to maturity	6.12	2.37	3.32	4.07
Simple average time to maturity	5.70	2.00	2.69	3.19

10.1.2.2 Basic Materials

Figure 58: Year of debt issuance for all debts issued by companies in the basic materials sector

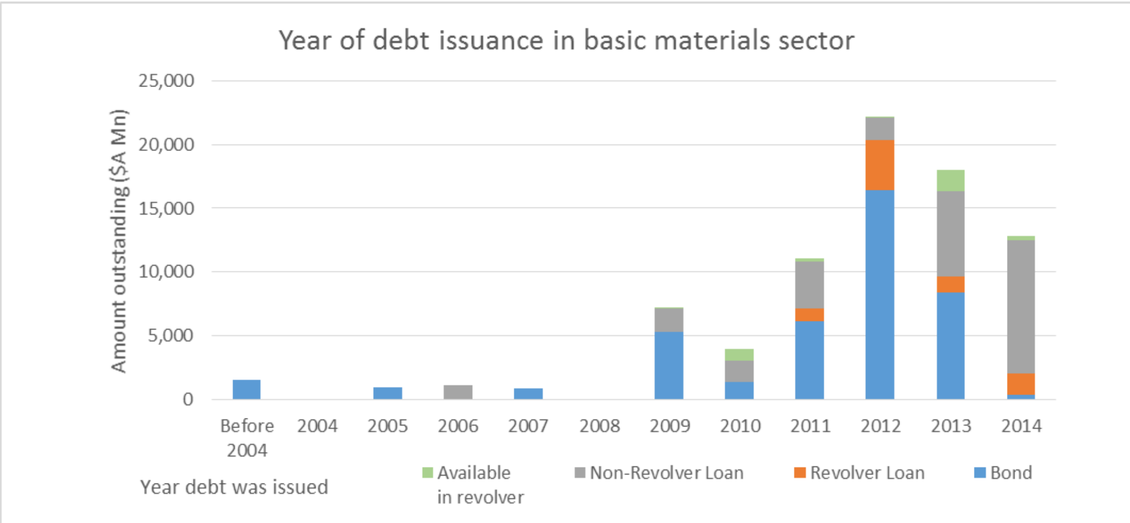

Figure 59: Year of debt maturity for all debts issued by companies in the basic materials sector

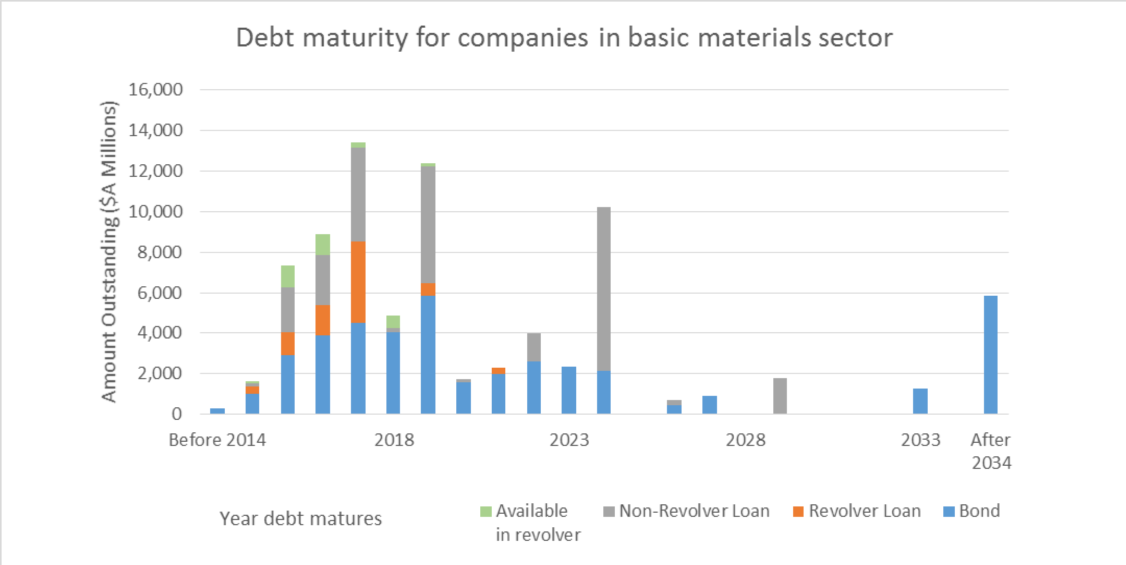

Table 47: Average time to maturity for all debts issued by companies in the basic materials sector

	Bond	Revolver loan	Non-revolver loan	Overall
Number	61	60	88	209
Amount Outstanding ($A Mn)	41,537.67	7,843.85	27,273.80	76,655.31
Weighted average time to maturity	8.49	2.53	6.13	7.04
Simple average time to maturity	6.57	2.08	4.39	3.98

10.1.2.3 Consumer, Cyclical

Figure 60: Year of debt issuance for all debts issued by companies in the consumer, cyclical sector

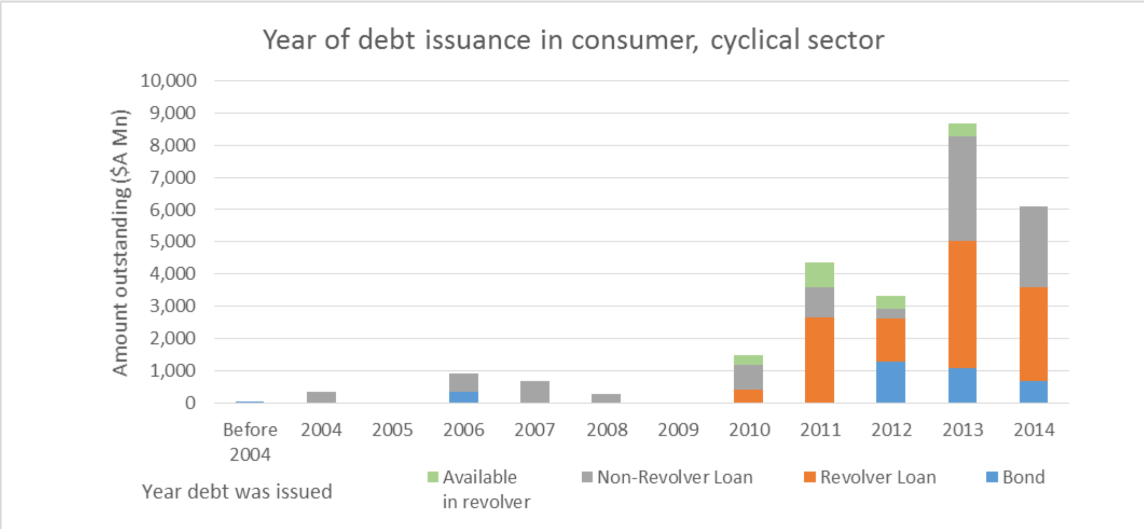

Figure 61: Year of debt maturity for all debts issued by companies in the consumer, cyclical sector

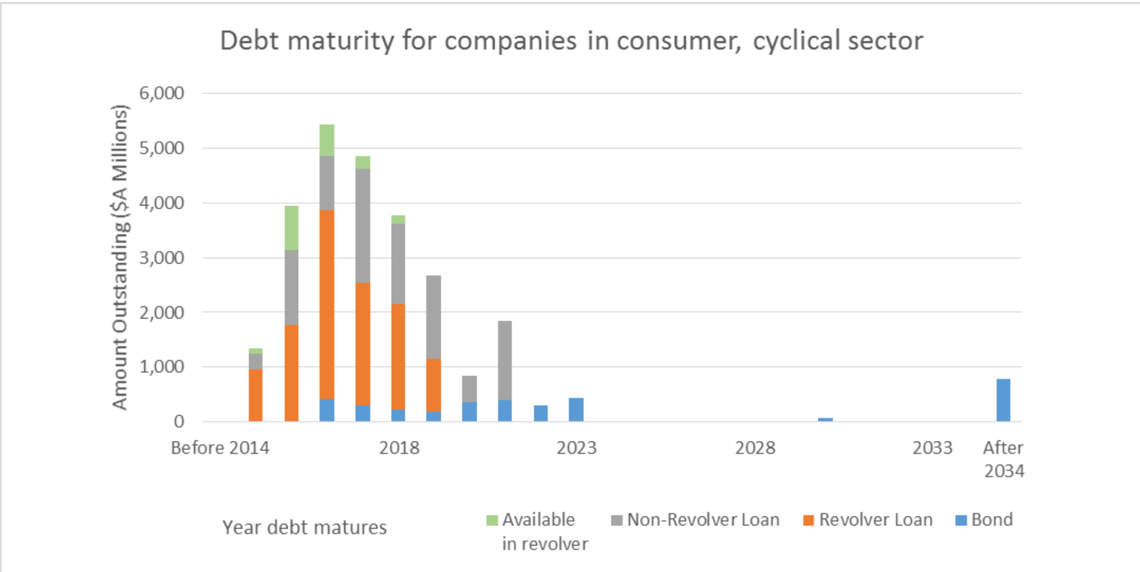

Table 48: Average time to maturity for all debts issued by companies in the consumer, cyclical sector

	Bond	Revolver loan	Non-revolver loan	Overall
Number	15	98	65	178
Amount Outstanding ($A Mn)	3,481.55	11,287.71	9,653.82	24,423.07
Weighted average time to maturity	14.83	2.23	3.47	4.51
Simple average time to maturity	10.25	2.13	1.59	2.91

10.1.2.4 Utilities

Figure 62: Year of debt issuance for all debts issued by companies in the utilities sector

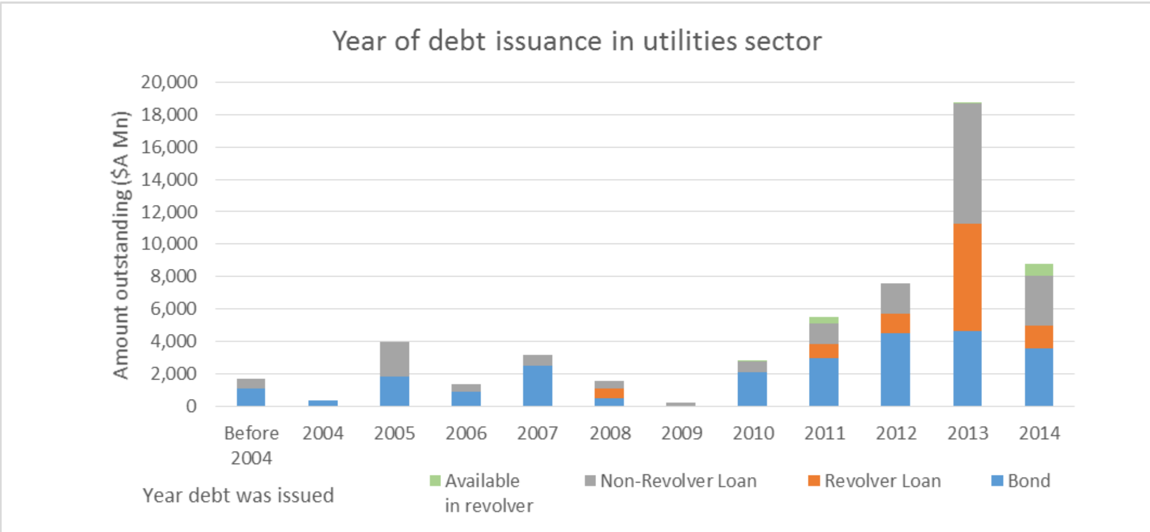

Figure 63: Year of debt maturity for all debts issued by companies in the utilities sector

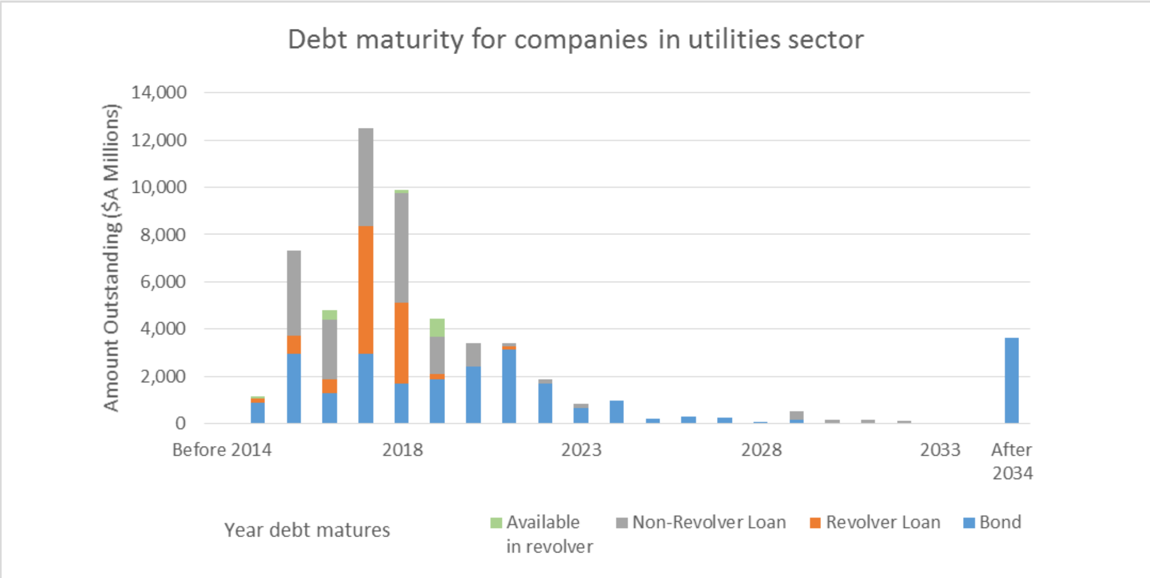

Table 49: Average time to maturity for all debts issued by companies in the utilities sector

	Bond	Revolver loan	Non-revolver loan	Overall
Number	76	43	91	210
Amount Outstanding ($A Mn)	25,190.74	10,776.21	18,658.52	54,625.46
Weighted average time to maturity	11.69	2.95	3.49	7.17
Simple average time to maturity	7.26	2.28	7.73	4.84

10.1.3 Sectors with low level of competition

10.1.3.1 Communications

Figure 64: Year of debt issuance for all debts issued by companies in the communications sector

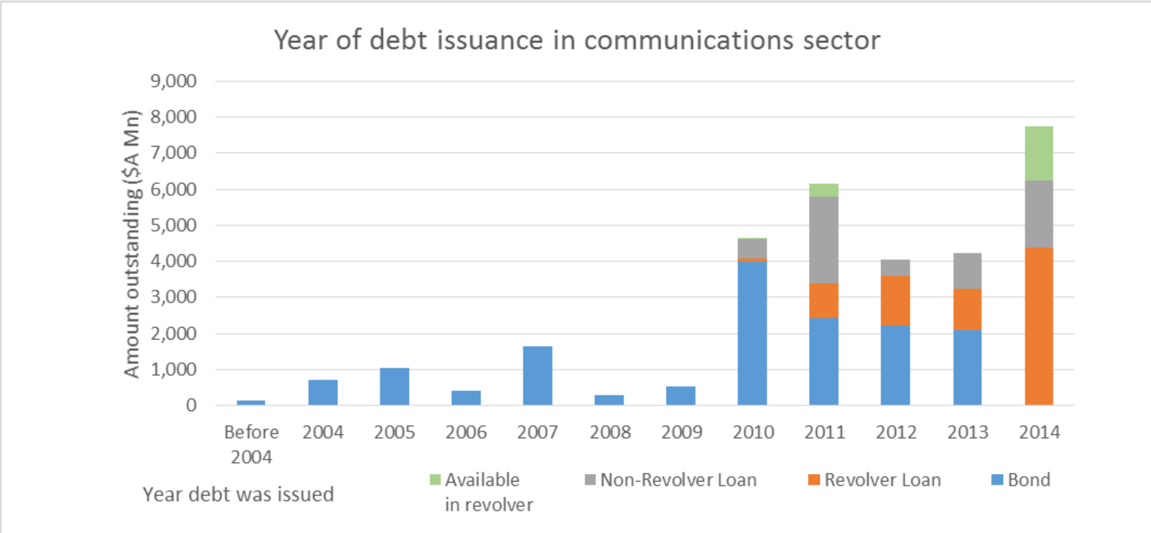

Figure 65: Year of debt maturity for all debts issued by companies in the communications sector

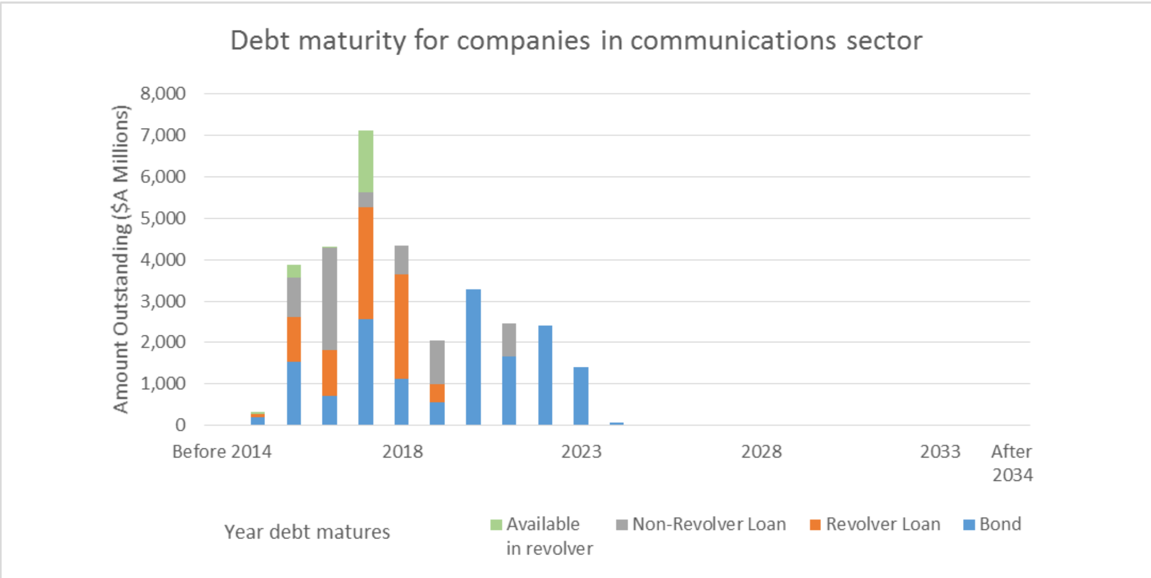

Table 50: Average time to maturity for all debts issued by companies in the communications sector

	Bond	Revolver loan	Non-revolver loan	Overall
Number	46	44	25	115
Amount Outstanding ($A Mn)	15,522.87	7,929.83	6,302.07	29,754.76
Weighted average time to maturity	5.03	2.57	3.18	3.98
Simple average time to maturity	4.29	2.37	1.68	3.27

10.1.3.2 Technology

Figure 66: Year of debt issuance for all debts issued by companies in the technology sector

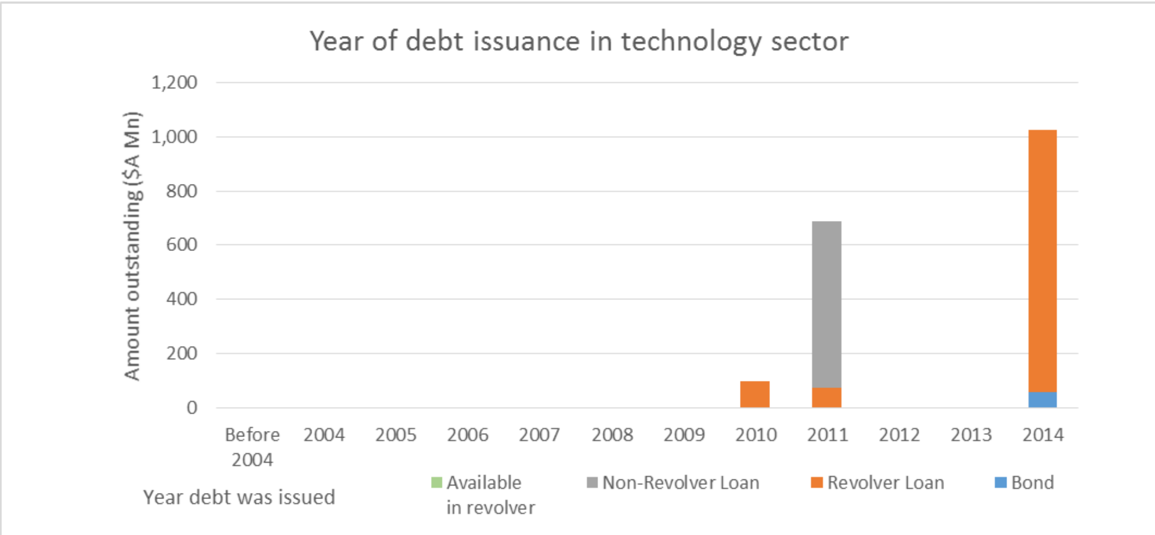

Figure 67: Year of debt maturity for all debts issued by companies in the technology sector

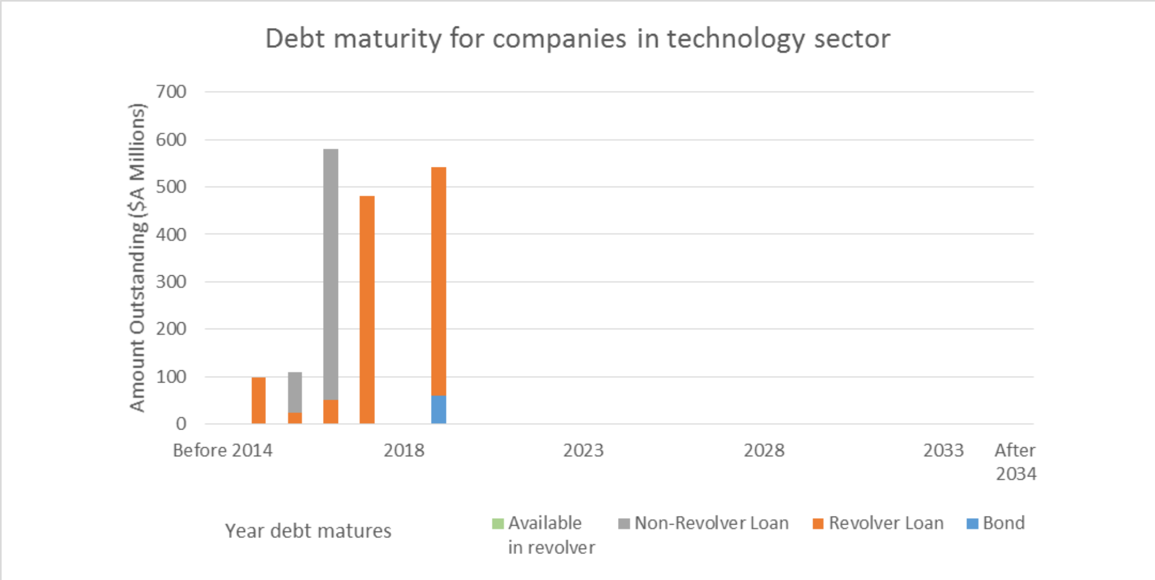

Table 51: Average time to maturity for all debts issued by companies in the technology sector

	Bond	Revolver loan	Non-revolver loan	Overall
Number	1	6	6	13
Amount Outstanding ($A Mn)	60.00	1,135.46	615.00	1,810.46
Weighted average time to maturity	4.65	3.29	1.74	2.81
Simple average time to maturity	4.65	1.69	1.13	1.96

10.1.3.3 Energy

Figure 68: Year of debt issuance for all debts issued by companies in the energy sector

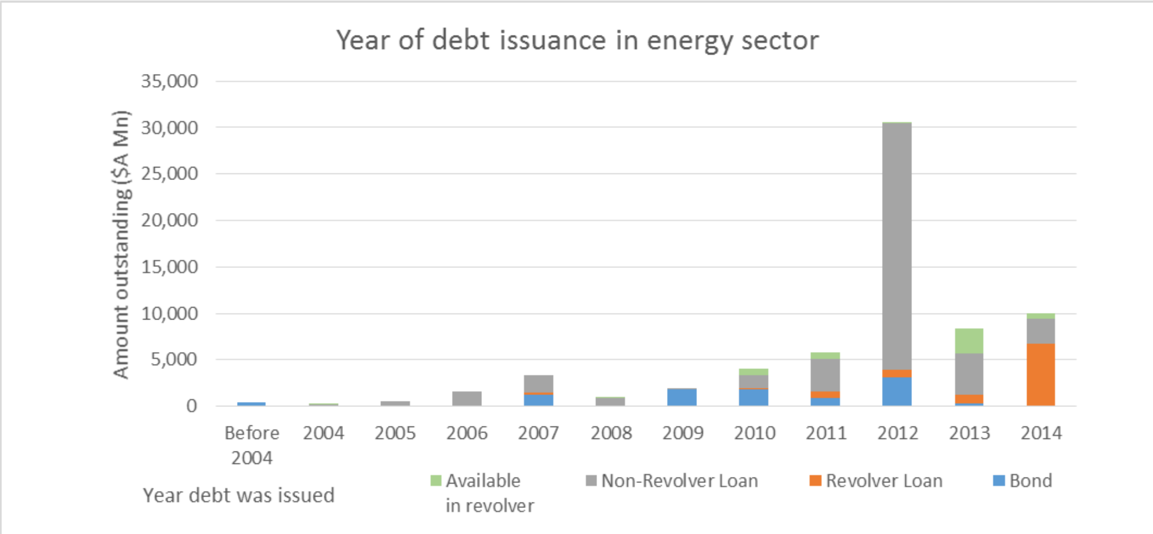

Figure 69: Year of debt maturity for all debts issued by companies in the energy sector

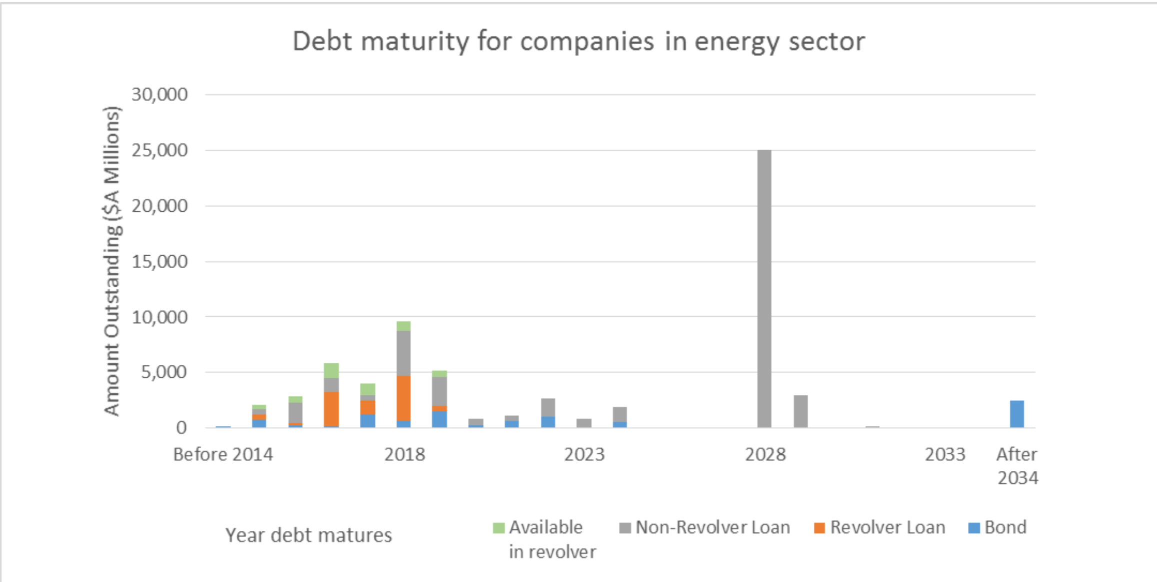

Table 52: Average time to maturity for all debts issued by companies in the energy sector

	Bond	Revolver loan	Non-revolver loan	Overall
Number	37	43	86	166
Amount Outstanding ($A Mn)	9,823.48	9,443.77	43,641.07	62,908.32
Weighted average time to maturity	15.63	2.74	10.70	10.28
Simple average time to maturity	6.86	2.53	11.07	5.27

10.1.4 Unclassified sectors

10.1.4.1 Funds

Figure 70: Year of debt issuance for all debts issued by companies in the funds sector

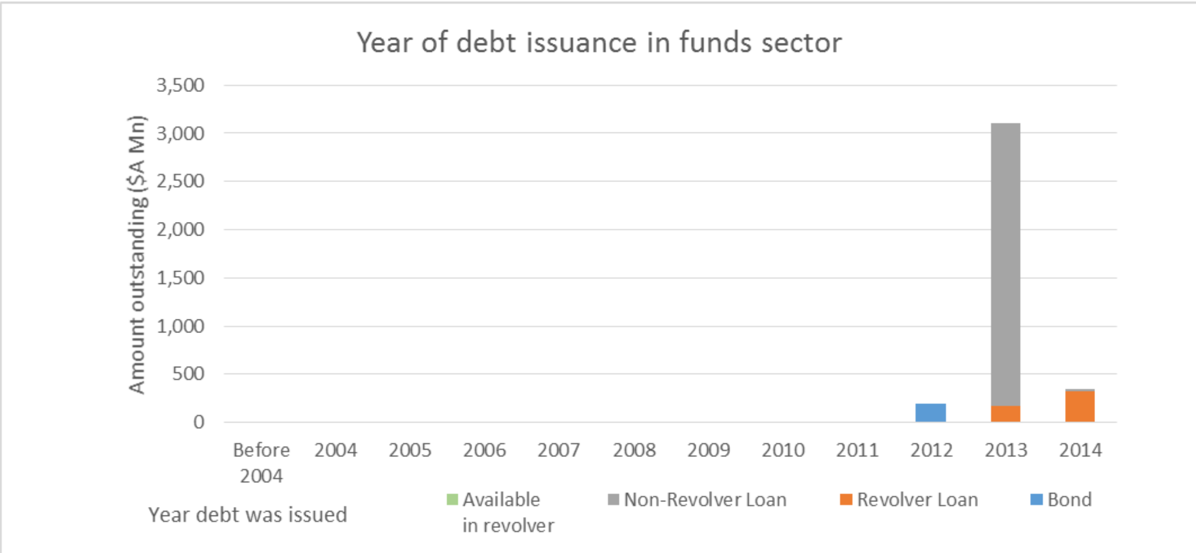

Figure 71: Year of debt maturity for all debts issued by companies in the funds sector

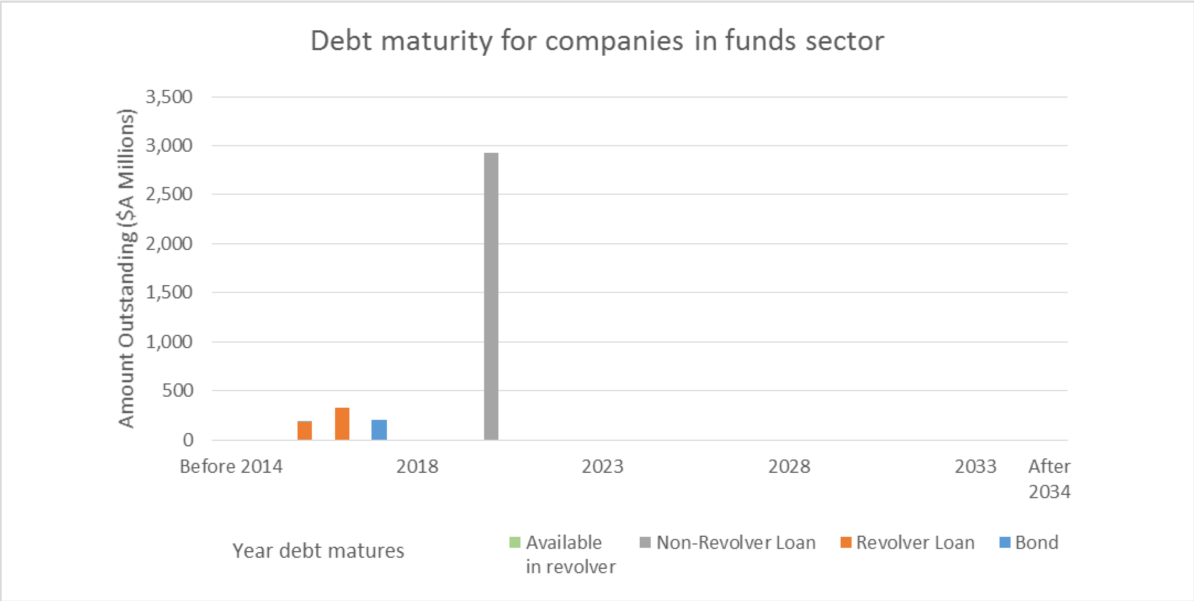

Table 53: Average time to maturity for all debts issued by companies in the funds sector

	Bond	Revolver loan	Non-revolver loan	Overall
Number	1	4	3	8
Amount Outstanding ($A Mn)	200.00	500.00	2,950.85	3,650.85
Weighted average time to maturity	3.07	1.15	5.71	4.94
Simple average time to maturity	3.07	0.97	3.11	2.42

10.1.4.2 Government

Figure 72: Year of debt issuance for all debts issued by companies in the government sector

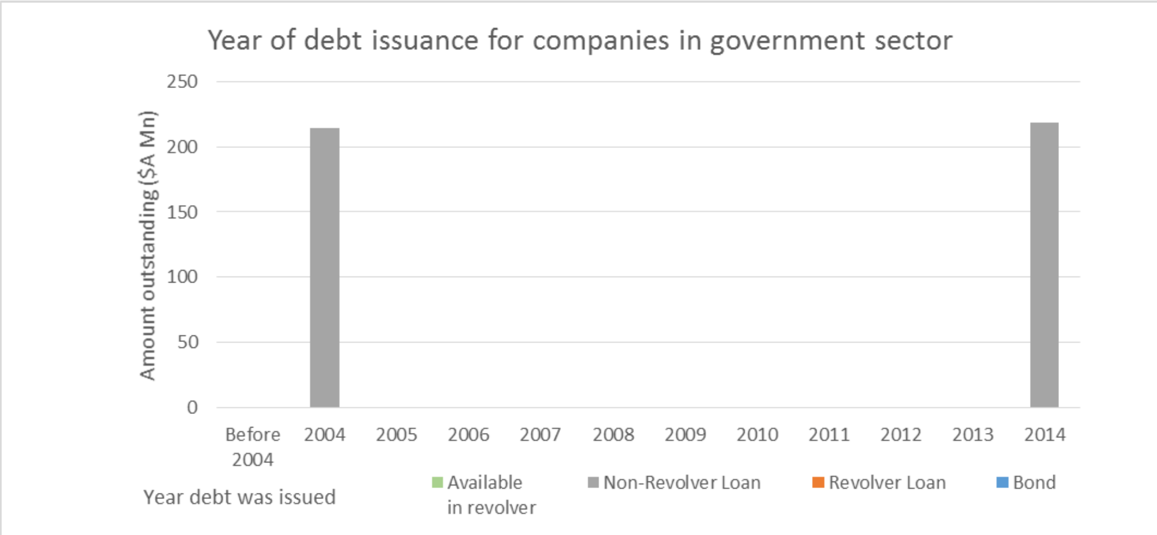

Figure 73: Year of debt maturity for all debts issued by companies in the government sector

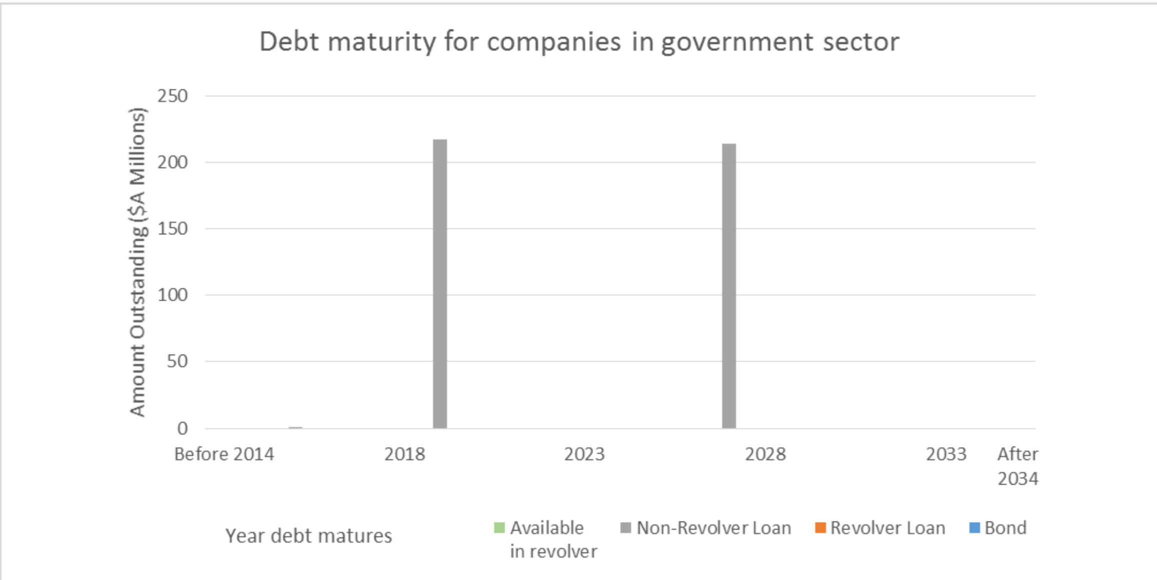

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Table 54: Average time to maturity for all debts issued by companies in the government sector

	Bond	Revolver loan	Non-revolver loan	Overall
Number	0	0	3	3
Amount Outstanding ($A Mn)	0.00	0.00	432.09	432.09
Weighted average time to maturity	N/A	N/A	8.65	8.65
Simple average time to maturity	N/A	N/A	N/A	5.93

10.1.4.3 Diversified

Figure 74: Year of debt issuance for all debts issued by companies in the diversified sector

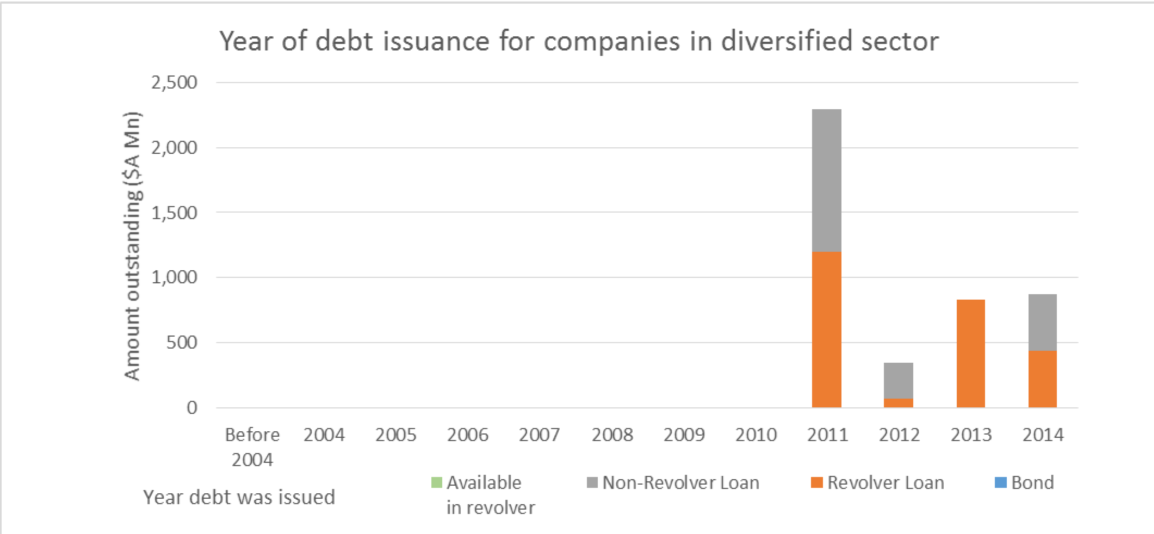

Figure 75: Year of debt maturity for all debts issued by companies in the financial sector

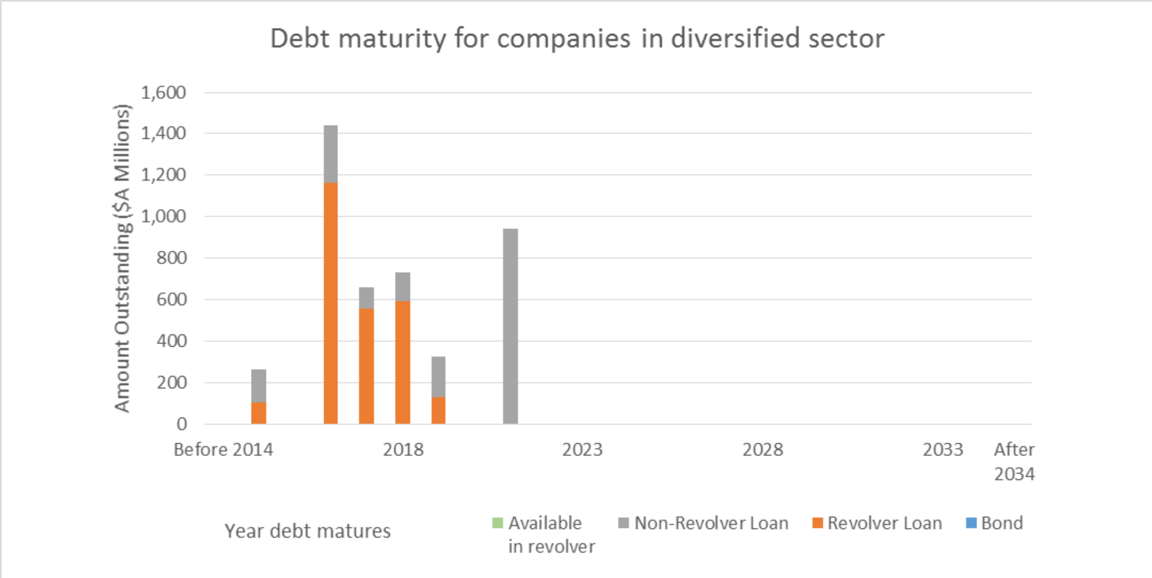

Table 55: Average time to maturity for all debts issued by companies in the diversified sector

	Bond	Revolver loan	Non-revolver loan	Overall
Number	0	11	8	19
Amount Outstanding ($A Mn)	0.00	2,544.51	1,805.65	4,350.16
Weighted average time to maturity	N/A	2.40	4.93	3.45
Simple average time to maturity	N/A	2.30	2.22	2.61

10.2 Debt maturity and fixed cost levels

152. In order to compare debt maturities for parent companies with different fixed cost levels, the sample is divided into the same two subsamples in Section 9.2, with one subsample containing debts issued by parent companies with net fixed asset values up to and including the median ($A 1,952 million), and the other containing debts issued by parent companies with net fixed asset values above the median. The weighted average debt term and simple average debt term for both groups are shown below in Table 56.

153. The weighted average and simple average time to maturity for debts where the parent company has net fixed assets up to and including the median are 3.32 years and 4.59 years respectively. When the parent company has net fixed assets above the median, the weighted average time to maturity is 5.28 years and the simple average time to maturity is 6.86 years. Sections 10.2.1 and 10.2.2 show charts

containing the year of debt issuance and year of debt maturity for both subsamples, as well as the average debt terms for all three types of debt.

154. We note that Figure 76 and Figure 78 do not accurately show the amount of debt issued in 2005, 2006, and 2011. This is because Bloomberg does not have any historical data on fixed costs for those years, as pointed out in Section 3.2.5.

Table 56: Average time to maturity for different fixed cost levels

Fixed cost levels	Weighted average time to maturity	Simple average time to maturity
≤ Median ($A 1,952 Mn)	3.32	4.59
> Median ($A 1,952 Mn)	5.28	6.86

10.2.1 Fixed cost levels up to and including the median

Figure 76: Year of debt issuance for debts issued by companies with net fixed assets up to and including the median

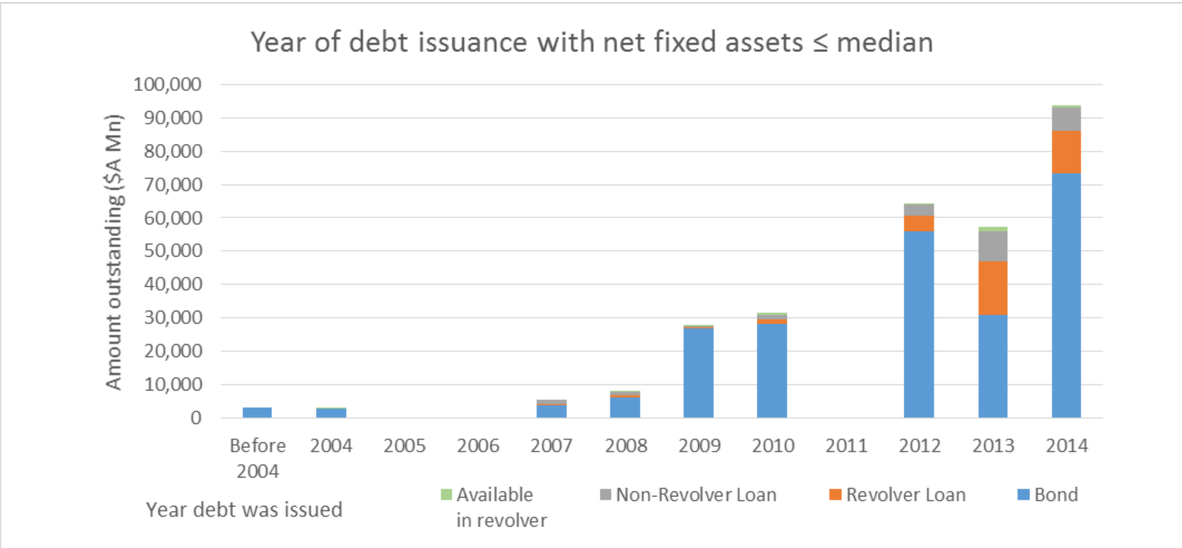

Figure 77: Time to maturity for debts issued by companies with net fixed assets up to and including the median

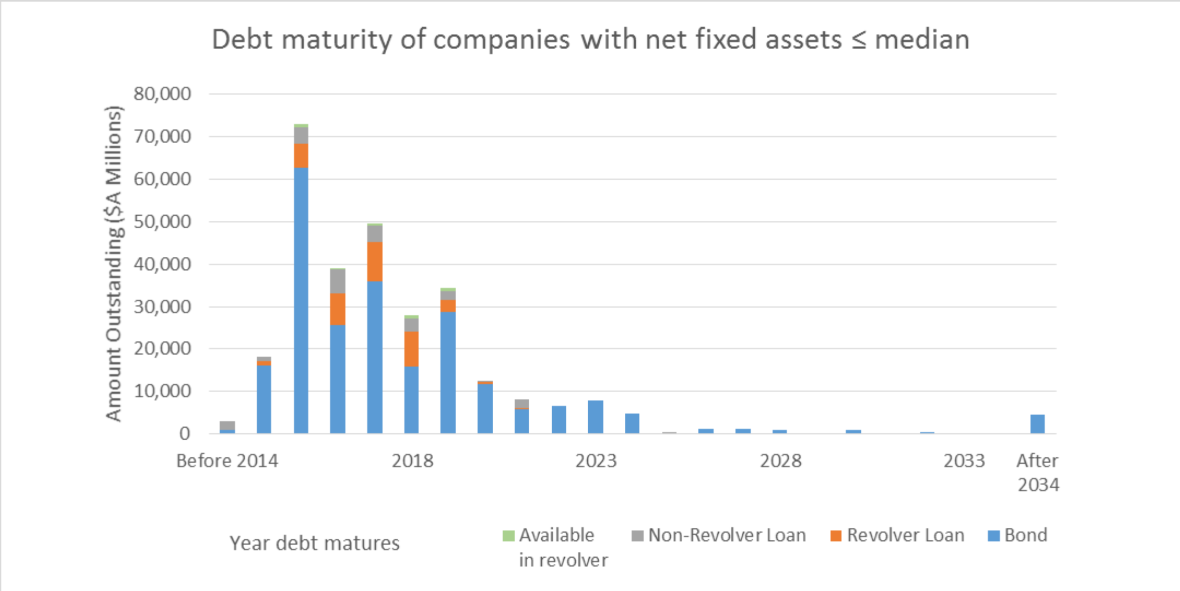

Table 57: Average time to maturity for debt issued by companies with net fixed assets up to and including the median

	Bond	Revolver loan	Non-revolver loan	Overall
Number	1085	286	148	1519
Amount Outstanding ($A Mn)	232,209.32	35,264.86	23,552.14	291,026.31
Weighted average time to maturity	3.55	2.54	2.26	3.32
Simple average time to maturity	5.51	2.21	1.04	4.59

10.2.2 Fixed cost levels above the median

Figure 78: Year of debt issuance for debts issued by companies with net fixed assets above the median

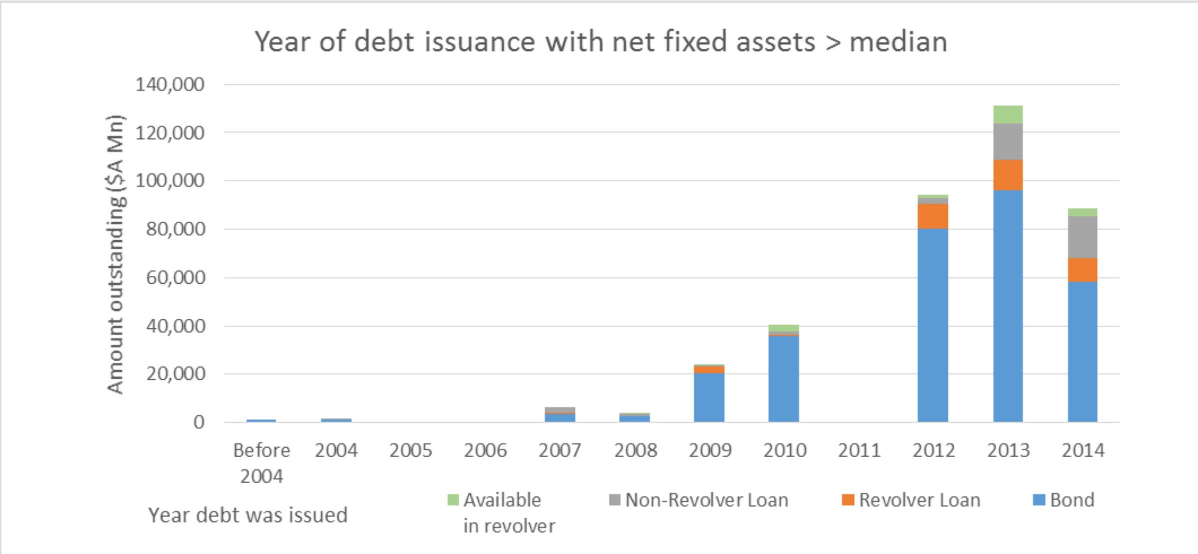

Figure 79: Time to maturity for debts issued by companies with net fixed assets above the median

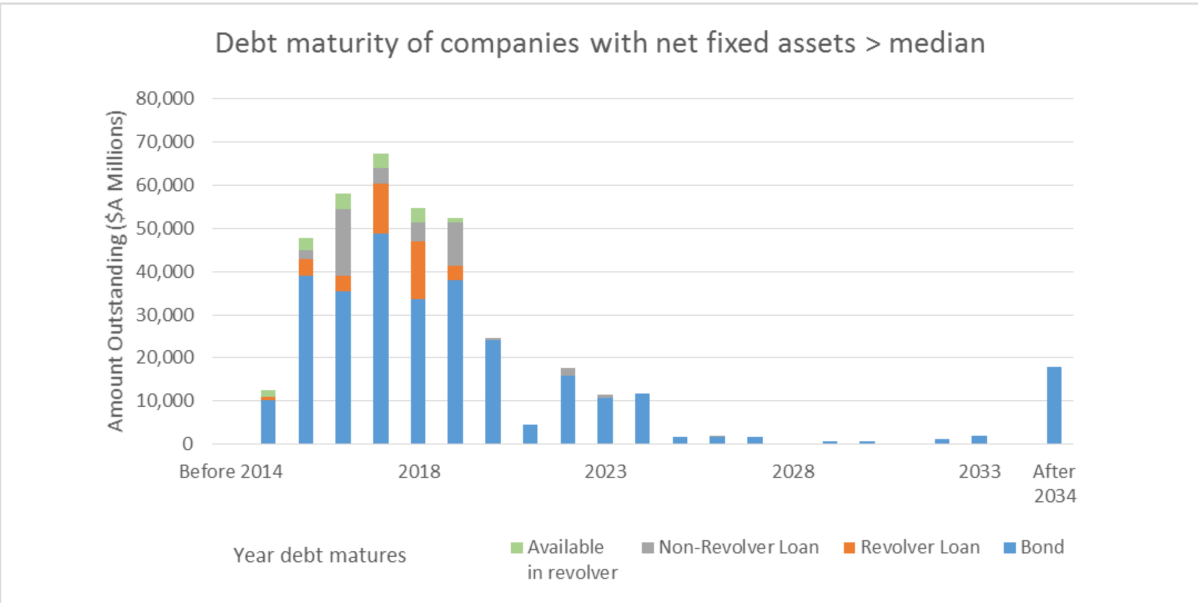

Table 58: Average time to maturity for debt issued by companies with net fixed assets above the median

	Bond	Revolver loan	Non-revolver loan	Overall
Number	1296	126	94	1516
Amount Outstanding ($A Mn)	300,046.73	36,926.65	39,603.97	376,577.35
Weighted average time to maturity	5.84	2.95	3.22	5.28
Simple average time to maturity	7.51	2.56	2.18	6.86

10.3 Debt maturity and debt-to-equity ratios

155. Similar to Section 9.3, the sample is subdivided into two, with one subsample containing the debts with associated parent companies having debt-to-equity ratios up to and including the median (368.4%), and the second containing debts with associated parent companies having debt-to-equity ratios above the median. The weighted average and simple average time to maturity for both groups are shown below in Table 59.

156. The weighted average and simple average time to maturity for the subsample with debt-to-equity ratios up to and including the median are 5.02 years and 4.93 years respectively, while the corresponding averages for the subsample with debt-to-equity ratios above the median are 3.70 years and 6.61 years respectively. Sections 10.3.1 and 10.3.2 show charts containing the year of debt issuance and year of debt maturity for both subsamples. The sections also show the average debt terms for all three types of debt in both subsamples.

157. We note that Figure 80 and Figure 82Figure 78 do not accurately show the amount of debt issued in 2005, 2006, and 2011 because Bloomberg does not have any historical data on debt-to-equity ratios for those years, as pointed out in Section 3.2.6.

Table 59: Average time to maturity for different debt-to-equity ratios

Debt-to-equity ratio	Weighted average time to maturity	Simple average time to maturity
≤ Median (368.4%)	5.02	4.93
> Median (368.4%)	3.70	6.61

10.3.1 Debt-to-equity ratio up to and including the median

Figure 80: Year of debt issuance for debts issued by companies with debt-to-equity ratio up to and including the median

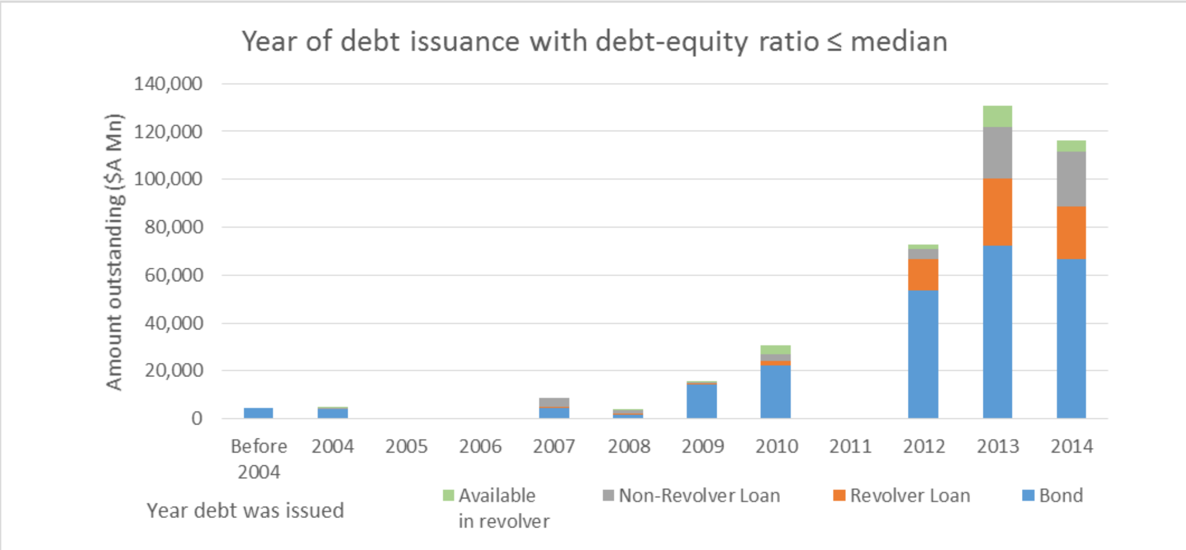

Figure 81: Time to maturity for debts issued by companies with debt-to-equity ratio up to and including the median

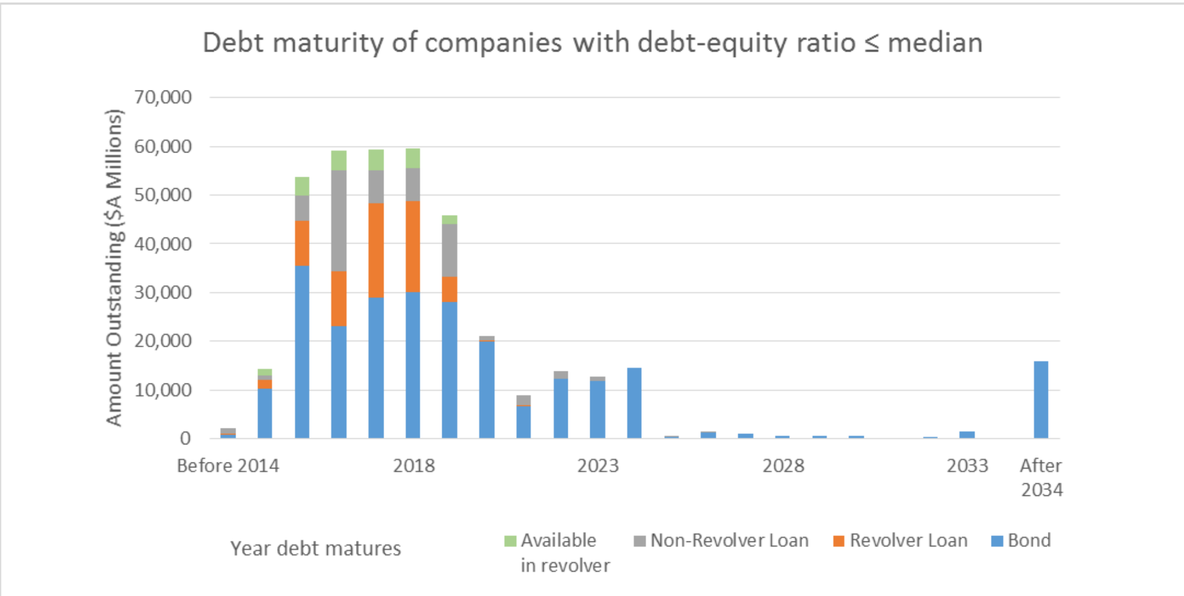

Table 60: Average time to maturity for debt issued by companies with debt-to-equity ratio up to and including the median

	Bond	Revolver loan	Non-revolver loan	Overall
Number	972	396	218	1586
Amount Outstanding ($A Mn)	244,549.05	66,539.78	58,553.83	369,642.66
Weighted average time to maturity	6.14	2.70	2.94	5.02
Simple average time to maturity	6.46	2.31	1.32	4.93

10.3.2 Debt-to-equity ratio above the median

Figure 82: Year of debt issuance for debts issued by companies with debt-to-equity ratio above the median

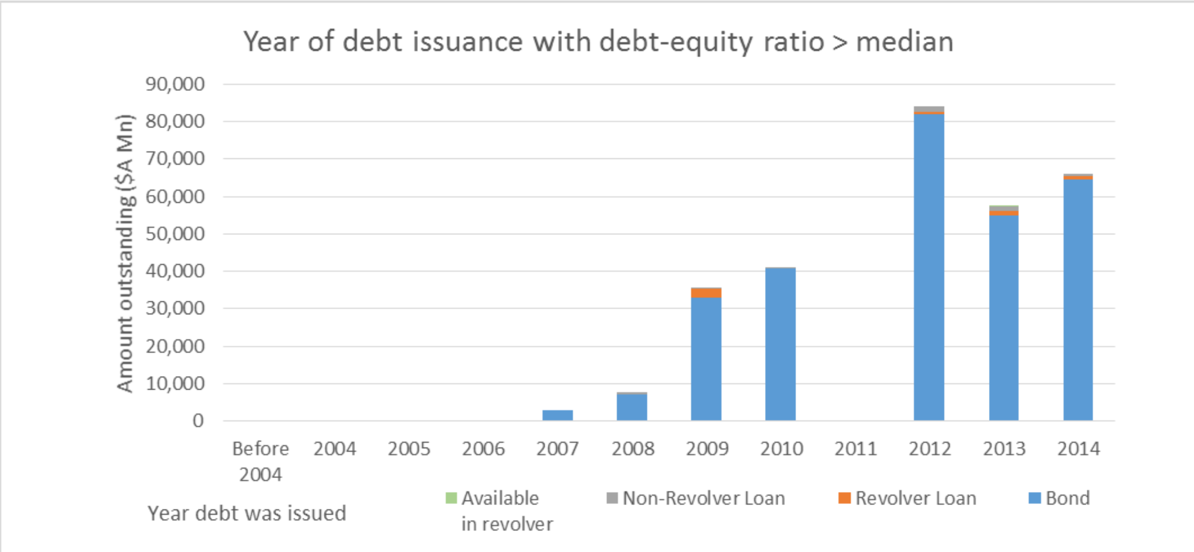

Figure 83: Time to maturity for debts issued by companies with debt-to-equity ratio above the median

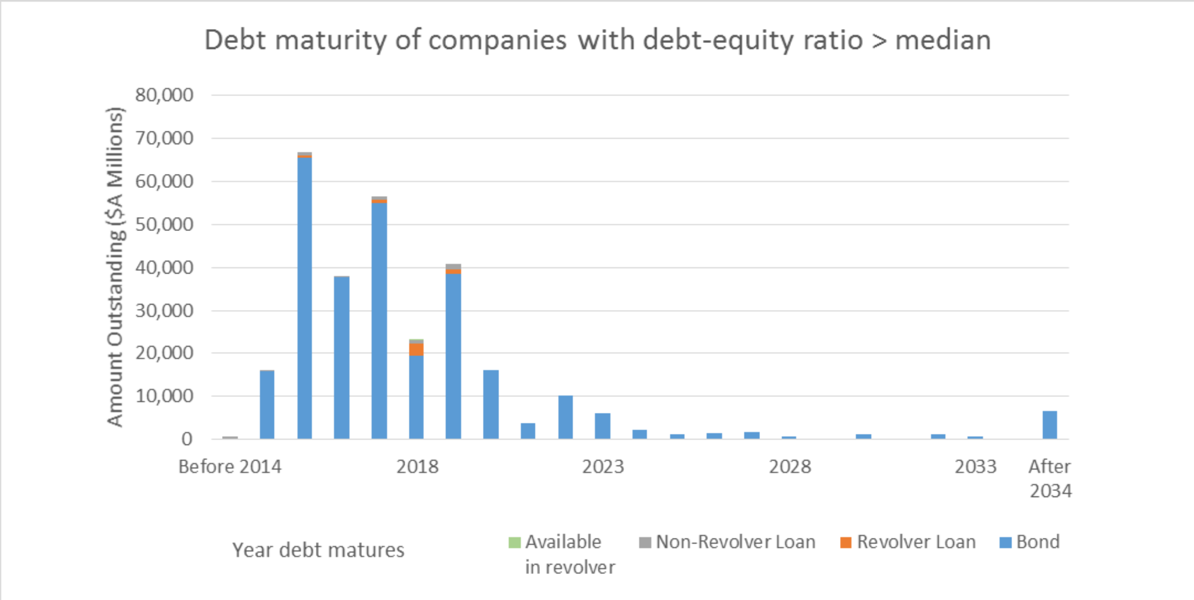

Table 61: Average time to maturity for debt issued by companies with debt-to-equity ratio above the median

	Bond	Revolver loan	Non-revolver loan	Overall
Number	1401	16	25	1442
Amount Outstanding ($A Mn)	285,714.81	4,871.73	4,842.28	295,428.82
Weighted average time to maturity	3.73	3.44	1.79	3.70
Simple average time to maturity	6.72	2.20	3.11	6.61

10.4 Debt maturity and credit ratings

158. Similar to the approach taken in Section 9.4 for term of debt at issuance, the debts in the sample are subdivided according to "broad" credit ratings, as measured by the S&P Long Term Local Currency Issuer Credit Rating. The weighted average debt term and simple average debt term for each broad crediting rating are shown below in Table 62.

159. Debts with broad BBB credit rating have the highest weighted average time to maturity at 5.32 years, while debts with broad AA credit rating have the highest simple average time to maturity at 7.34 years. Broad B rated debts have the lowest weighted average and simple average time to maturity, at 2.66 and 2.67 years respectively. These observations mirror those made in Section 9.4 concerning the term of debt at issuance. We also observe that broad BB and B rated debts appear to have averages that are considerably lower than the higher-rated debts. Sections 10.4.1 to 10.4.6 show charts containing the year of debt issuance and year of debt

maturity for the various broad credit ratings. The sections also show the average debt terms for all three types of debt in the broad credit rating subsamples.

Table 62: Average time to maturity for different broad credit ratings

Broad credit rating	Weighted average time to maturity	Simple average time to maturity
AA	4.11	7.34
A	4.33	3.85
BBB	5.32	4.62
BB	3.45	3.06
B	2.66	2.67
No credit rating	5.19	3.70

10.4.1 Debt maturity of broad AA rated debt

Figure 84: Year of debt issuance for debts issued by companies with broad AA credit ratings

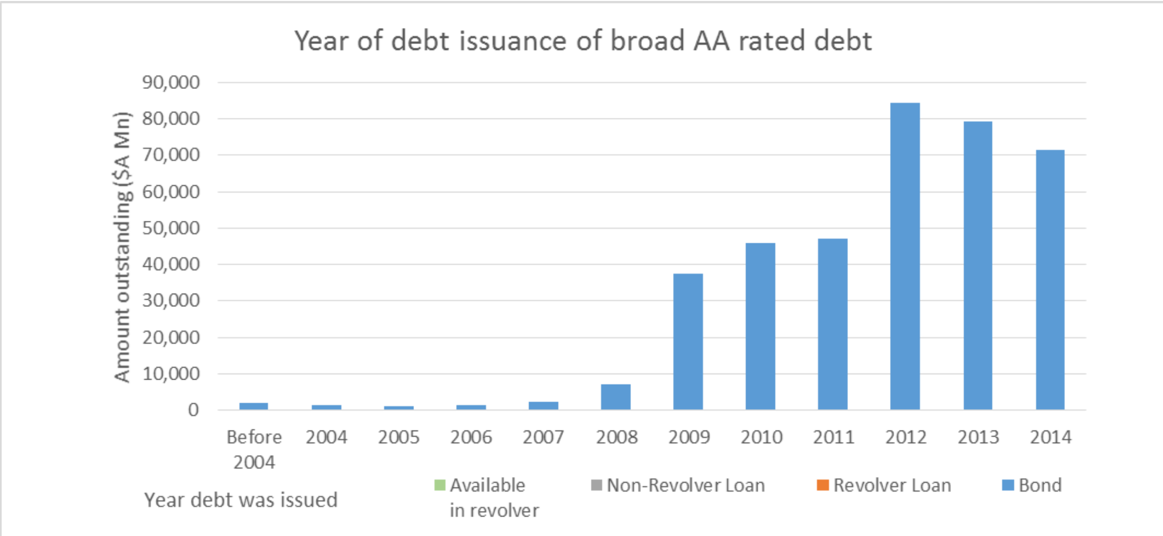

Figure 85: Year of debt maturity for debts issued by companies with broad AA credit ratings

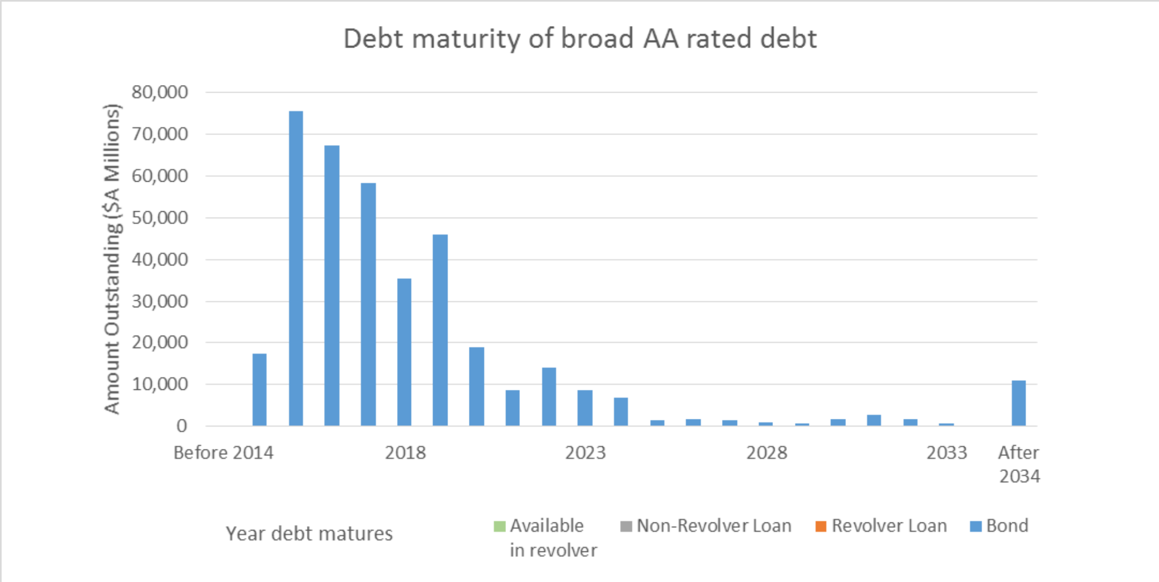

Table 63: Average time to maturity for debt issued by companies with broad AA credit ratings

	Bond	Revolver loan	Non-revolver loan	Overall
Number	2084	0	0	2084
Amount Outstanding ($A Mn)	380,761.98	0.00	0.00	380,761.98
Weighted average time to maturity	4.11	N/A	N/A	4.11
Simple average time to maturity	7.32	N/A	N/A	7.34

10.4.2 Debt maturity of broad A rated debt

Figure 86: Year of debt issuance for debts issued by companies with broad A credit ratings

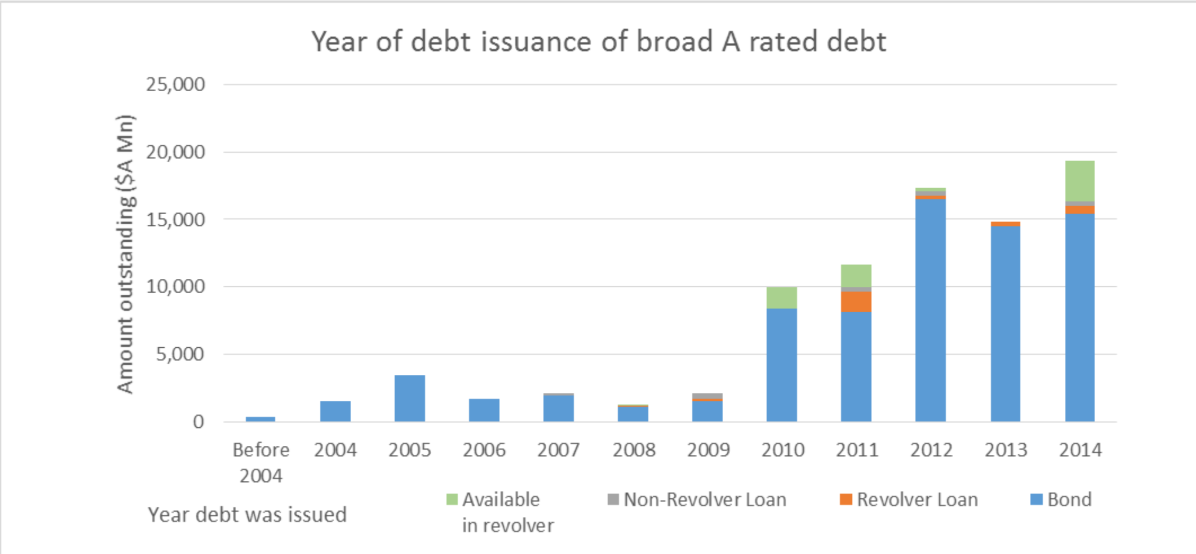

Figure 87: Year of debt maturity for debts issued by companies with broad A credit ratings

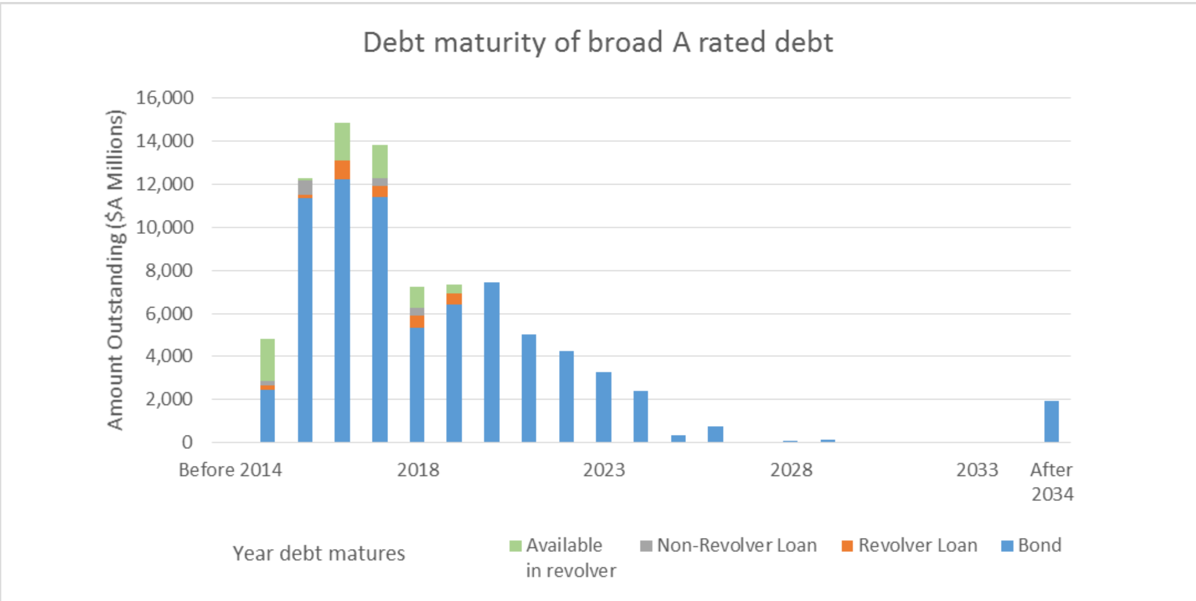

Table 64: Average time to maturity for debt issued by companies with broad A credit ratings

	Bond	Revolver loan	Non-revolver loan	Overall
Number	336	32	8	376
Amount Outstanding ($A Mn)	74,849.68	2,880.50	1,588.97	79,319.15
Weighted average time to maturity	4.45	2.71	1.66	4.33
Simple average time to maturity	4.02	2.30	0.42	3.85

10.4.3 Debt maturity of broad BBB rated debt

Figure 88: Year of debt issuance for debts issued by companies with broad BBB credit ratings

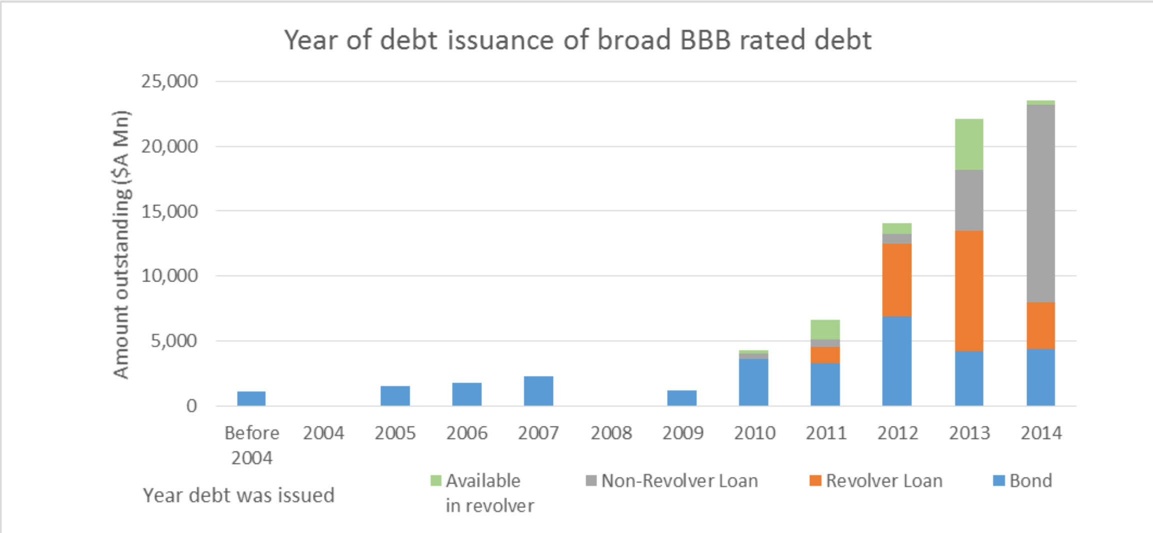

Figure 89: Year of debt maturity for debts issued by companies with broad BBB credit ratings

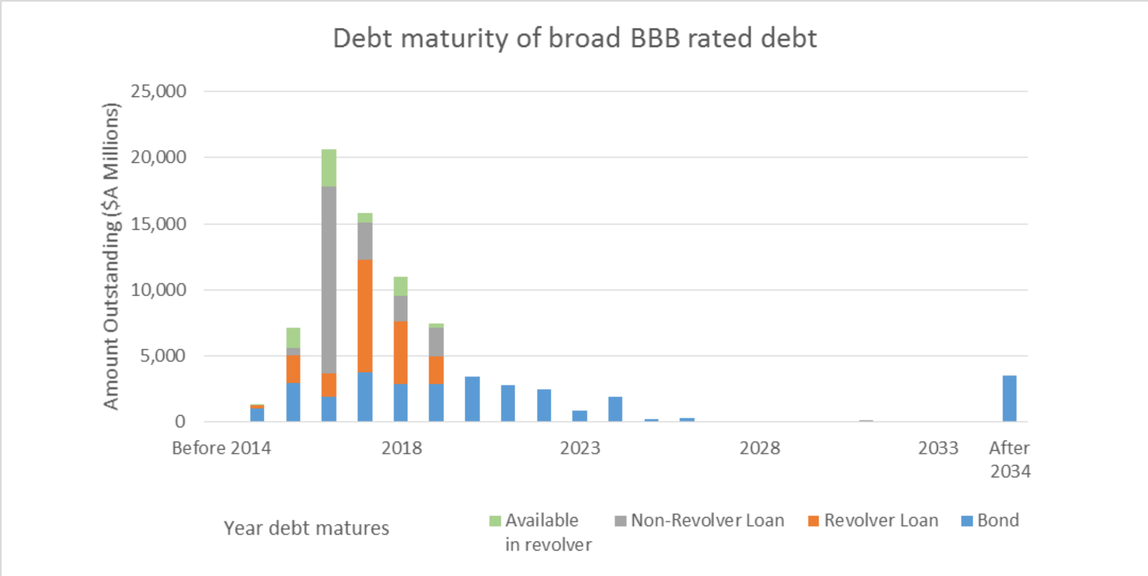

Table 65: Average time to maturity for debt issued by companies with broad BBB credit ratings

	Bond	Revolver loan	Non-revolver loan	Overall
Number	121	68	33	222
Amount Outstanding ($A Mn)	30,698.95	19,551.13	21,676.64	71,926.72
Weighted average time to maturity	9.02	2.93	2.23	5.32
Simple average time to maturity	6.25	2.55	1.40	4.62

10.4.4 Debt maturity of broad BB rated debt

Figure 90: Year of debt issuance for debts issued by companies with broad BB credit ratings

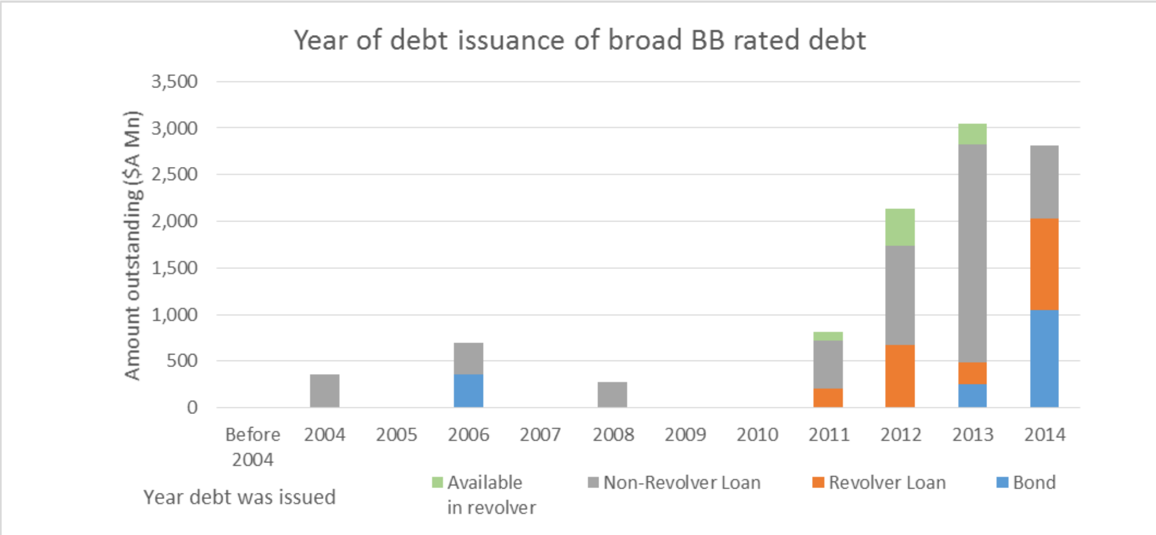

Figure 91: Year of debt maturity for debts issued by companies with broad BB credit ratings

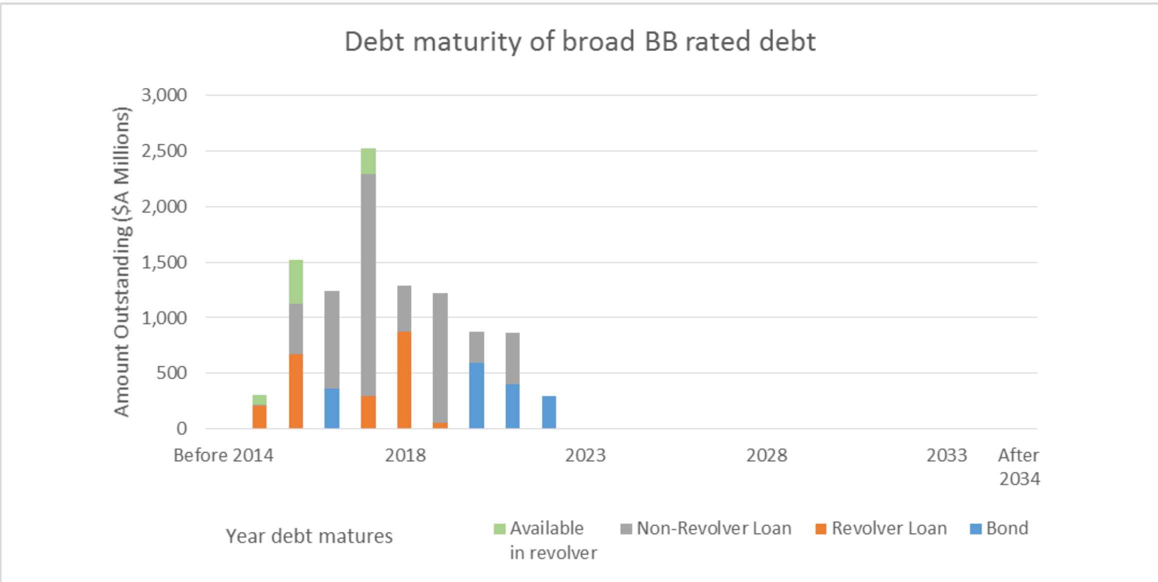

Table 66: Average time to maturity for debt issued by companies with broad BB credit ratings

	Bond	Revolver loan	Non-revolver loan	Overall
Number	5	15	14	34
Amount Outstanding ($A Mn)	1,657.51	2,100.55	5,667.47	9,425.53
Weighted average time to maturity	5.30	2.23	3.36	3.45
Simple average time to maturity	5.36	2.06	3.08	3.06

10.4.5 Debt maturity of broad B rated debt

Figure 92: Year of debt issuance for debts issued by companies with broad B credit ratings

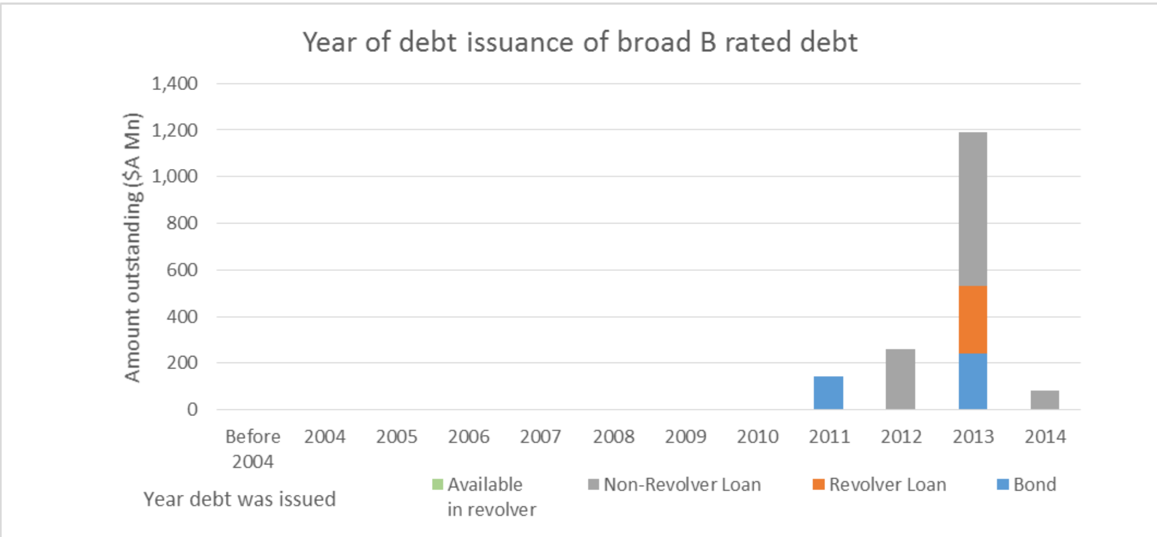

Figure 93: Year of debt maturity for debts issued by companies with broad B credit ratings

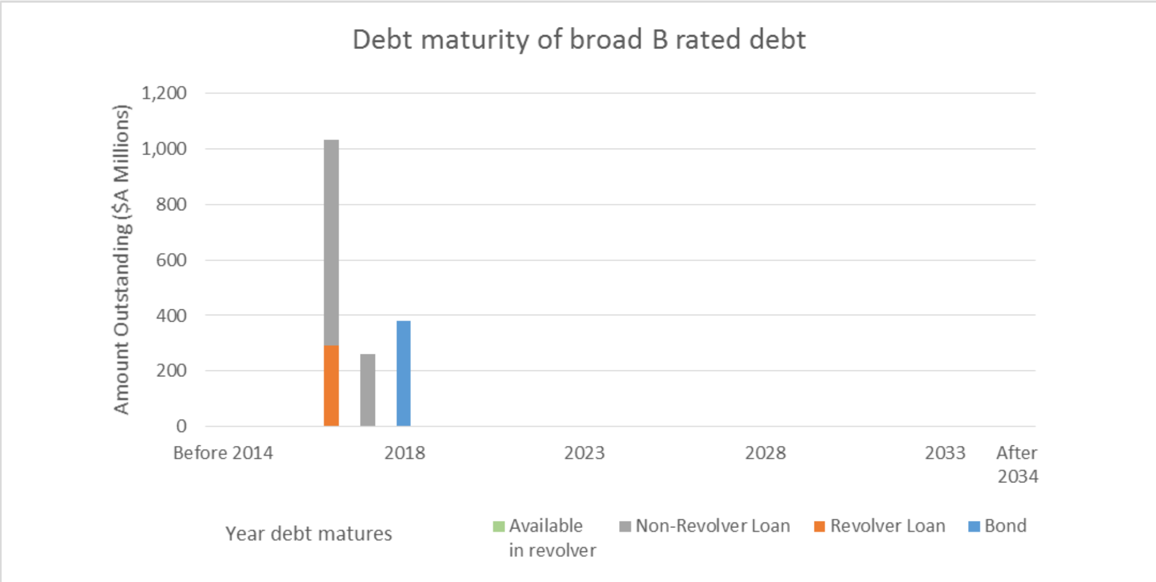

Table 67: Average time to maturity for debt issued by companies with broad B credit ratings

	Bond	Revolver loan	Non-revolver loan	Overall
Number	2	2	4	8
Amount Outstanding ($A Mn)	380.81	290.00	1,005.36	1,676.18
Weighted average time to maturity	3.58	2.20	2.44	2.66
Simple average time to maturity	3.61	2.20	4.87	2.67

10.4.6 Debt maturity of debt with no credit rating

Figure 94: Year of debt issuance for debts issued by companies with no credit rating

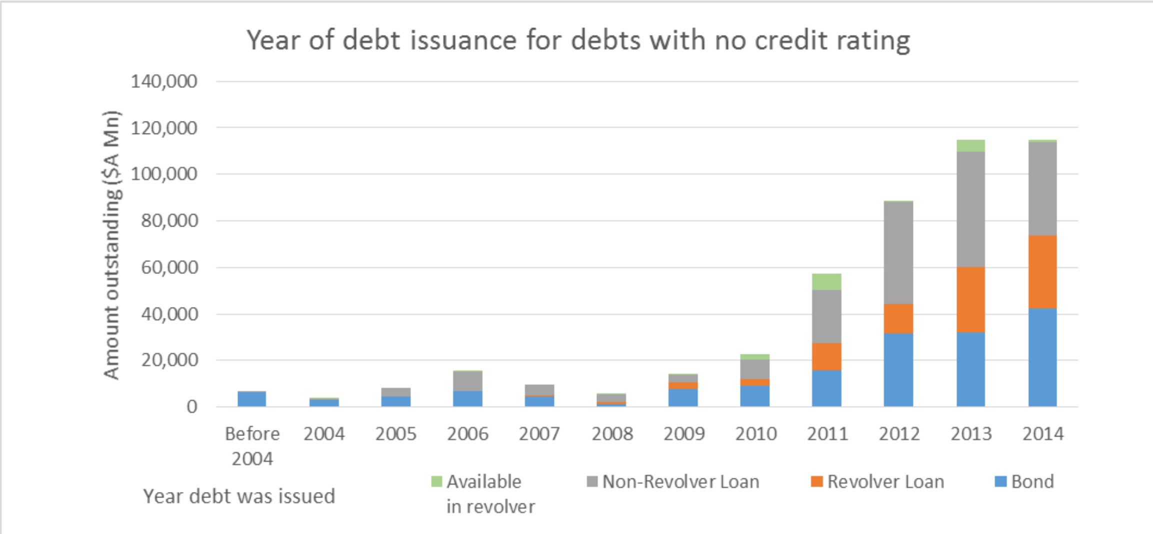

Figure 95: Year of debt maturity for debts issued by companies with no credit ratings

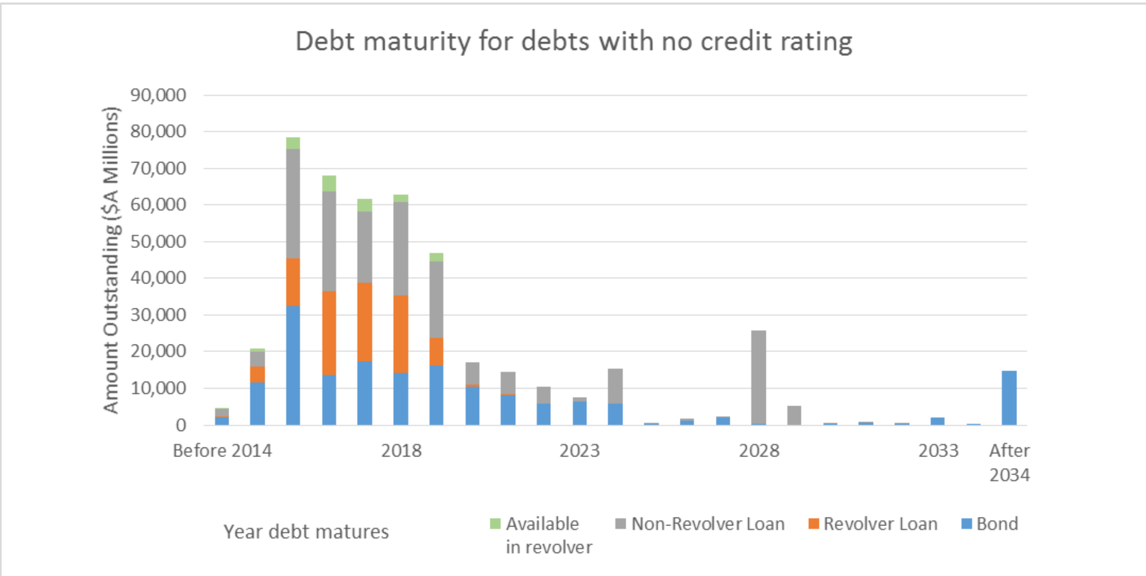

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Table 68: Average time to maturity for debt issued by companies with no credit rating

	Bond	Revolver loan	Non-revolver loan	Overall
Number	623	628	722	1973
Amount Outstanding ($A Mn)	165,729.53	91,193.65	188,458.12	445,381.30
Weighted average time to maturity	6.70	2.47	5.18	5.19
Simple average time to maturity	5.72	2.13	3.48	3.70

11 Quantifying debt staggering

160. Section 4.6 showed the debt term at issuance and year of debt maturity charts for Qantas Airways Ltd and Sun Group Finance Pty Ltd – two examples of parent companies in our sample that practise debt staggering. The corresponding charts for all 82 companies that issued at least one credit-rated debt in our sample are in the Appendix. This section further develops the concept of debt staggering by introducing three statistical measures that quantify the extent of debt staggering used by a firm.

161. The debt maturity charts for the two example companies identified in Section 4.6 are reproduced below for convenience in Figure 96 and Figure 97.

Figure 96: Year of debt maturity for Qantas Airways Ltd

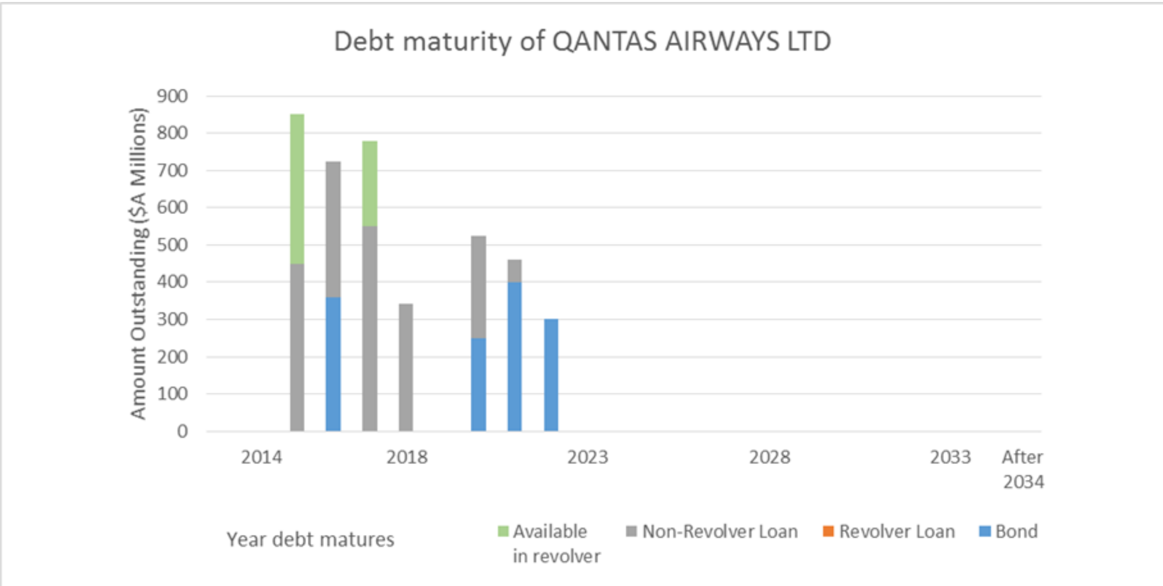
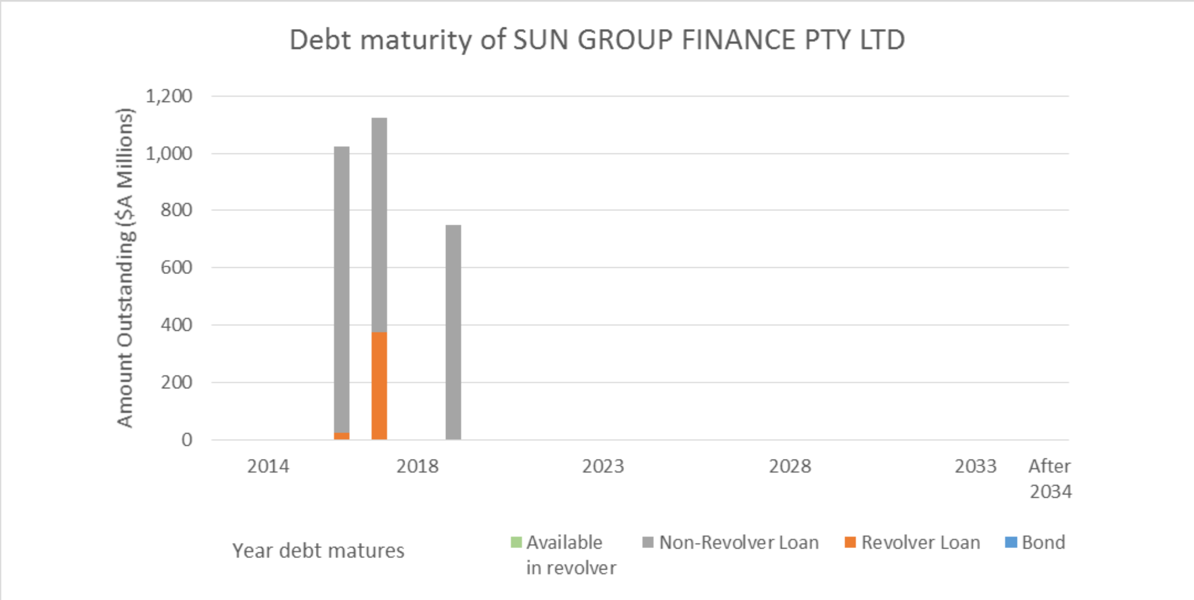


Figure 97: Year of debt maturity for Sun Group Finance Pty Ltd



162. Comparing the year of debt maturity charts in Figure 96 and Figure 97, it is easy to see that Qantas Airways Ltd utilised a greater level of debt staggering compared to Sun Group Finance Pty Ltd. First, the soonest due date for Qantas Airways' debts is in 2015, while the latest is in 2022, resulting in a gap of around 7 years. For Sun Group Finance Pty Ltd, the due year for its earliest debt is in 2016, while the latest due year is in 2019, for a difference of only 3 years. Secondly, a visual inspection of the two debt maturity charts strongly suggests that Qantas Airways' debts are more spread out than Sun Group Finance's.

163. The above two observations lay the foundations for the three statistical measures of debt staggering set out in Section 11.1.

11.1 Statistical measures of debt staggering

11.1.1 Measure 1: Range

164. The range is defined as the difference between the largest and smallest values in the sample. When applied to debt staggering, calculating the range involves determining the number of years between the debts with the longest and shortest time to maturity.

165. The main benefit of the range as a measure of debt staggering is its simplicity, which makes it a useful starting point as a measure of spread. However, this simplicity is also its major weakness, and it is generally considered to be a crude measurement for several reasons.

166. First, the range is highly affected by outliers, and a single extreme value can have a great effect on the estimated range. Secondly, the range statistic only takes the two observations at each end of the sample without taking into account any of the observations in between. As a result, the range statistic is unable to capture any differences in the distribution of the company's debt. Thirdly, the range statistic does not place different weights on different loan amounts, which means that a very small debt at one end of the sample will produce an excessively high range measurement even though that single small debt did not actually lead to substantial changes in debt staggering.

167. Some of the weaknesses of range as a measure of debt staggering, as identified above, are addressed by the next two measures set out below.

11.1.2 Measure 2: Weighted mean absolute deviation (WMAD)

168. Mean absolute deviation (MAD) is a commonly used statistical measure of the amount of spread in a sample. MAD is based on the concept of absolute deviations, whereby an observation's absolute deviation from the mean refers to its absolute distance from the mean of the entire sample.

169. If the sample contains observations that are far from the mean, it would indicate that the sample data is fairly spread out. The converse is true for samples with observations near the mean, which indicates that the sample has low spread. An intuitive measure of spread would thus be to obtain the mean of the absolute deviations (MAD) for all observations in the sample. Such a measure will account for the first two problems associated with range, as stated in Section 11.1.2.

170. MAD can be modified in order to address the third problem, which requires different weights to be placed on debts with larger amounts outstanding. Instead of obtaining the mean of the absolute deviations for all observations in the sample, the absolute deviations are weighted according to the amount of debt outstanding, which results in the weighted mean absolute deviation (WMAD) measure. With this modification, larger debts will have more influence on the measure and vice versa.

171. The WMAD of the debts issued by a parent company is interpreted as the average difference in time to maturity between an issued debt and the sample average time to maturity, weighted by the amount of debt outstanding.

172. The formal definitions of MAD and WMAD are shown in Equation 2 below:

Equation 2: Mean Absolute Deviation (MAD) and Weighted Mean Absolute Deviation (WMAD)

$$MAD = \frac{\sum_{i=1}^{n} |x_i - \bar{x}|}{n}, \quad WMAD = \frac{\sum_{i=1}^{n} w_i |x_i - \bar{x}_w|}{\sum_{i=1}^{n} w_i},$$

where x_i is the time to maturity of debt i;

$\bar{x}$ is the mean time to maturity of all debts issued by the parent company;

$\bar{x}_w$ is the weighted average of all debts issued by the parent company;

w_i is the amount outstanding for debt i; and

n is the number of debts issued by the firm

173. A closely-related pair of alternatives to MAD and WMAD are the standard deviation and weighted standard deviation. These replace the absolute deviations in the formulae with squared deviations. Although standard deviation is a more popular measure of sample spread since it possesses desirable properties for statistical inferences, it does not have an intuitive interpretation and is also more influenced by extreme values. For these reasons, we do not present the results for weighted standard deviation, although we note that the WMAD results are intended to be used for making comparisons about the extent of debt staggering by different companies, and should not be used for statistical inferences or hypothesis testing.

174. The main weakness of WMAD is that it sometimes does not provide an accurate measure of debt staggering in terms of spreading debt amounts equally across time. For example, a firm that has two debts of equal size with maturities four years apart will return a higher WMAD than a firm with five equal debts that are consecutively one year apart, even though the latter case represents greater debt staggering. This is addressed below in the next measure of debt.

11.1.3 Measure 3: Sum of squared percentage debt

175. An approach similar to HHI can be used to measure debt staggering. As described in paragraph 97, HHI measures the competitiveness of an industry based on the sum of squared market share percentages of its firms. When there are many small firms in the industry with low market shares, HHI returns a small value approaching 1, which suggests that the industry is highly competitive. If the industry is a monopoly, HHI returns a value of 10,000.

176. Similarly, the relative individual sizes of a firm's debts can provide information on the extent of debt staggering utilised by the firm. A firm that splits its total debt amount to several small debts has a more staggered debt structure than one that only has a few large debts. Taking the sum of squared percentages of individual debts relative to the firm's total amount of debt outstanding thus provides a measure of how much staggering the firm has used.

177. The formula for sum of squared percentage debt (SSD) is shown in Equation 3:

Equation 3: Sum of squared percentage debt

$$SSD = \sum_{i=1}^{n} \left(\frac{Amount\ outstanding\ for\ debt_i}{Total\ debt\ outstanding\ for\ the\ firm} \times 100\% \right)$$

178. Similar to our approach in Section 5.2, we define firms with high degree of debt staggering as having SSD less than 2000, while firms with medium debt staggering have SSD between 2000 and 4000, and firms with SSD exceeding 4000 are regarded as having low debt staggering.

179. Unfortunately, SSD is also an imperfect measure of debt staggering, because it only accounts for staggering in terms of the relative amount of each separate debt without considering their corresponding time to maturity. For example, a firm that only has two debts of equal size with maturities one year apart will return the same SSD as two debts with maturities ten years apart. This problem extends to cases where two debts have the same maturity date, as SSD will treat both debts as separate debts even if they were to be issued on the same day as well.

180. As a result, SSD is only indicative of debt staggering in terms of a firm spreading its total outstanding debt across a large number of small debts, and does not provide any information regarding debt staggering across time.

11.2 Empirical evidence of debt staggering

11.2.1 Application to Qantas Airways Ltd and Sun Group Finance Pty Ltd.

181. The three measures of debt staggering were calculated for the two example companies identified in Sections 4.6.1 and 4.6.2. These are shown in Table 69.

182. As expected, all three measures identify Qantas Airways Ltd as having a more staggered debt structure. The range of Qantas Airways' debts is 7.09 years, which exceeds Sun Group Finance's range of 3.00 years. Qantas Airways' debts have a weighted mean absolute deviation of 2.18 years, which also exceeds Sun Group Finance's 0.95 years. Both measures suggest that Qantas Airways has a more staggered debt structure in terms of having their debts maturing at different times.

183. Furthermore, Qantas Airways' sum of squared percentage debt of 1,135.35 is smaller than Sun Group Finance's 2,694.71, indicating that the former's debt structure is also more staggered in terms of spreading its total outstanding debt more evenly across a larger number of debts.

Table 69: Measures of debt staggering for Qantas Airways Ltd and Sun Group Finance Pty Ltd

Parent company	Number	Weighted average debt term	Max time to maturity	Min time to maturity	Range	WMAD	SSD
QANTAS AIRWAYS LTD	12	3.66	7.58	0.49	7.09	2.18	1,135.35
SUN GROUP FINANCE PTY LTD	5	2.86	4.70	1.70	3.00	0.95	2694.71

11.2.2 Debt staggering in the full sample

184. Table 70 shows the results for the three measures of debt staggering when applied to the full sample of 4697 debts. The sample range is 72.87 years, while the WMAD and SSD are 3.68 and 10.13 respectively.

185. The minimum time to maturity is listed at -12.96, which arises from overdue debts that Bloomberg continues to list as active after the maturity date has passed. This particular debt was issued by HIH Insurance Ltd on 23 December 1996 with a maturity date on 2 November 2001, and continues to remain active since the company is currently undergoing liquidation.

186. When the 21 overdue debts in the sample are excluded, the minimum time to maturity is 0.00 years, arising from debts with the same maturity date as the time of search (20 October 2014). The resulting range for the sample with overdue debts excluded would thus be 59.91 years.

Table 70: Measures of debt staggering for the full sample of debts

	Number	Weighted average debt term	Max time to maturity	Min time to maturity	Range	WMAD	SSD
Full sample	4697	4.69	59.91	-12.96	72.87	3.68	10.13

187. The distributions of the three measures of debt staggering across the 619 parent companies in our sample are shown in Section 11.2.2.1 to Section 11.2.2.3.

11.2.2.1 Range statistic

188. Companies with a range statistic of zero are identified as having unstaggered debts. Of the 619 parent companies in our sample, 323 do not stagger their debts, while the remaining 296 do. This comparison can be seen in Figure 98.

189. Figure 99 shows a histogram of the range statistics for the 296 parent companies with staggered debts, which indicates that 70% of all parent companies that stagger their debt do so with a maximum span of up to 5 years between their the debts with the longest and shortest times to maturity.

Figure 98: Staggered and unstaggered parent companies measured using the range statistic

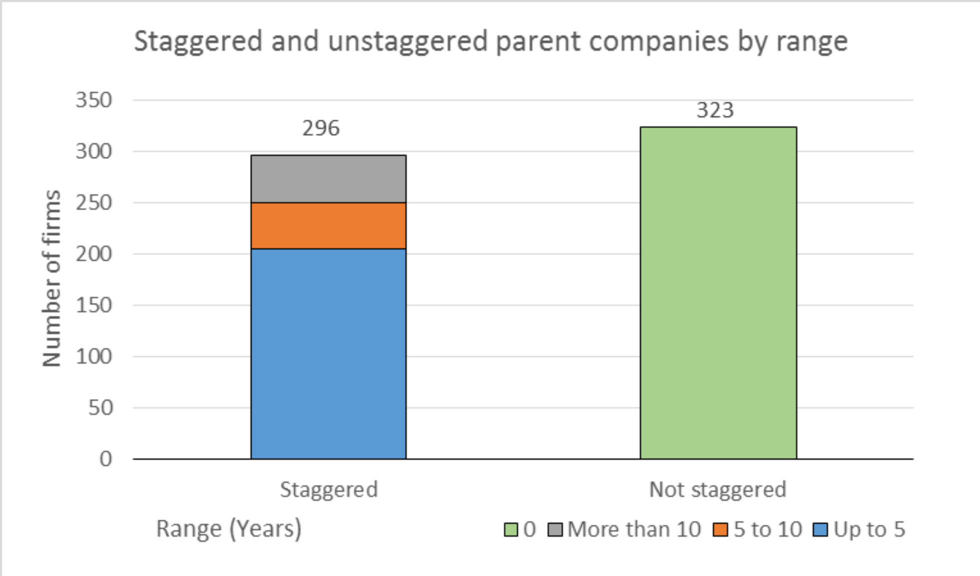
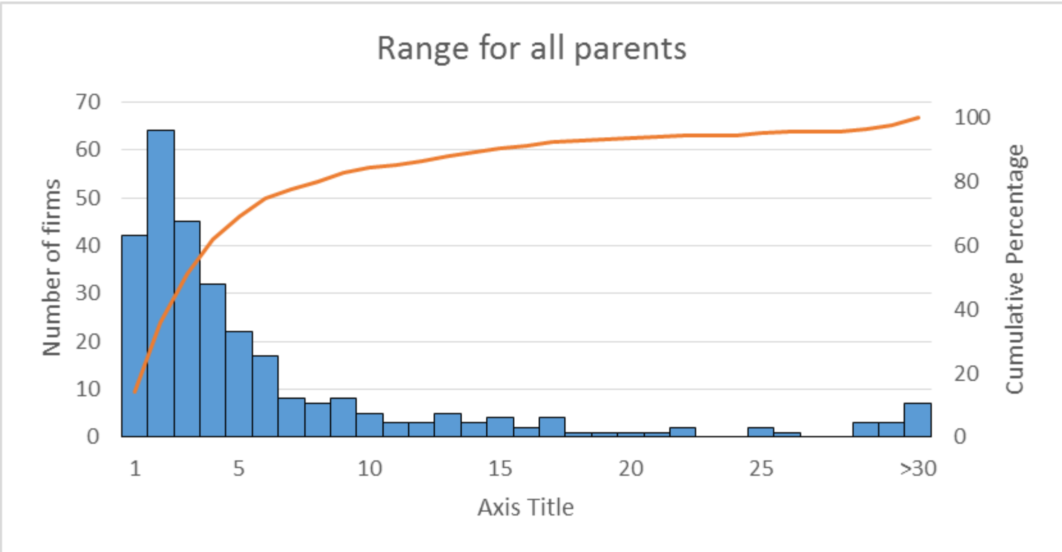


Figure 99: Distribution of the range statistic for parent companies with staggered debt



11.2.2.2 Weighted mean absolute deviation

190. Companies with zero WMAD are identified as ones that do not stagger their debts. Within our sample, WMAD also identifies 323 parent companies as not having staggered their debt and 296 as having done so. This comparison is shown below in Figure 100.

191. Figure 101 shows a histogram of the WMAD for the 296 parent companies that stagger their debt. It shows that most of these parent companies stagger their debt in such a way that the absolute deviation from the mean time to maturity for an average debt is less than 1.5 years in 70% of all parent companies after taking into account the amount of debt outstanding.

Figure 100: Staggered and unstaggered parent companies measured using the Weighted Mean Absolute Deviation statistic

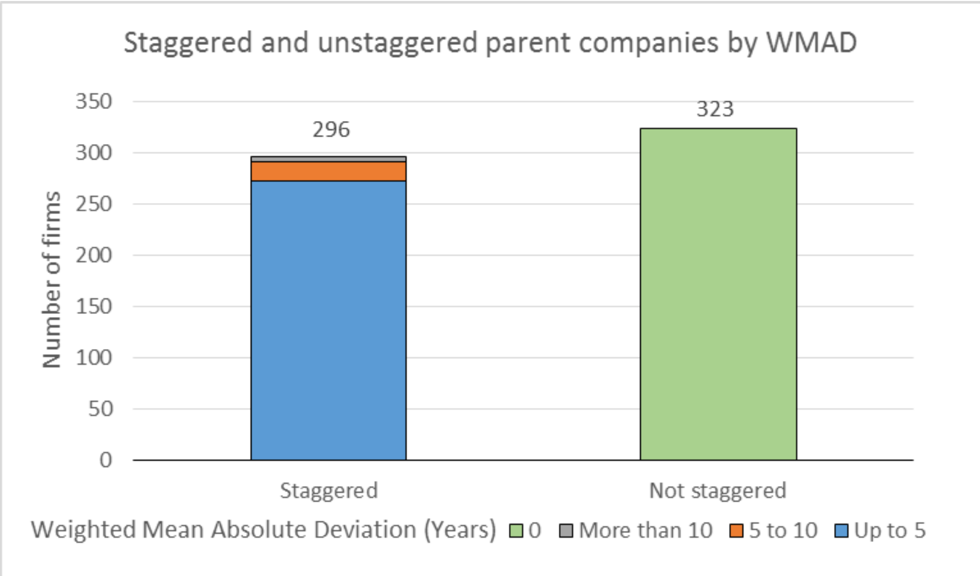
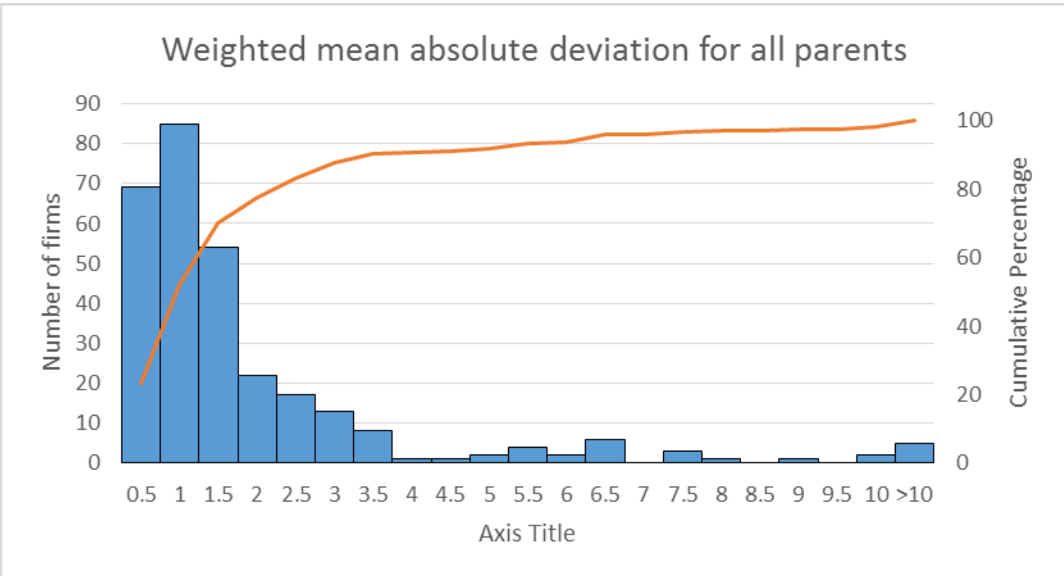


Figure 101: Distribution of the Weighted Mean Absolute Deviation statistic for parent companies with staggered debt



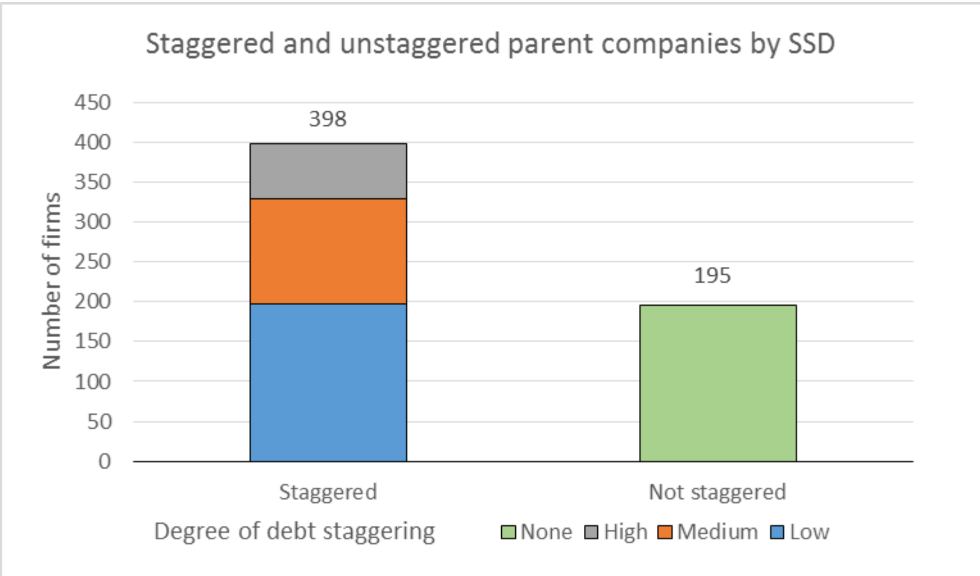
11.2.2.3 Sum of squared percentage debt

192. Companies that do not stagger their debts are identified as having a single debt that represents 100% of their debts outstanding, which generates an SSD of 10,000. Within our sample, SSD identifies 195 parent companies as not having staggered their debt, and 398 parent companies as having done so. This comparison can be seen in Figure 102.

193. SSD identifies less parent companies with unstaggered debts compared to the previous two measures because, as pointed out in Section 11.1.3, SSD only measures debt staggering in terms of firms spreading their total outstanding debts across a large number of debts, and does not differentiate between debts with different times to maturity. The 218 additional firms that the range statistic and WMAD identified as having unstaggered debt had issued multiple debts maturing on the same date, which is not identified by SSD.

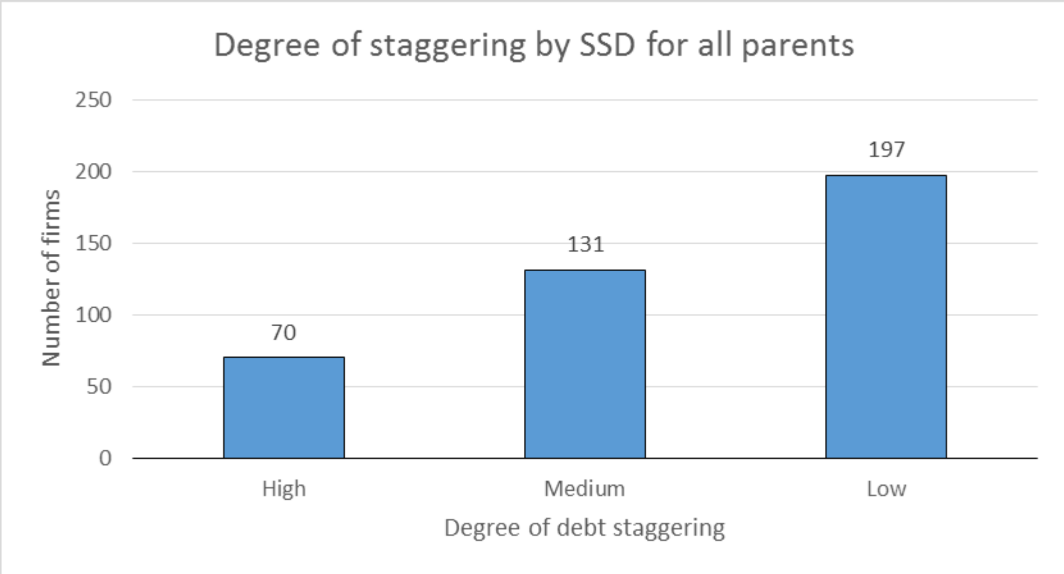
194. Of the 398 parent companies identified as having staggered debt, 70 had high debt staggering, 131 had medium debt staggering, and 197 had low debt staggering. This is shown in Figure 103.

Figure 102: Staggered and unstaggered parent companies measured using the Sum of Squared Percentage Debt statistic



COMPETITION ECONOMISTS GROUP

Figure 103: Degree of debt staggering by parent companies as measured by the Sum of Squared Percentage Debt statistic



11.2.3 Debt staggering for parent companies with credit ratings

195. Table 71 shows the results for the three measures of debt staggering when applied to the 2724 debts issued by the 82 credit-rated parent companies in the Appendix.

196. The sample range for this subsample is 57.95 years, while the WMAD and SSD are 3.21 and 19.40 respectively.

Table 71: Measures of debt staggering for the 82 parent companies with credit ratings

	Number	Weighted average debt term	Max time to maturity	Min time to maturity	Range	WMAD	SSD
Credit-rated debts only	2724	4.29	57.95	0.00	57.95	3.21	19.40

197. The distributions of the three measures of debt staggering for the 82 parent companies in our subsample are shown in Section 11.2.2.1 to Section 11.2.2.3.

11.2.3.1 Range statistic

198. Of the 82 parent companies in our sample, 9 do not stagger their debts, while the remaining 73 do. This comparison can be seen in Figure 104.

199. Figure 105 shows a histogram of the range statistics for the 73 parent companies in our subsample that stagger their debt. Comparing Figure 105 with the full-sample chart in Figure 99, it is apparent that the parent companies with credit ratings

practise debt staggering to a greater extent. For example, in Figure 99, 70% of the companies in the full sample have a range of 5 years or less. In Figure 105, only 37% of the companies with credit ratings have a range of 5 years or less.

Figure 104: Staggered and unstaggered parent companies with credit ratings, measured using the range statistic

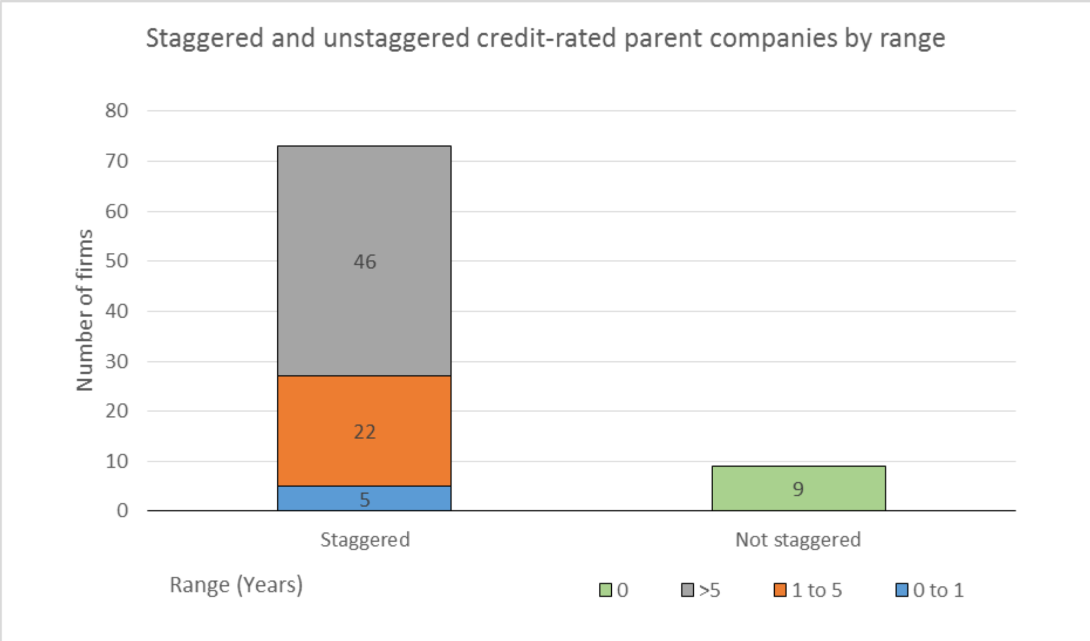
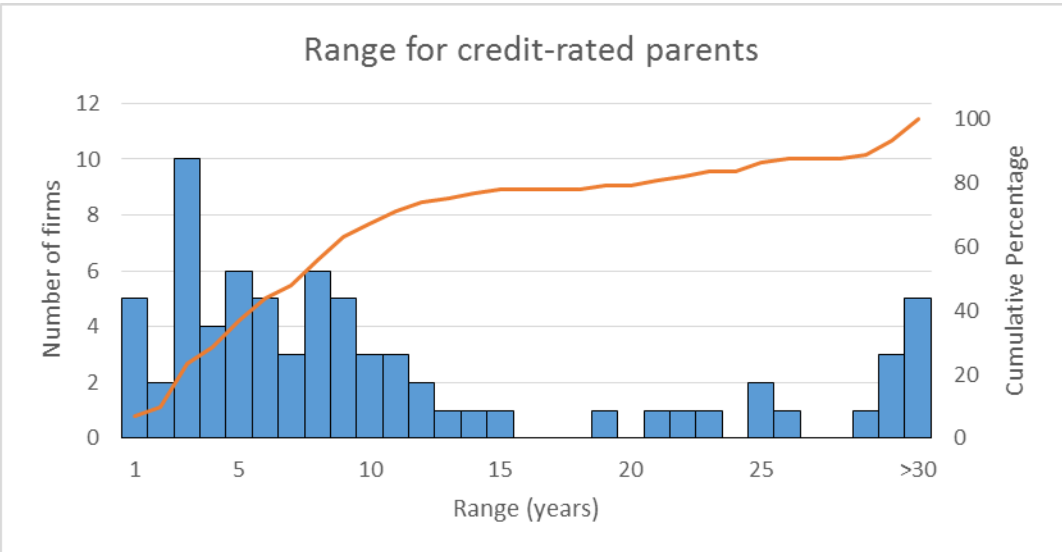


Figure 105: Distribution of the range statistic for parent companies with credit ratings and staggered debt

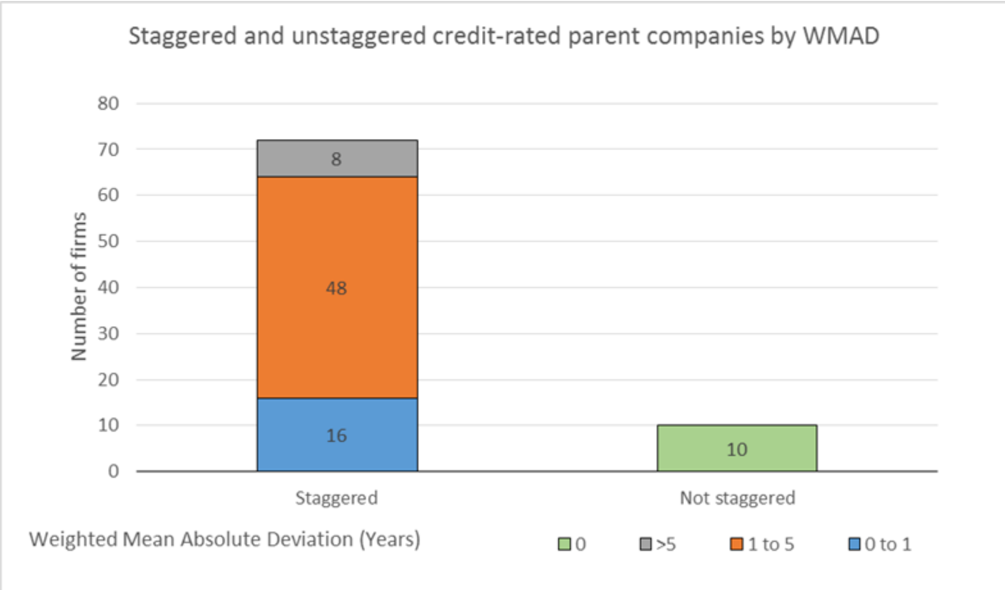


11.2.3.2 Weighted mean absolute deviation

200. Of the 82 parent companies with credit ratings, 10 are identified by WMAD as not having staggered their debt while the remaining 72 are identified as having done so. This comparison is shown below in Figure 106.[12]

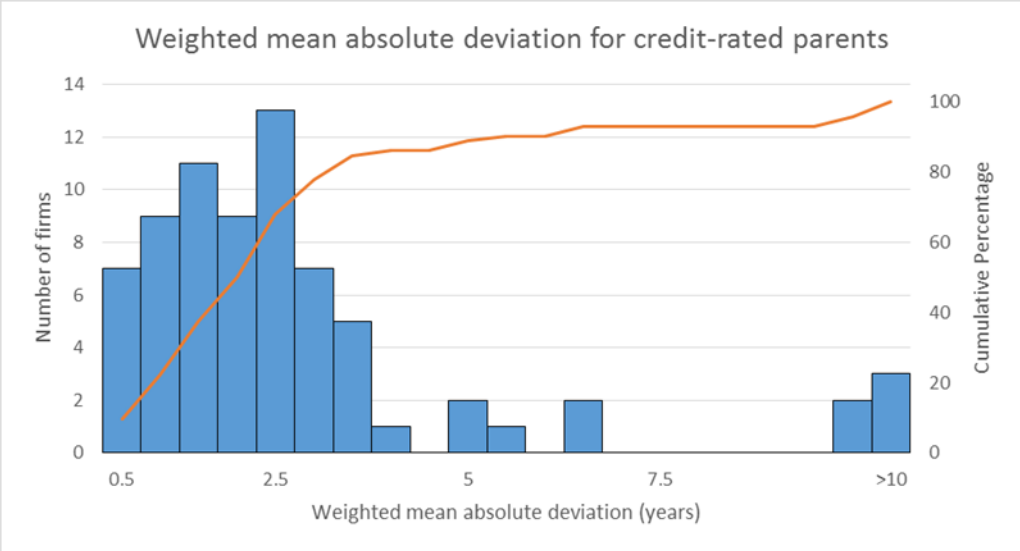
201. Figure 107 shows a histogram of the WMAD for the 62 parent companies in our subsample that stagger their debt. Comparing Figure 107 with the full-sample chart in Figure 101, it is apparent that the parent companies with credit ratings practise debt staggering to a greater extent. For example, in Figure 101, 70% of companies in the full sample have a WMAD of 1.5 years or less. In Figure 107, the percentage of companies with WMAD of 1.5 years or less is only 40%.

Figure 106: Staggered and unstaggered parent companies with credit ratings, measured using the Weighted Mean Absolute Deviation statistic



[12] WMAD (and SSD) identify one additional company, Boral Ltd, as having unstaggered debt. This arises because Boral Ltd has two debts – a bond with A$ 157.78 m outstanding, and a revolver loan of amount A$ 500 m, but $0 outstanding. The range statistic takes the revolver loan into account, but the WMAD and SSD both assign no weight to it, which leads these two measures to conclude that no debt staggering occurred in this case.

Figure 107: Distribution of the Weighted Mean Absolute Deviation statistic for parent companies with credit ratings and staggered debt



11.2.3.3 Sum of squared percentage deviation

202. Within the subsample of 82 parent companies with credit ratings, SSD identifies 10 parent companies as not having staggered their debt, and 72 parent companies as having done so. This comparison can be seen in Figure 108.

203. Of the 72 parent companies in the subsample identified as having staggered debt, 31 had high debt staggering, 27 had medium debt staggering, and 14 had low debt staggering. This is shown in Figure 109.

204. Comparing Figure 108 and Figure 109 with the full-sample charts in Figure 102 and Figure 103, it can be seen that SSD also identifies the subsample of parent companies with credit ratings as having more staggered debts than the full sample. In particular, the subsample with credit ratings have a higher proportion of companies with staggered debts. Of these, the proportion of companies with high and medium debt staggering in the subsample are both higher than their counterparts in the full sample.

Figure 108: Staggered and unstaggered parent companies with credit ratings, measured using the Sum of Squared Percentage Deviation statistic

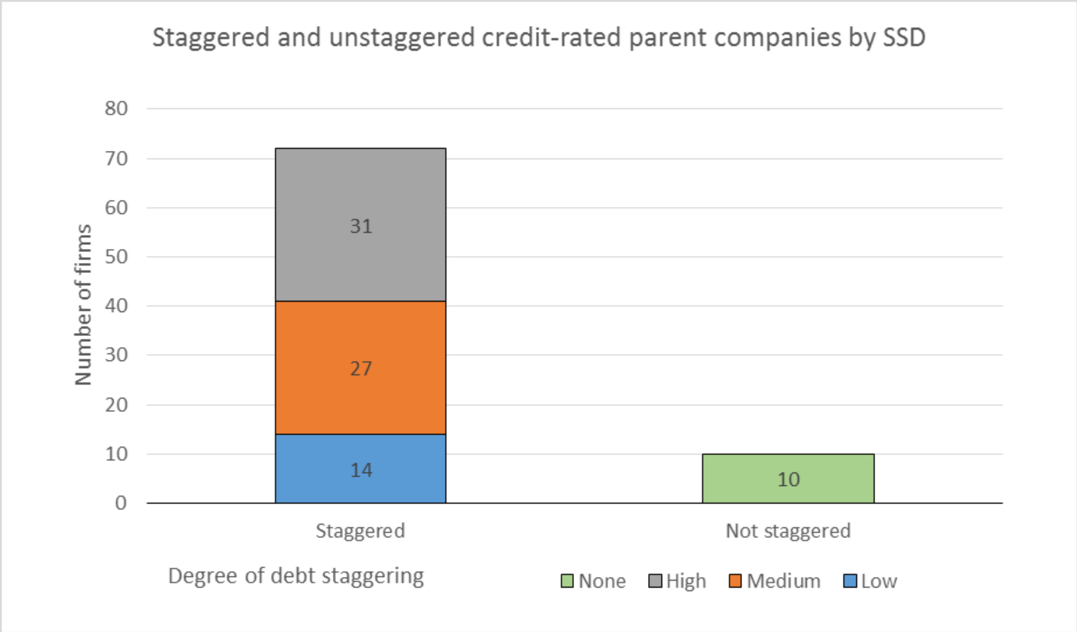
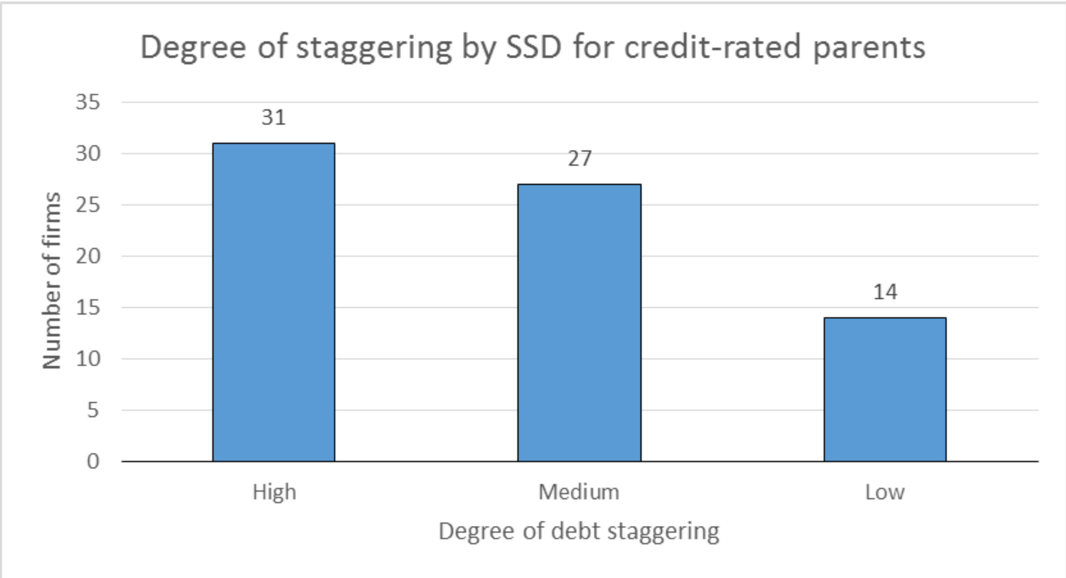


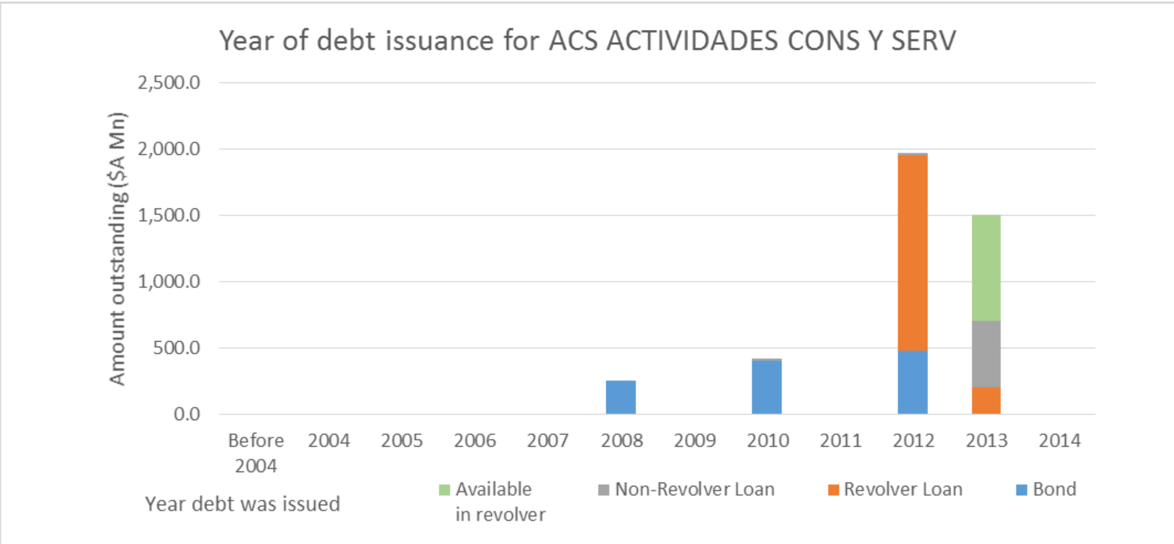
Figure 109: Degree of debt staggering by parent companies with credit ratings, as measured by the Sum of Squared Percentage Debt statistic

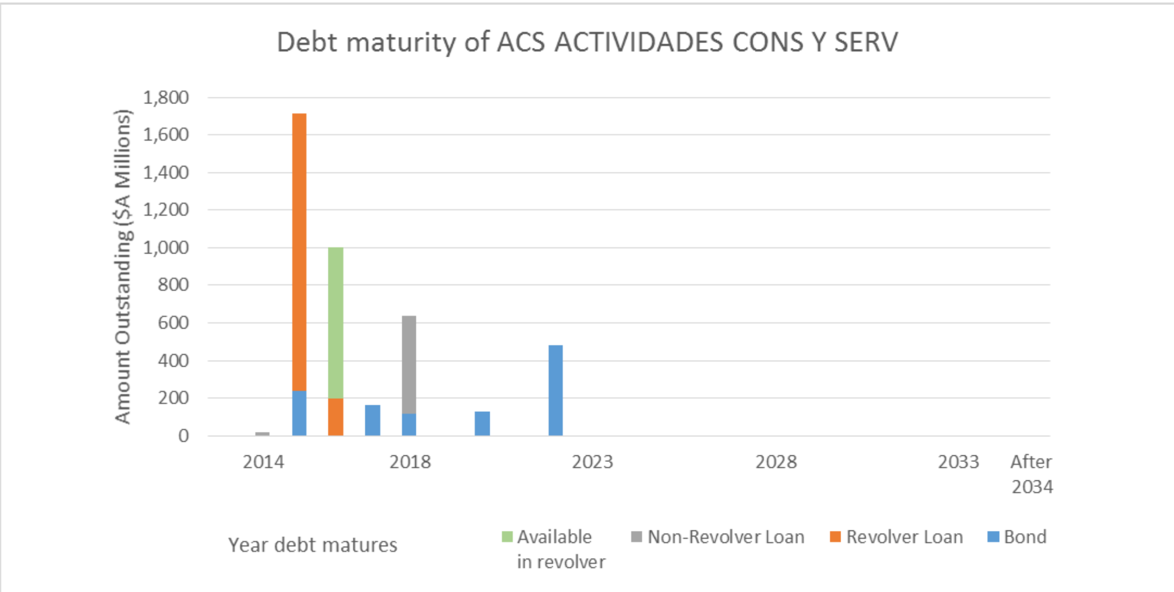


Appendix A Parent companies with credit ratings

1. This appendix contains the year of debt issuance and year of debt maturity charts for the credit-rated debts of all 82 parent companies with credit ratings. It also shows tables indicating the number of debts, amount outstanding, and the simple and weighted average debt terms, as well as simple and weighted average time to maturity for those 82 parent companies.

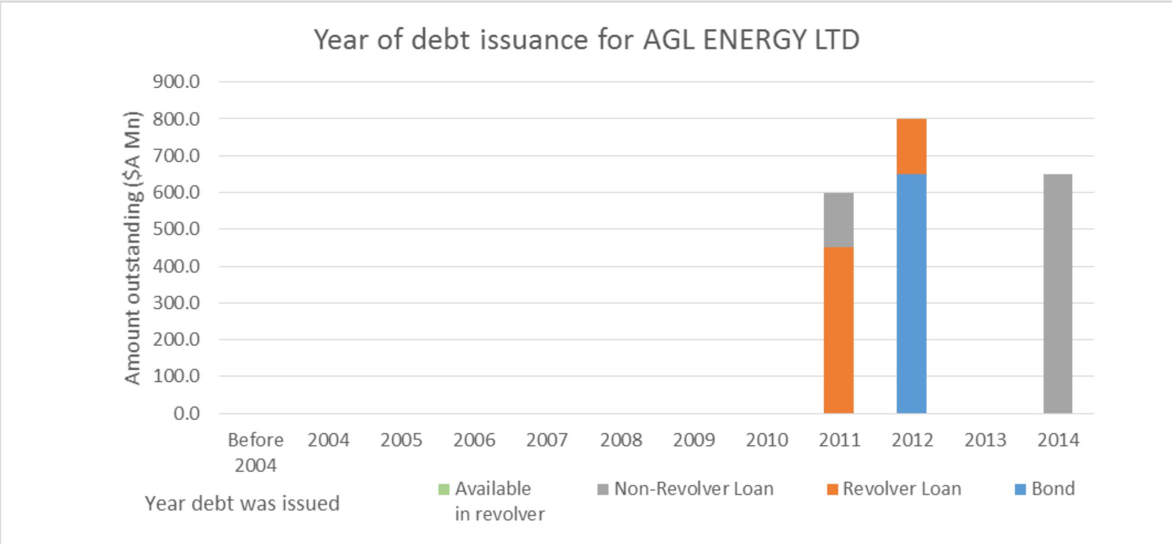
A.1.1 ACS ACTIVIDADES DE CONSTRUCCION Y SERVICIOS SA

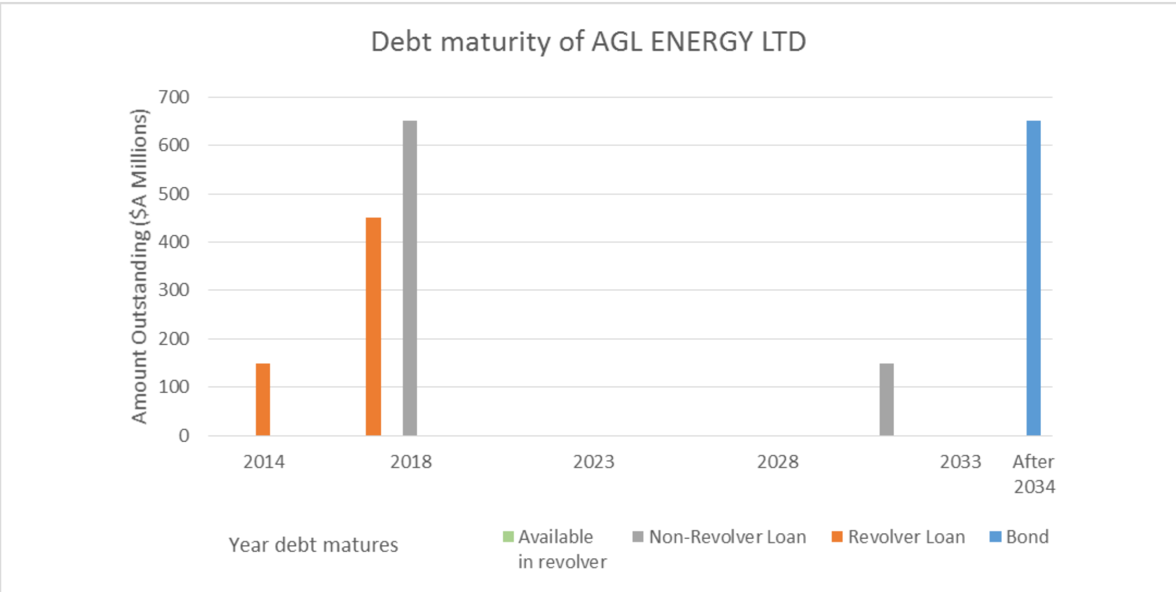




	Bond	Revolver loan	Non-revolver loan	Overall
Number	6	6	4	16
Amount Outstanding ($A Mn)	1,133.15	1,675.00	535.80	3,343.95
Weighted average debt term	8.75	3.06	4.99	5.29
Simple average debt term	8.17	3.04	3.42	5.49
Weighted average time to maturity	5.08	1.17	3.96	2.94
Simple average time to maturity	3.72	1.17	1.95	2.56

A.1.2 AGL ENERGY LTD

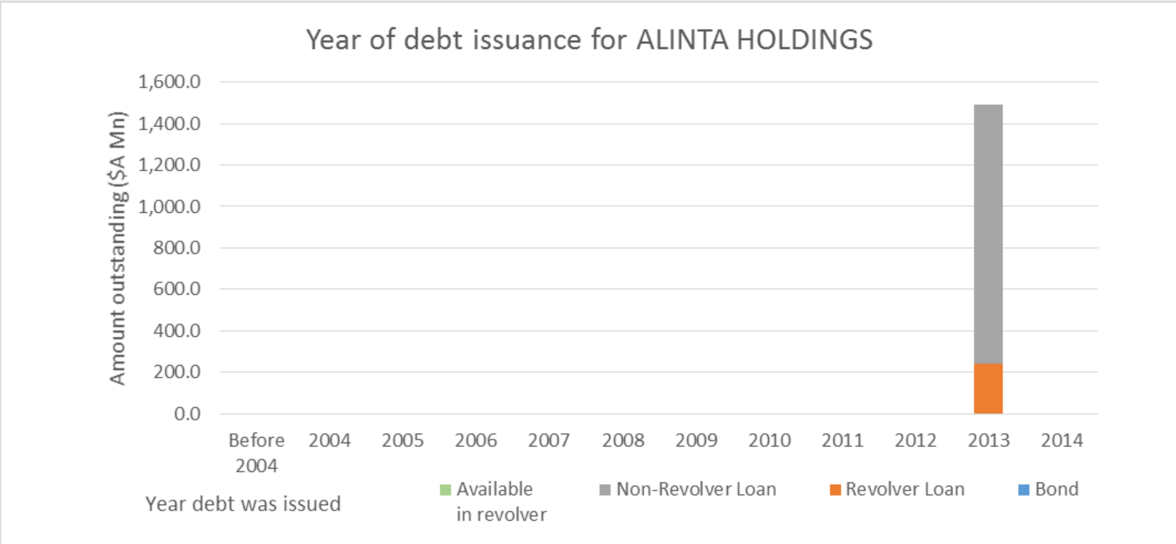


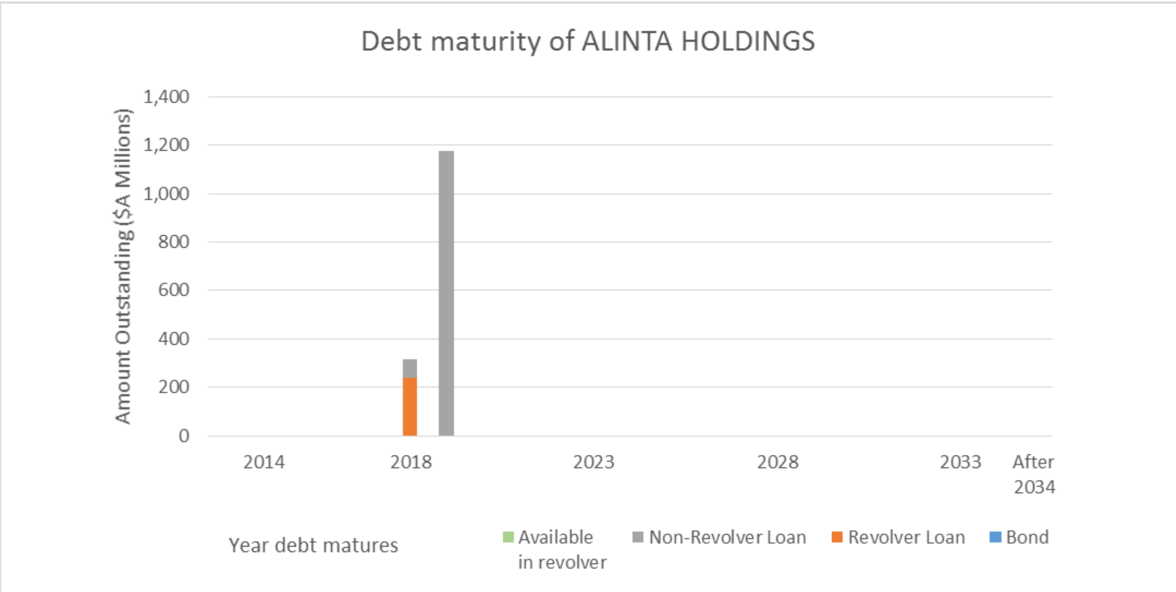


	Bond	Revolver loan	Non-revolver loan	Overall
Number	1	2	2	5
Amount Outstanding ($A Mn)	650.00	600.00	800.00	2,050.00
Weighted average debt term	27.18	4.91	7.00	12.78
Simple average debt term	27.18	3.94	12.00	11.81
Weighted average time to maturity	24.63	2.01	6.09	10.77
Simple average time to maturity	24.63	1.39	10.19	9.56

**One bond is due in 2031 with A$ 150 million outstanding, and another is due in 2039 with A$650 million outstanding.*

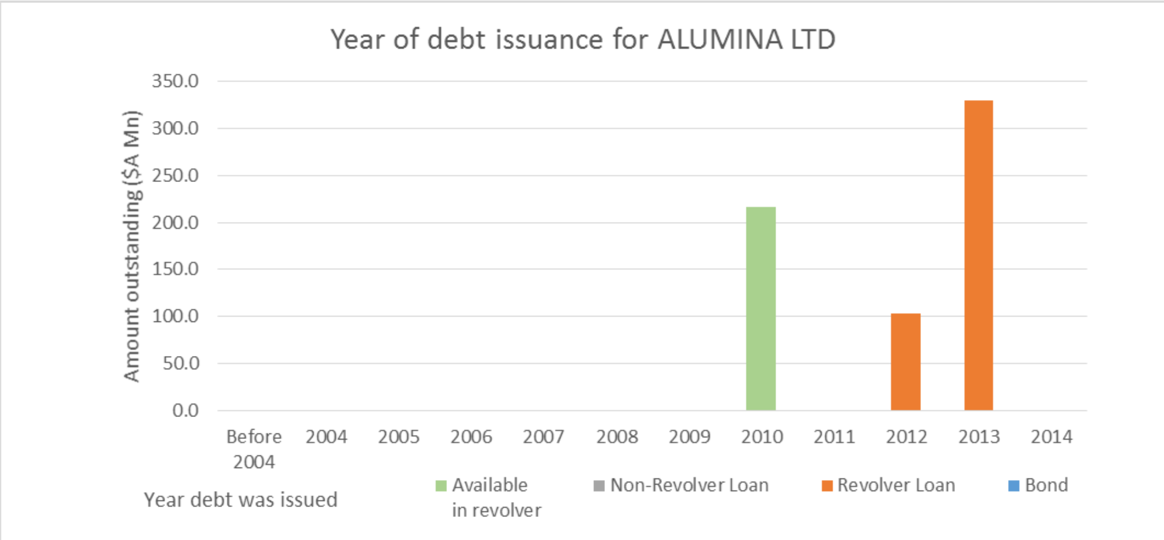
A.1.3 ALINTA HOLDINGS

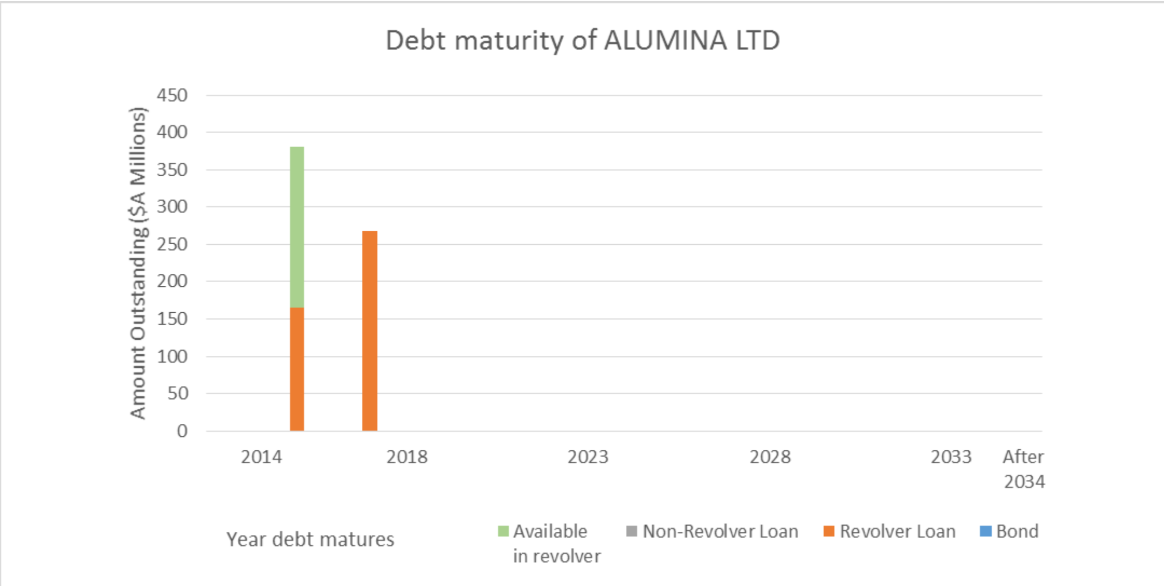




	Bond	Revolver loan	Non-revolver loan	Overall
Number	0	1	3	4
Amount Outstanding ($A Mn)	0.00	240.00	1,250.82	1,490.82
Weighted average debt term	N/A	5.00	5.94	5.79
Simple average debt term	N/A	5.00	11.00	4.00
Weighted average time to maturity	N/A	3.81	4.75	4.60
Simple average time to maturity	N/A	3.81	8.63	4.15

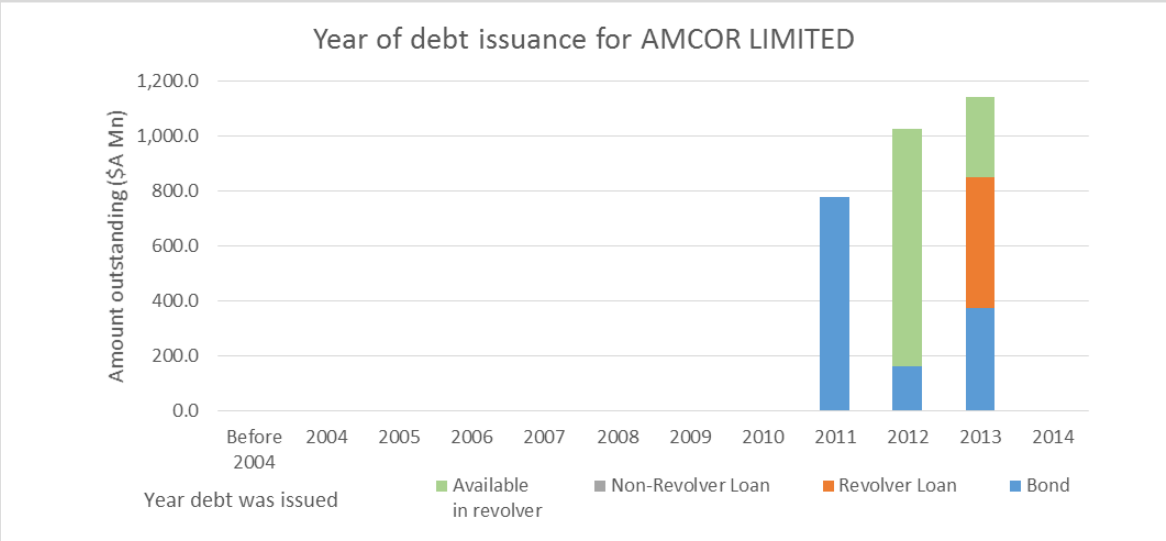
A.1.4 ALUMINA LTD

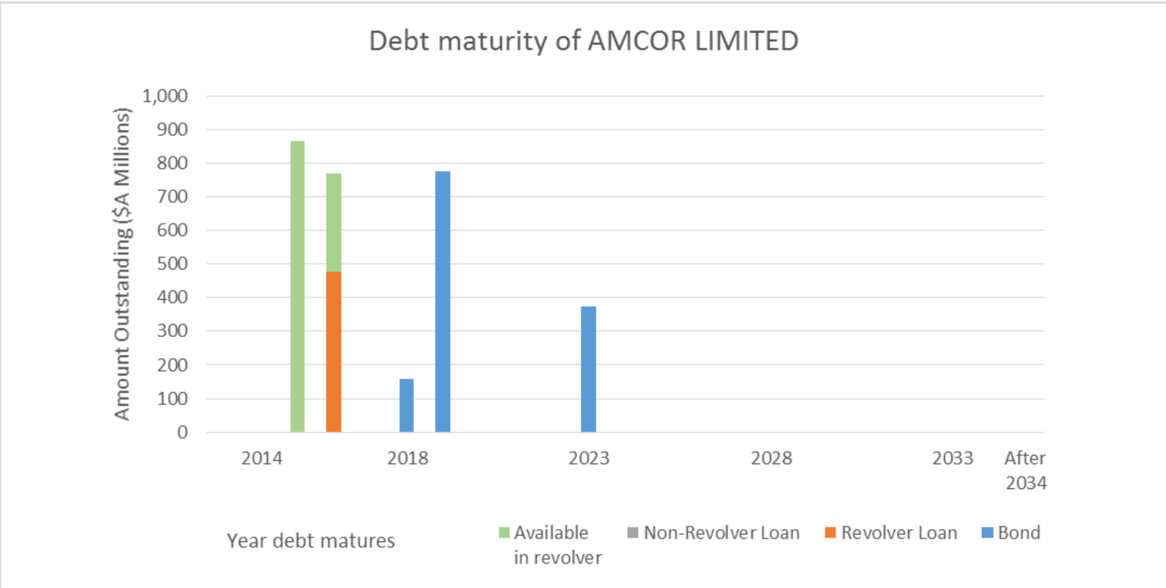




	Bond	Revolver loan	Non-revolver loan	Overall
Number	0	4	0	4
Amount Outstanding ($A Mn)	0.00	432.62	0.00	432.62
Weighted average debt term	N/A	3.50	N/A	3.50
Simple average debt term	N/A	4.02	0.00	4.02
Weighted average time to maturity	N/A	2.37	N/A	2.37
Simple average time to maturity	N/A	2.11	0.00	2.11

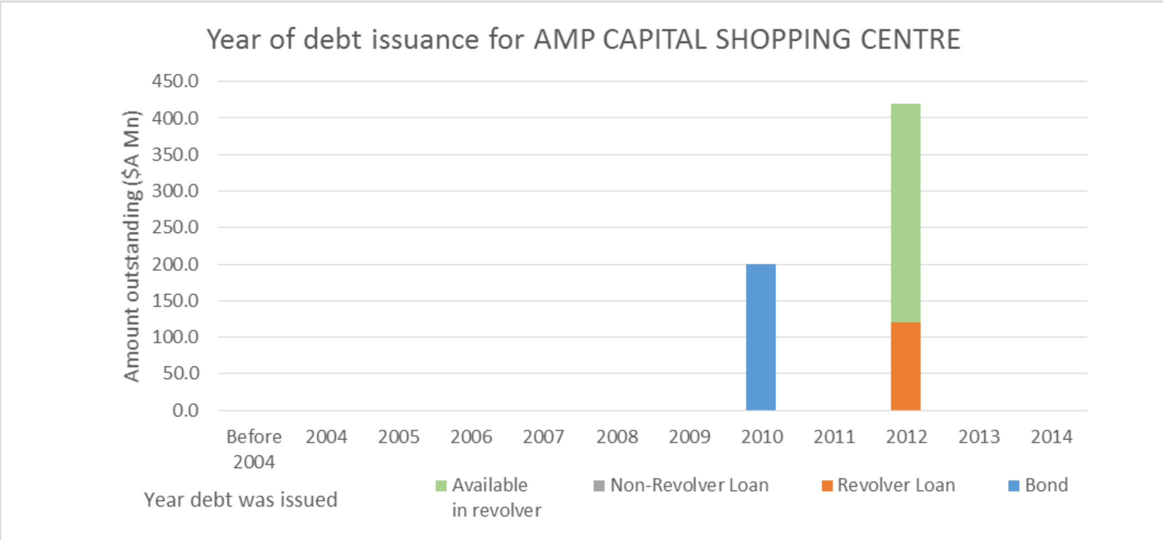
A.1.5 AMCOR LIMITED

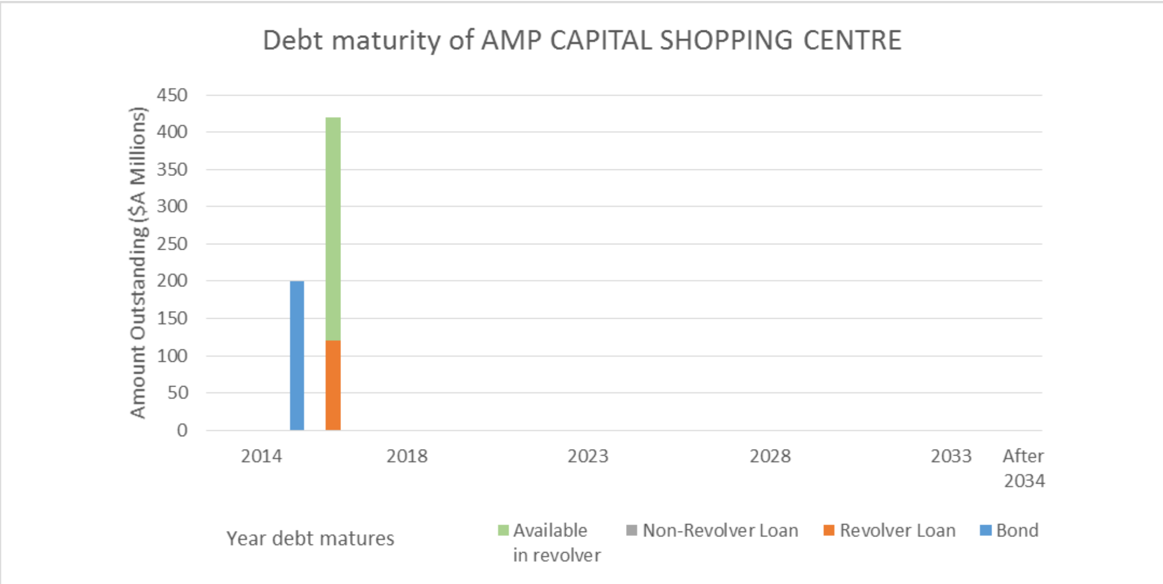




	Bond	Revolver loan	Non-revolver loan	Overall
Number	3	2	0	5
Amount Outstanding ($A Mn)	1,309.63	475.94	0.00	1,785.58
Weighted average debt term	8.38	3.00	N/A	6.94
Simple average debt term	8.03	3.02	0.00	6.02
Weighted average time to maturity	5.48	2.01	N/A	4.56
Simple average time to maturity	5.45	1.41	0.00	3.84

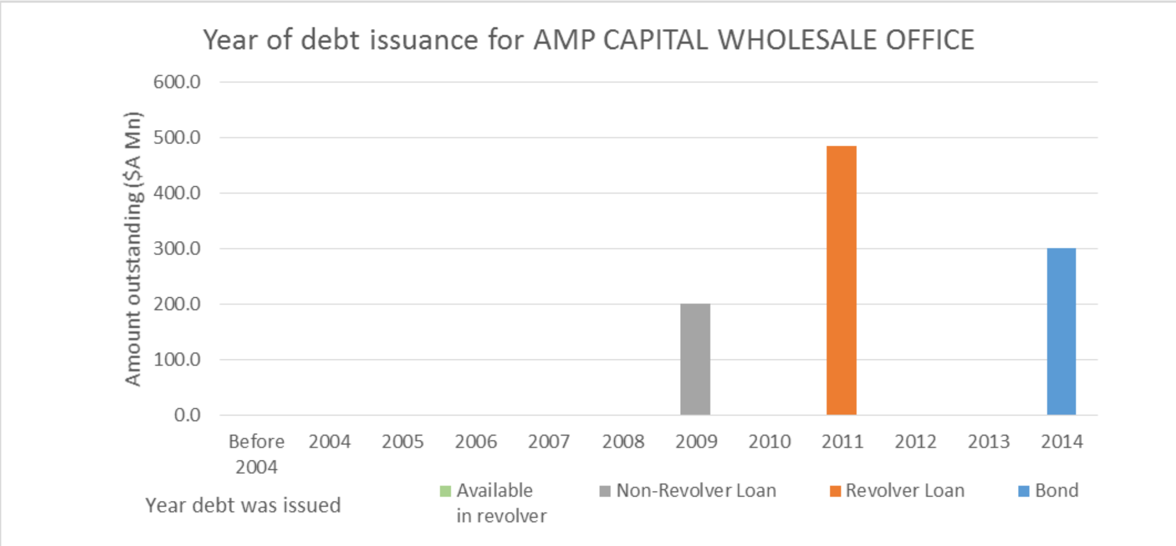
A.1.6 AMP CAPITAL SHOPPING CENTRE FUND

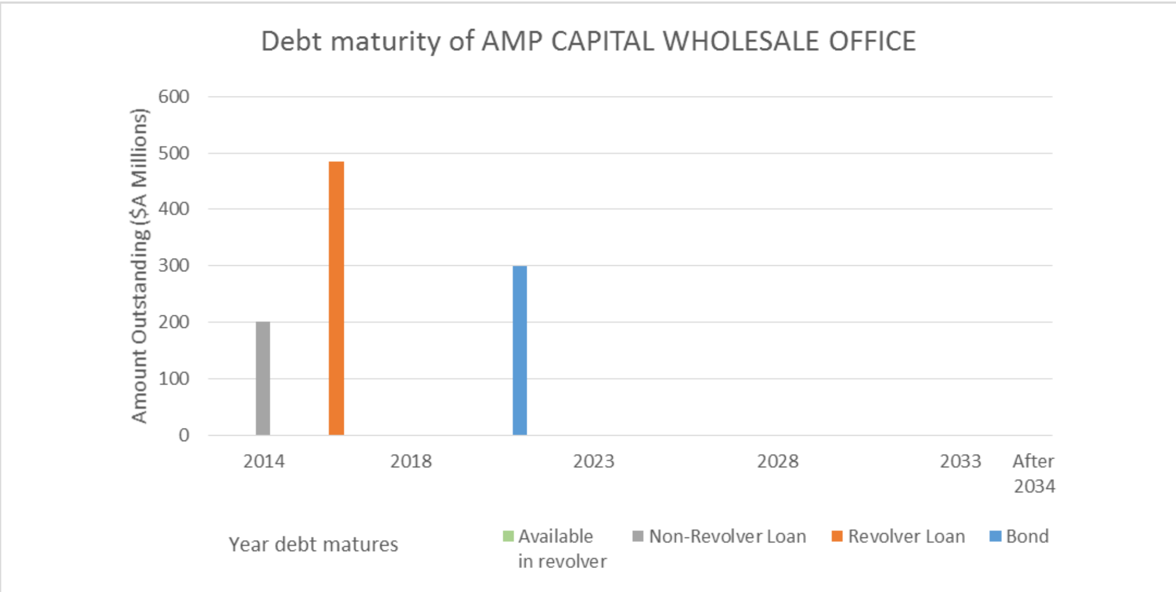




	Bond	Revolver loan	Non-revolver loan	Overall
Number	1	1	0	2
Amount Outstanding ($A Mn)	200.00	120.00	0.00	320.00
Weighted average debt term	5.00	4.46	N/A	4.80
Simple average debt term	5.00	4.46	0.00	4.73
Weighted average time to maturity	0.52	2.11	N/A	1.12
Simple average time to maturity	0.52	2.11	0.00	1.32

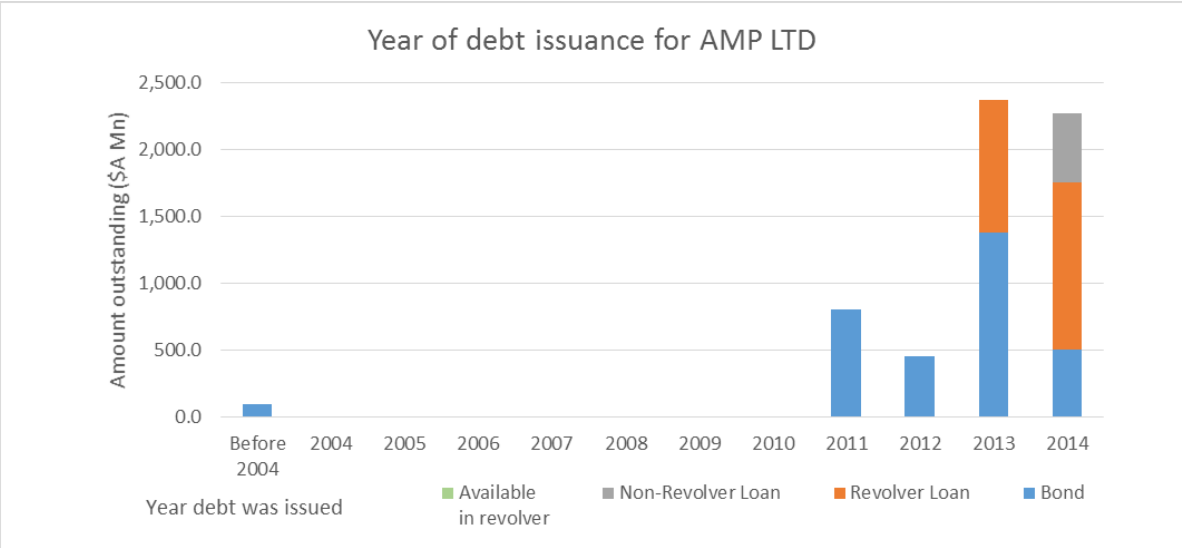
A.1.7 AMP CAPITAL WHOLESALE OFFICE FUND

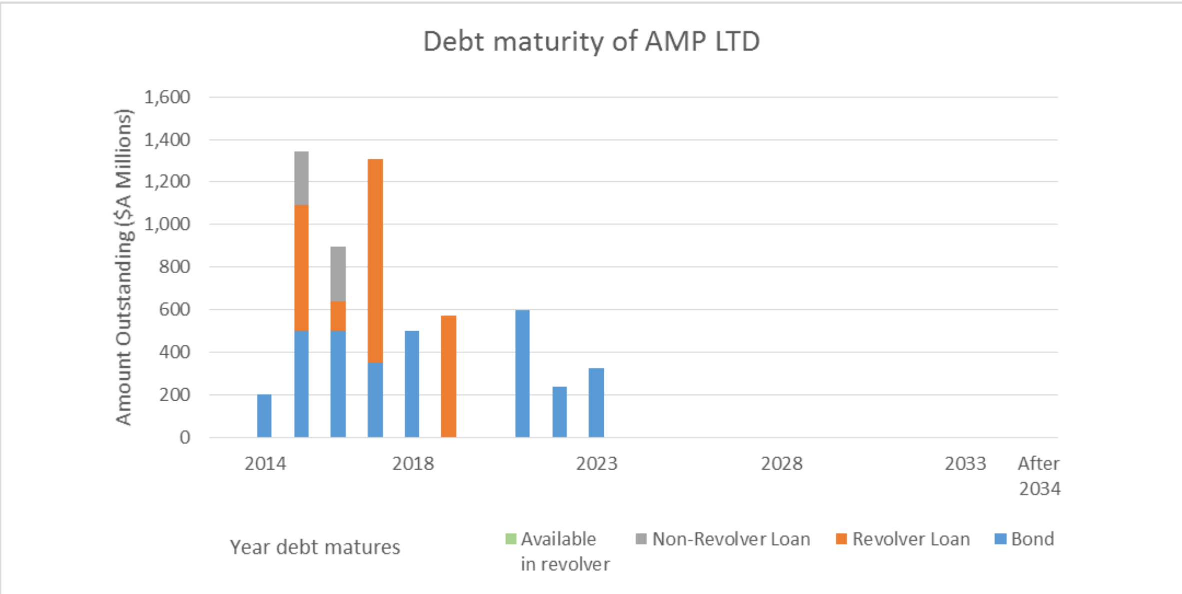




	Bond	Revolver loan	Non-revolver loan	Overall
Number	1	1	1	3
Amount Outstanding ($A Mn)	300.00	485.00	200.00	985.00
Weighted average debt term	7.00	4.50	5.00	5.36
Simple average debt term	7.00	4.50	5.00	5.50
Weighted average time to maturity	6.97	1.60	0.08	2.93
Simple average time to maturity	6.97	1.60	0.08	2.88

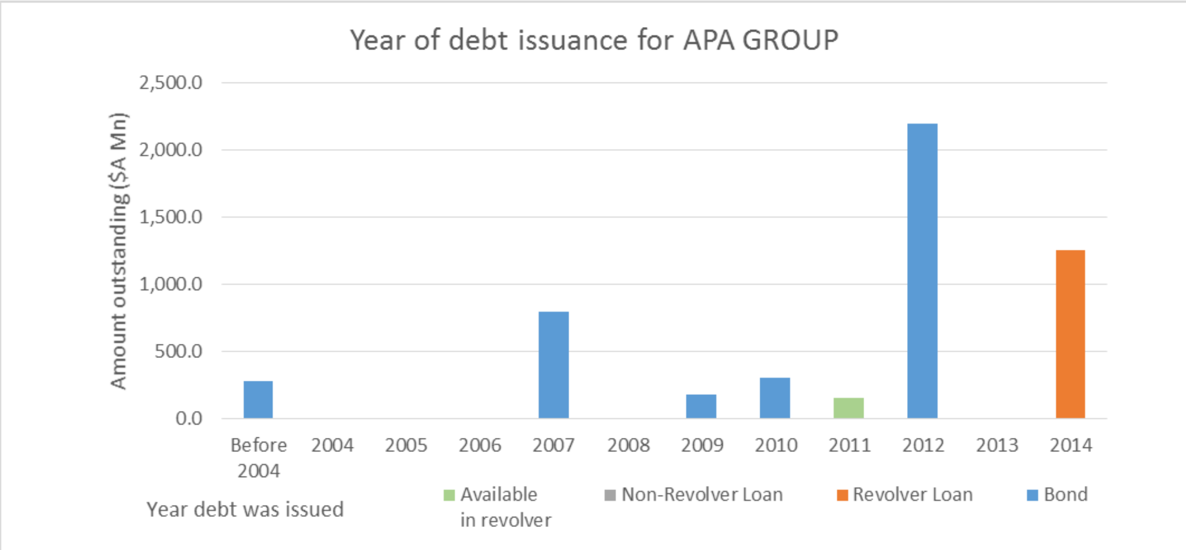
A.1.8 AMP LTD

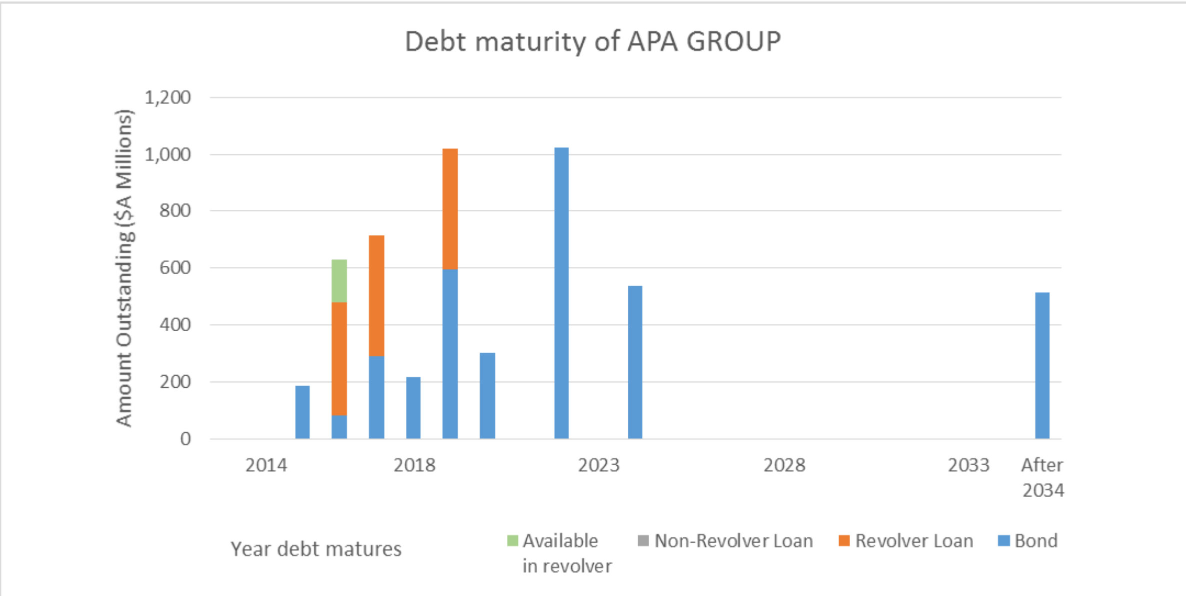




	Bond	Revolver loan	Non-revolver loan	Overall
Number	12	9	2	23
Amount Outstanding ($A Mn)	3,214.87	2,255.81	513.00	5,983.68
Weighted average debt term	6.10	3.45	1.74	4.73
Simple average debt term	6.33	2.58	0.39	4.46
Weighted average time to maturity	3.89	2.85	1.16	3.27
Simple average time to maturity	3.45	1.98	0.26	2.68

A.1.9 APA GROUP



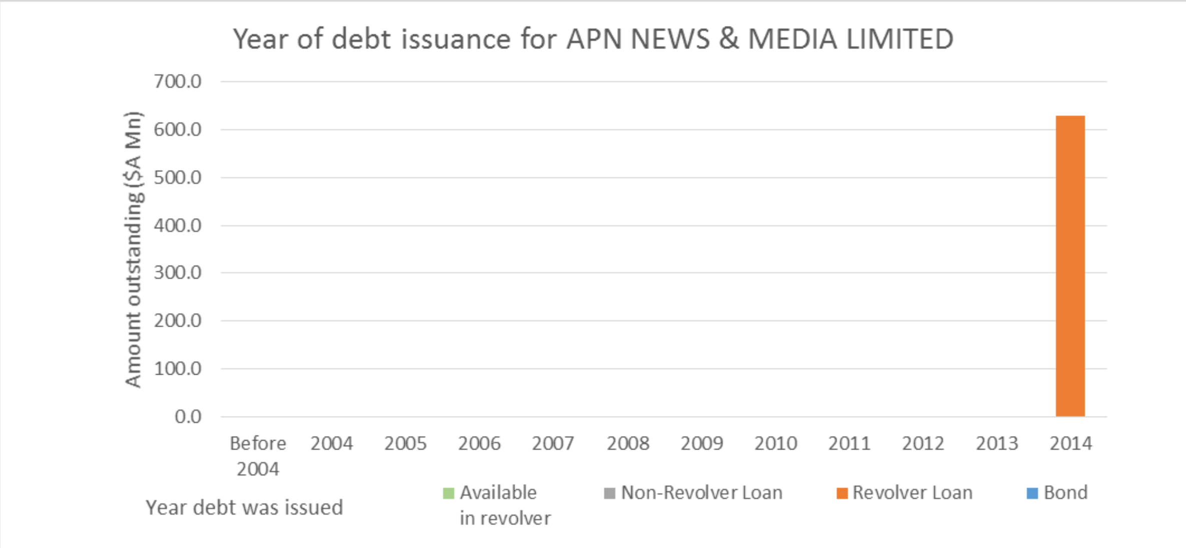


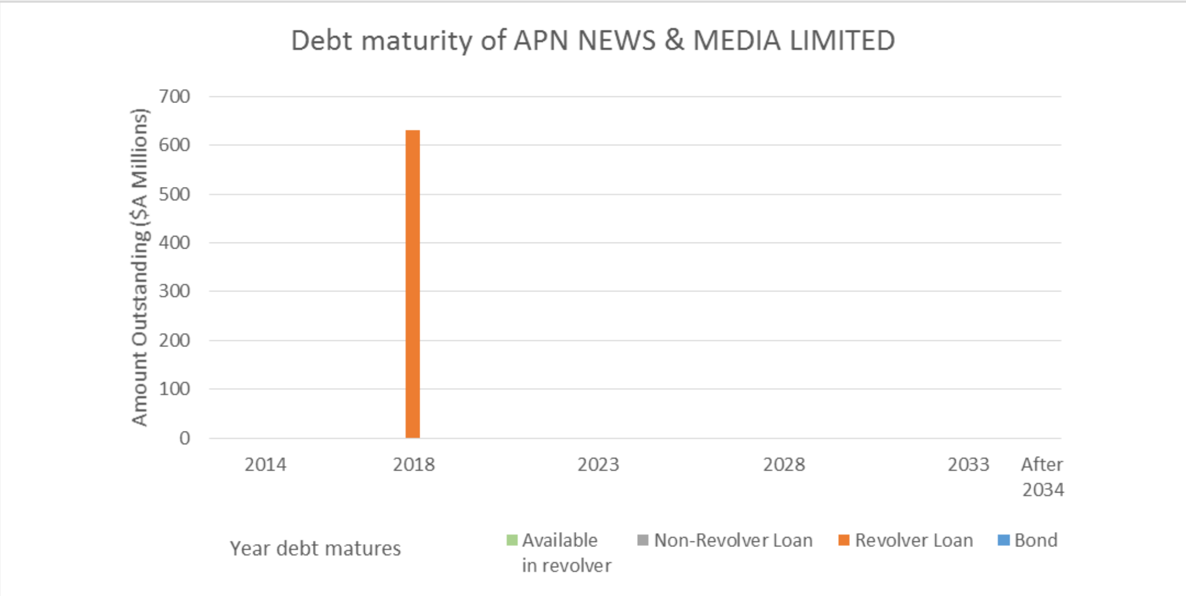
18 bonds, 4 rev, 0 non-rev. After 2034: 1 bond due 2072.

	Bond	Revolver loan	Non-revolver loan	Overall
Number	18	4	0	22
Amount Outstanding ($A Mn)	3,741.89	1,250.00	0.00	4,991.89
Weighted average debt term	17.50	3.61	N/A	14.02
Simple average debt term	13.81	3.94	0.00	12.01
Weighted average time to maturity	13.27	3.28	N/A	10.77
Simple average time to maturity	7.83	2.93	0.00	6.94

**One bond due in 2072 with A$ 515 million outstanding.*

A.1.10 APN NEWS & MEDIA LIMITED

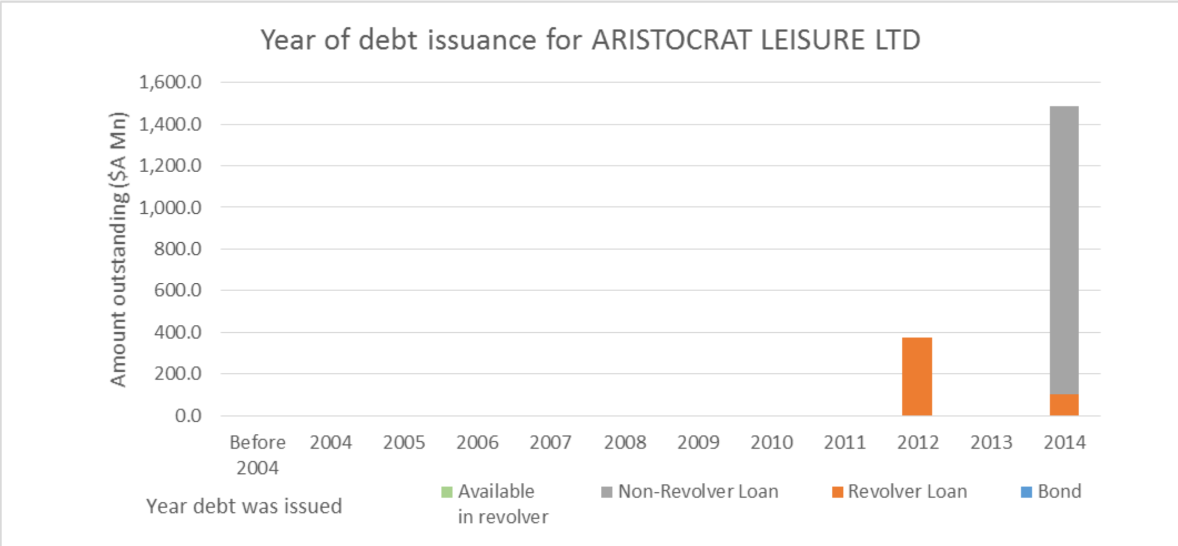


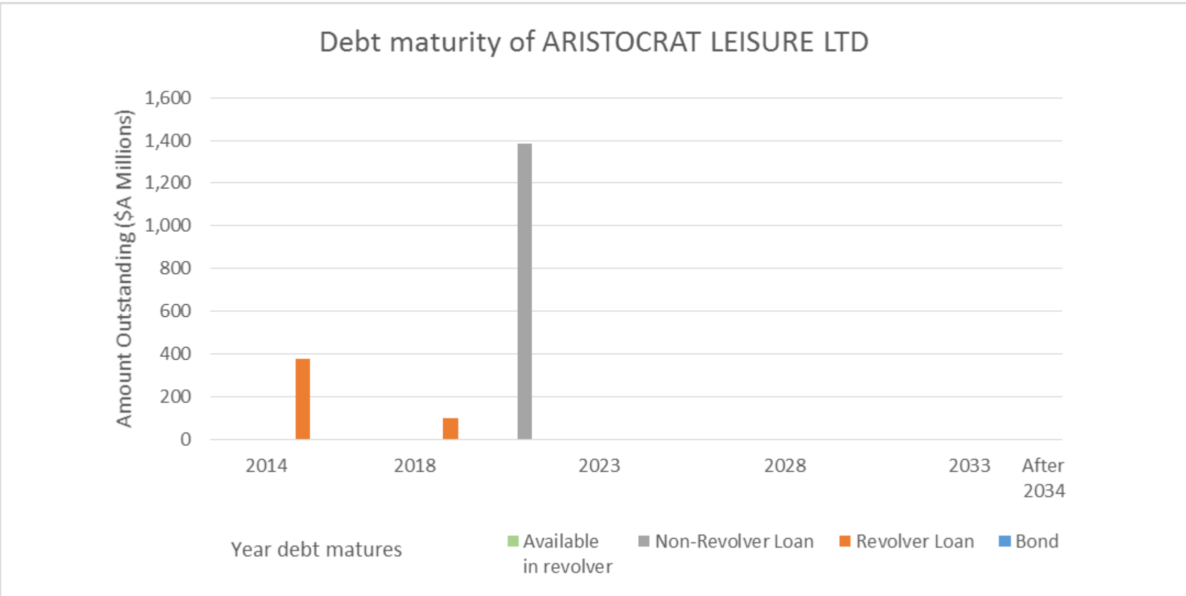


	Bond	Revolver loan	Non-revolver loan	Overall
Number	0	1	0	1
Amount Outstanding ($A Mn)	0.00	630.00	0.00	630.00
Weighted average debt term	N/A	3.42	N/A	3.42
Simple average debt term	N/A	3.42	0.00	3.42
Weighted average time to maturity	N/A	3.26	N/A	3.26
Simple average time to maturity	N/A	3.26	0.00	3.26

**Bloomberg does not have any information on the amount outstanding in the revolver loan.*

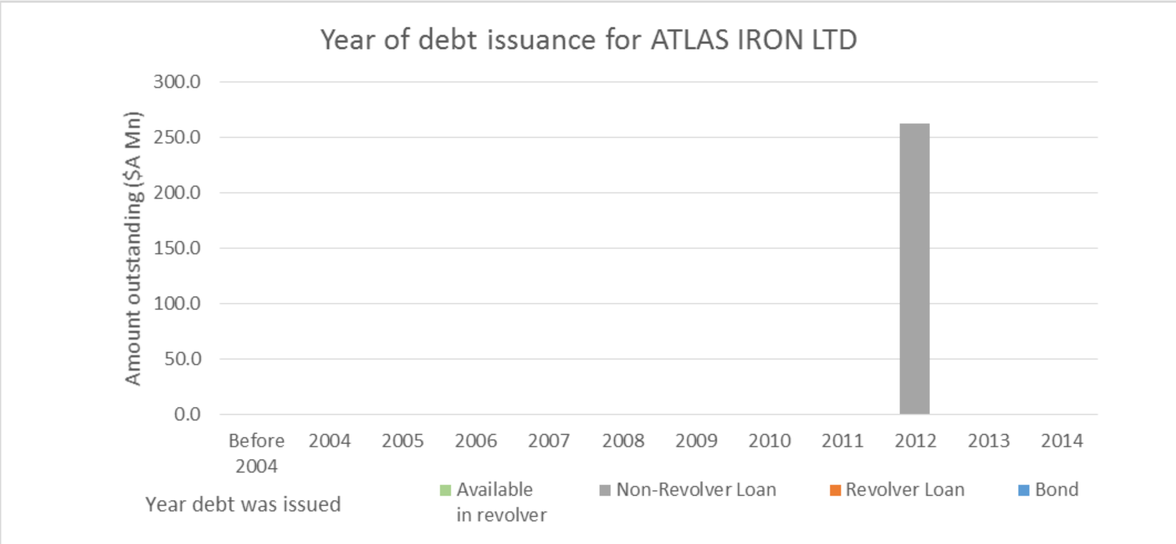
A.1.11 ARISTOCRAT LEISURE LTD

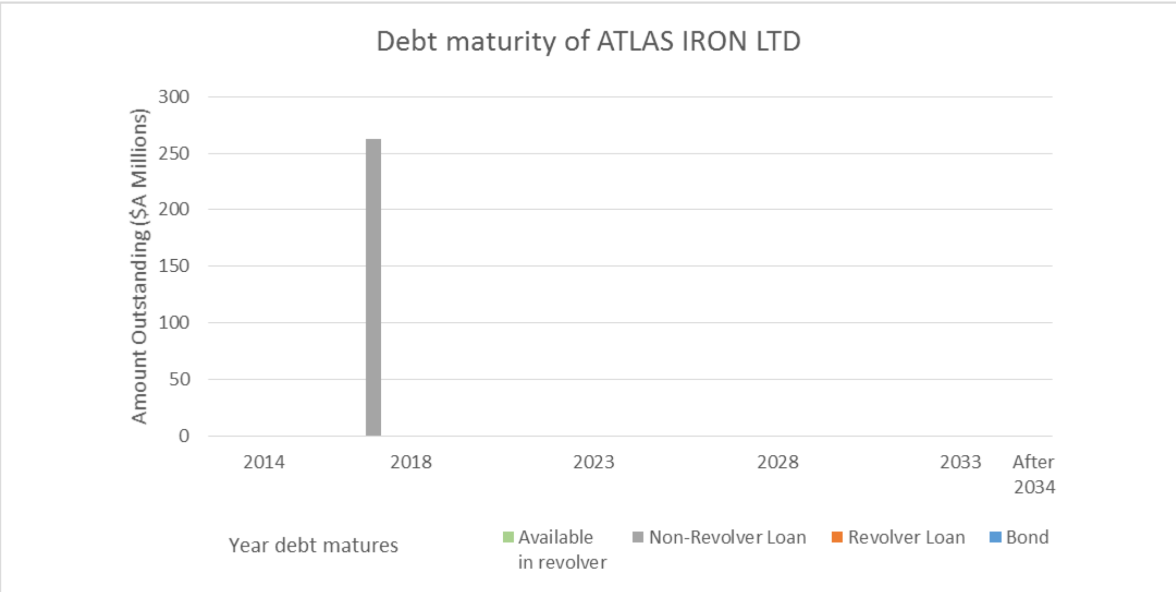




	Bond	Revolver loan	Non-revolver loan	Overall
Number	0	3	1	4
Amount Outstanding ($A Mn)	0.00	475.00	1,386.96	1,861.96
Weighted average debt term	N/A	3.76	7.23	6.34
Simple average debt term	N/A	3.99	2.41	4.80
Weighted average time to maturity	N/A	1.85	6.94	5.64
Simple average time to maturity	N/A	2.33	2.31	3.48

A.1.12 ATLAS IRON LTD

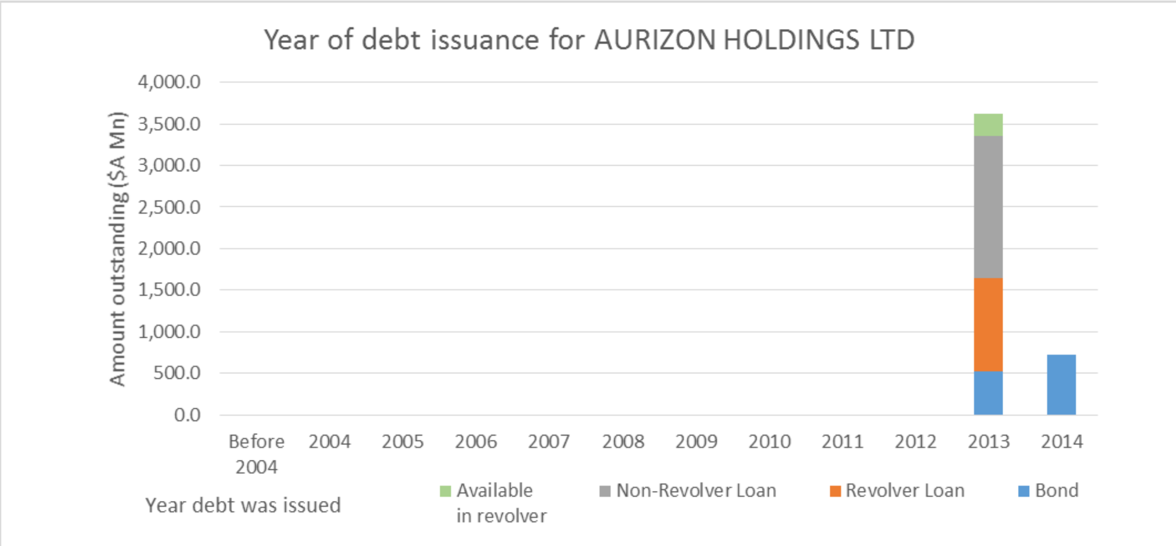


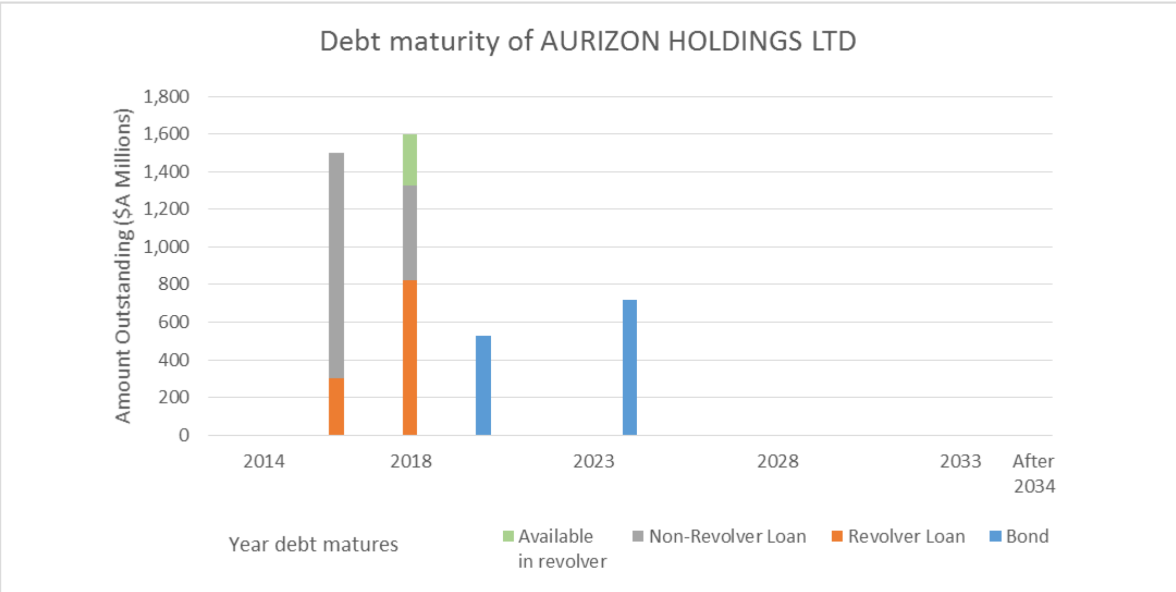


	Bond	Revolver loan	Non-revolver loan	Overall
Number	0	0	1	1
Amount Outstanding ($A Mn)	0.00	0.00	262.20	262.20
Weighted average debt term	N/A	N/A	5.00	5.00
Simple average debt term	N/A	N/A	N/A	5.00
Weighted average time to maturity	N/A	N/A	3.14	3.14
Simple average time to maturity	N/A	N/A	N/A	3.14

**Atlas Iron Ltd has an exceptionally low debt-to-equity ratio of 17%.*

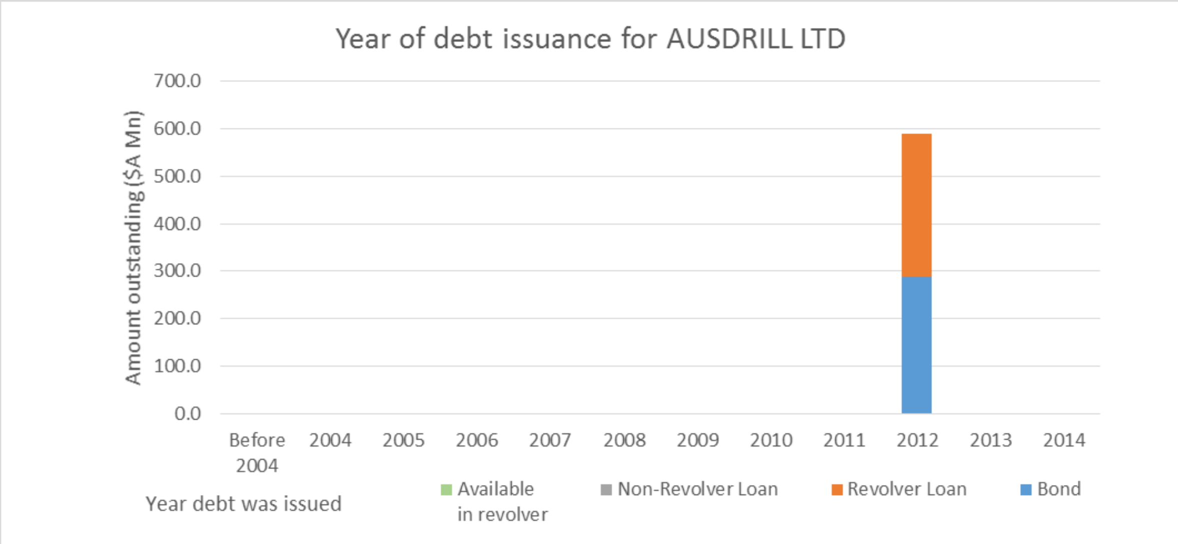
A.1.13 AURIZON HOLDINGS LTD

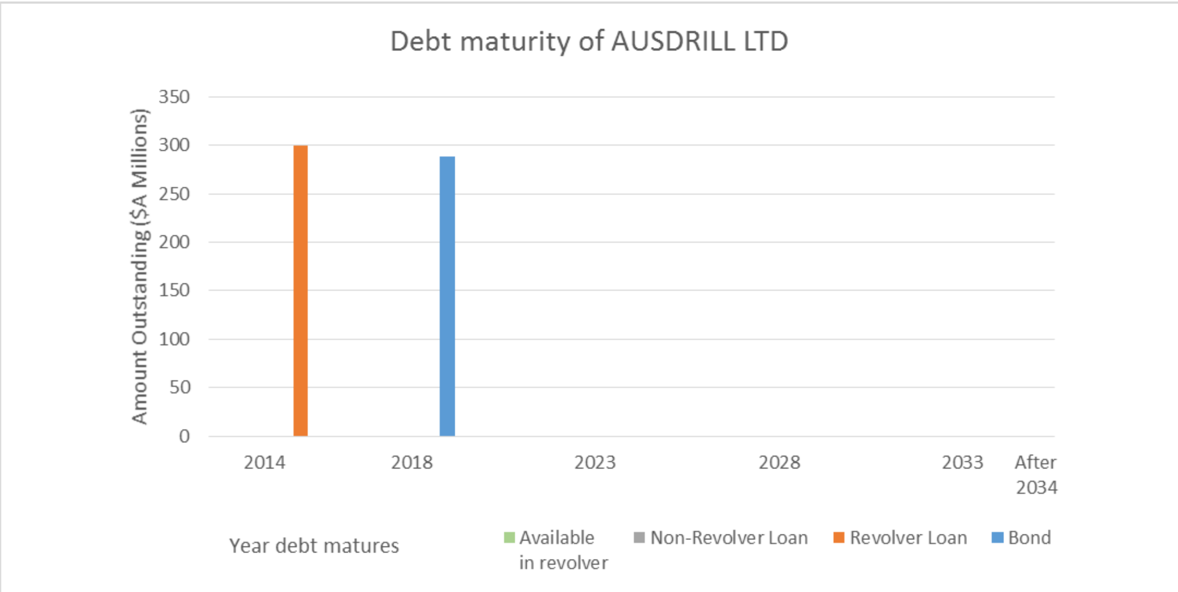




	Bond	Revolver loan	Non-revolver loan	Overall
Number	2	3	2	7
Amount Outstanding ($A Mn)	1,243.70	1,125.00	1,700.00	4,068.70
Weighted average debt term	8.73	4.47	3.59	5.40
Simple average debt term	8.50	4.33	2.67	5.43
Weighted average time to maturity	8.27	3.15	2.27	4.35
Simple average time to maturity	7.97	3.02	1.79	4.34

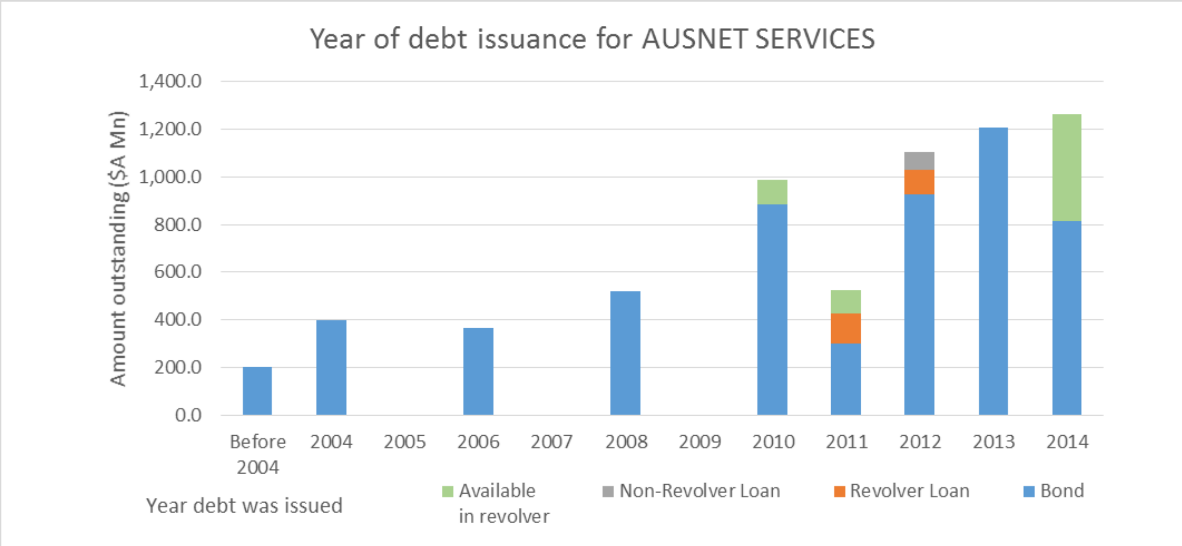
A.1.14 AUSDRILL LTD

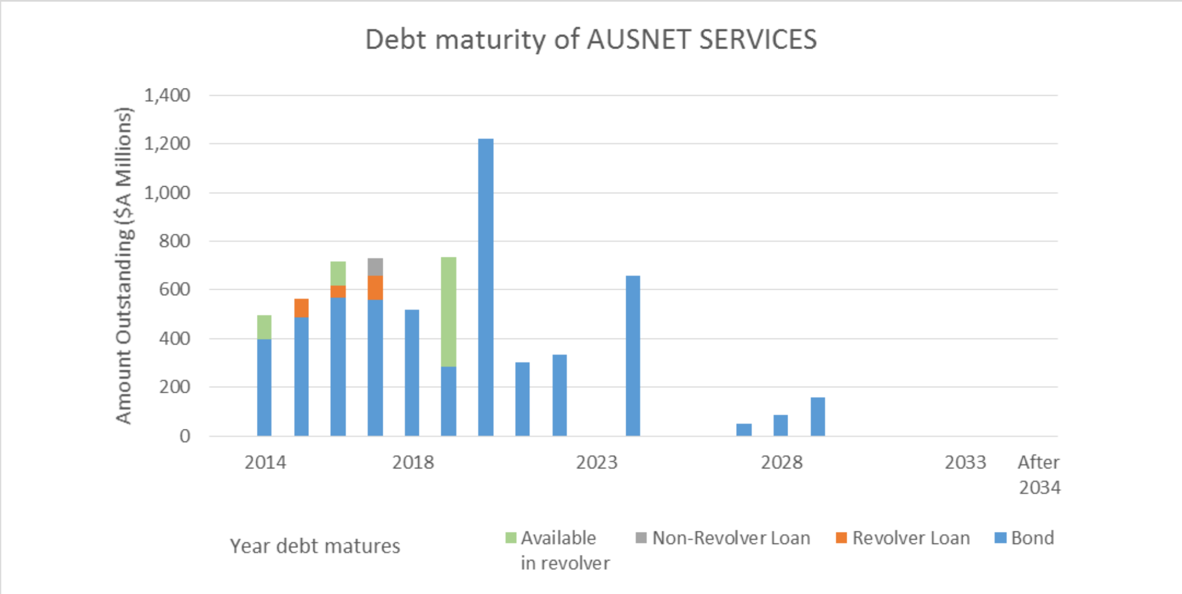




	Bond	Revolver loan	Non-revolver loan	Overall
Number	1	3	0	4
Amount Outstanding ($A Mn)	288.82	300.00	0.00	588.82
Weighted average debt term	6.98	3.00	N/A	4.95
Simple average debt term	6.98	3.00	0.00	3.99
Weighted average time to maturity	5.03	0.96	N/A	2.96
Simple average time to maturity	5.03	0.96	0.00	1.98

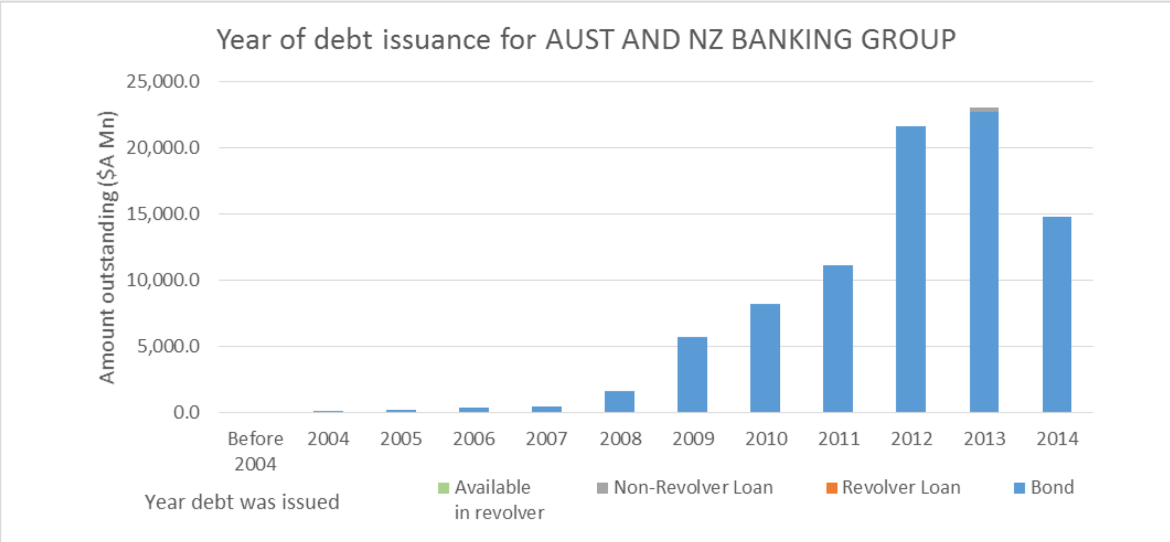
A.1.15 AUSNET SERVICES

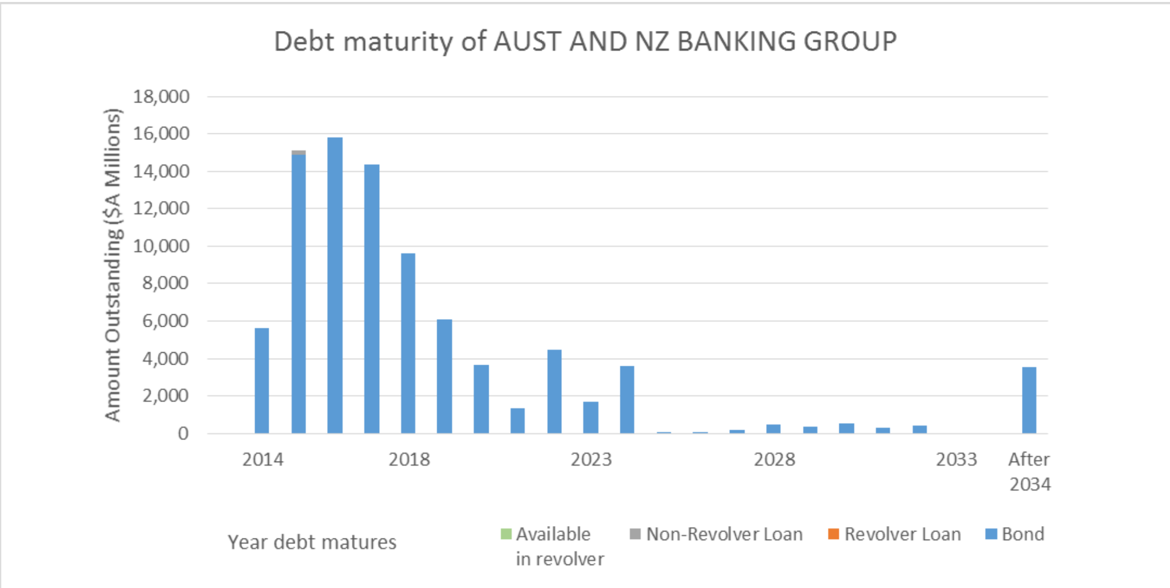




	Bond	Revolver loan	Non-revolver loan	Overall
Number	23	5	1	29
Amount Outstanding ($A Mn)	5,619.35	225.00	75.00	5,919.35
Weighted average debt term	9.01	4.67	5.00	8.80
Simple average debt term	10.72	4.60	1.00	9.47
Weighted average time to maturity	4.97	1.98	2.94	4.83
Simple average time to maturity	5.80	1.99	0.59	5.04

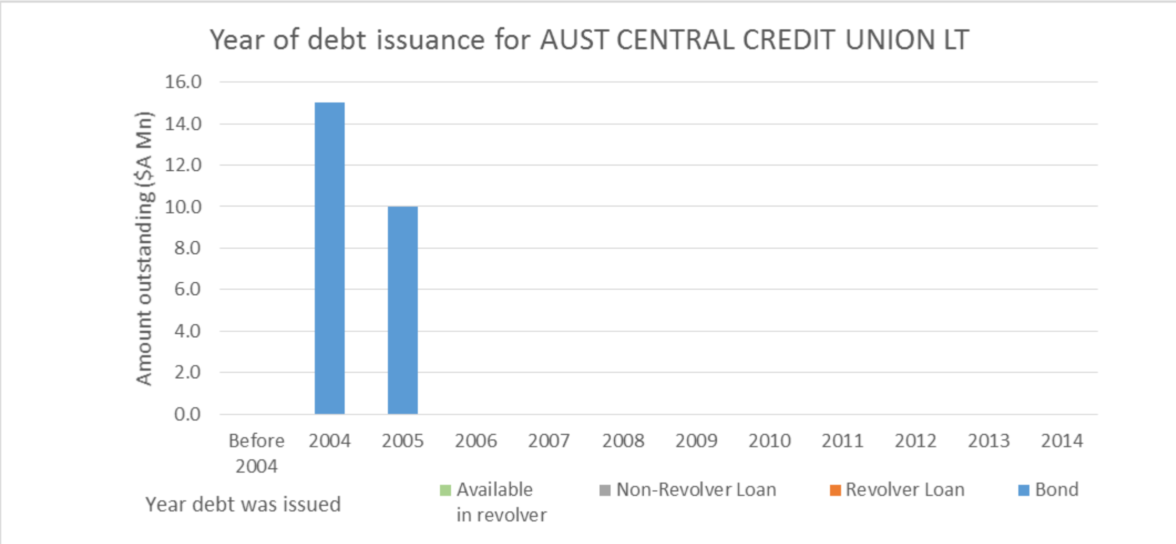
A.1.16 AUSTRALIA & NEW ZEALAND BANKING GROUP LTD

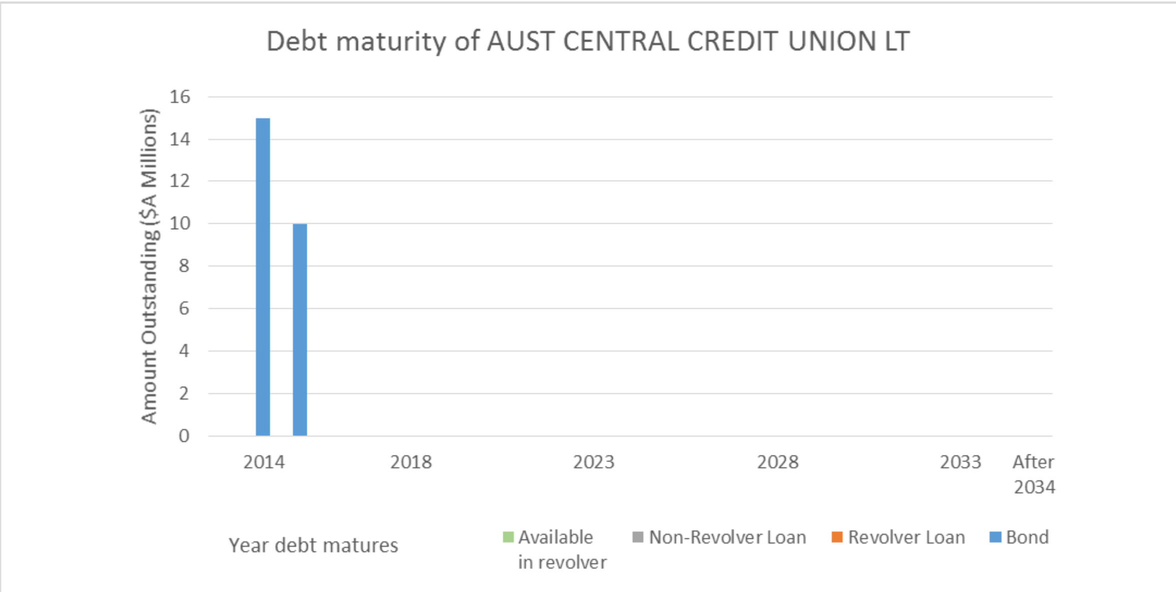




	Bond	Revolver loan	Non-revolver loan	Overall
Number	447	0	1	448
Amount Outstanding ($A Mn)	86,863.58	0.00	274.70	87,138.27
Weighted average debt term	6.81	N/A	1.83	6.80
Simple average debt term	10.25	N/A	N/A	10.23
Weighted average time to maturity	4.40	N/A	0.94	4.39
Simple average time to maturity	6.85	N/A	N/A	6.85

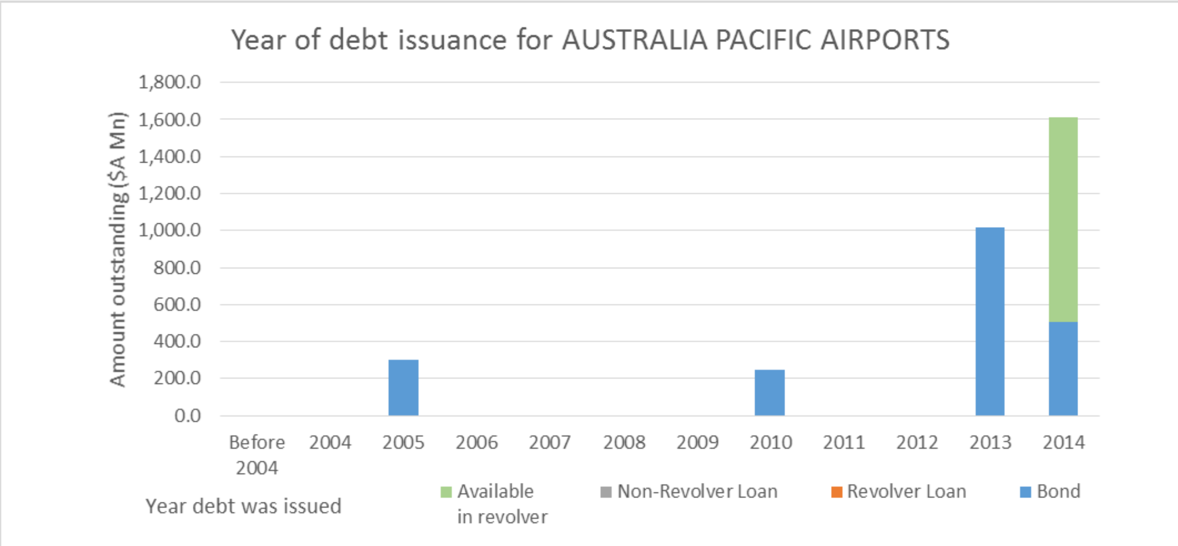
A.1.17 AUSTRALIAN CENTRAL CREDIT UNION LTD





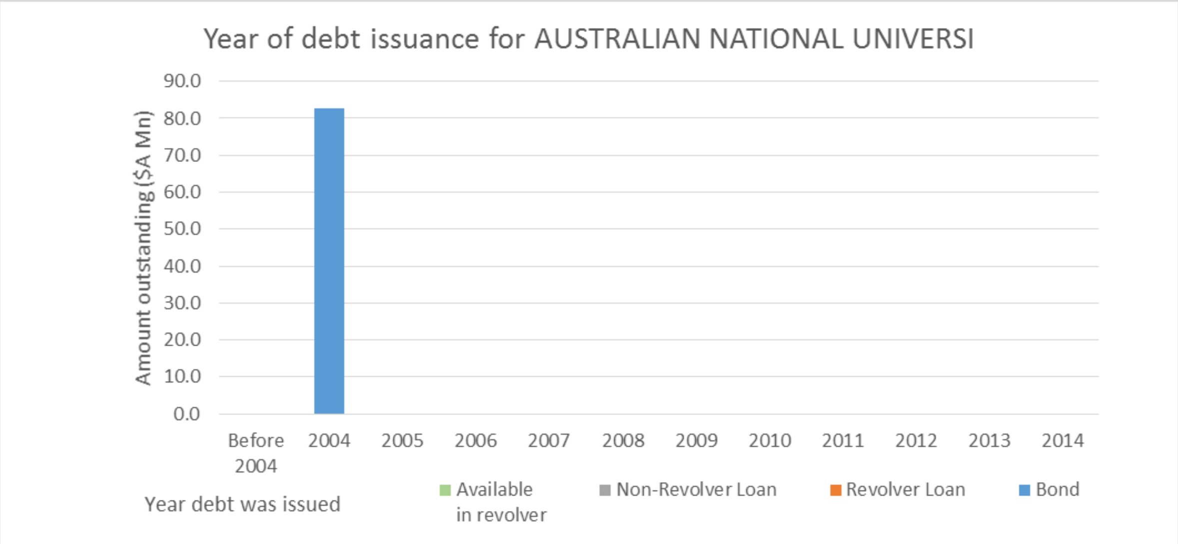
	Bond	Revolver loan	Non-revolver loan	Overall
Number	2	0	0	2
Amount Outstanding ($A Mn)	25.00	0.00	0.00	25.00
Weighted average debt term	10.00	N/A	N/A	10.00
Simple average debt term	10.00	N/A	N/A	10.00
Weighted average time to maturity	0.26	N/A	N/A	0.26
Simple average time to maturity	0.29	N/A	N/A	0.29

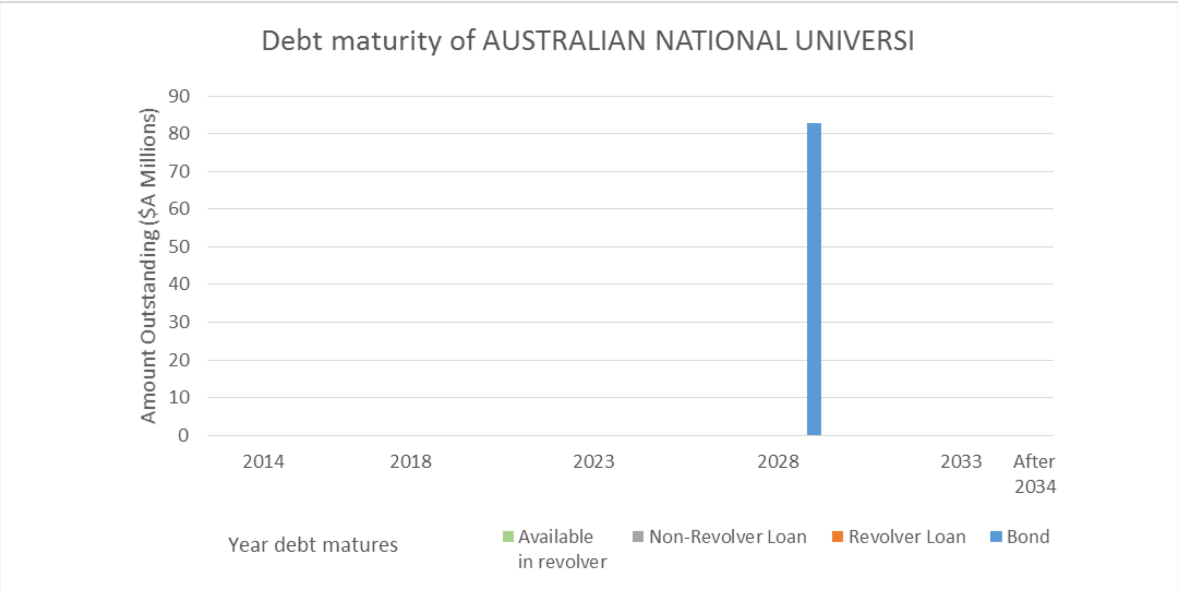
A.1.18 AUSTRALIA PACIFIC AIRPORTS CORP LTD



	Bond	Revolver loan	Non-revolver loan	Overall
Number	6	2	0	8
Amount Outstanding ($A Mn)	2,076.26	0.00	0.00	2,076.26
Weighted average debt term	9.19	N/A	N/A	9.19
Simple average debt term	8.83	3.00	0.00	7.38
Weighted average time to maturity	6.86	N/A	N/A	6.86
Simple average time to maturity	4.78	2.37	0.00	4.18

A.1.19 AUSTRALIAN NATIONAL UNIVERSITY

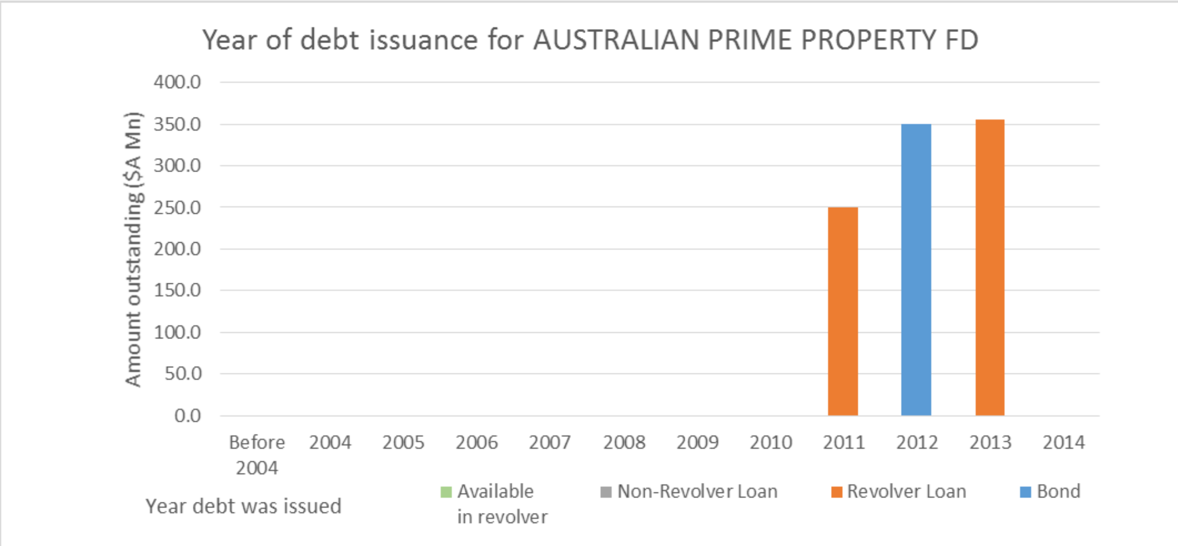


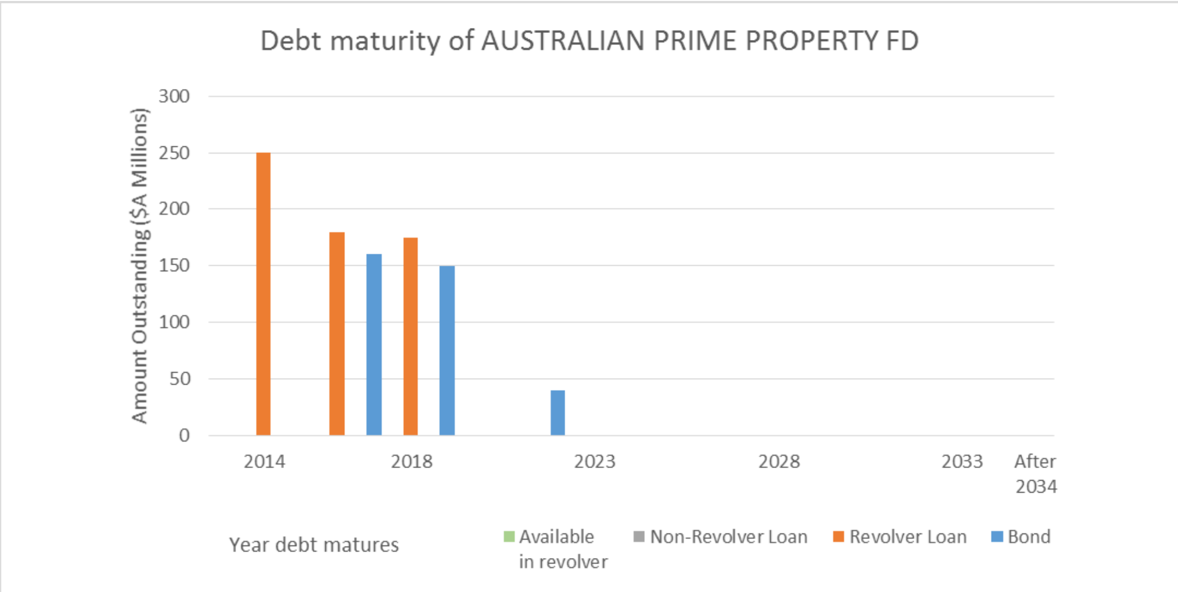


	Bond	Revolver loan	Non-revolver loan	Overall
Number	1	0	0	1
Amount Outstanding ($A Mn)	82.74	0.00	0.00	82.74
Weighted average debt term	25.00	N/A	N/A	25.00
Simple average debt term	25.00	N/A	N/A	25.00
Weighted average time to maturity	14.97	N/A	N/A	14.97
Simple average time to maturity	14.97	N/A	N/A	14.97

**Australian National University has an AA+ credit rating*

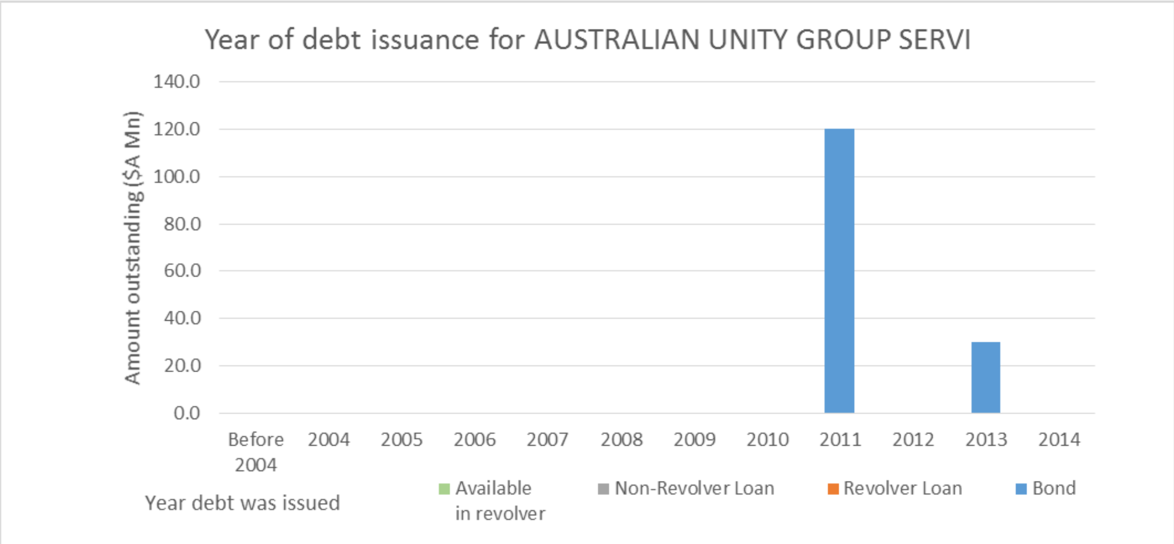
A.1.20 AUSTRALIAN PRIME PROPERTY FUND RETAIL

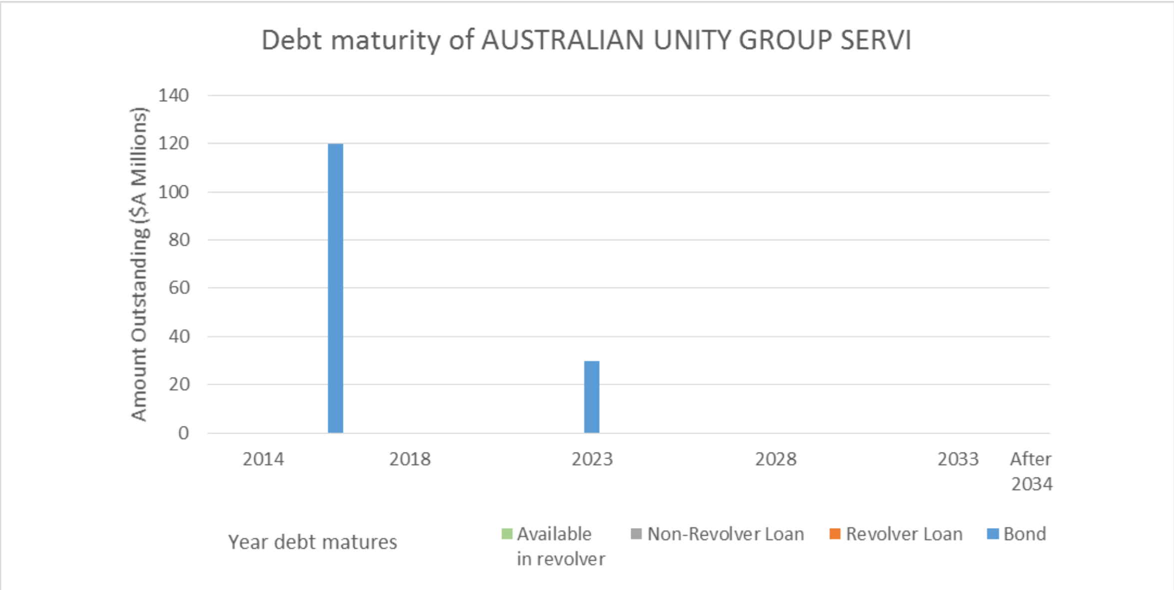




	Bond	Revolver loan	Non-revolver loan	Overall
Number	3	4	0	7
Amount Outstanding ($A Mn)	350.00	605.00	0.00	955.00
Weighted average debt term	6.43	3.55	N/A	4.61
Simple average debt term	7.33	3.47	0.00	5.12
Weighted average time to maturity	4.48	1.89	N/A	2.84
Simple average time to maturity	5.38	2.13	0.00	3.52

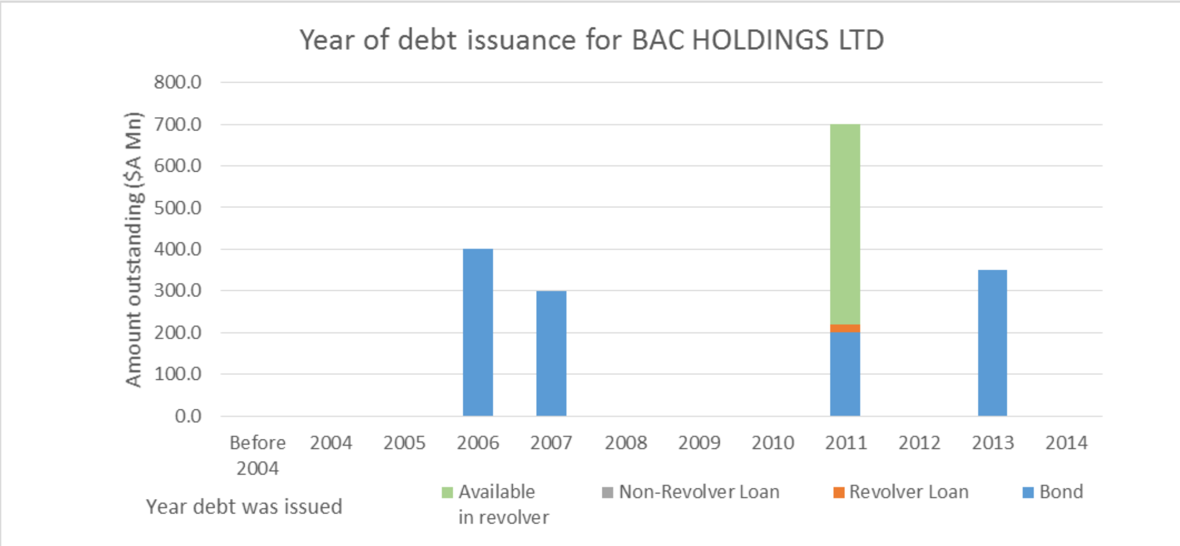
A.1.21 AUSTRALIAN UNITY GROUP SERVICES PTY LTD

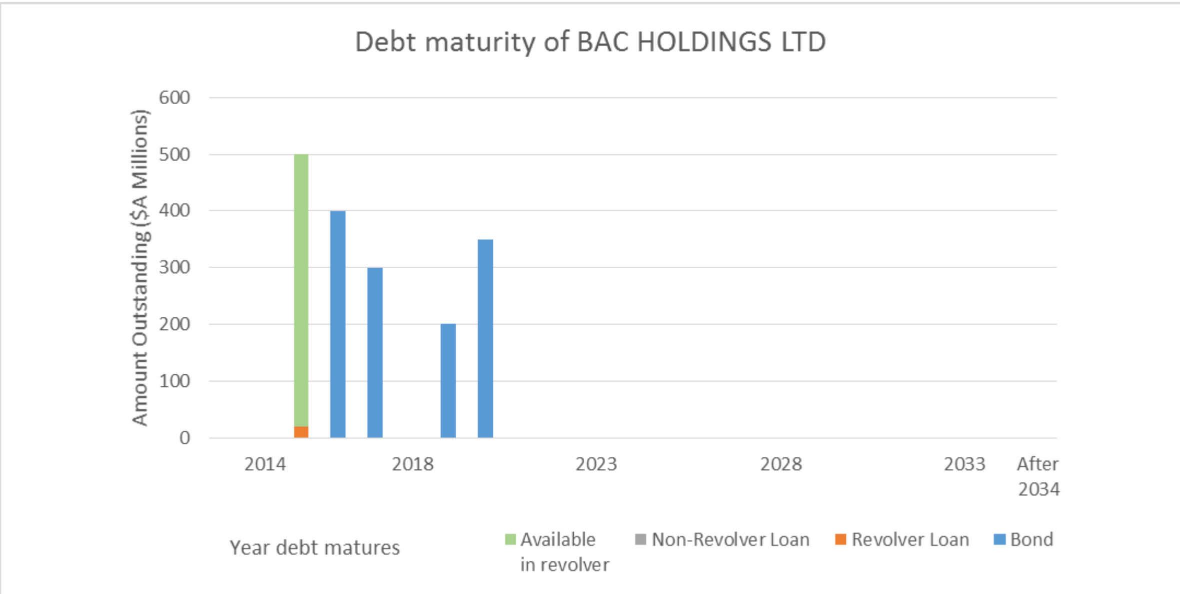




	Bond	Revolver loan	Non-revolver loan	Overall
Number	2	0	0	2
Amount Outstanding ($A Mn)	150.00	0.00	0.00	150.00
Weighted average debt term	6.00	N/A	N/A	6.00
Simple average debt term	7.50	N/A	N/A	7.50
Weighted average time to maturity	2.93	N/A	N/A	2.93
Simple average time to maturity	5.10	N/A	N/A	5.10

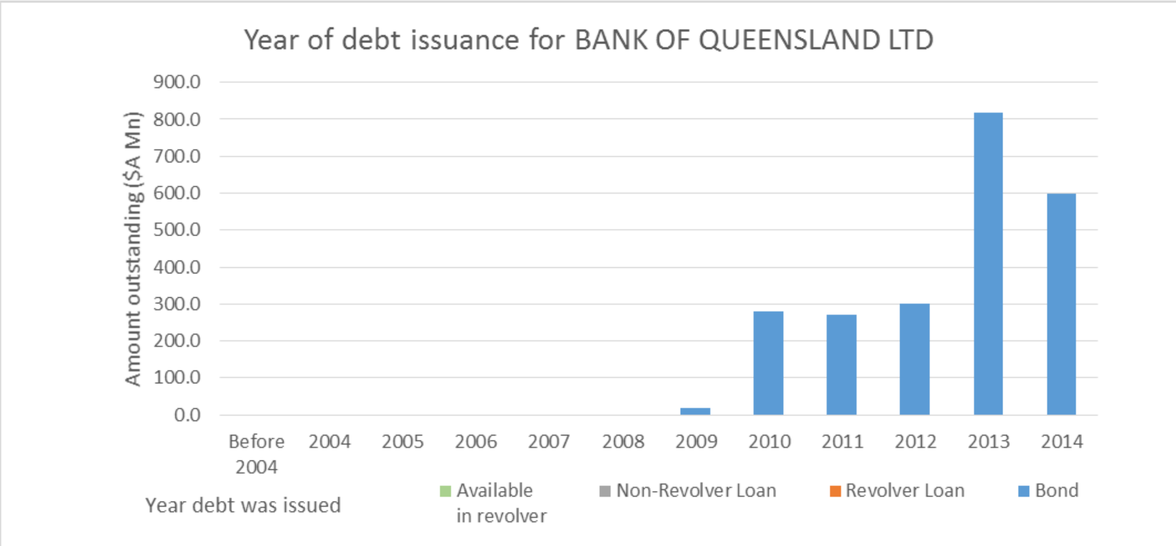
A.1.22 BAC HOLDINGS LTD

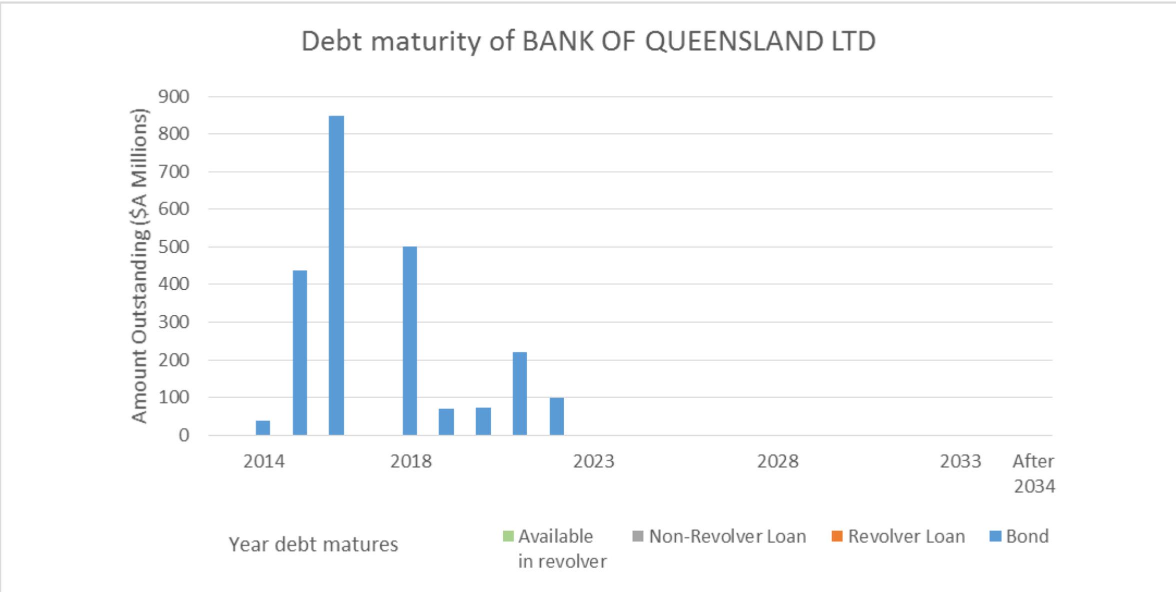




	Bond	Revolver loan	Non-revolver loan	Overall
Number	4	1	0	5
Amount Outstanding ($A Mn)	1,250.00	20.00	0.00	1,270.00
Weighted average debt term	8.88	4.00	N/A	8.81
Simple average debt term	8.82	4.00	0.00	7.85
Weighted average time to maturity	3.74	0.94	N/A	3.69
Simple average time to maturity	3.90	0.94	0.00	3.31

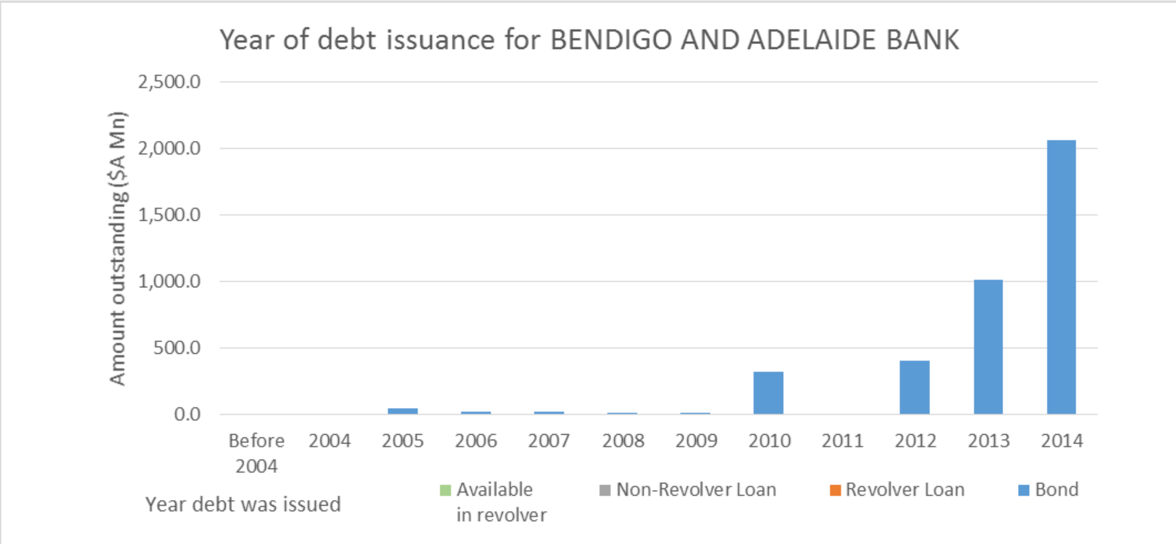
A.1.23 BANK OF QUEENSLAND LTD

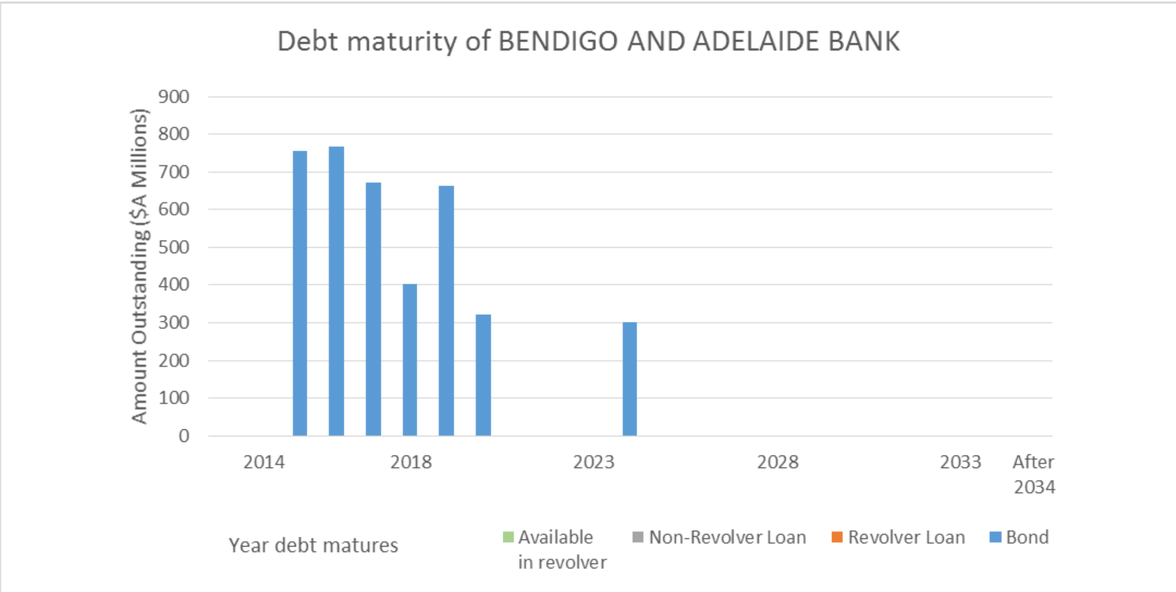




	Bond	Revolver loan	Non-revolver loan	Overall
Number	21	0	0	21
Amount Outstanding ($A Mn)	2,287.24	0.00	0.00	2,287.24
Weighted average debt term	4.66	N/A	N/A	4.66
Simple average debt term	5.68	N/A	N/A	5.68
Weighted average time to maturity	2.92	N/A	N/A	2.92
Simple average time to maturity	3.37	N/A	N/A	3.37

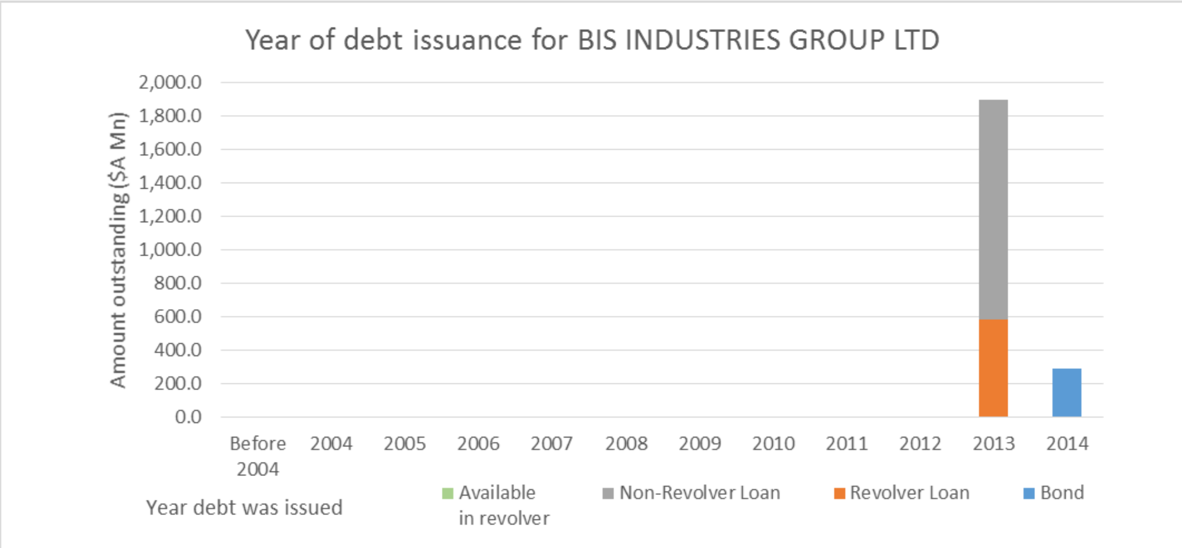
A.1.24 BENDIGO & ADELAIDE BANK LTD

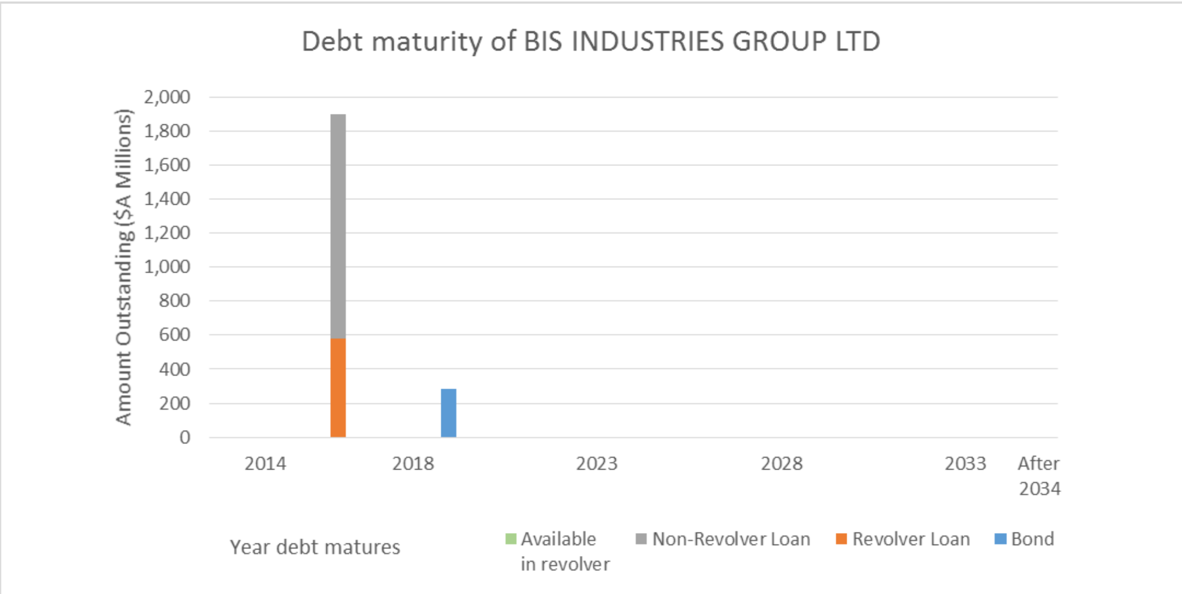




	Bond	Revolver loan	Non-revolver loan	Overall
Number	35	0	0	35
Amount Outstanding ($A Mn)	3,881.99	0.00	0.00	3,881.99
Weighted average debt term	4.67	N/A	N/A	4.67
Simple average debt term	7.29	N/A	N/A	7.29
Weighted average time to maturity	3.42	N/A	N/A	3.42
Simple average time to maturity	2.91	N/A	N/A	2.99

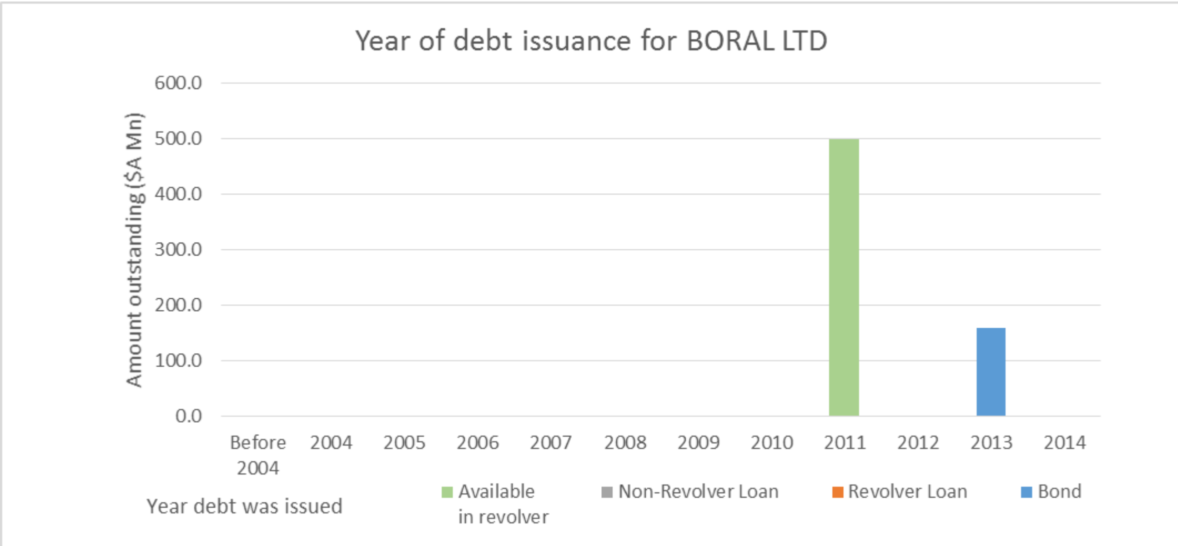
A.1.25 BIS INDUSTRIES GROUP LTD

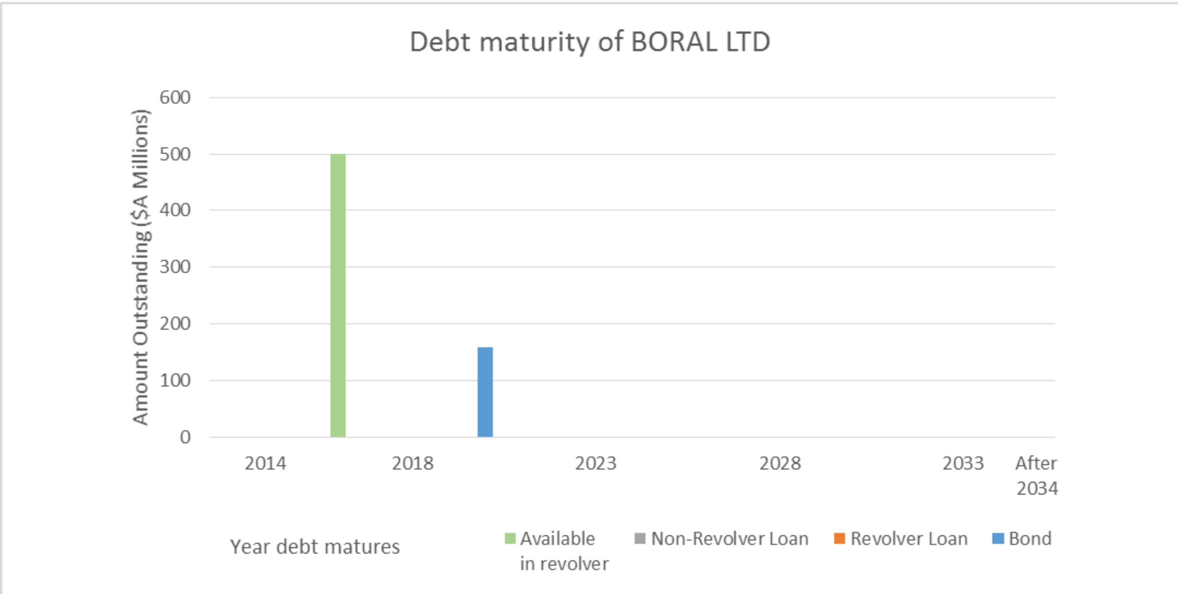




	Bond	Revolver loan	Non-revolver loan	Overall
Number	1	4	2	7
Amount Outstanding ($A Mn)	286.57	580.00	1,320.00	2,186.57
Weighted average debt term	5.01	3.02	3.02	3.28
Simple average debt term	5.01	3.02	1.51	3.30
Weighted average time to maturity	4.45	1.84	1.84	2.18
Simple average time to maturity	4.45	1.84	0.92	2.21

A.1.26 BORAL LTD

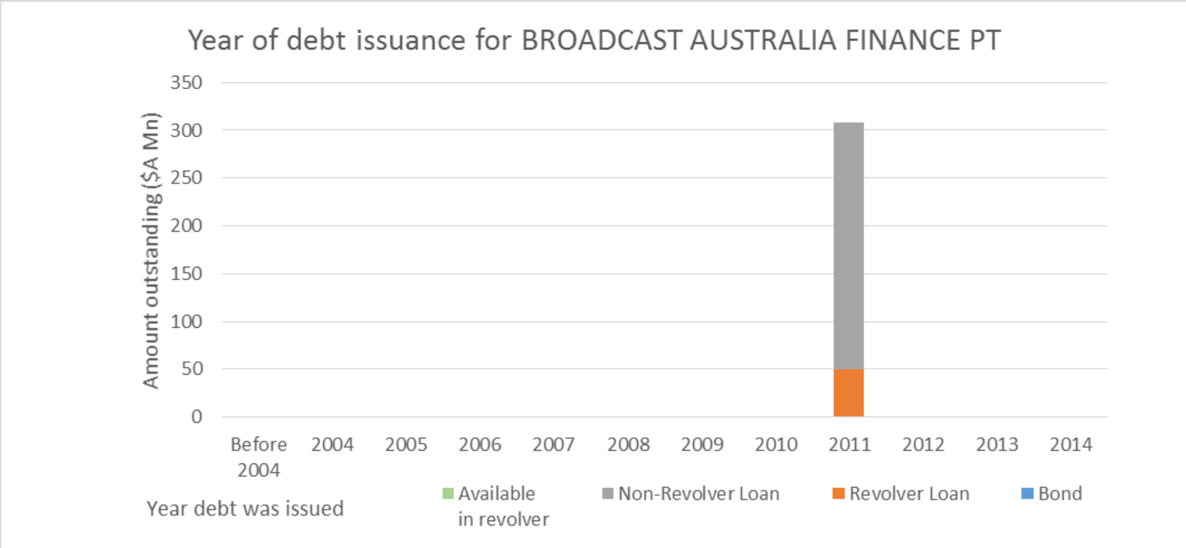


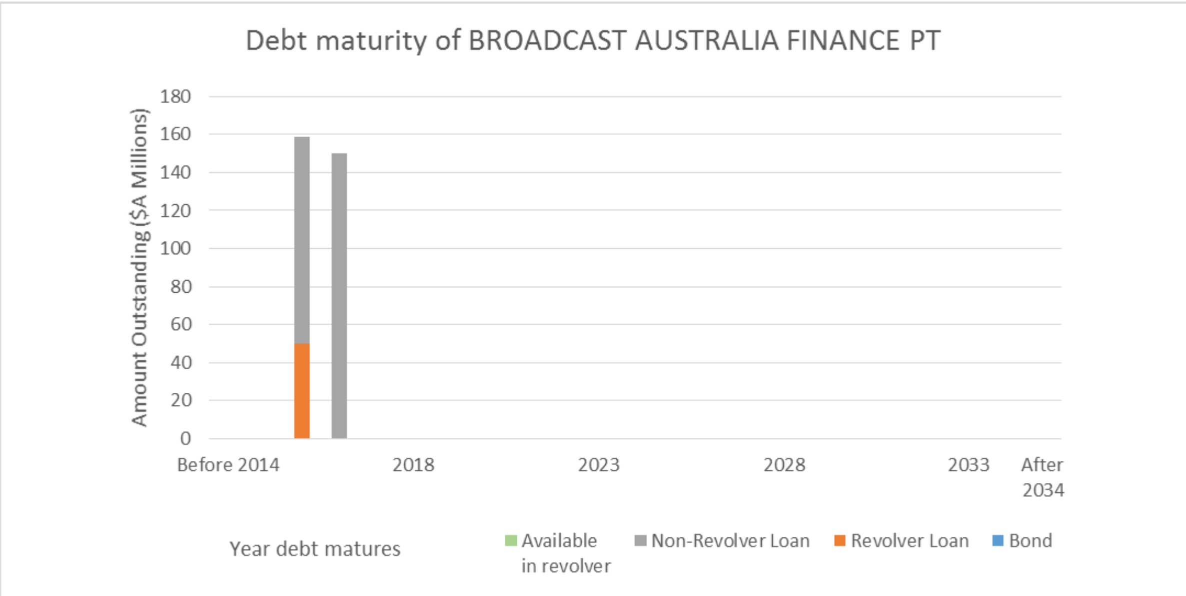


	Bond	Revolver loan	Non-revolver loan	Overall
Number	1	1	0	2
Amount Outstanding ($A Mn)	157.78	0.00	0.00	157.78
Weighted average debt term	7.00	N/A	N/A	7.00
Simple average debt term	7.00	5.00	0.00	6.00
Weighted average time to maturity	5.34	N/A	N/A	5.34
Simple average time to maturity	5.34	2.09	0.00	3.72

COMPETITION ECONOMISTS GROUP

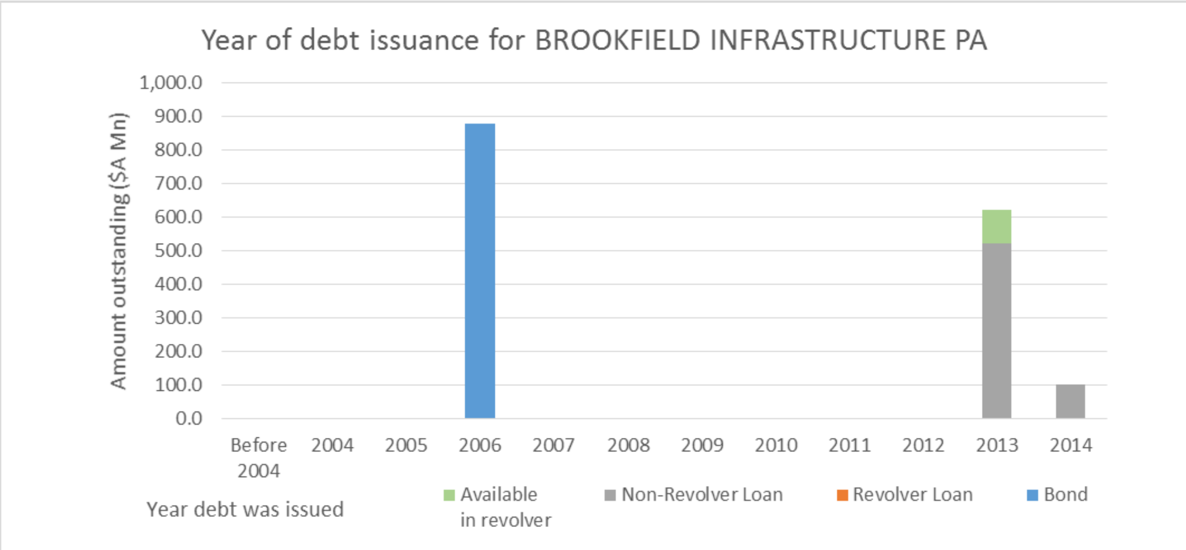
A.1.27 BROADCAST AUSTRALIA FINANCE PTY LTD

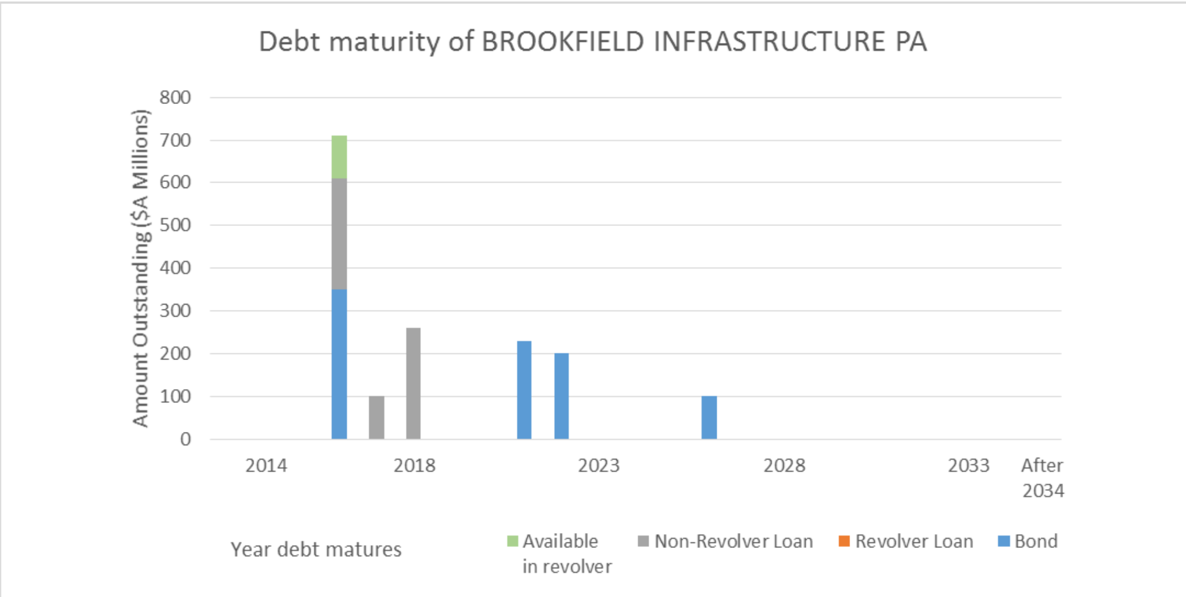




	Bond	Revolver loan	Non-revolver loan	Overall
Number	1	1	2	4
Amount Outstanding ($A Mn)	0.00	50.00	258.50	308.50
Weighted average debt term	N/A	4.01	4.60	4.50
Simple average debt term	12.00	4.01	9.03	6.26
Weighted average time to maturity	N/A	0.88	1.46	1.37
Simple average time to maturity	4.72	0.88	2.77	2.09

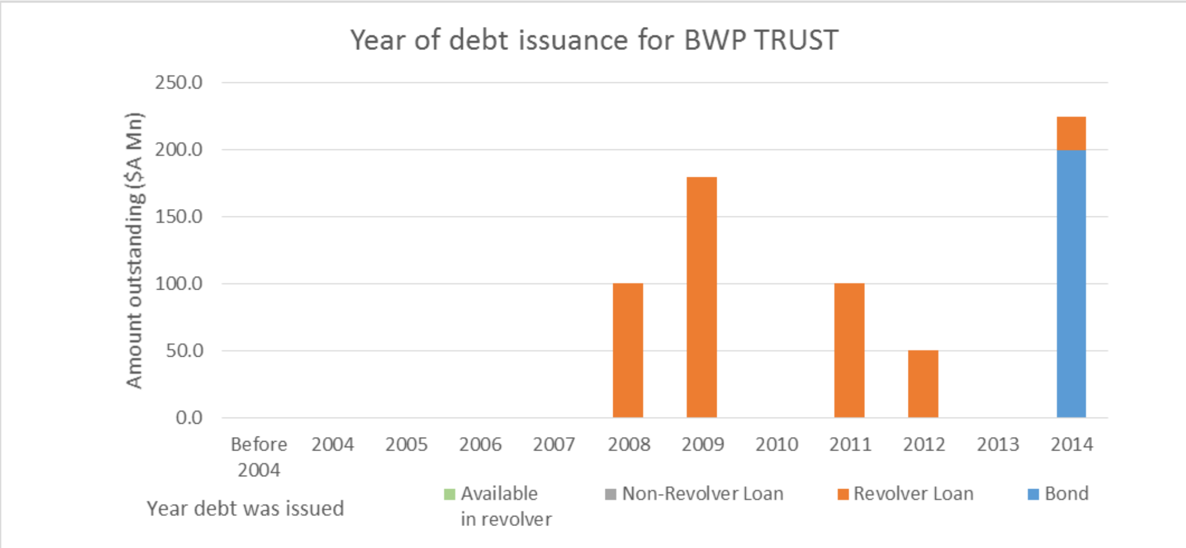
A.1.28 BROOKFIELD INFRASTRUCTURE PARTNERS LP

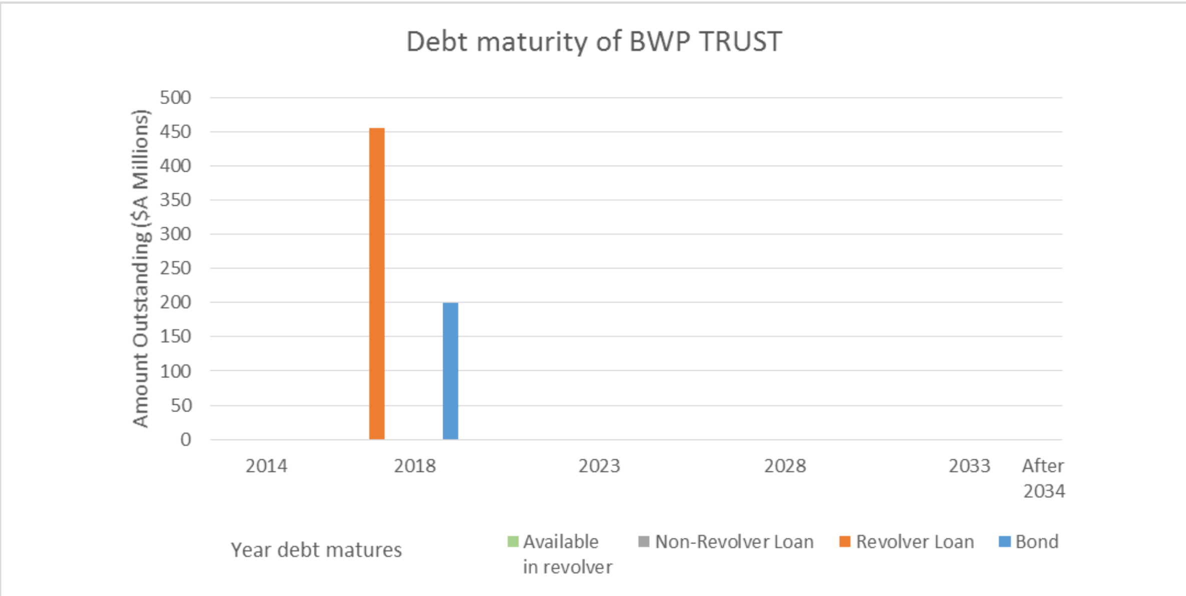




	Bond	Revolver loan	Non-revolver loan	Overall
Number	5	1	3	9
Amount Outstanding ($A Mn)	880.00	0.00	620.00	1,500.00
Weighted average debt term	13.81	N/A	3.84	9.69
Simple average debt term	14.20	3.00	11.00	9.44
Weighted average time to maturity	5.56	N/A	2.43	4.27
Simple average time to maturity	5.94	1.38	7.48	4.28

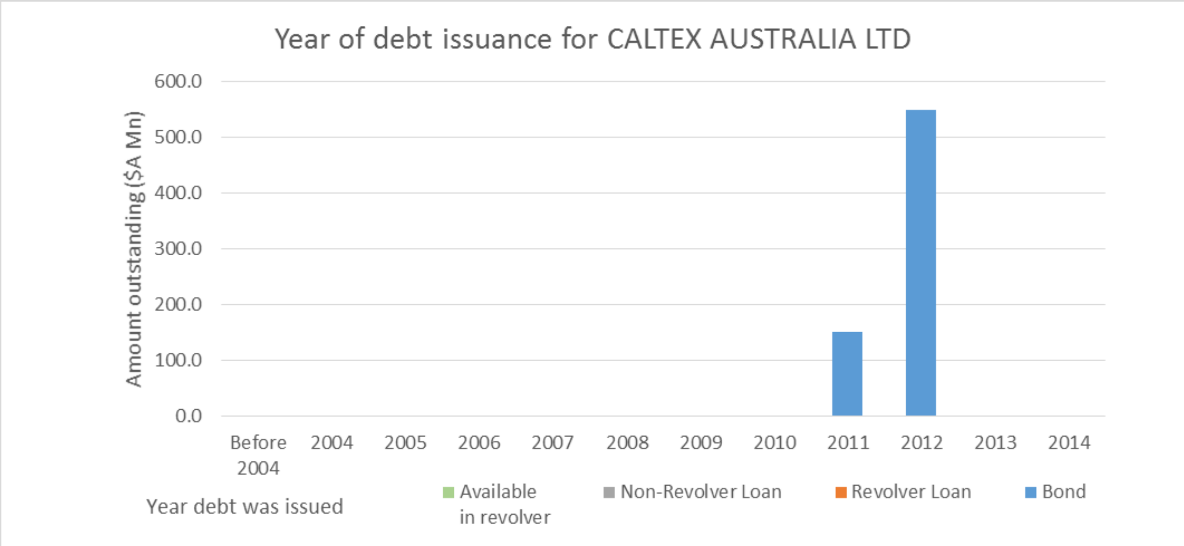
A.1.29 BWP TRUST

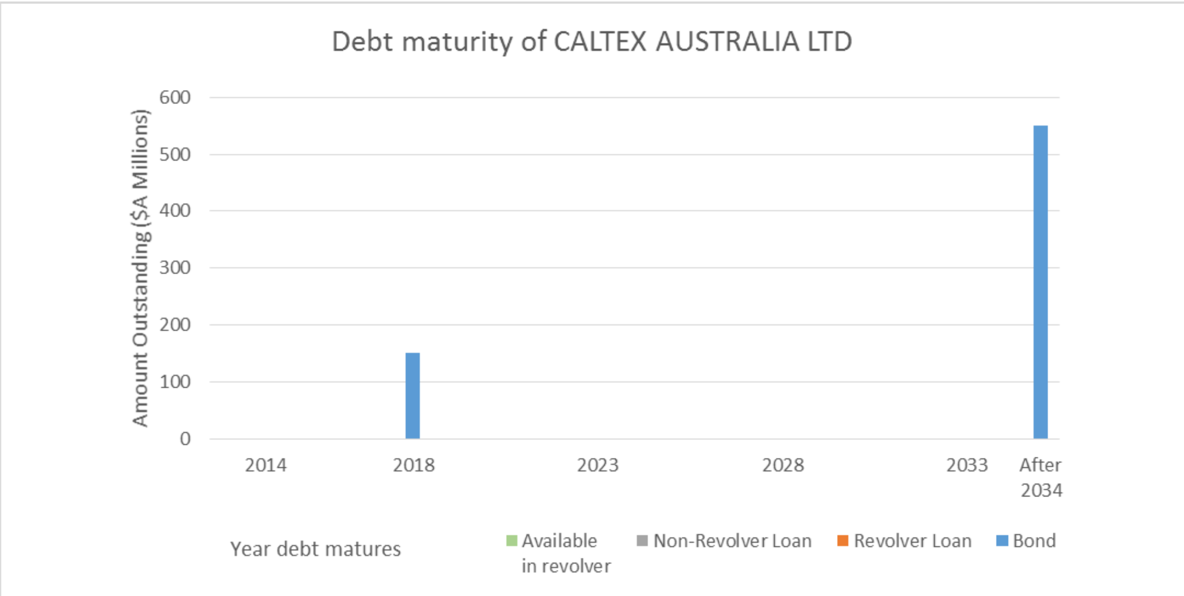




	Bond	Revolver loan	Non-revolver loan	Overall
Number	1	6	0	7
Amount Outstanding ($A Mn)	200.00	455.00	0.00	655.00
Weighted average debt term	5.00	7.17	N/A	6.50
Simple average debt term	5.00	6.57	0.00	6.35
Weighted average time to maturity	4.60	2.77	N/A	3.33
Simple average time to maturity	4.60	2.75	0.00	3.01

A.1.30 CALTEX AUSTRALIA LTD

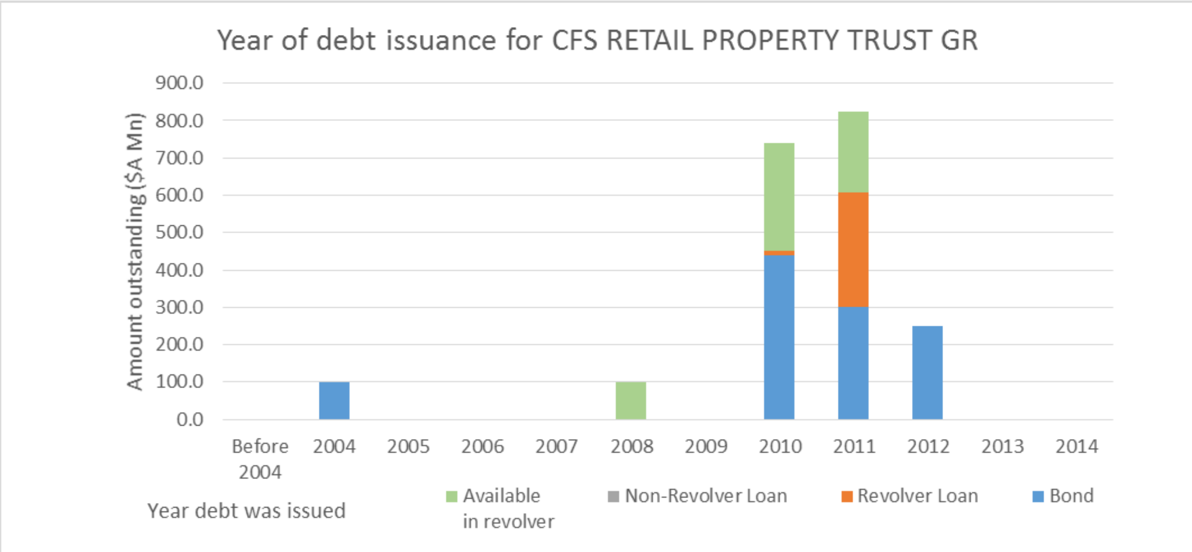


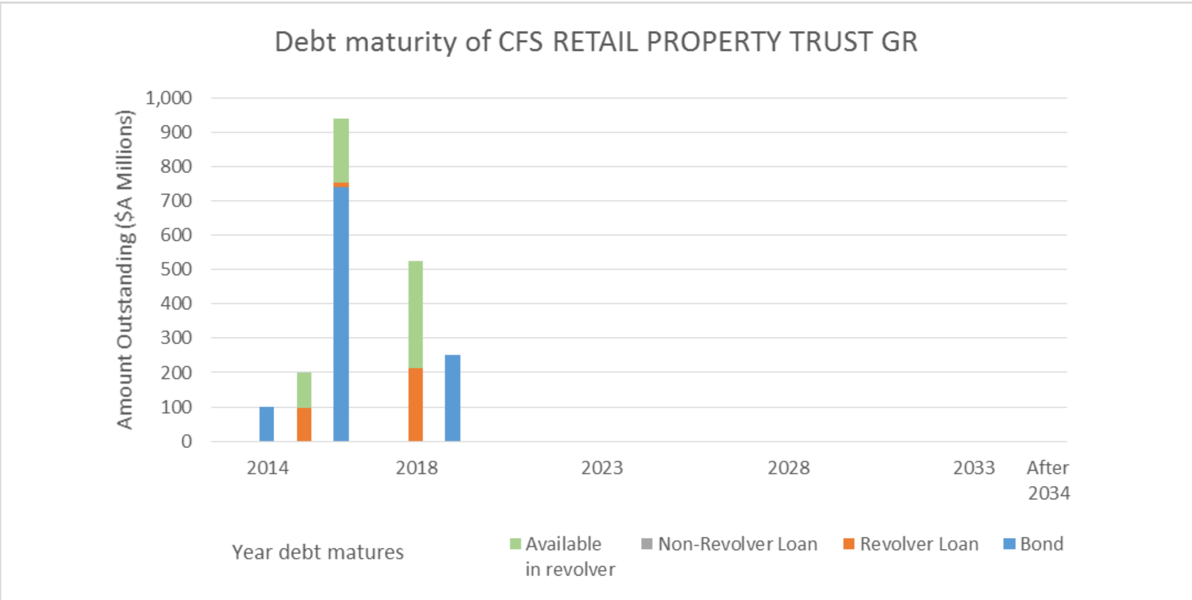


	Bond	Revolver loan	Non-revolver loan	Overall
Number	2	0	0	2
Amount Outstanding ($A Mn)	700.00	0.00	0.00	700.00
Weighted average debt term	21.17	N/A	N/A	21.17
Simple average debt term	16.02	N/A	N/A	16.02
Weighted average time to maturity	18.87	N/A	N/A	18.87
Simple average time to maturity	13.50	N/A	N/A	13.50

**One bond due in 2037 with A$ 550 million outstanding.*

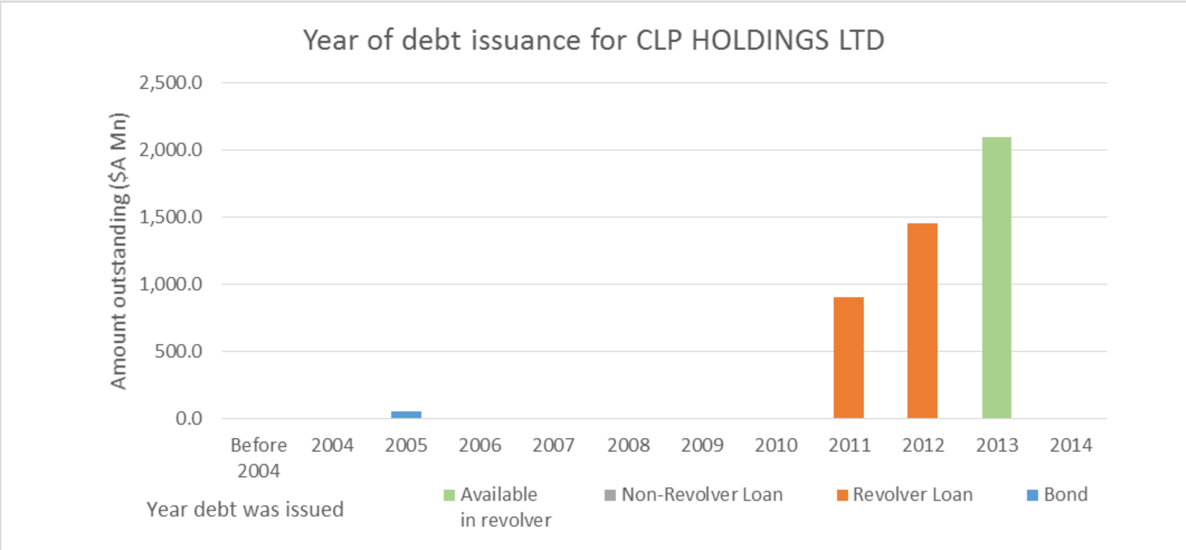
A.1.31 CFS RETAIL PROPERTY TRUST GROUP

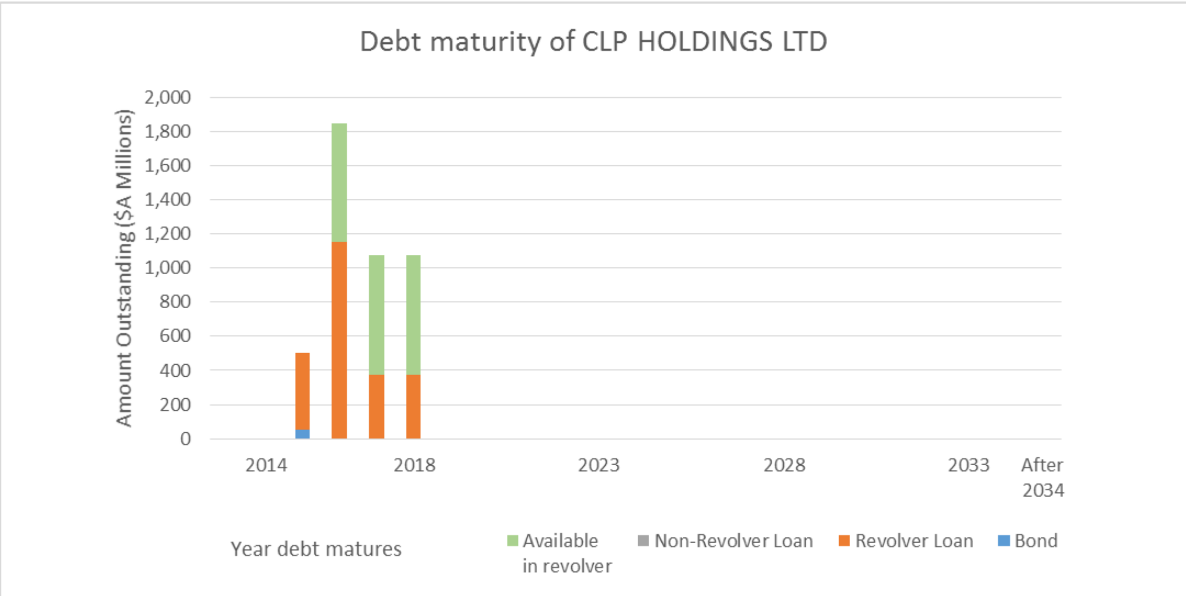




	Bond	Revolver loan	Non-revolver loan	Overall
Number	4	7	0	11
Amount Outstanding ($A Mn)	1,090.00	319.00	0.00	1,409.00
Weighted average debt term	6.12	6.15	N/A	6.13
Simple average debt term	6.87	6.37	0.00	6.55
Weighted average time to maturity	2.29	2.79	N/A	2.40
Simple average time to maturity	2.14	2.41	0.00	2.32

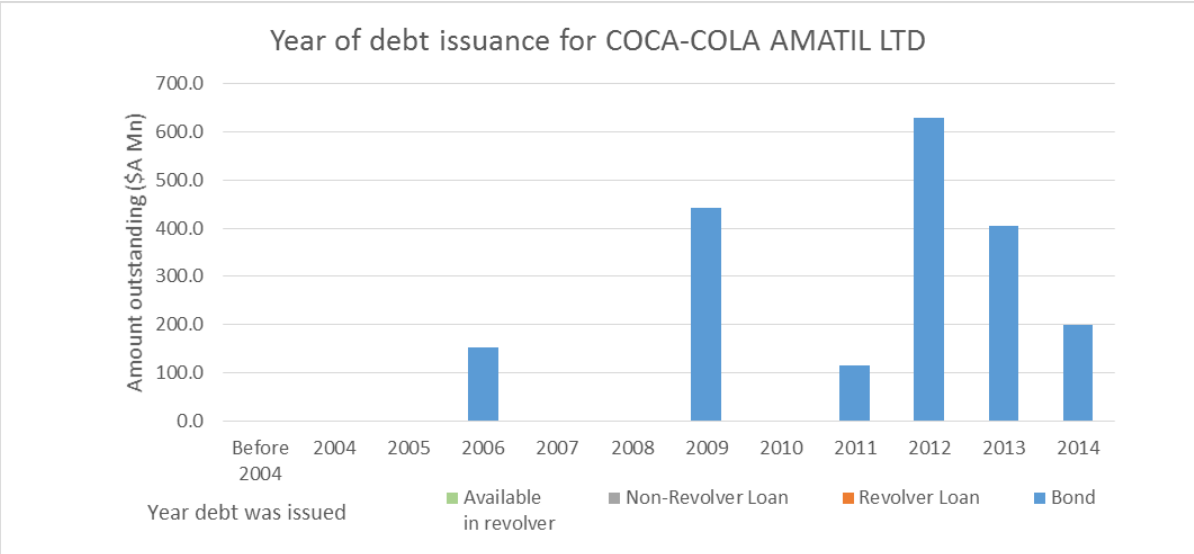
A.1.32 CLP HOLDINGS LTD

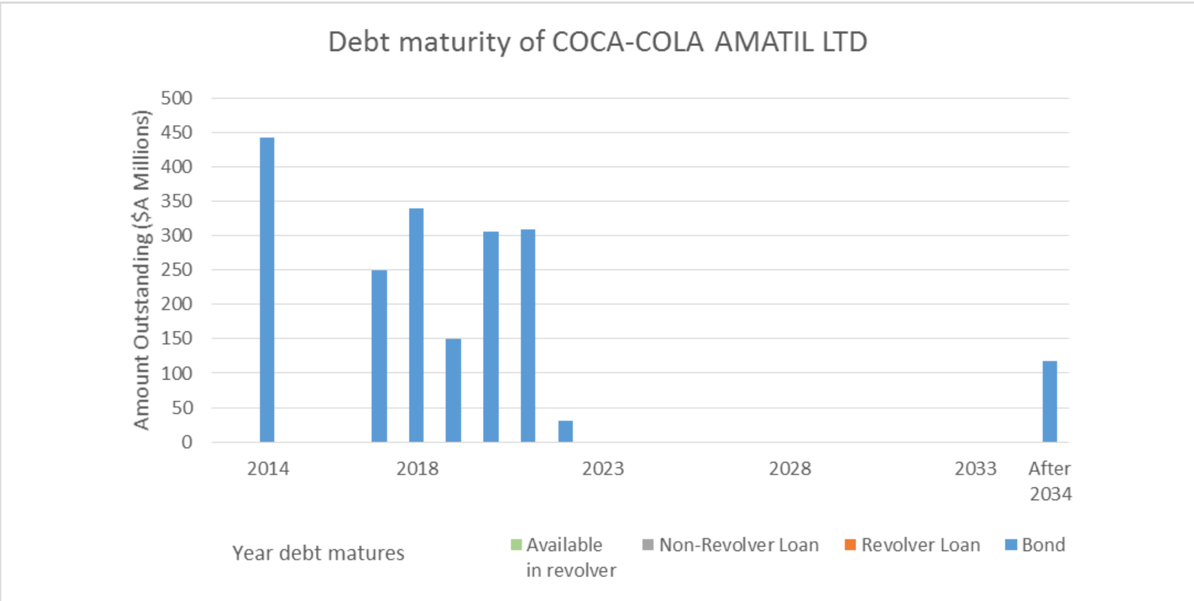




	Bond	Revolver loan	Non-revolver loan	Overall
Number	1	10	0	11
Amount Outstanding ($A Mn)	50.00	2,349.92	0.00	2,399.92
Weighted average debt term	10.00	4.41	N/A	4.53
Simple average debt term	10.00	4.34	0.00	4.85
Weighted average time to maturity	1.07	1.84	N/A	1.82
Simple average time to maturity	1.07	2.64	0.00	2.50

A.1.33 COCA-COLA AMATIL LTD

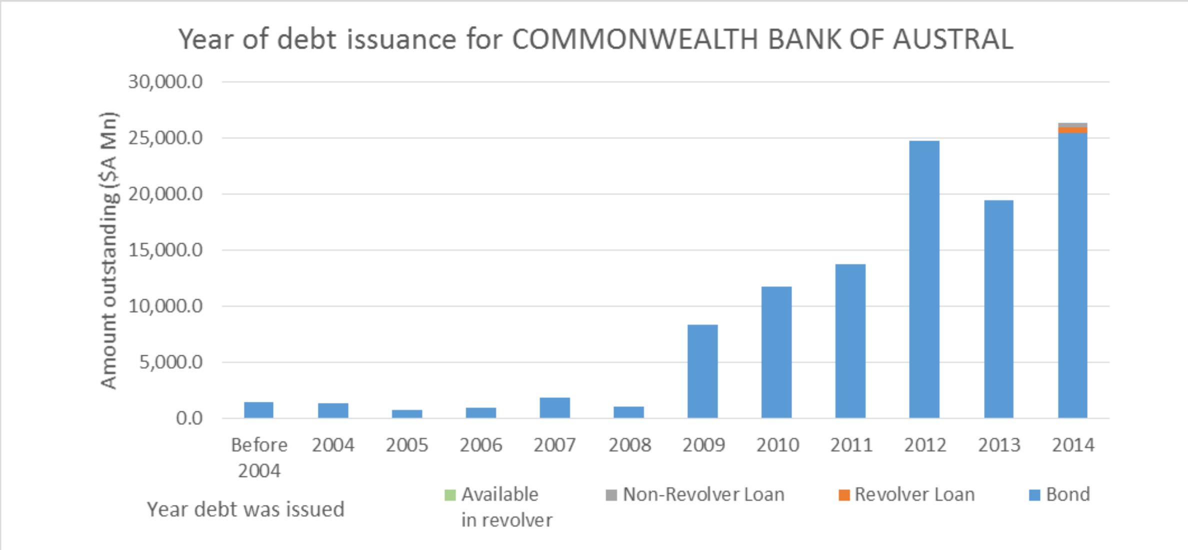


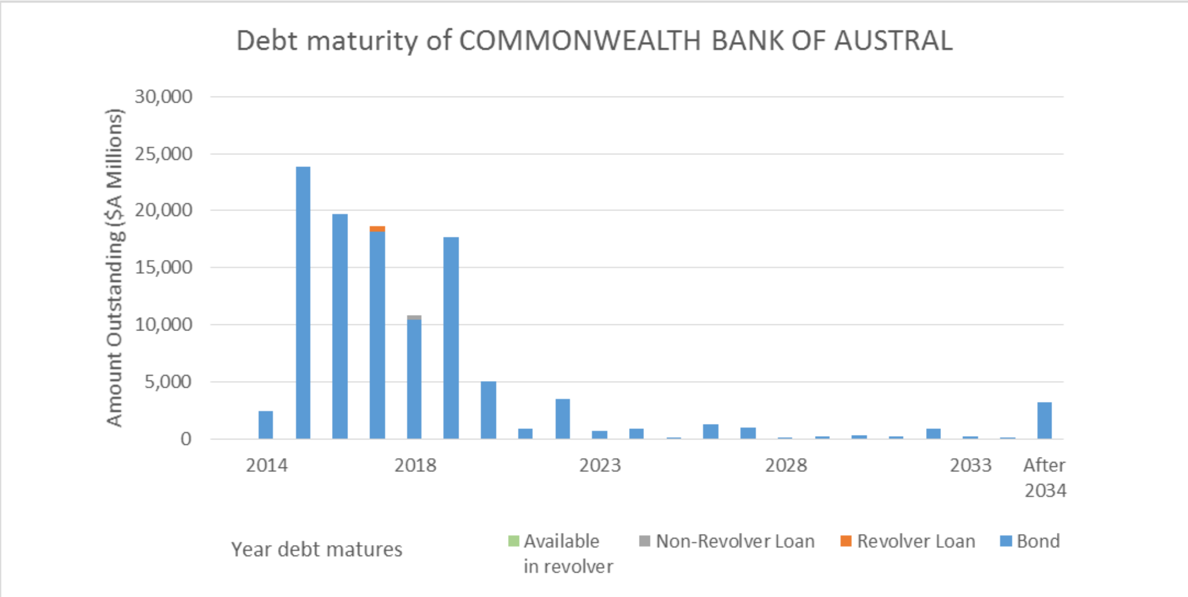


	Bond	Revolver loan	Non-revolver loan	Overall
Number	15	0	0	15
Amount Outstanding ($A Mn)	1,944.60	0.00	0.00	1,944.60
Weighted average debt term	7.78	N/A	N/A	7.78
Simple average debt term	9.20	N/A	N/A	9.20
Weighted average time to maturity	4.75	N/A	N/A	4.75
Simple average time to maturity	6.22	N/A	N/A	6.22

**One bond due in 2036 with A$ 117.95 million outstanding.*

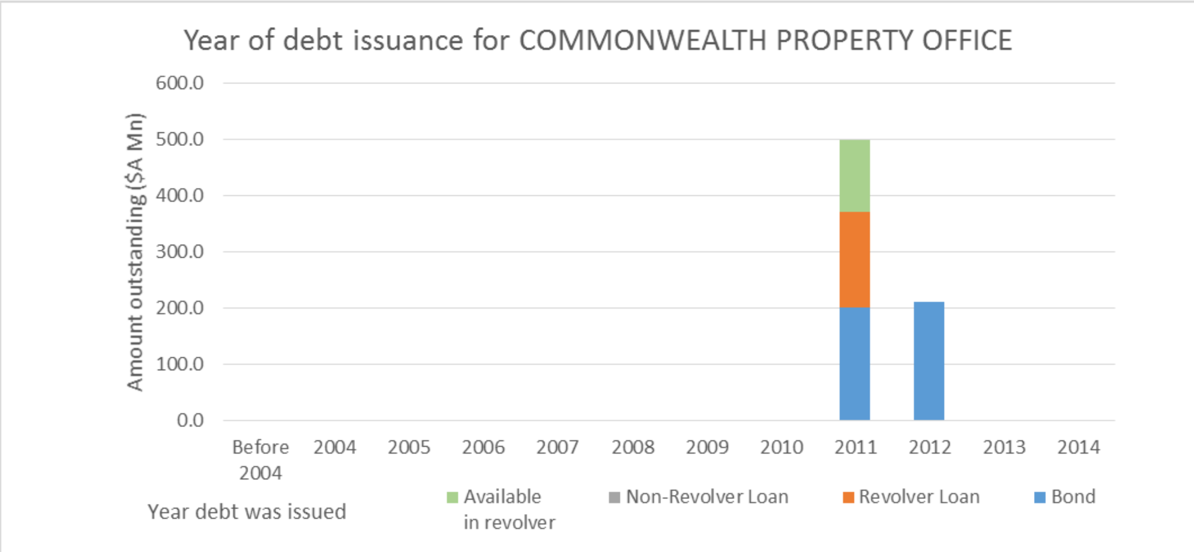
A.1.34 COMMONWEALTH BANK OF AUSTRALIA

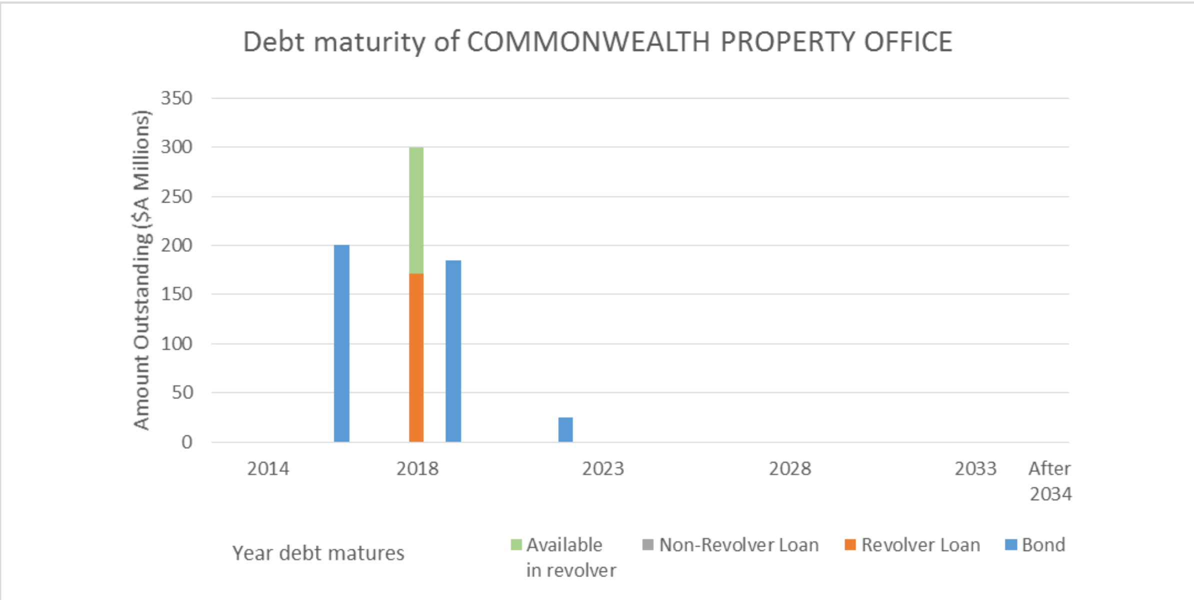




	Bond	Revolver loan	Non-revolver loan	Overall
Number	915	1	1	917
Amount Outstanding ($A Mn)	110,576.28	500.00	350.00	111,426.28
Weighted average debt term	6.64	2.98	4.00	6.62
Simple average debt term	11.81	2.98	4.00	11.79
Weighted average time to maturity	3.89	2.97	3.68	3.89
Simple average time to maturity	7.06	2.97	3.68	7.09

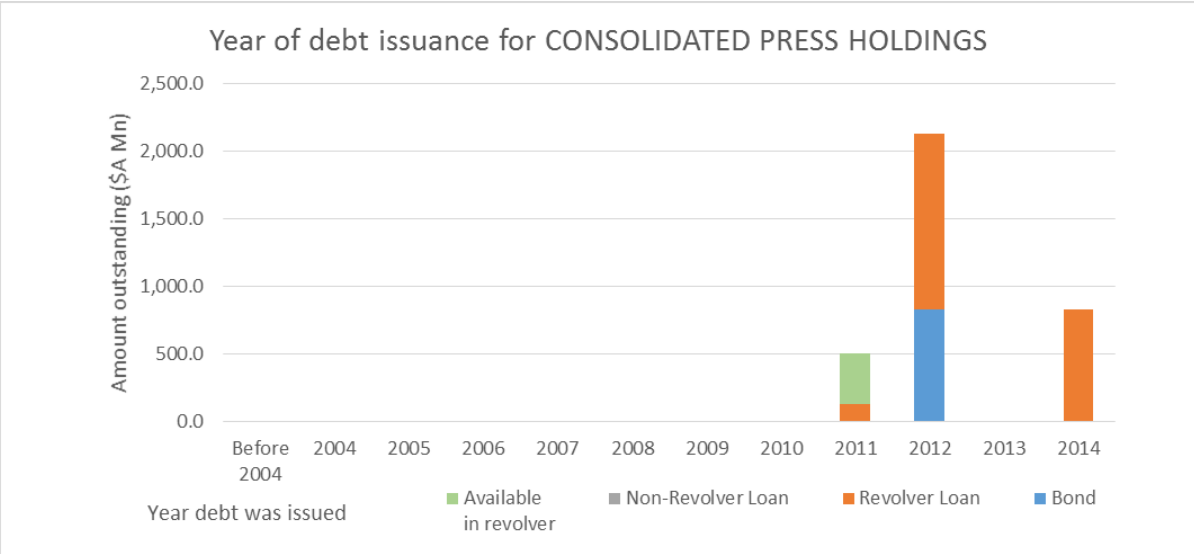
A.1.35 COMMONWEALTH PROPERTY OFFICE FUND

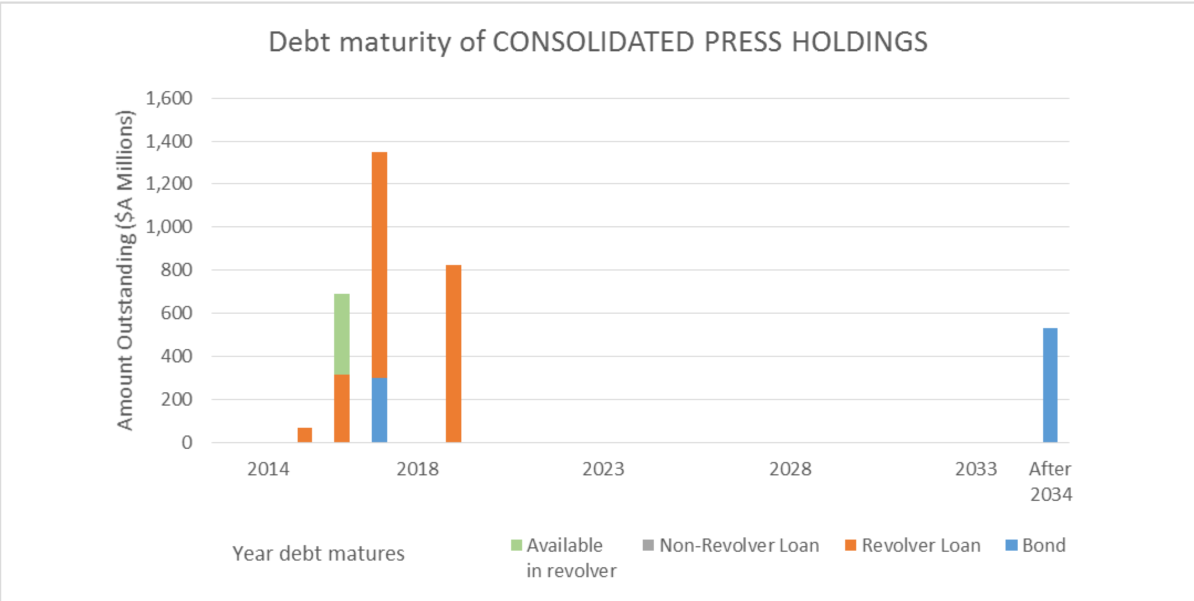




	Bond	Revolver loan	Non-revolver loan	Overall
Number	3	1	0	4
Amount Outstanding ($A Mn)	410.00	171.50	0.00	581.50
Weighted average debt term	6.21	7.24	N/A	6.51
Simple average debt term	7.33	7.24	0.00	7.31
Weighted average time to maturity	3.50	3.53	N/A	3.51
Simple average time to maturity	4.90	3.53	0.00	4.55

A.1.36 CONSOLIDATED PRESS HOLDINGS LTD

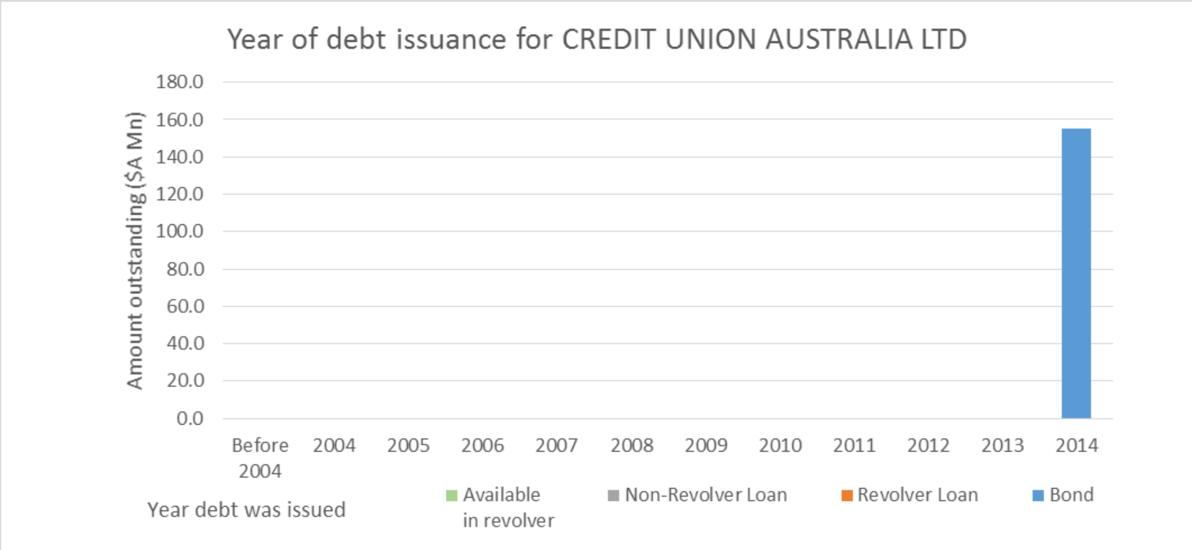


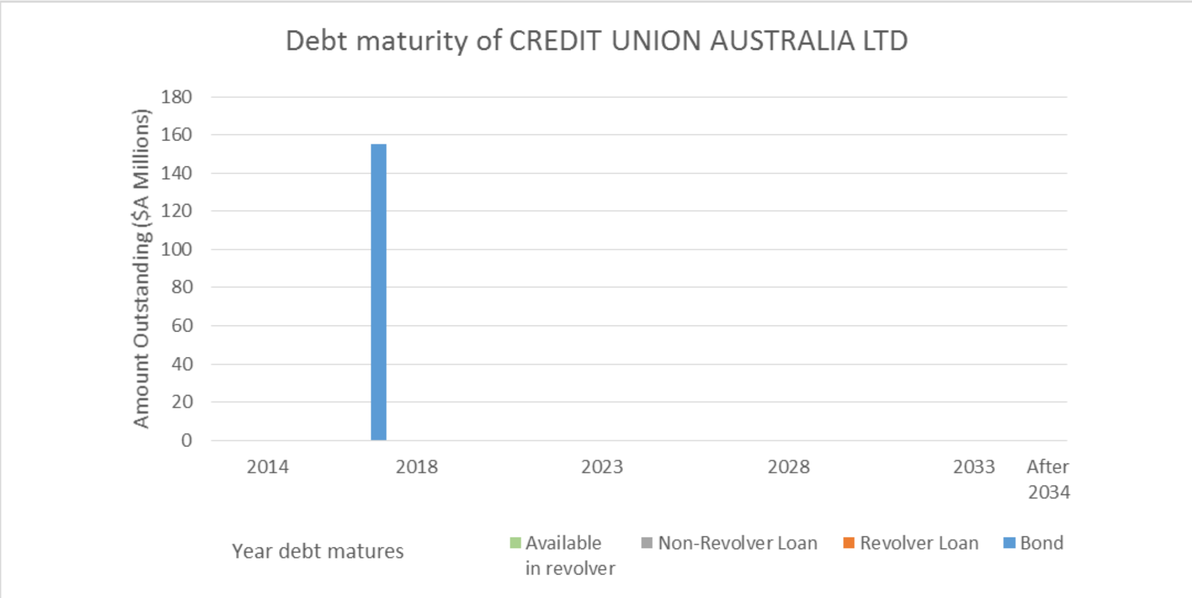


	Bond	Revolver loan	Non-revolver loan	Overall
Number	2	11	0	13
Amount Outstanding ($A Mn)	831.97	2,255.67	0.00	3,087.64
Weighted average debt term	40.17	4.89	N/A	14.40
Simple average debt term	32.50	4.83	0.00	9.09
Weighted average time to maturity	38.01	3.47	N/A	12.78
Simple average time to maturity	30.32	2.84	0.00	7.07

**One bond due in 2072 with A$ 531.97 million outstanding.*

A.1.37 CREDIT UNION AUSTRALIA LTD



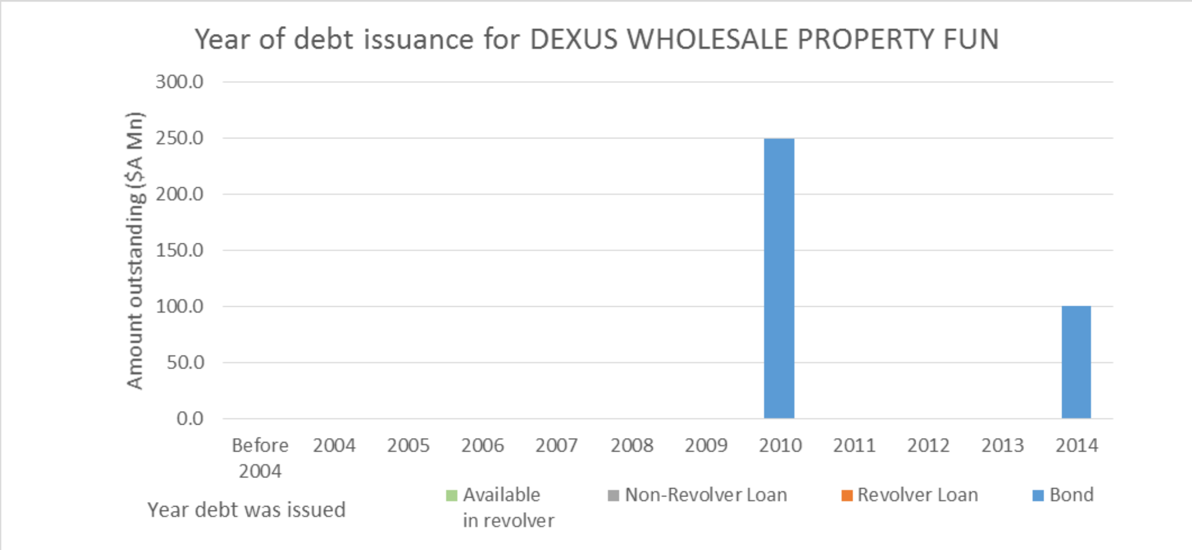


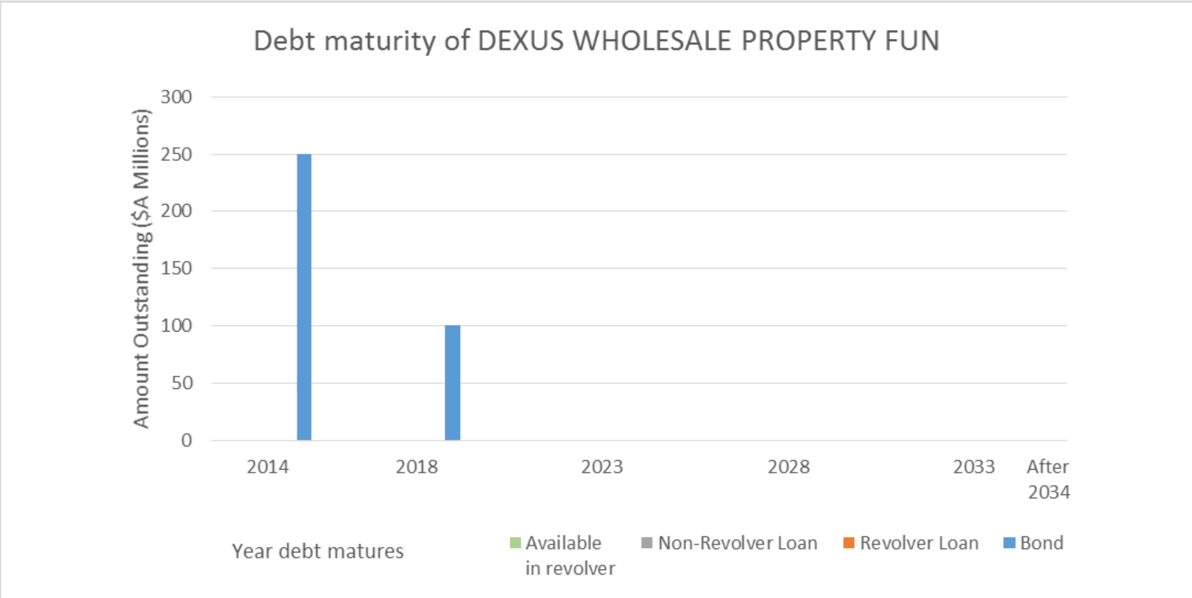
	Bond	Revolver loan	Non-revolver loan	Overall
Number	2	0	0	2
Amount Outstanding ($A Mn)	155.00	0.00	0.00	155.00
Weighted average debt term	3.08	N/A	N/A	3.08
Simple average debt term	3.13	N/A	N/A	3.13
Weighted average time to maturity	2.66	N/A	N/A	2.66
Simple average time to maturity	2.79	N/A	N/A	2.79

**There are actually two debts due 9 months apart – one bond issued on 20 Mar 2014 with A$105 Mn maturing on 20 Mar 2017, and one bond issued on 22 Sep 2014 with A$50 Mn maturing on 22 Dec 2017.*

COMPETITION ECONOMISTS GROUP

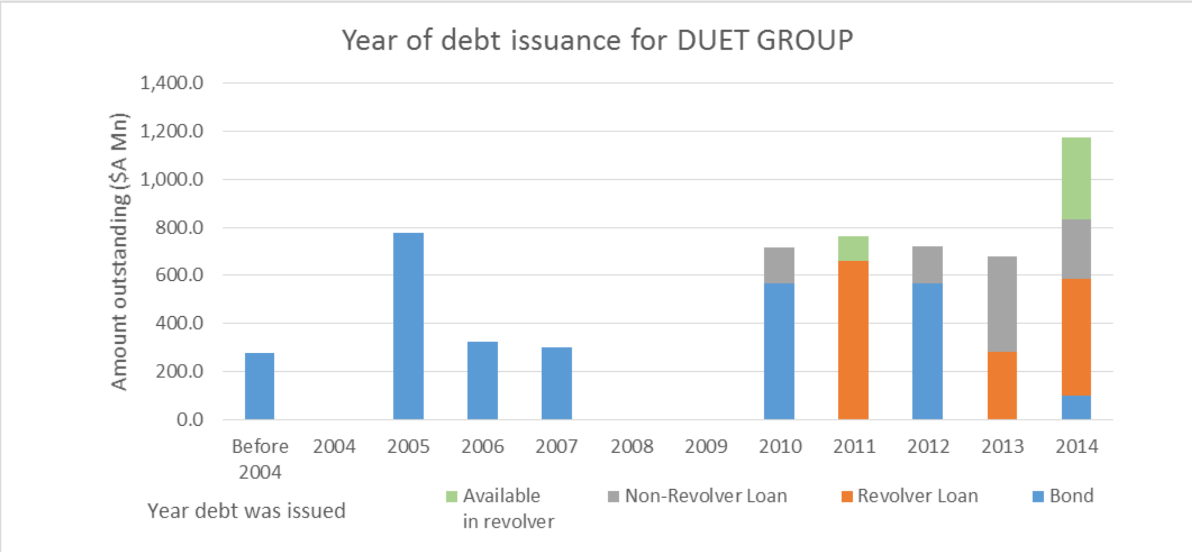
A.1.38 DEXUS WHOLESALE PROPERTY FUND

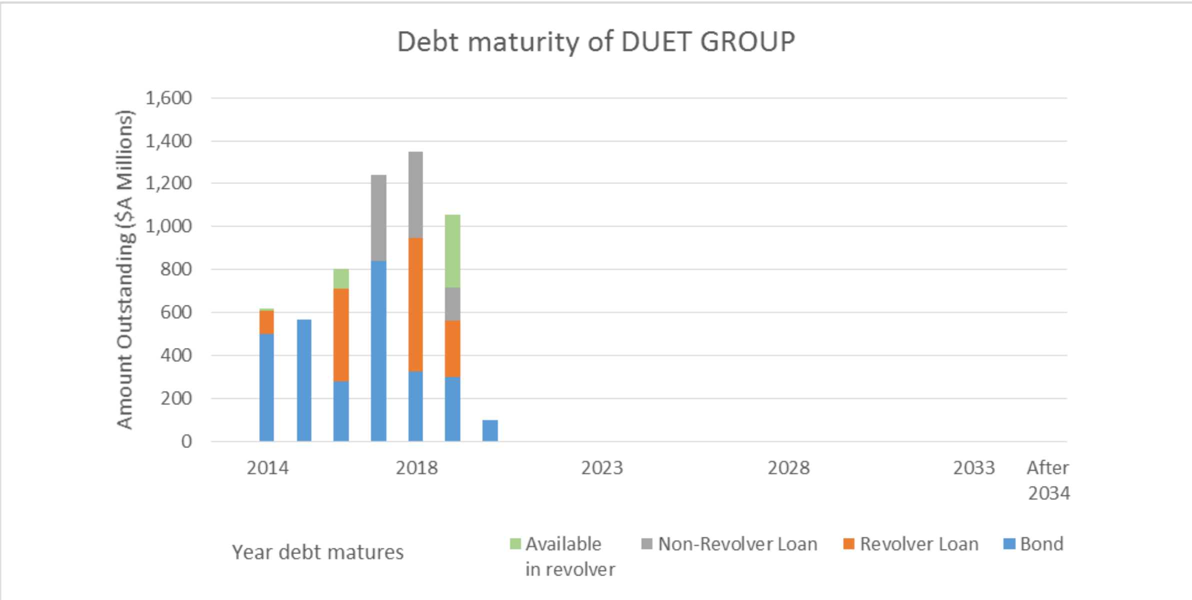




	Bond	Revolver loan	Non-revolver loan	Overall
Number	2	0	0	2
Amount Outstanding ($A Mn)	350.00	0.00	0.00	350.00
Weighted average debt term	5.00	N/A	N/A	5.00
Simple average debt term	5.00	N/A	N/A	5.00
Weighted average time to maturity	2.08	N/A	N/A	2.08
Simple average time to maturity	2.87	N/A	N/A	2.87

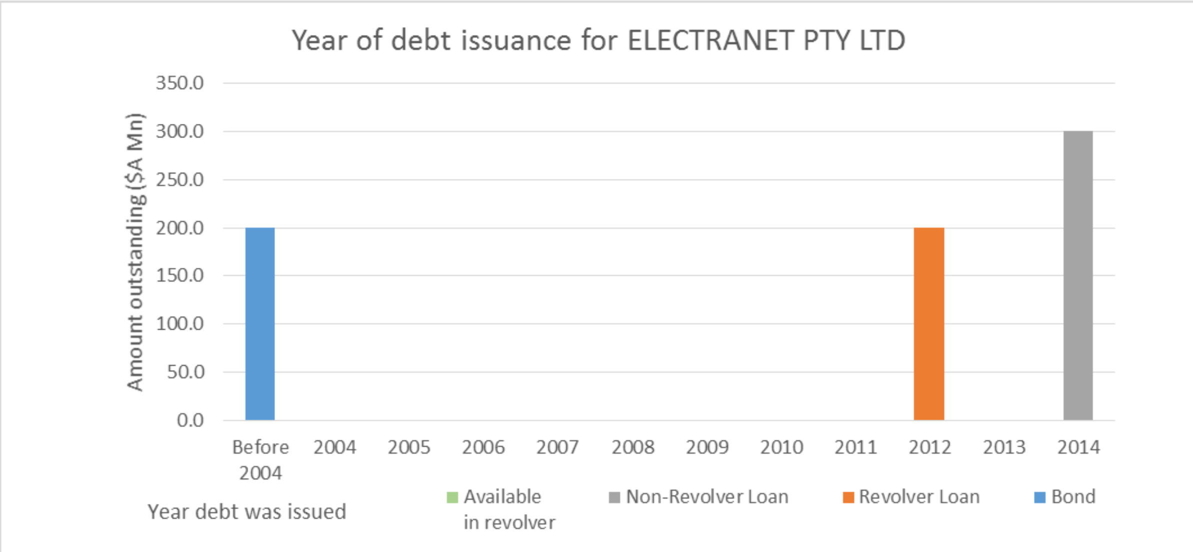
A.1.39 DUET GROUP

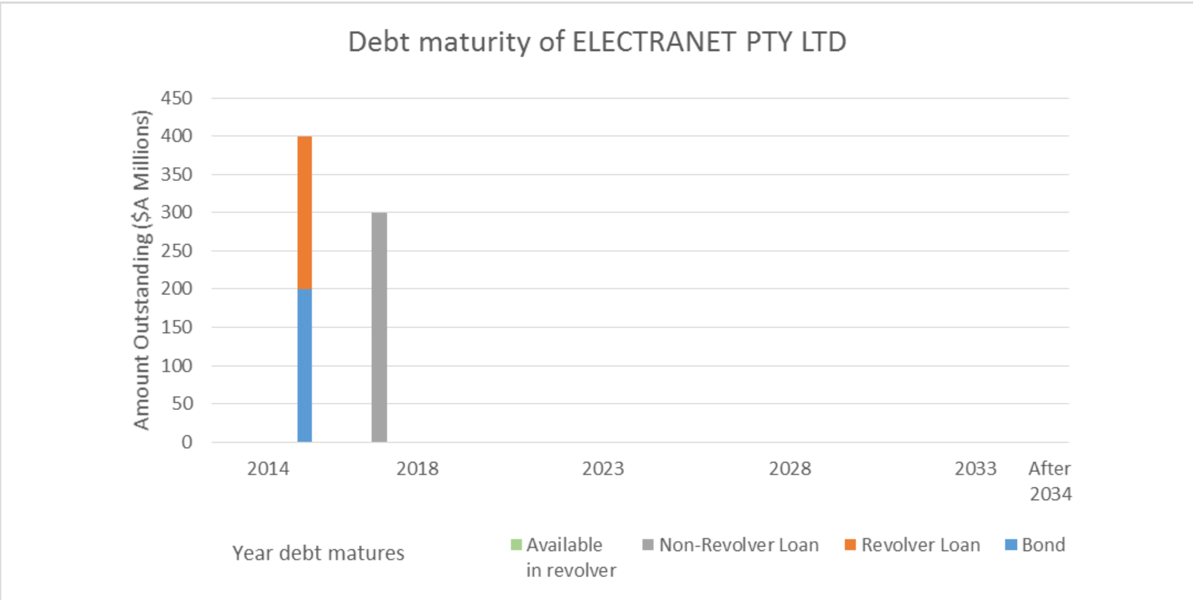




	Bond	Revolver loan	Non-revolver loan	Overall
Number	10	9	5	24
Amount Outstanding ($A Mn)	2,907.74	1,424.90	955.00	5,287.64
Weighted average debt term	8.59	4.87	5.13	6.96
Simple average debt term	8.34	4.67	2.78	6.27
Weighted average time to maturity	2.18	3.06	3.37	2.63
Simple average time to maturity	2.55	2.68	1.83	2.75

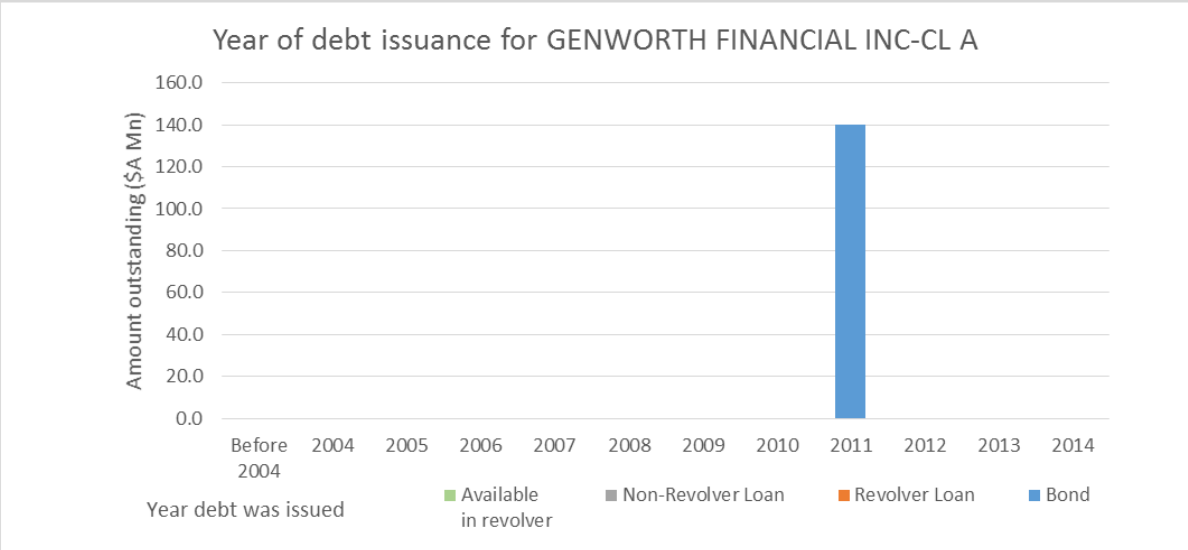
A.1.40 ELECTRANET PTY LTD

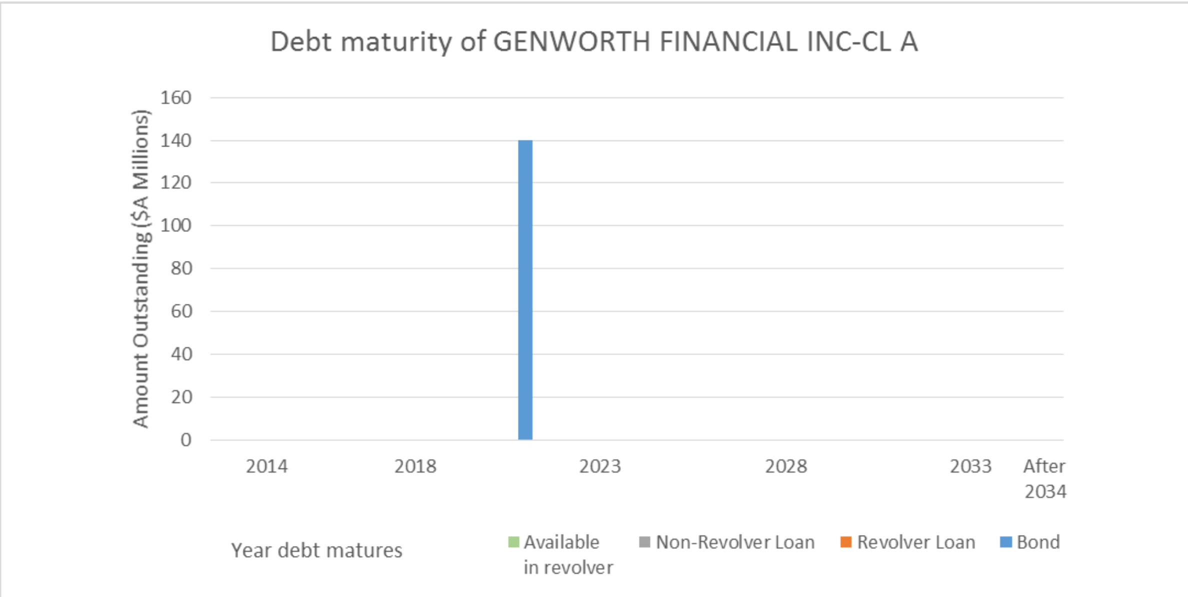




	Bond	Revolver loan	Non-revolver loan	Overall
Number	1	1	1	3
Amount Outstanding ($A Mn)	200.00	200.00	300.00	700.00
Weighted average debt term	14.75	3.00	3.00	6.36
Simple average debt term	14.75	3.00	3.00	6.92
Weighted average time to maturity	0.83	0.28	2.77	1.50
Simple average time to maturity	0.83	0.28	2.77	1.29

A.1.41 GENWORTH FINANCIAL INC

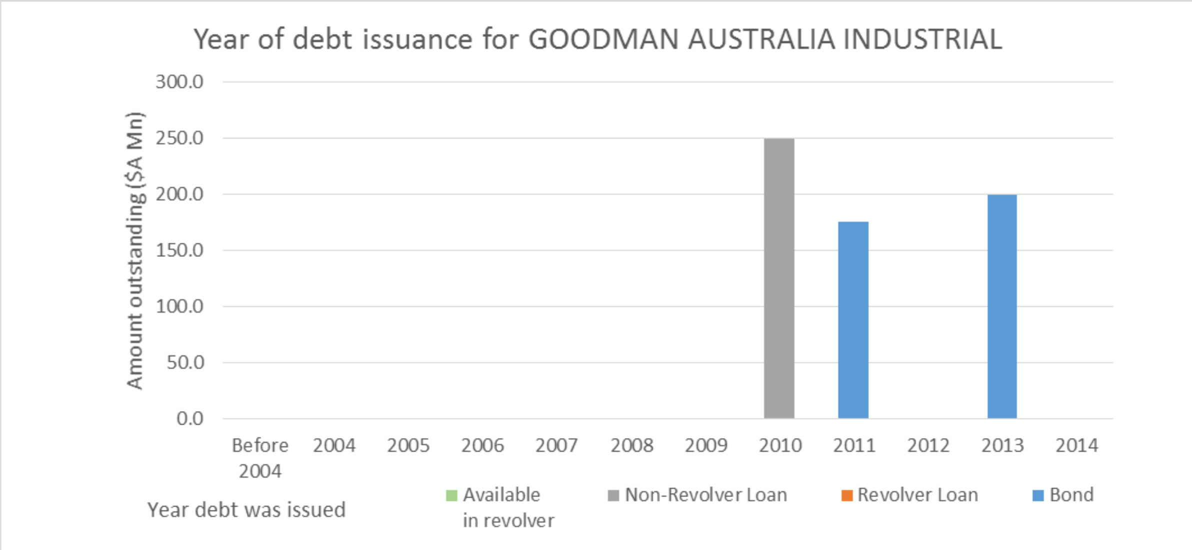


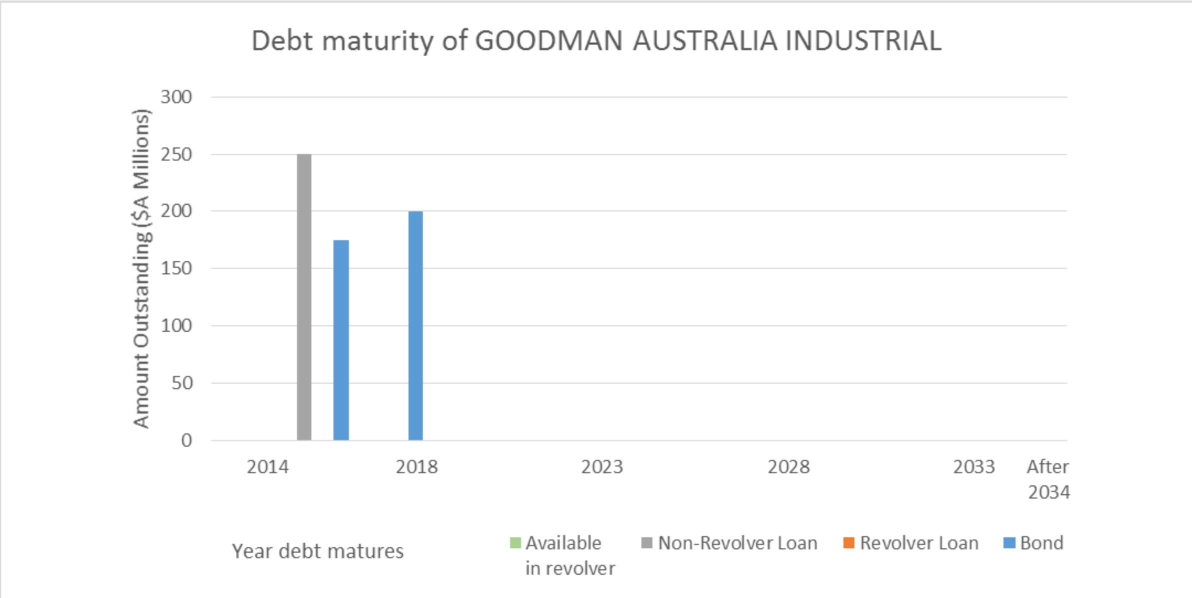


	Bond	Revolver loan	Non-revolver loan	Overall
Number	1	0	0	1
Amount Outstanding ($A Mn)	140.00	0.00	0.00	140.00
Weighted average debt term	10.00	N/A	N/A	10.00
Simple average debt term	10.00	N/A	N/A	10.00
Weighted average time to maturity	6.69	N/A	N/A	6.69
Simple average time to maturity	6.69	N/A	N/A	6.69

Genworth Financial Inc has a AA- credit rating. No debt-to-equity ratio available.

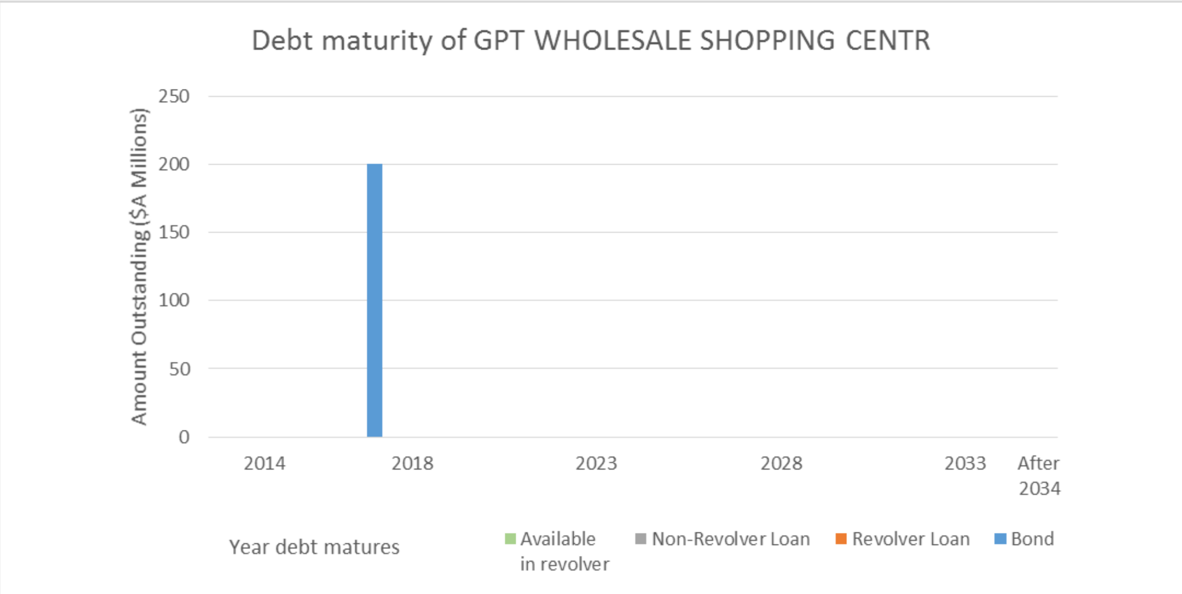
A.1.42 GOODMAN AUSTRALIA INDUSTRIAL FUND





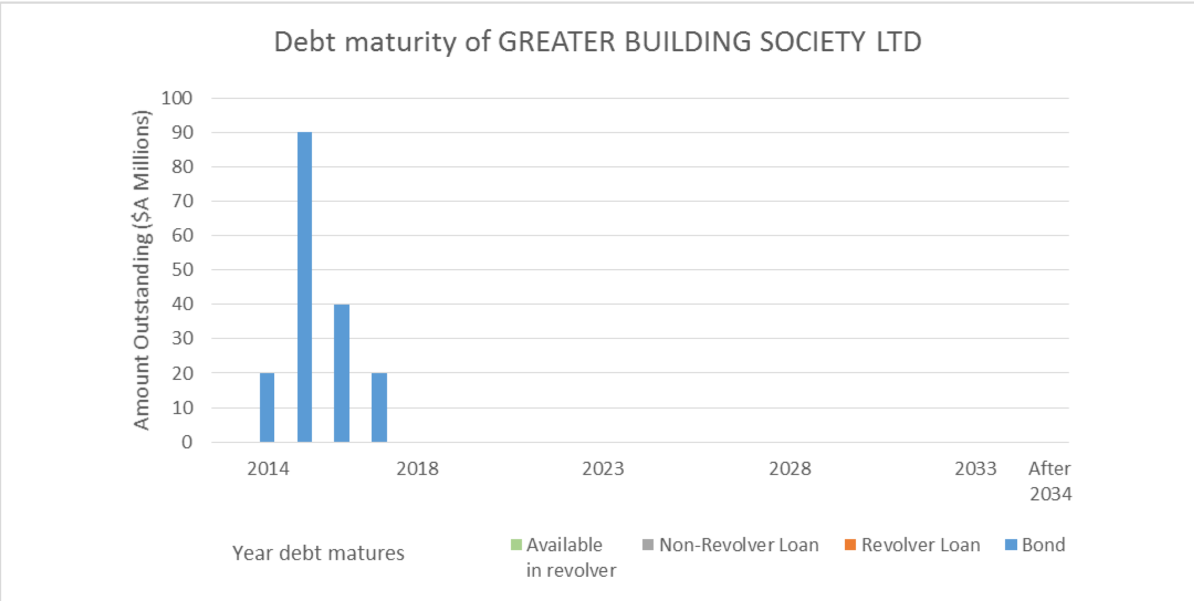
	Bond	Revolver loan	Non-revolver loan	Overall
Number	2	0	1	3
Amount Outstanding ($A Mn)	375.00	0.00	250.00	625.00
Weighted average debt term	5.00	N/A	5.35	5.14
Simple average debt term	5.00	N/A	N/A	5.11
Weighted average time to maturity	2.56	N/A	0.94	1.91
Simple average time to maturity	2.50	N/A	N/A	1.98

A.1.43 GPT WHOLESALE SHOPPING CENTRE FUND NO 1



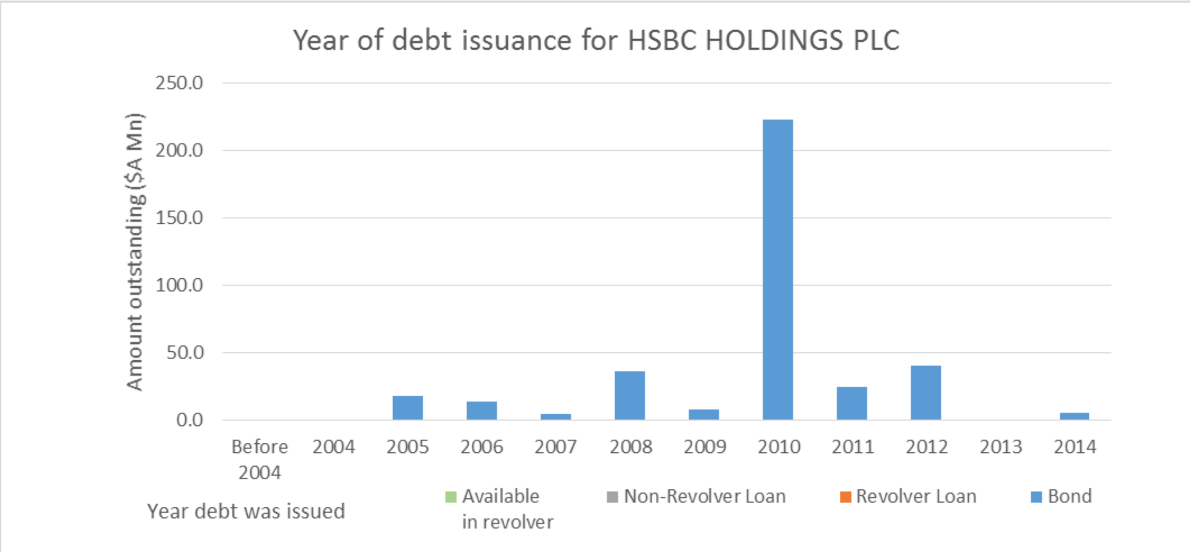
	Bond	Revolver loan	Non-revolver loan	Overall
Number	1	0	0	1
Amount Outstanding ($A Mn)	200.00	0.00	0.00	200.00
Weighted average debt term	5.00	N/A	N/A	5.00
Simple average debt term	5.00	N/A	N/A	5.00
Weighted average time to maturity	3.07	N/A	N/A	3.07
Simple average time to maturity	3.07	N/A	N/A	3.07

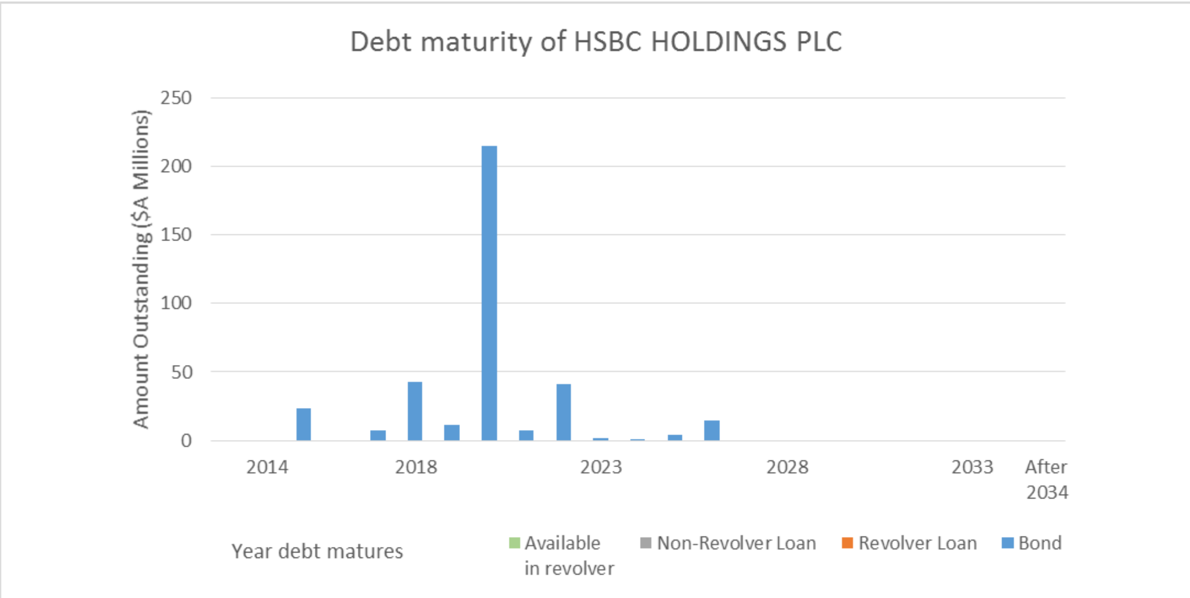
A.1.44 GREATER BUILDING SOCIETY LTD



	Bond	Revolver loan	Non-revolver loan	Overall
Number	7	0	0	7
Amount Outstanding ($A Mn)	170.00	0.00	0.00	170.00
Weighted average debt term	1.70	N/A	N/A	1.70
Simple average debt term	1.86	N/A	N/A	1.86
Weighted average time to maturity	0.98	N/A	N/A	0.98
Simple average time to maturity	1.05	N/A	N/A	1.05

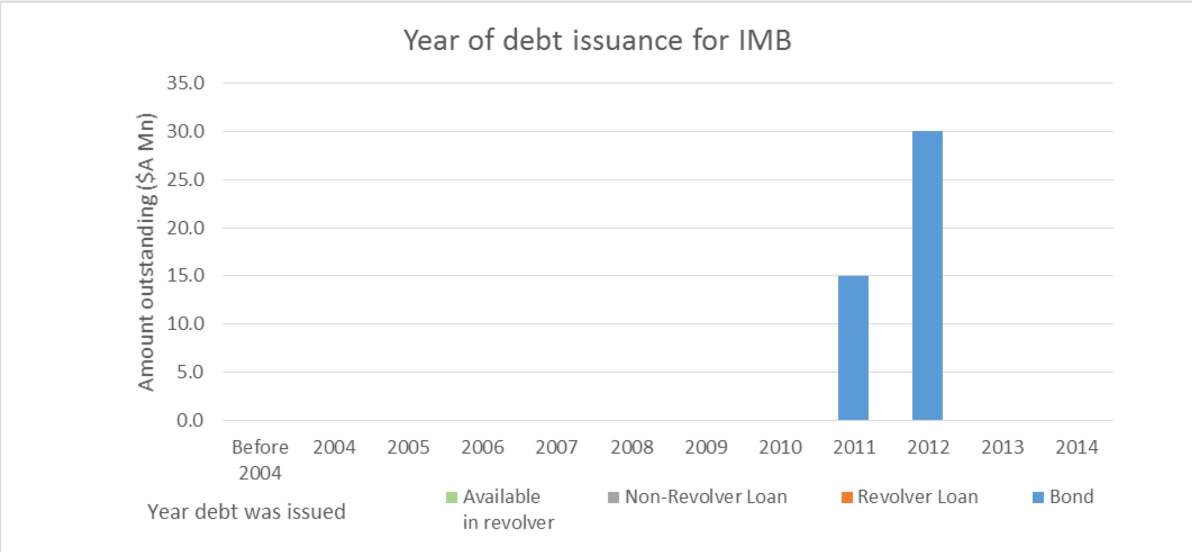
A.1.45 HSBC HOLDINGS PLC

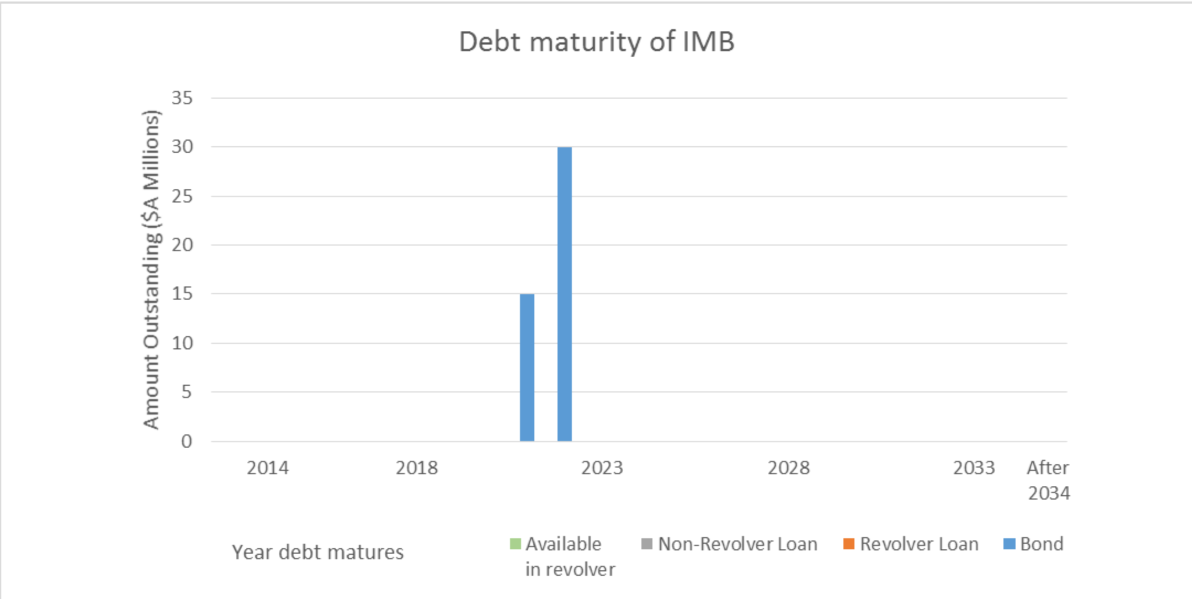




	Bond	Revolver loan	Non-revolver loan	Overall
Number	33	0	0	33
Amount Outstanding ($A Mn)	371.04	0.00	0.00	371.04
Weighted average debt term	10.23	N/A	N/A	10.23
Simple average debt term	11.18	N/A	N/A	11.18
Weighted average time to maturity	5.81	N/A	N/A	5.81
Simple average time to maturity	6.15	N/A	N/A	6.15

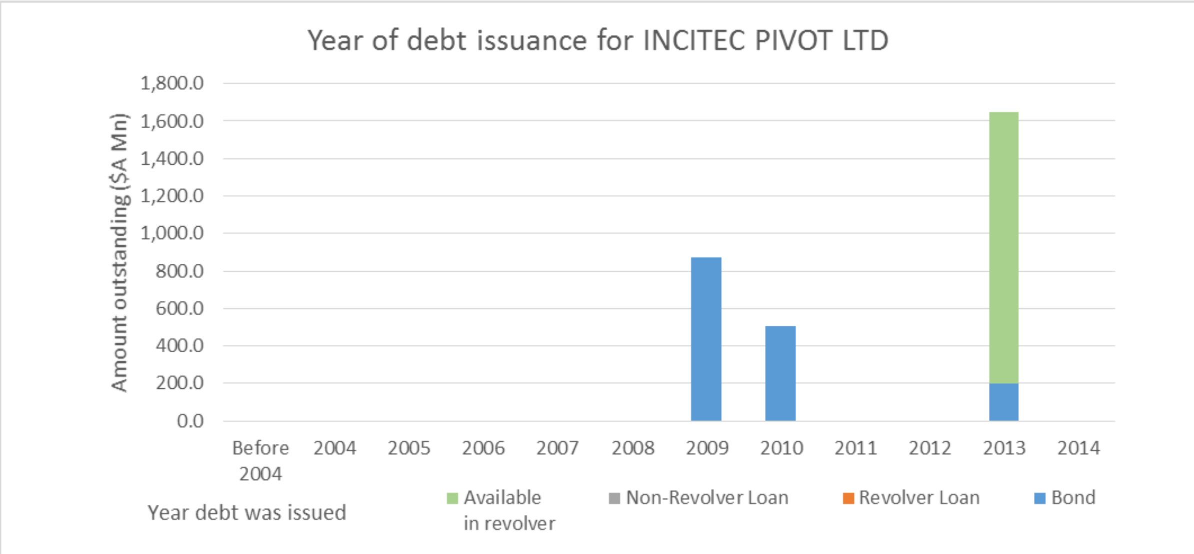
A.1.46 IMB

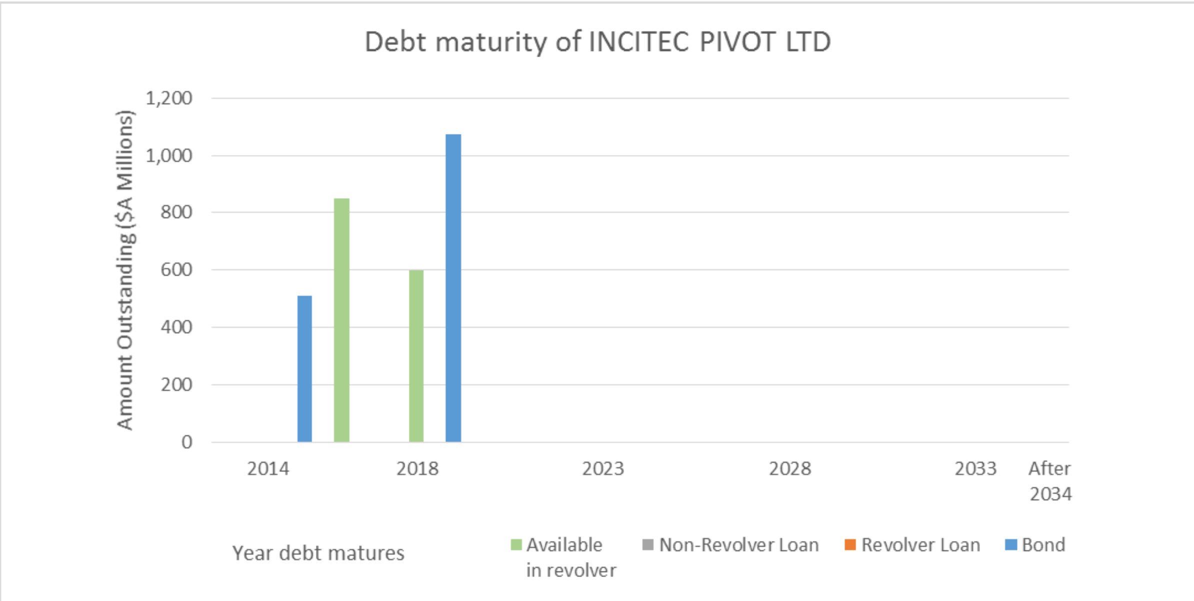




	Bond	Revolver loan	Non-revolver loan	Overall
Number	2	0	0	2
Amount Outstanding ($A Mn)	45.00	0.00	0.00	45.00
Weighted average debt term	10.00	N/A	N/A	10.00
Simple average debt term	10.00	N/A	N/A	10.00
Weighted average time to maturity	7.43	N/A	N/A	7.43
Simple average time to maturity	7.30	N/A	N/A	7.30

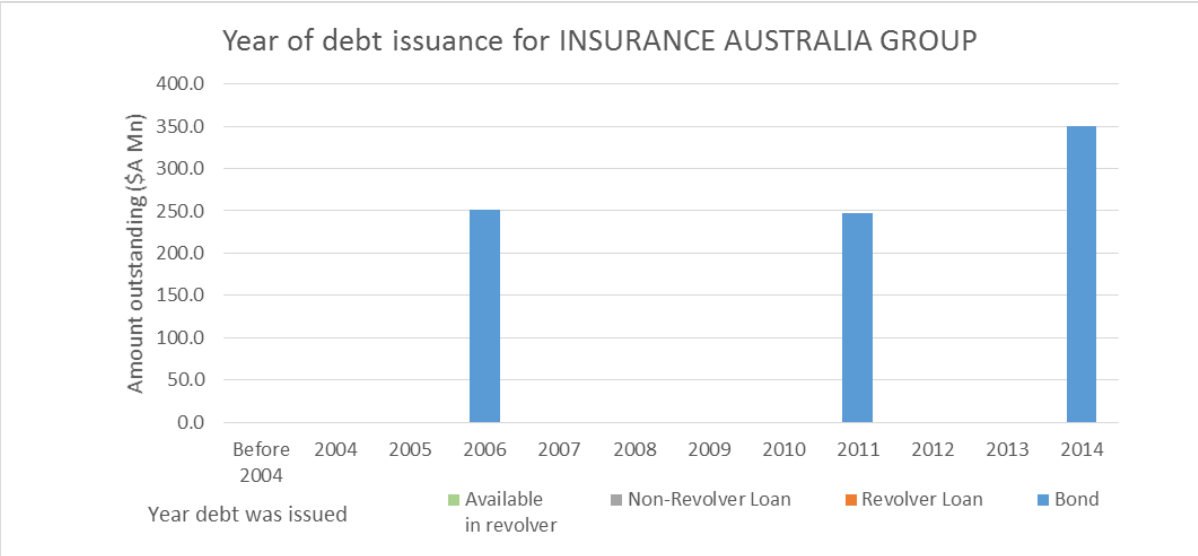
A.1.47 INCITEC PIVOT LTD

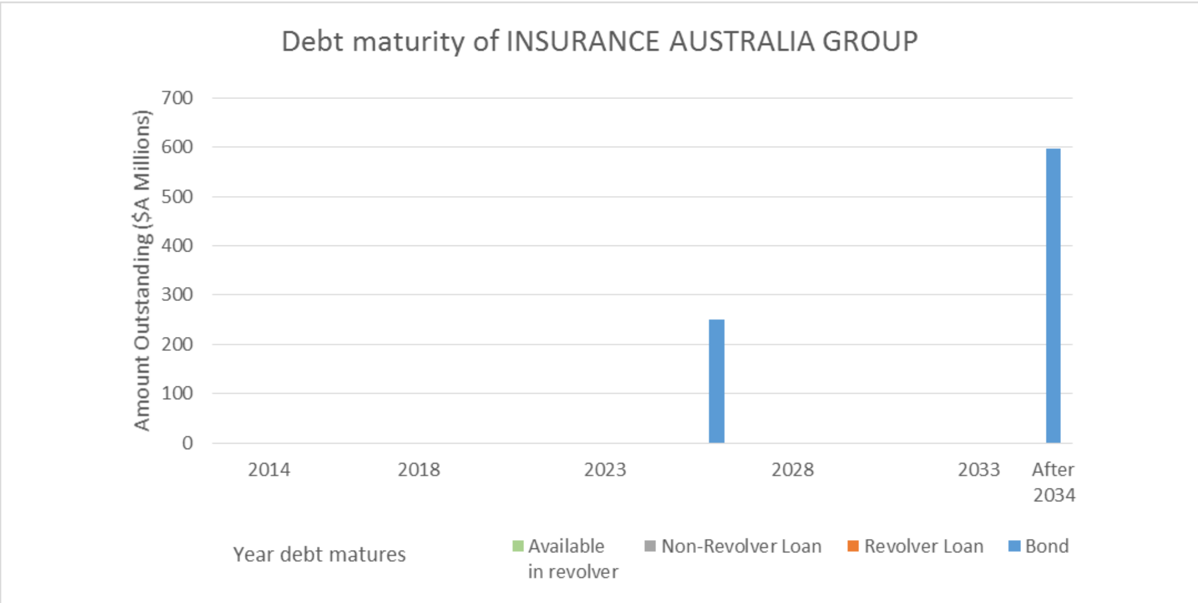




	Bond	Revolver loan	Non-revolver loan	Overall
Number	3	2	0	5
Amount Outstanding ($A Mn)	1,581.49	0.00	0.00	1,581.49
Weighted average debt term	7.82	N/A	N/A	7.82
Simple average debt term	6.83	4.11	0.00	5.74
Weighted average time to maturity	3.75	N/A	N/A	3.75
Simple average time to maturity	3.54	2.95	0.00	3.30

A.1.48 INSURANCE AUSTRALIA GROUP LTD

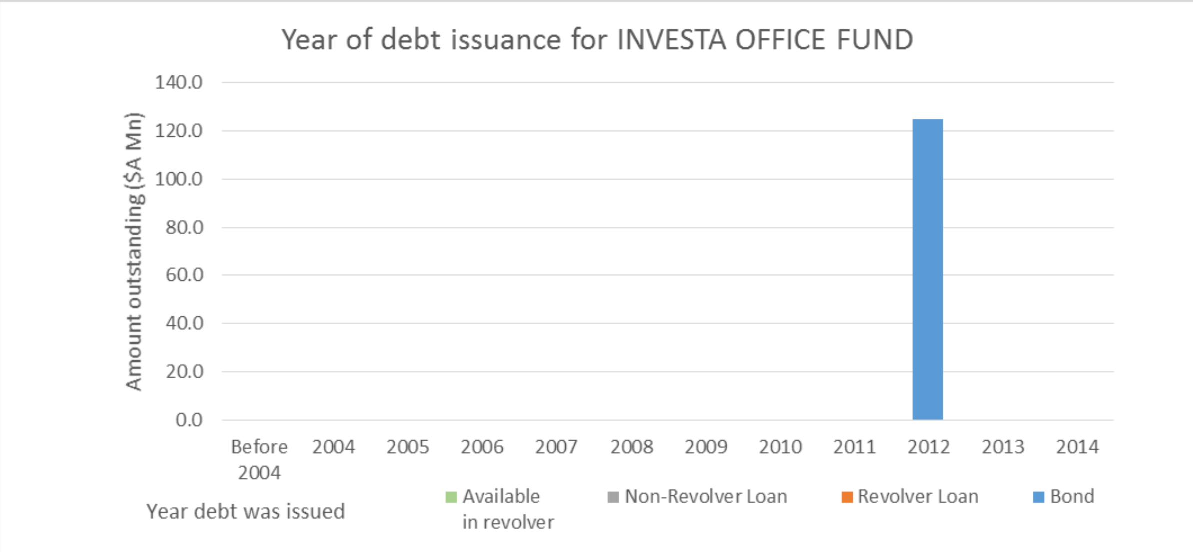


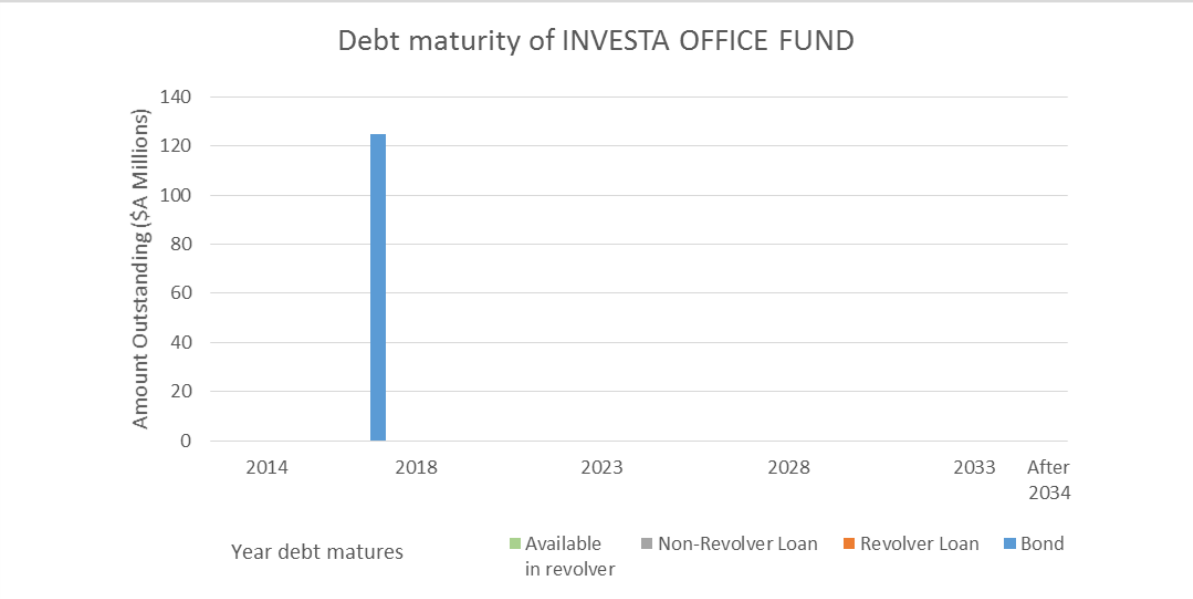


	Bond	Revolver loan	Non-revolver loan	Overall
Number	4	0	0	4
Amount Outstanding ($A Mn)	847.66	0.00	0.00	847.66
Weighted average debt term	23.93	N/A	N/A	23.93
Simple average debt term	17.75	N/A	N/A	17.75
Weighted average time to maturity	20.54	N/A	N/A	20.54
Simple average time to maturity	14.93	N/A	N/A	19.91

**One bond due in 2036 with A$ 246.72 million outstanding, and another due in 2040 with A$350 million outstanding.*

A.1.49 INVESTA OFFICE FUND

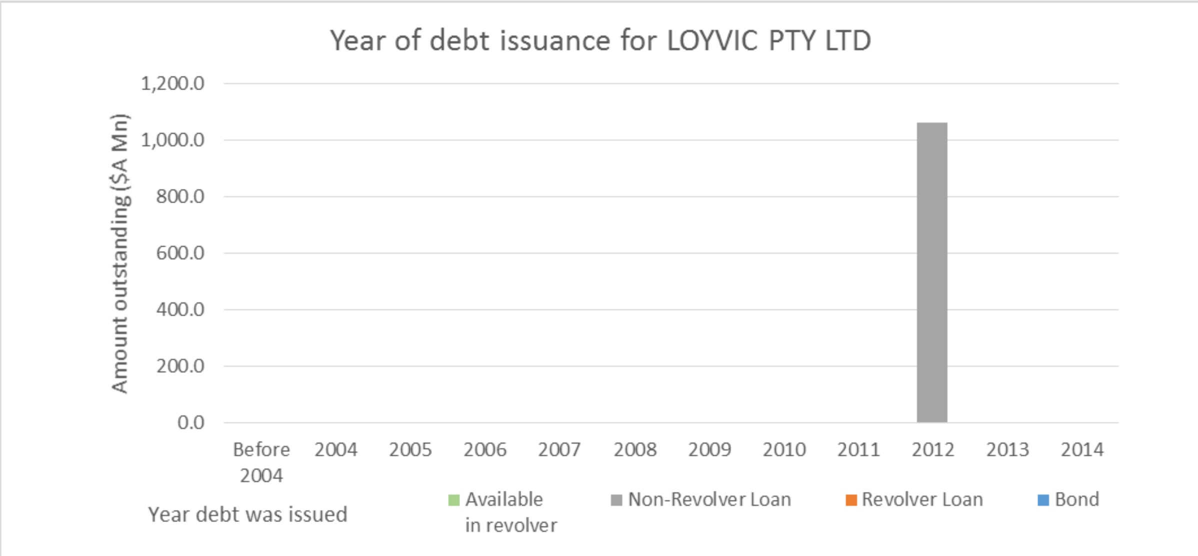


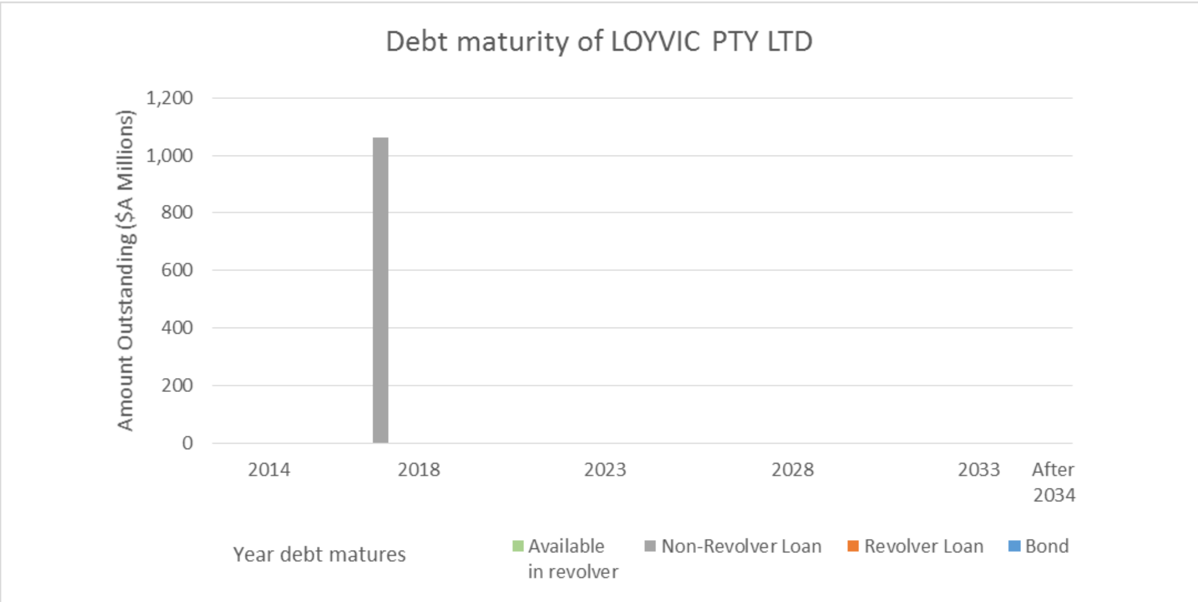


	Bond	Revolver loan	Non-revolver loan	Overall
Number	1	0	0	1
Amount Outstanding ($A Mn)	125.00	0.00	0.00	125.00
Weighted average debt term	5.00	N/A	N/A	5.00
Simple average debt term	5.00	N/A	N/A	5.00
Weighted average time to maturity	3.05	N/A	N/A	3.05
Simple average time to maturity	3.05	N/A	N/A	3.05

**Investa Office Fund has a BBB+ credit rating and a low debt-to-equity ratio of 46%.*

A.1.50 LOYVIC PTY LTD

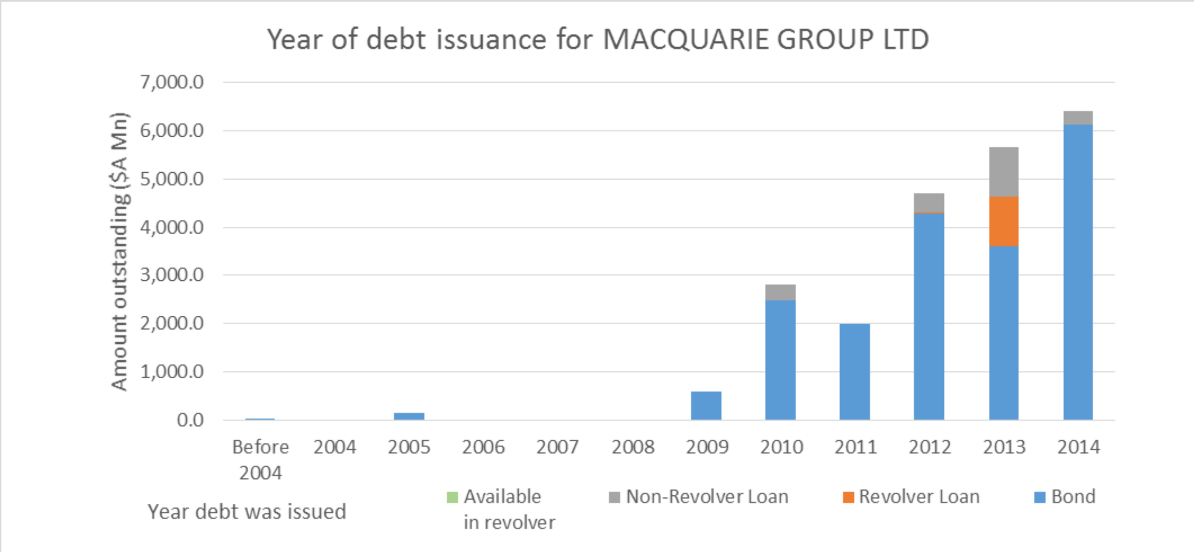


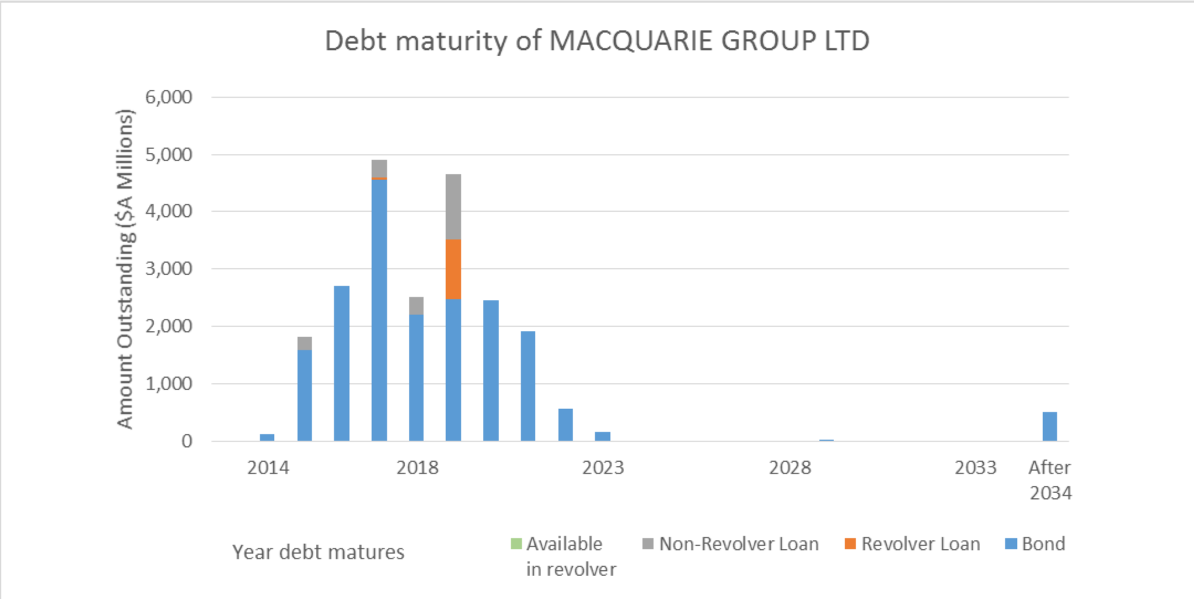


	Bond	Revolver loan	Non-revolver loan	Overall
Number	0	0	1	1
Amount Outstanding ($A Mn)	0.00	0.00	1,062.13	1,062.13
Weighted average debt term	N/A	N/A	5.04	5.04
Simple average debt term	N/A	N/A	N/A	5.04
Weighted average time to maturity	N/A	N/A	2.69	2.69
Simple average time to maturity	N/A	N/A	N/A	2.69

**Loyvic Pty Ltd has a BB+ credit rating. No debt-to-equity ratio available.*

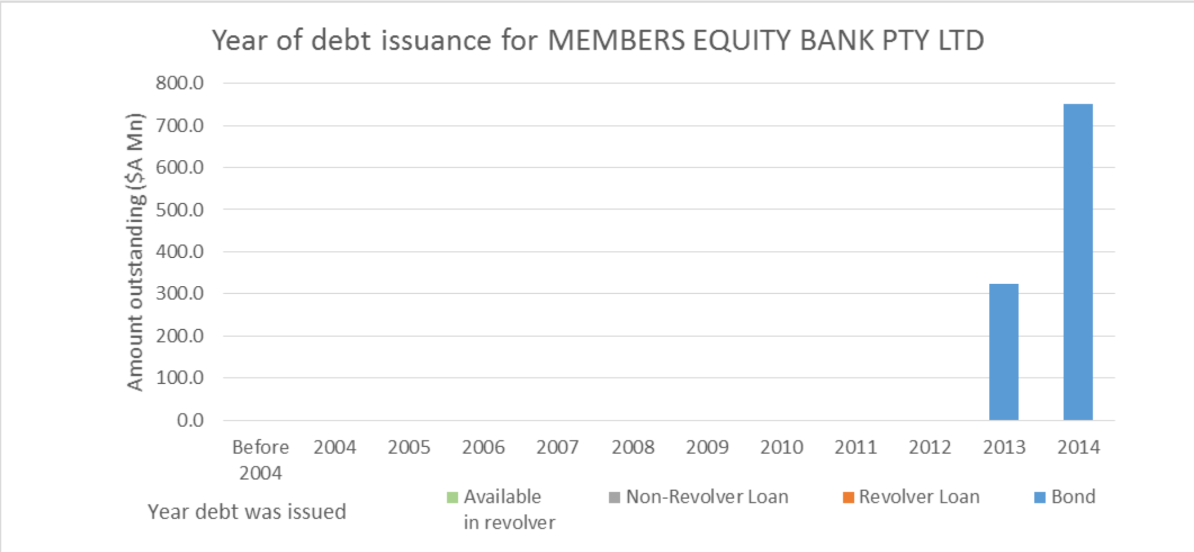
A.1.51 MACQUARIE GROUP LTD

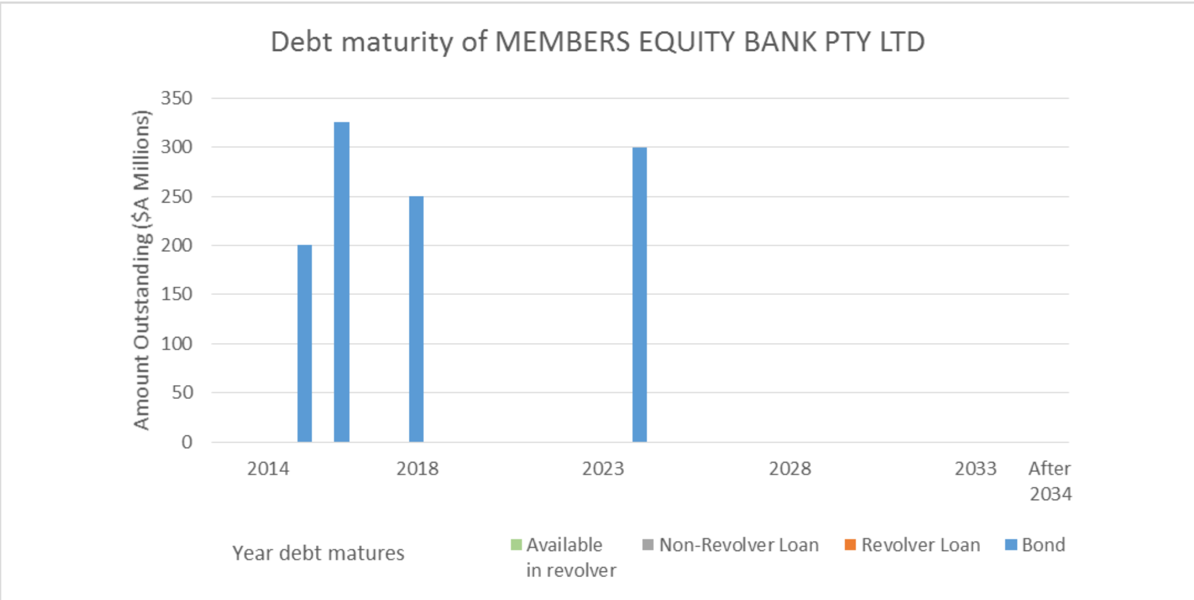




	Bond	Revolver loan	Non-revolver loan	Overall
Number	113	4	7	124
Amount Outstanding ($A Mn)	19,251.19	1,069.26	2,019.91	22,340.36
Weighted average debt term	6.56	5.06	5.00	6.35
Simple average debt term	6.61	5.13	7.88	6.45
Weighted average time to maturity	4.51	4.16	3.57	4.41
Simple average time to maturity	4.57	3.43	5.58	4.57

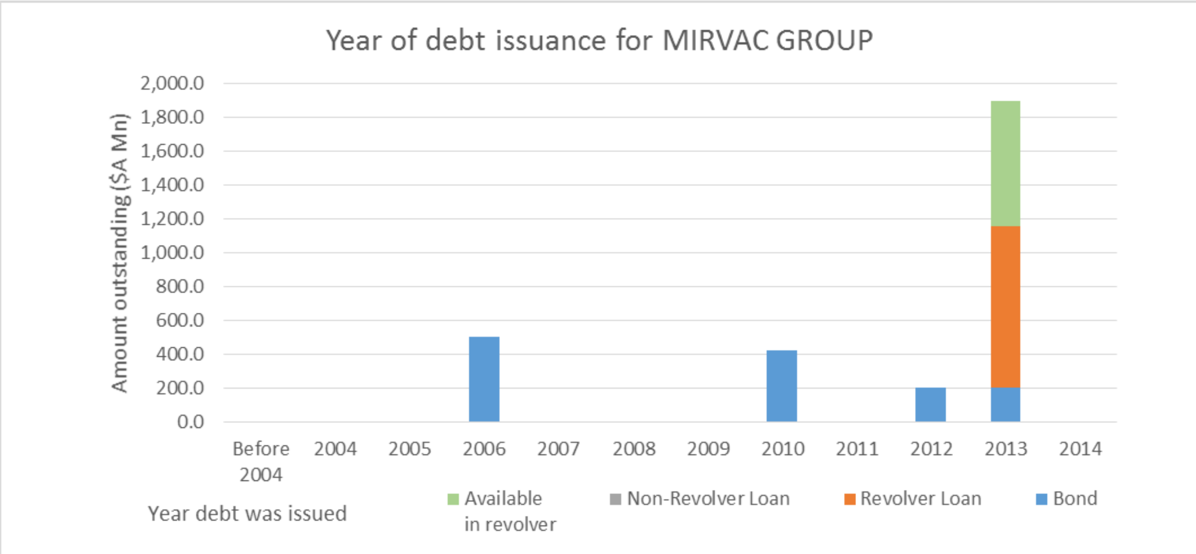
A.1.52 MEMBERS EQUITY BANK PTY LTD

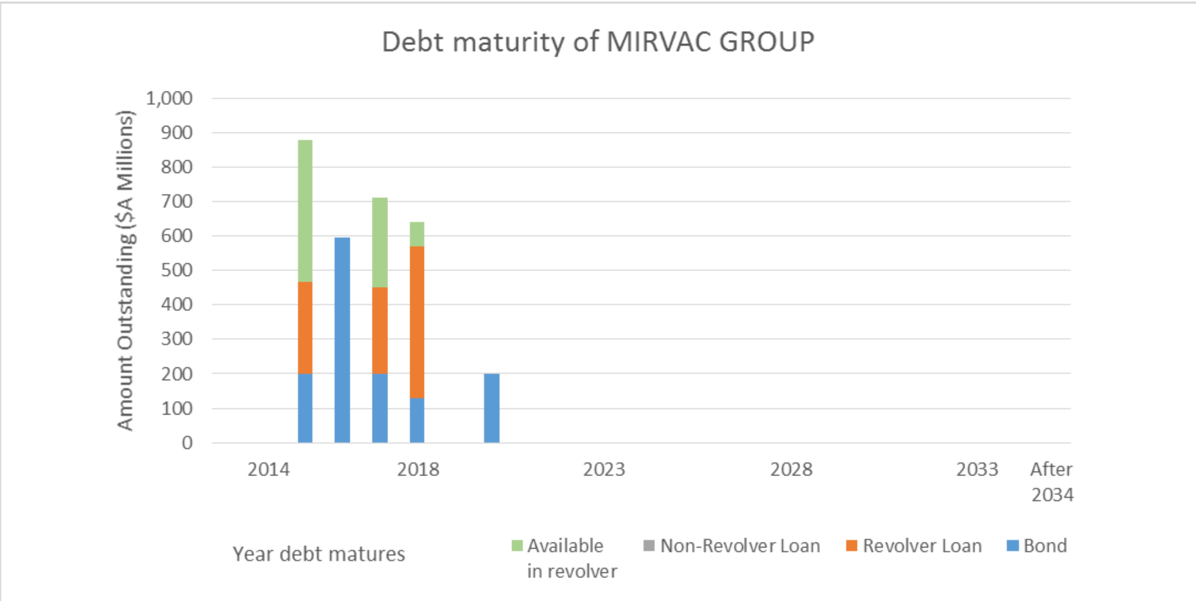




	Bond	Revolver loan	Non-revolver loan	Overall
Number	5	0	0	5
Amount Outstanding ($A Mn)	1,075.00	0.00	0.00	1,075.00
Weighted average debt term	4.81	N/A	N/A	4.81
Simple average debt term	3.80	N/A	N/A	3.80
Weighted average time to maturity	4.27	N/A	N/A	4.27
Simple average time to maturity	3.25	N/A	N/A	3.25

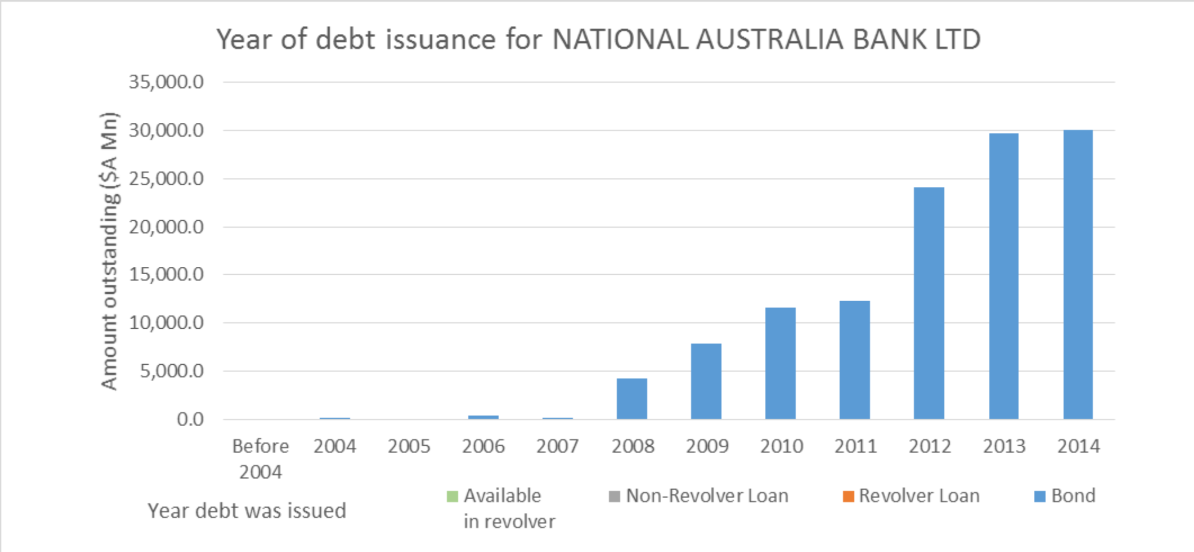
A.1.53 MIRVAC GROUP

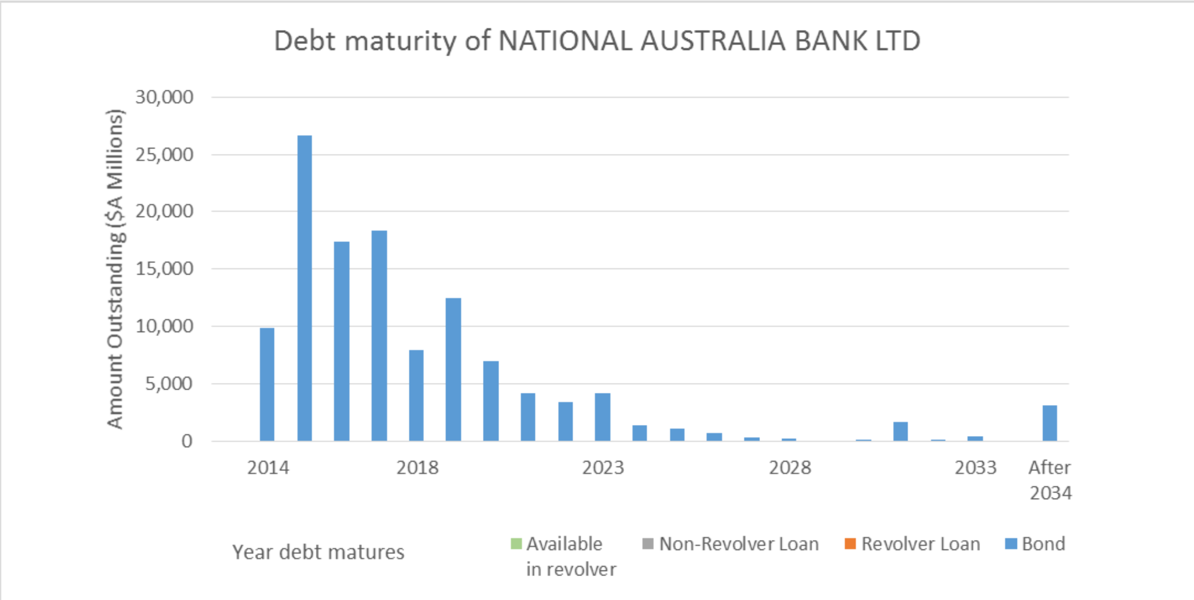




	Bond	Revolver loan	Non-revolver loan	Overall
Number	7	3	0	10
Amount Outstanding ($A Mn)	1,325.00	957.30	0.00	2,282.30
Weighted average debt term	7.54	4.16	N/A	6.12
Simple average debt term	7.84	3.92	0.00	6.67
Weighted average time to maturity	2.73	2.85	N/A	2.78
Simple average time to maturity	2.80	2.61	0.00	2.74

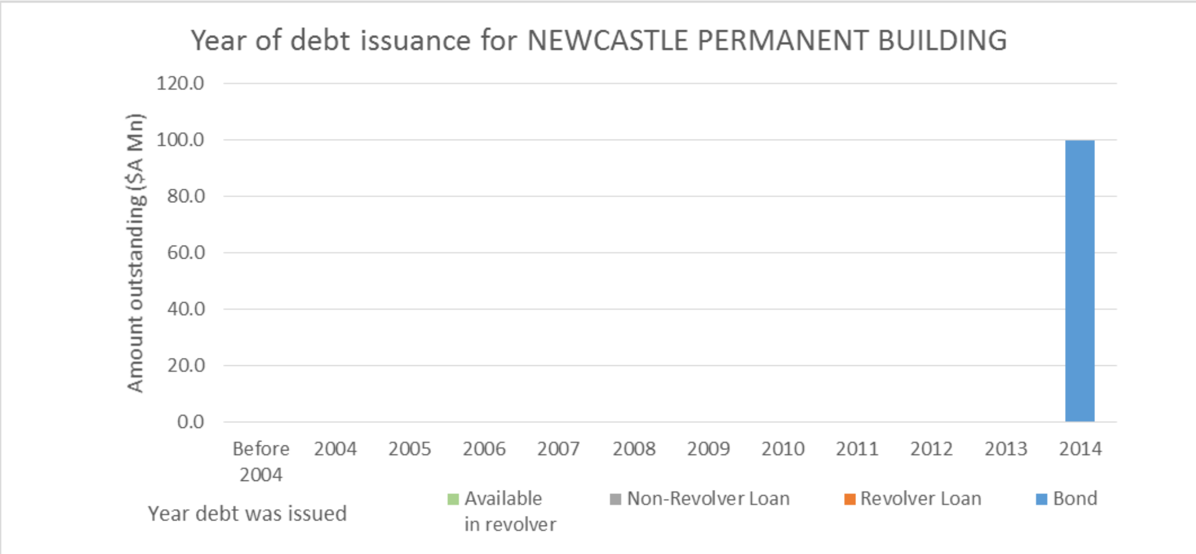
A.1.54 NATIONAL AUSTRALIA BANK LTD

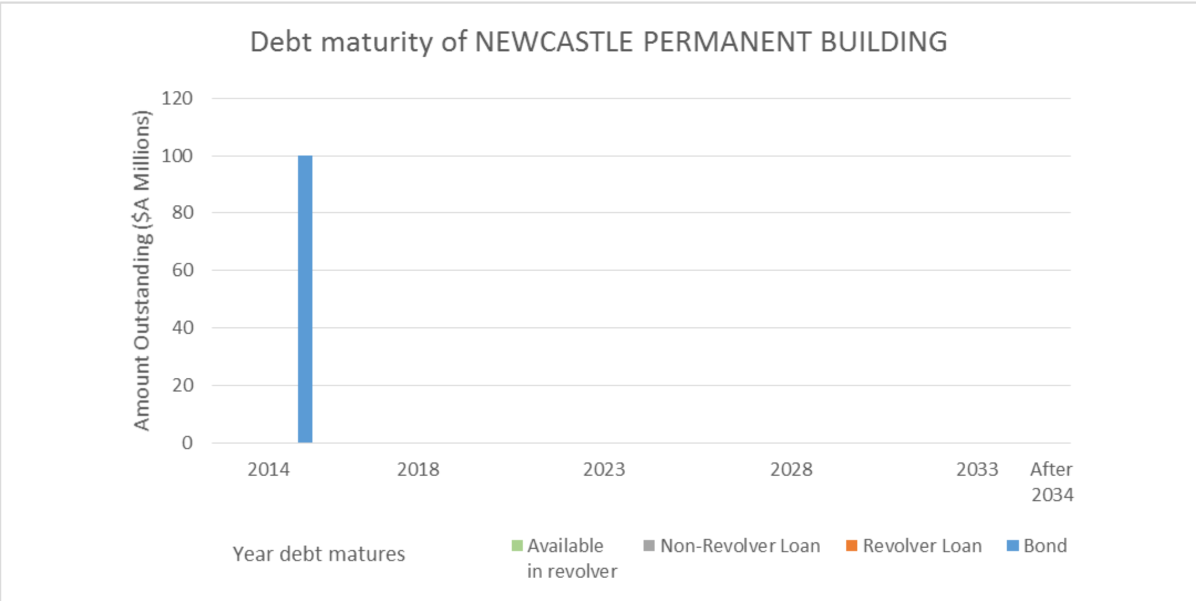




	Bond	Revolver loan	Non-revolver loan	Overall
Number	388	0	0	388
Amount Outstanding ($A Mn)	120,346.18	0.00	0.00	120,346.18
Weighted average debt term	6.15	N/A	N/A	6.15
Simple average debt term	9.63	N/A	N/A	9.63
Weighted average time to maturity	3.93	N/A	N/A	3.93
Simple average time to maturity	7.07	N/A	N/A	7.12

A.1.55 NEWCASTLE PERMANENT BUILDING SOCIETY LTD

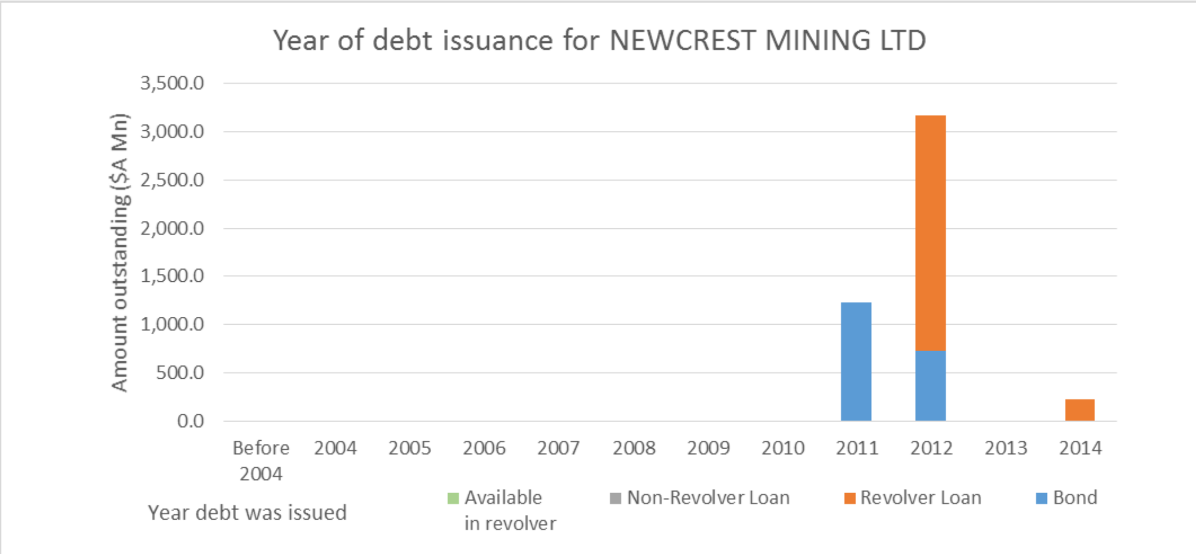


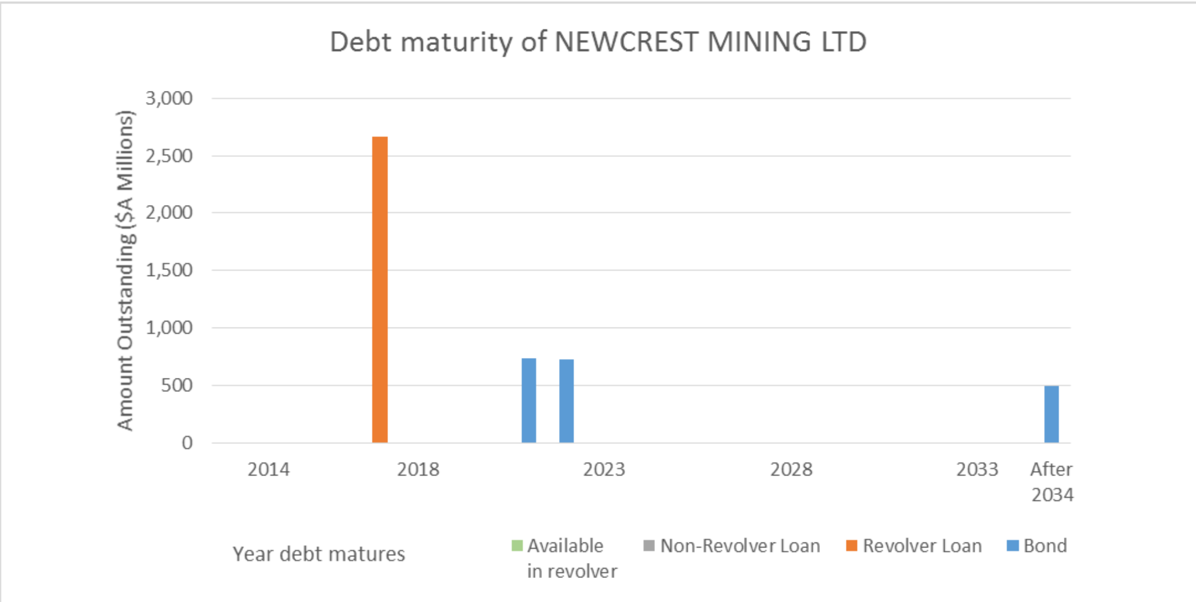


	Bond	Revolver loan	Non-revolver loan	Overall
Number	2	0	0	2
Amount Outstanding ($A Mn)	100.00	0.00	0.00	100.00
Weighted average debt term	1.00	N/A	N/A	1.00
Simple average debt term	1.00	N/A	N/A	1.00
Weighted average time to maturity	0.49	N/A	N/A	0.49
Simple average time to maturity	0.49	N/A	N/A	0.49

**Newcastle Permanent Building Society Ltd has a BBB+ credit rating. No debt-to-equity ratio available.*

A.1.56 NEWCREST MINING LTD



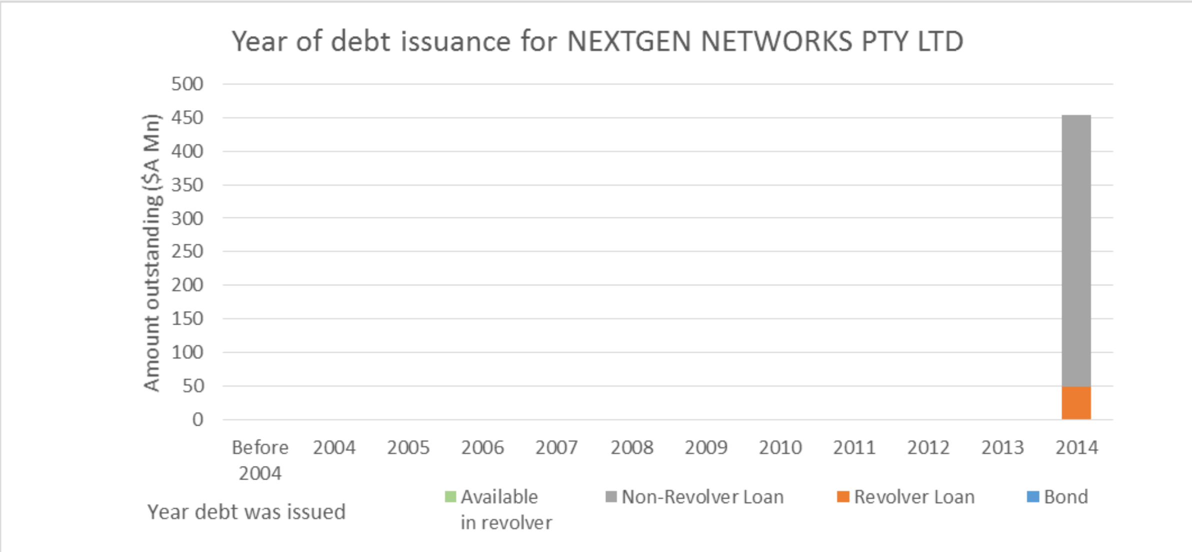


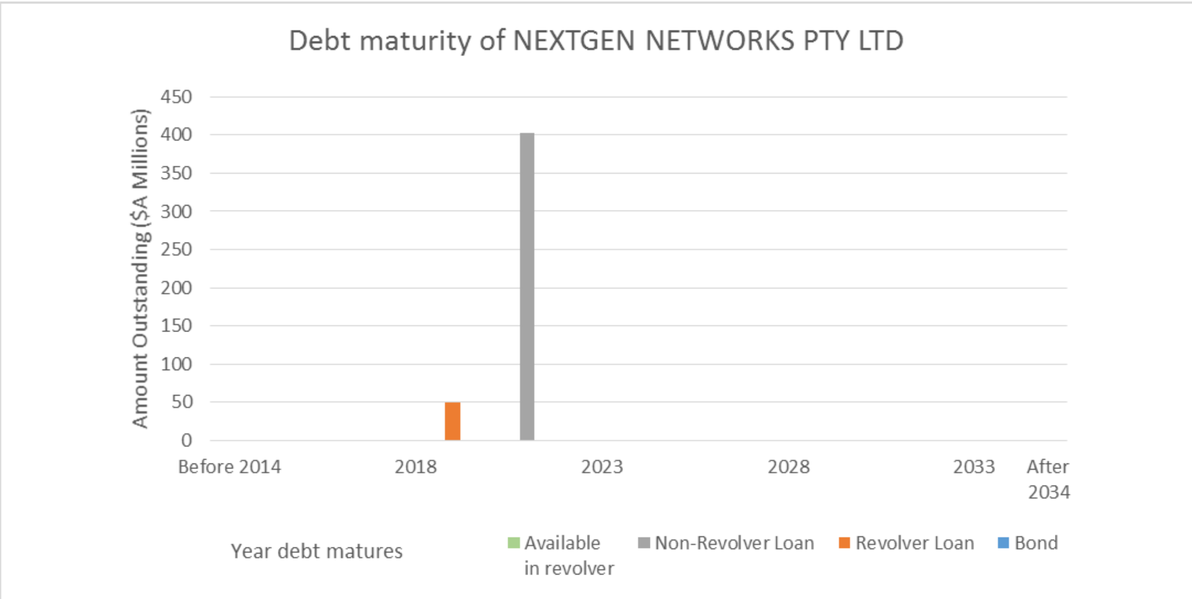
	Bond	Revolver loan	Non-revolver loan	Overall
Number	3	11	0	14
Amount Outstanding ($A Mn)	1,952.01	2,663.02	0.00	4,615.02
Weighted average debt term	15.03	4.83	N/A	9.15
Simple average debt term	16.67	4.82	0.00	7.36
Weighted average time to maturity	12.43	2.82	N/A	6.89
Simple average time to maturity	14.03	2.82	0.00	5.22

**One bond due in 2041 with A$ 491.26 million outstanding.*

COMPETITION ECONOMISTS GROUP

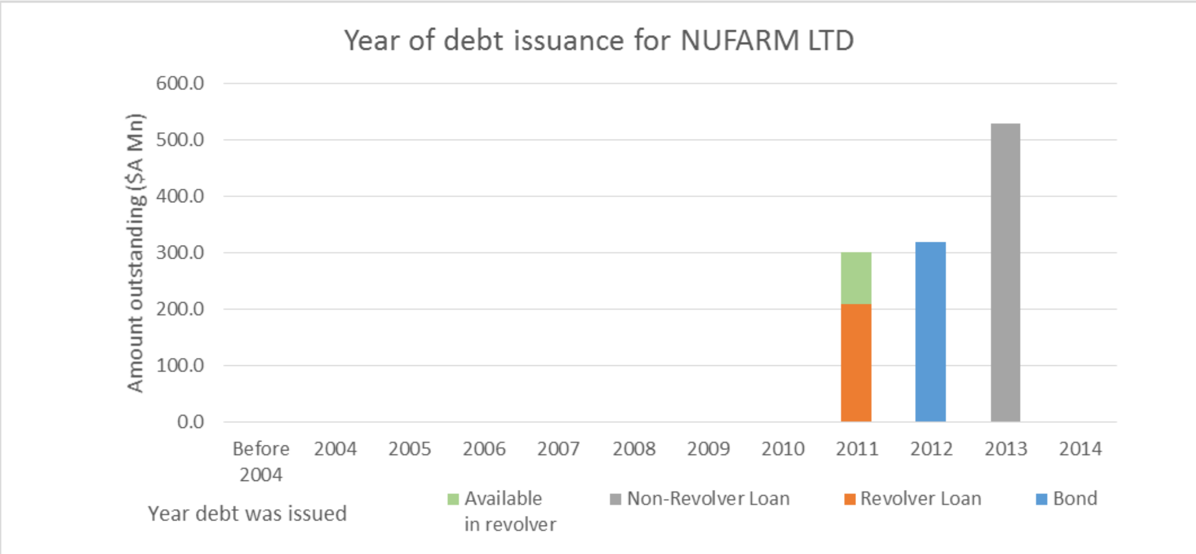
A.1.57 NEXTGEN NETWORKS PTY LTD

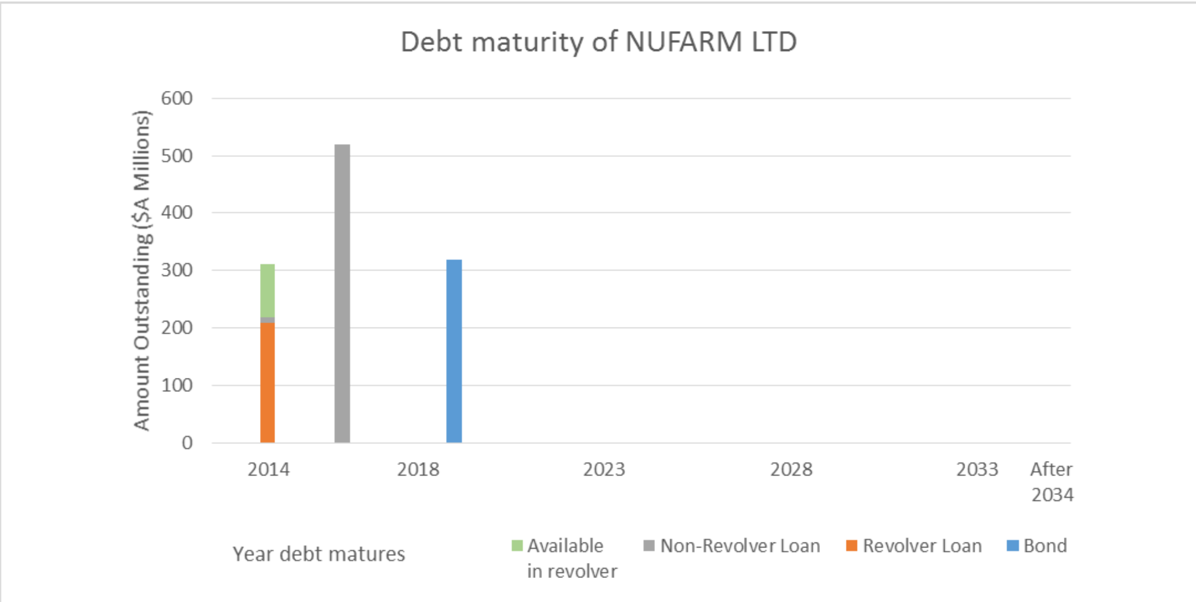




	Bond	Revolver loan	Non-revolver loan	Overall
Number	0	1	1	2
Amount Outstanding ($A Mn)	0.00	50.00	402.92	452.92
Weighted average debt term	N/A	5.00	7.00	6.78
Simple average debt term	N/A	5.00	7.00	6.00
Weighted average time to maturity	N/A	4.61	6.61	6.39
Simple average time to maturity	N/A	4.61	6.61	5.61

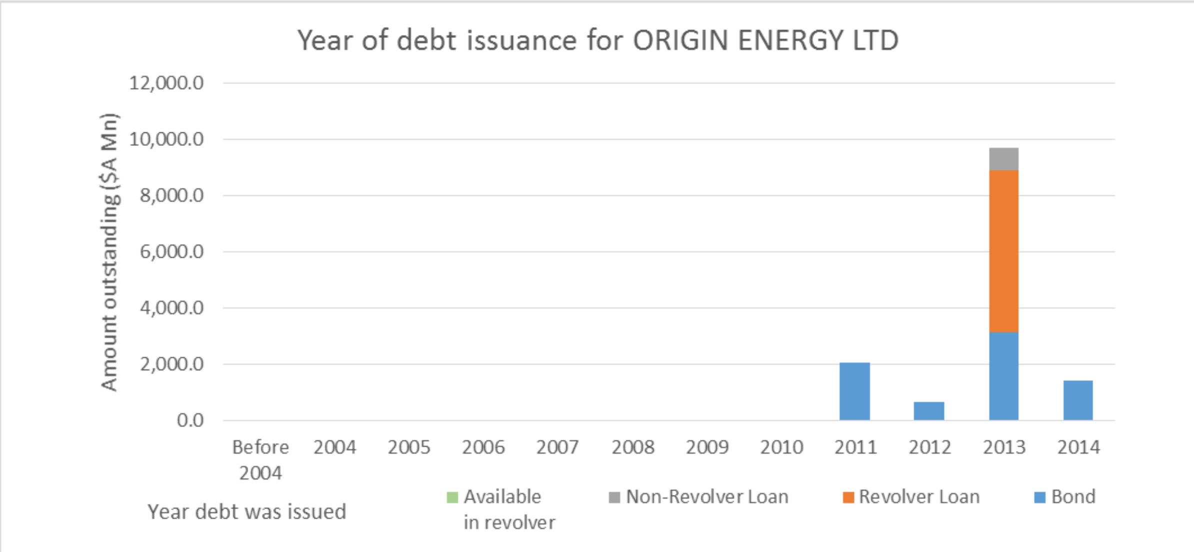
A.1.58 NUFARM LTD

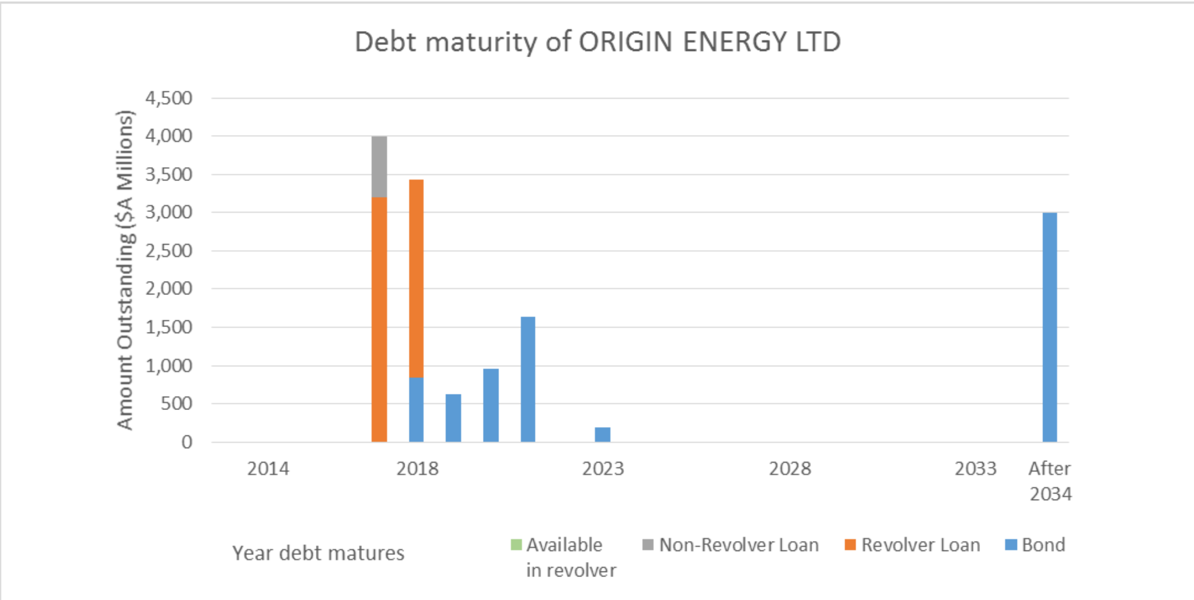




	Bond	Revolver loan	Non-revolver loan	Overall
Number	2	1	2	5
Amount Outstanding ($A Mn)	319.03	208.00	530.00	1,057.03
Weighted average debt term	7.03	3.00	2.96	4.20
Simple average debt term	3.51	3.00	4.00	2.81
Weighted average time to maturity	4.99	0.09	2.11	2.58
Simple average time to maturity	2.49	0.09	2.30	1.84

A.1.59 ORIGIN ENERGY LTD



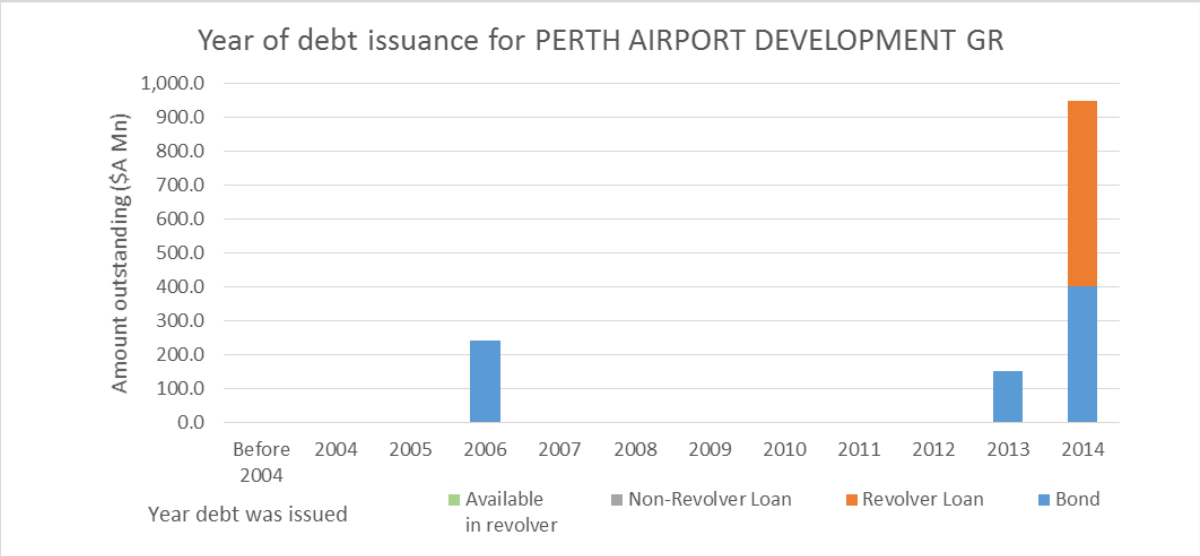


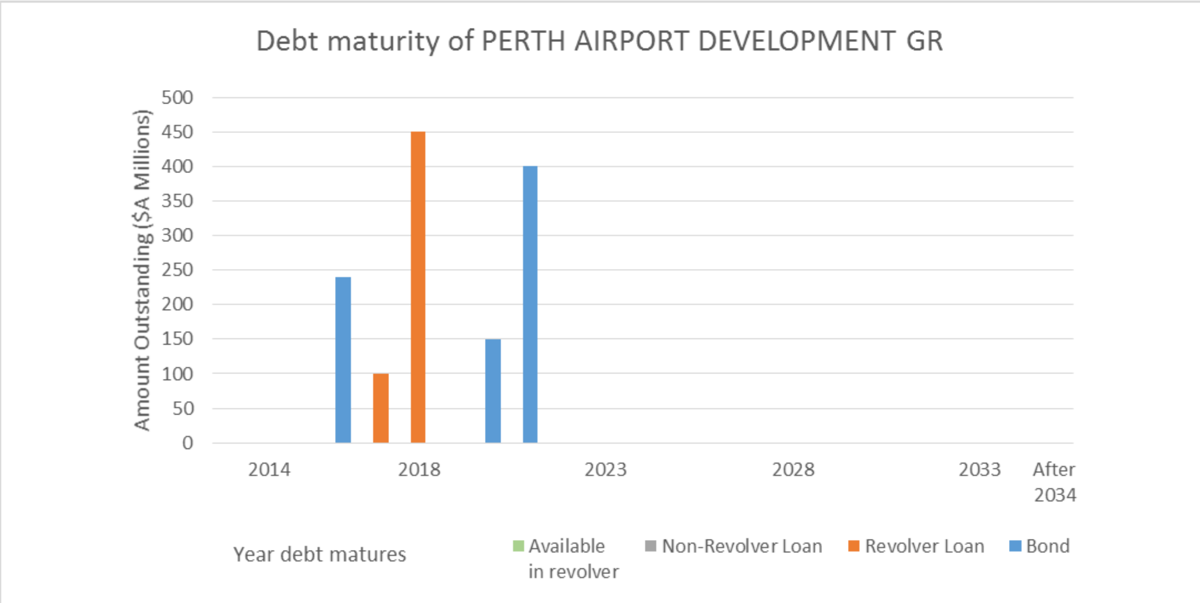
	Bond	Revolver loan	Non-revolver loan	Overall
Number	9	5	1	15
Amount Outstanding ($A Mn)	7,245.63	5,783.37	800.00	13,829.01
Weighted average debt term	29.20	4.45	4.00	17.39
Simple average debt term	25.28	4.20	0.80	16.83
Weighted average time to maturity	27.62	3.29	2.84	16.01
Simple average time to maturity	23.45	3.06	0.57	15.28

**Two bonds due in 2071 with A$ 672.68 million and A$900 million outstanding, and another due in 2074 with A$1,425.11 million outstanding.*

COMPETITION ECONOMISTS GROUP

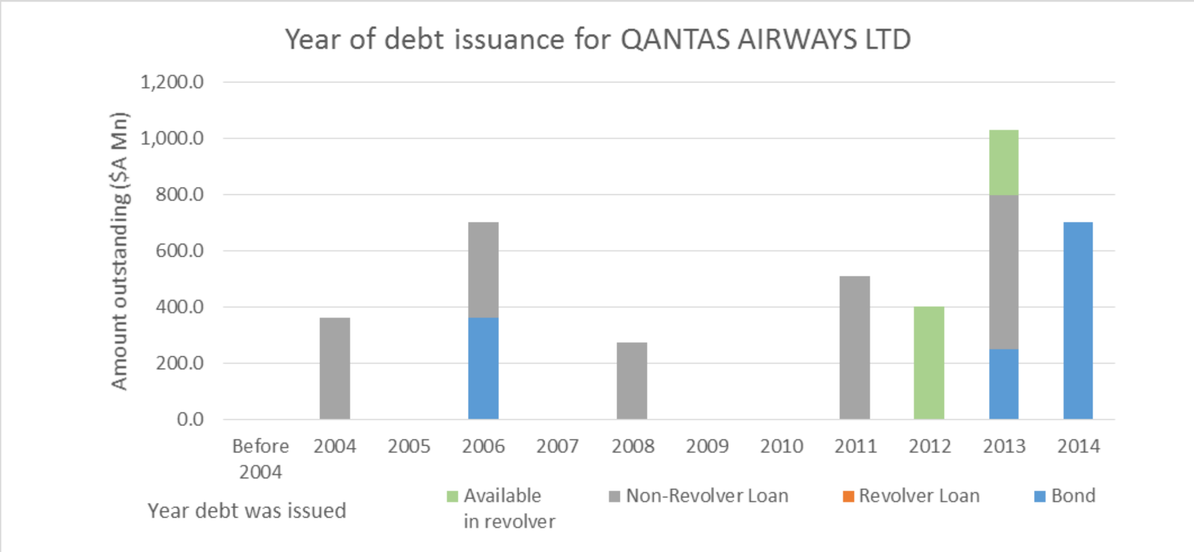
A.1.60 PERTH AIRPORT DEVELOPMENT GROUP PTY LTD

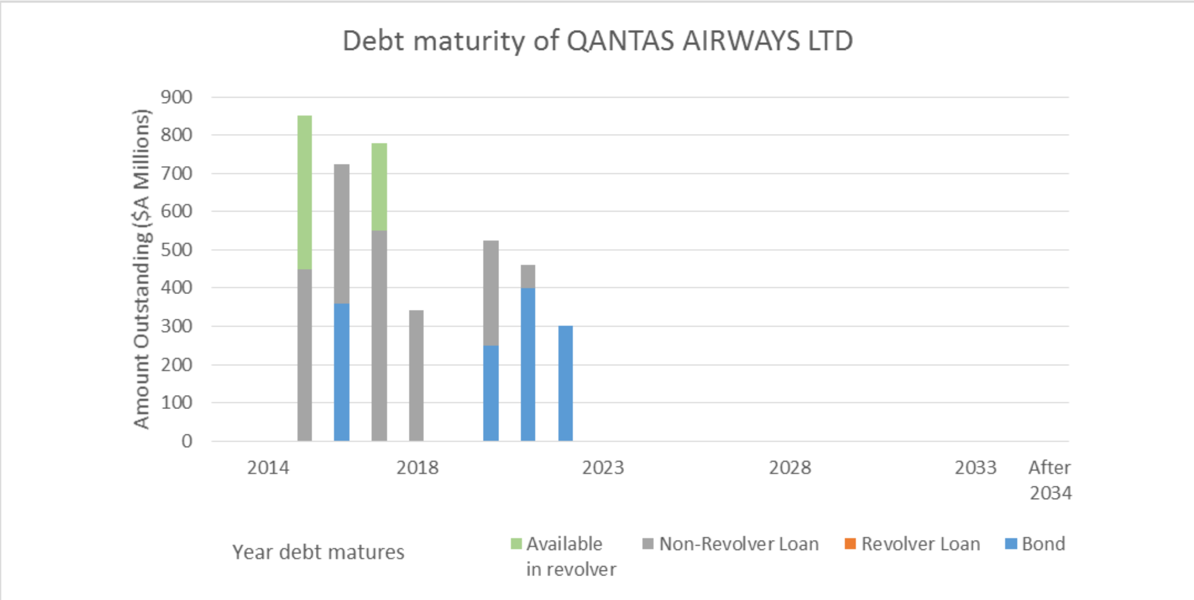




	Bond	Revolver loan	Non-revolver loan	Overall
Number	3	2	0	5
Amount Outstanding ($A Mn)	790.00	550.00	0.00	1,340.00
Weighted average debt term	7.90	3.85	N/A	6.24
Simple average debt term	7.99	3.53	0.00	6.21
Weighted average time to maturity	4.97	3.44	N/A	4.34
Simple average time to maturity	4.75	3.12	0.00	4.10

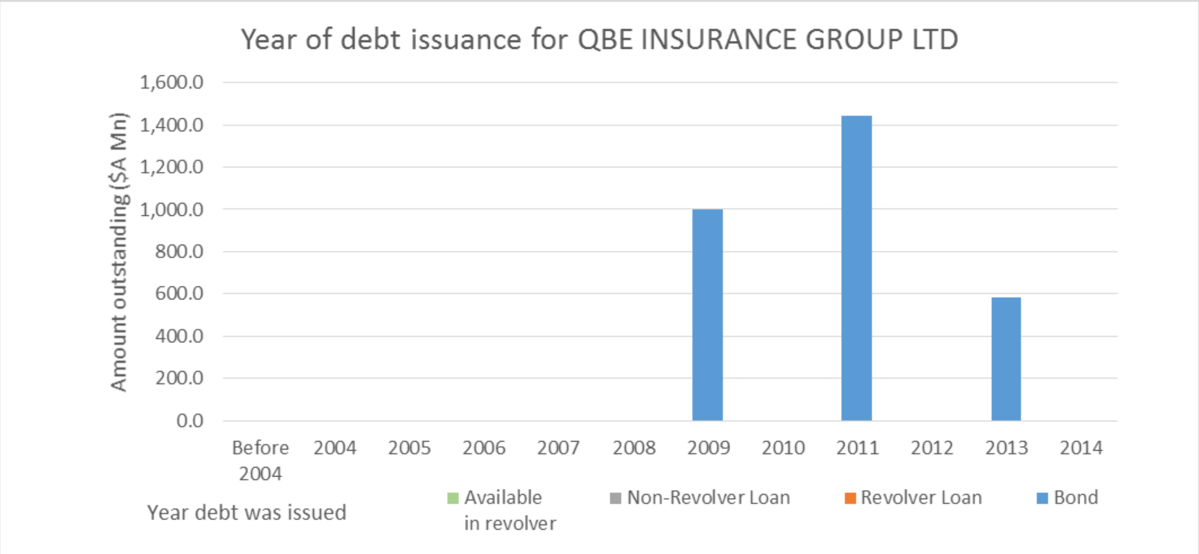
A.1.61 QANTAS AIRWAYS LTD

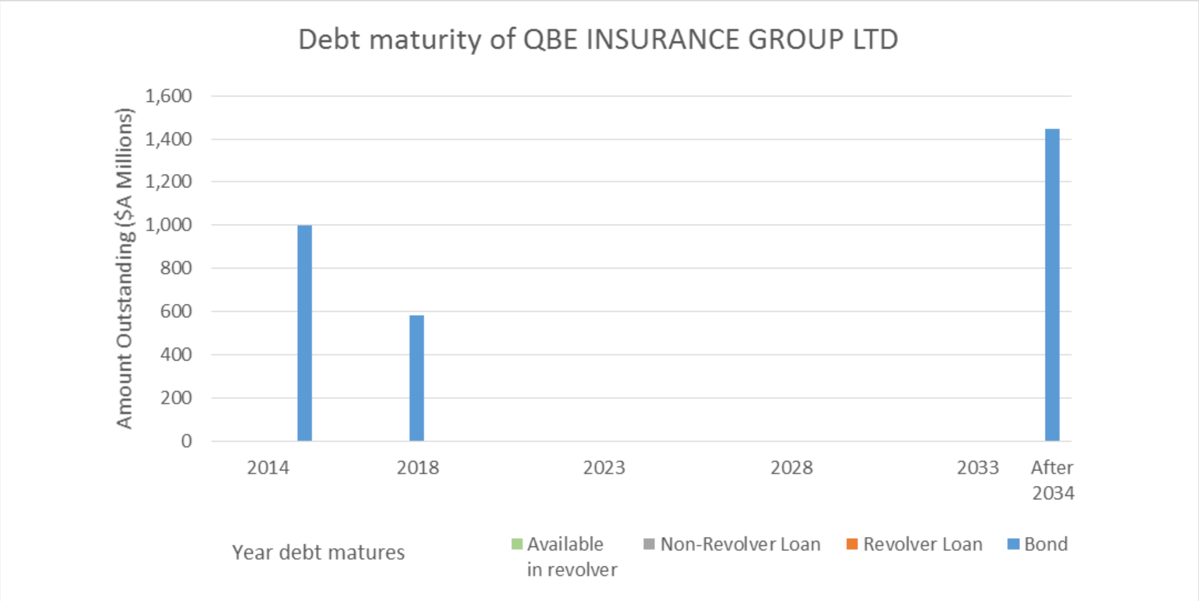




	Bond	Revolver loan	Non-revolver loan	Overall
Number	4	2	6	12
Amount Outstanding ($A Mn)	1,310.29	0.00	2,040.40	3,350.68
Weighted average debt term	8.06	N/A	8.02	8.04
Simple average debt term	8.01	3.51	27.02	7.76
Weighted average time to maturity	5.22	N/A	2.65	3.66
Simple average time to maturity	5.31	1.72	10.32	3.77

A.1.62 QBE INSURANCE GROUP LTD

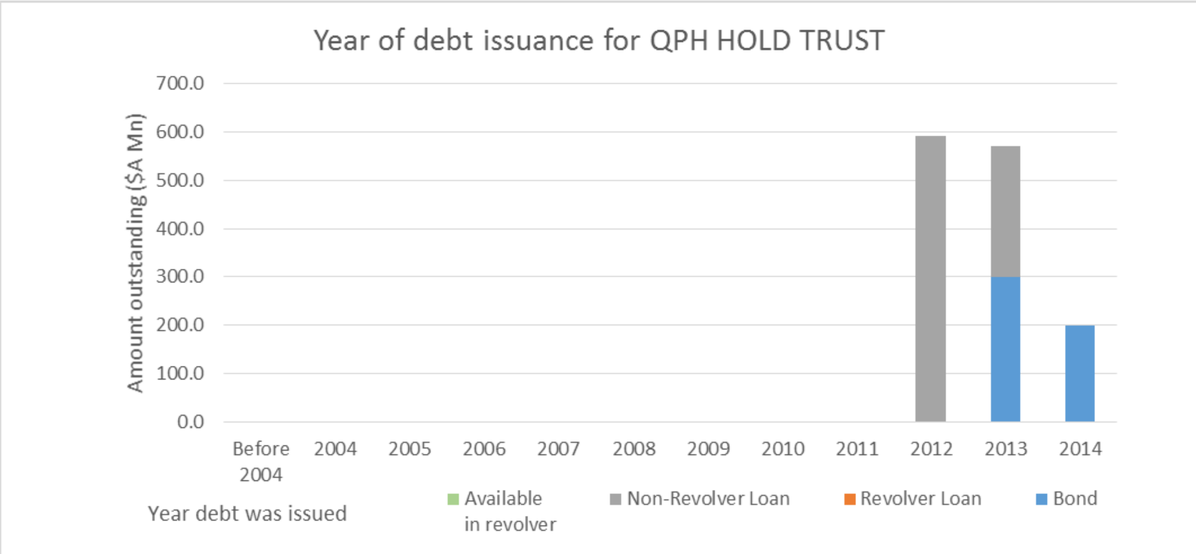


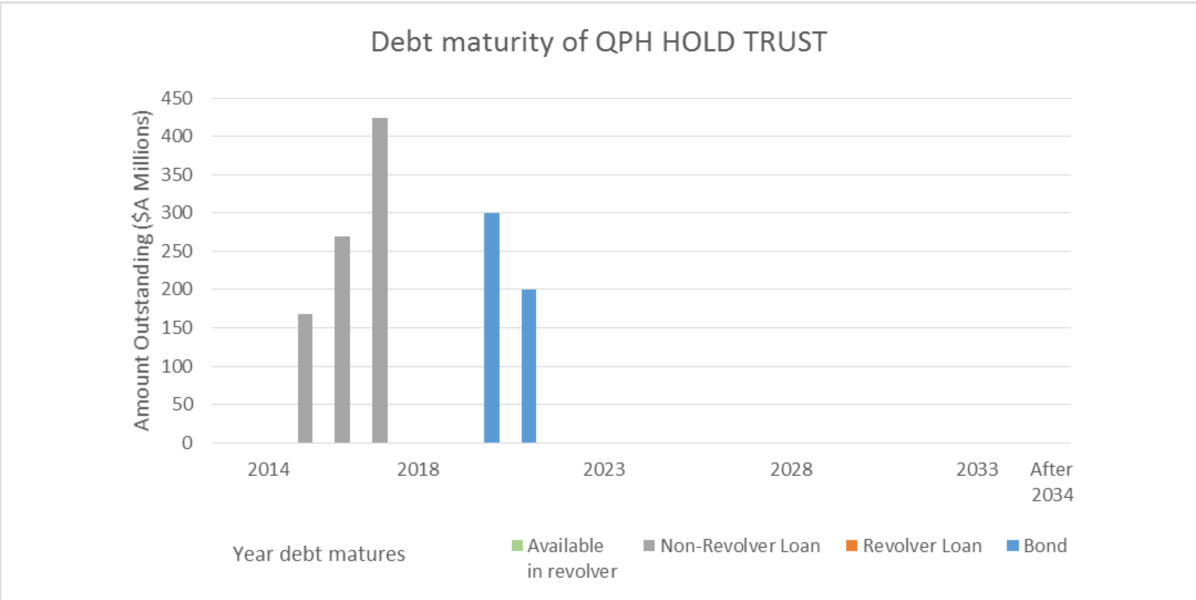


	Bond	Revolver loan	Non-revolver loan	Overall
Number	5	0	0	5
Amount Outstanding ($A Mn)	3,030.00	0.00	0.00	3,030.00
Weighted average debt term	17.25	N/A	N/A	17.25
Simple average debt term	14.20	N/A	N/A	14.20
Weighted average time to maturity	13.67	N/A	N/A	13.67
Simple average time to maturity	11.53	N/A	N/A	14.41

**Two bonds due in 2041 with A$ 947.06 million and A$ 498.06 million outstanding.*

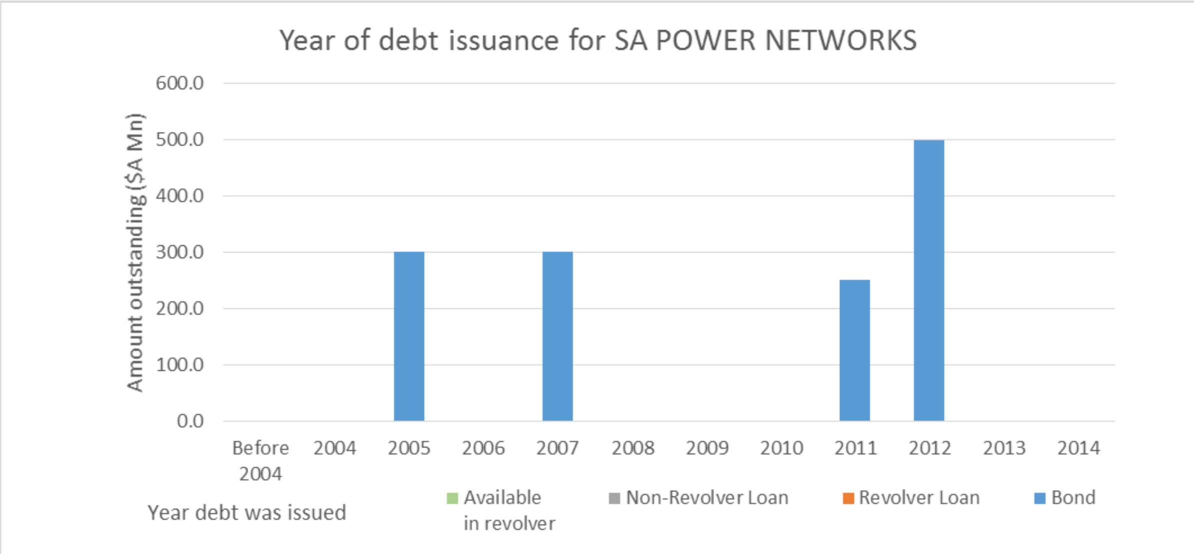
A.1.63 QPH HOLD TRUST

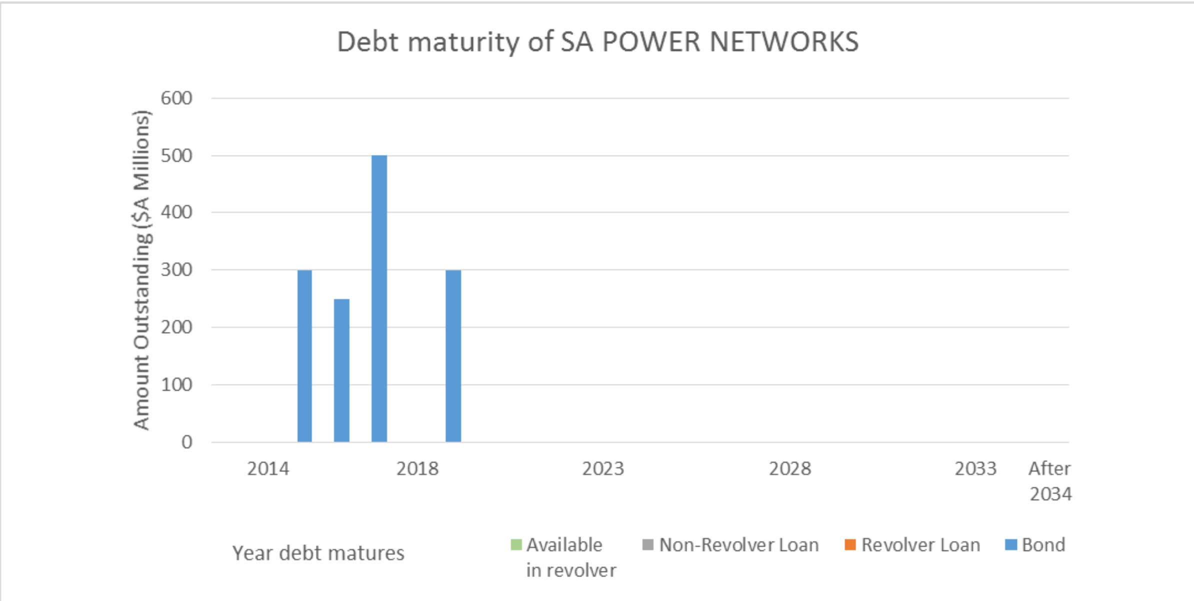




	Bond	Revolver loan	Non-revolver loan	Overall
Number	2	0	4	6
Amount Outstanding ($A Mn)	500.00	0.00	860.94	1,360.94
Weighted average debt term	7.00	N/A	4.42	5.37
Simple average debt term	7.00	N/A	N/A	4.96
Weighted average time to maturity	6.15	N/A	2.41	3.78
Simple average time to maturity	6.24	N/A	N/A	3.32

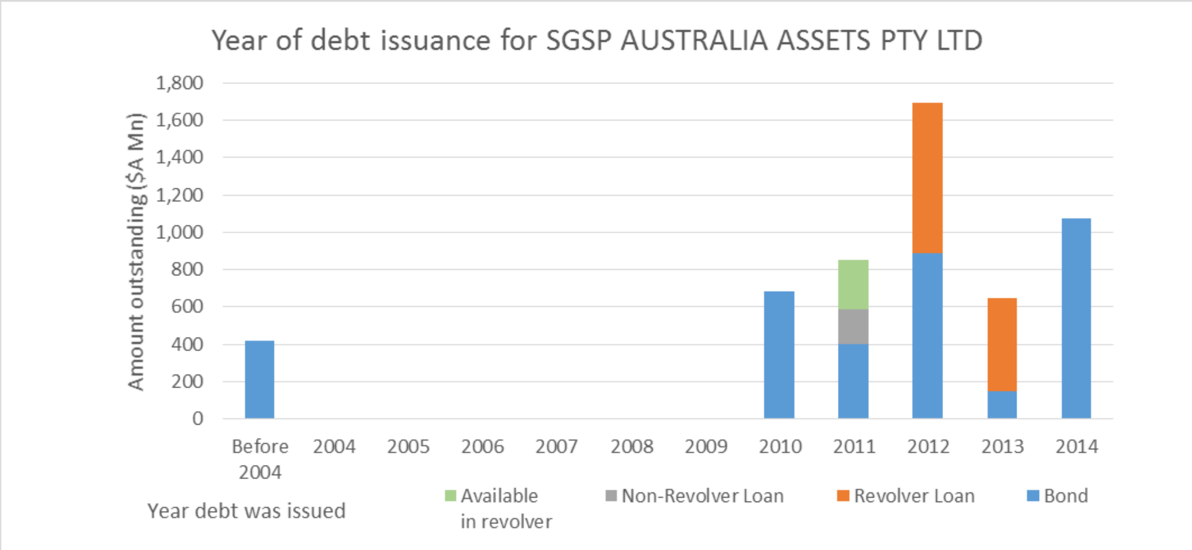
A.1.64 SA POWER NETWORKS

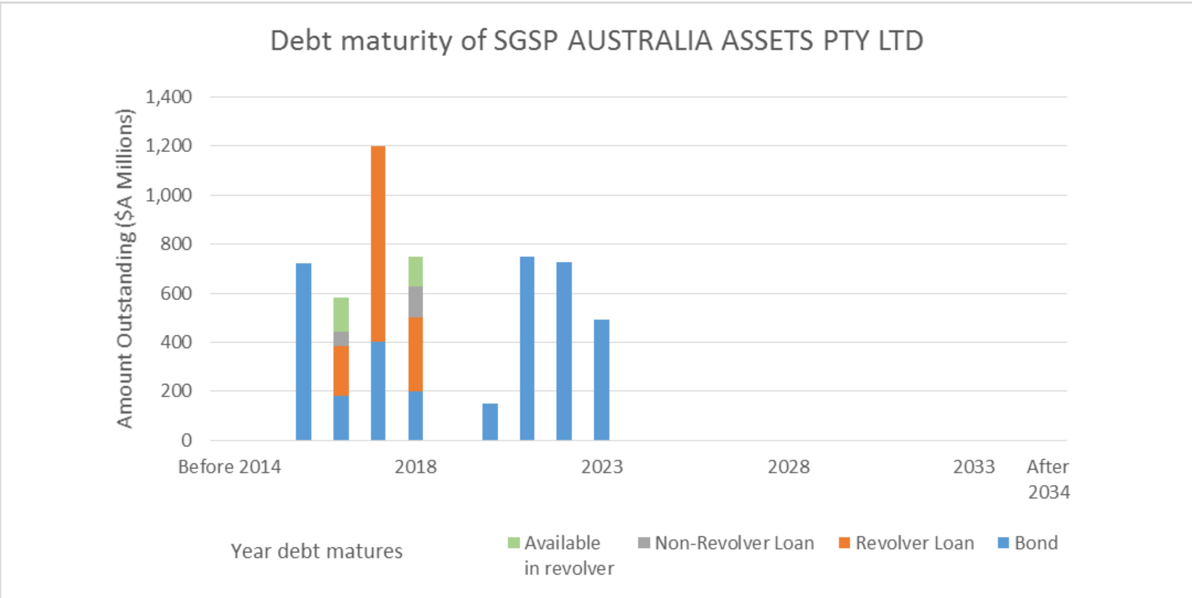




	Bond	Revolver loan	Non-revolver loan	Overall
Number	5	0	0	5
Amount Outstanding ($A Mn)	1,350.00	0.00	0.00	1,350.00
Weighted average debt term	7.98	N/A	N/A	7.98
Simple average debt term	7.67	N/A	N/A	7.67
Weighted average time to maturity	2.71	N/A	N/A	2.71
Simple average time to maturity	2.70	N/A	N/A	2.70

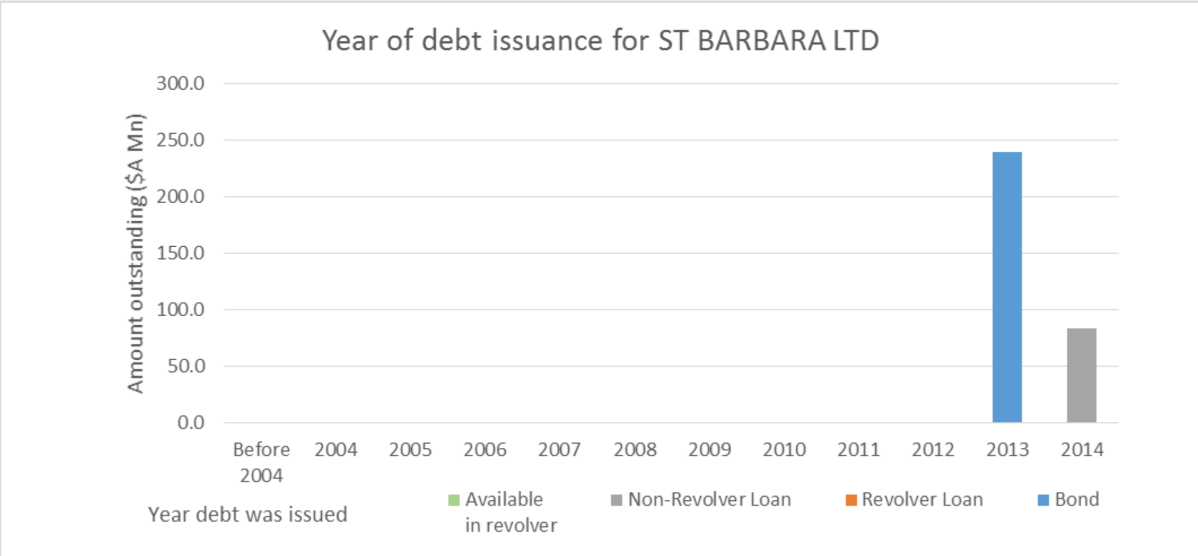
A.1.65 SGSP AUSTRALIA ASSETS PTY LTD

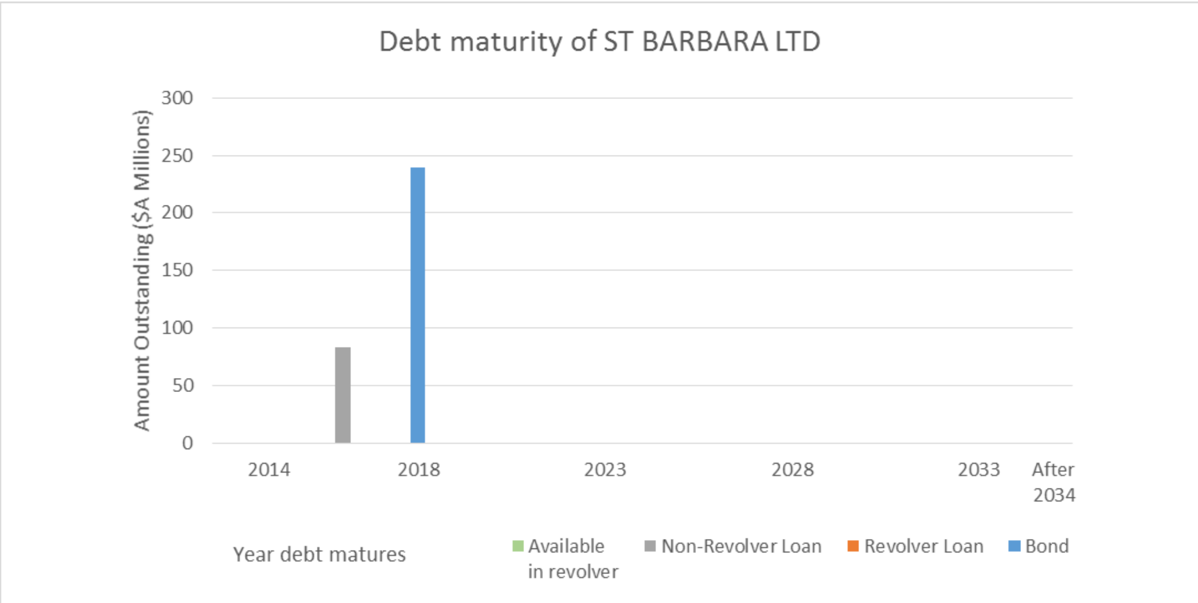




	Bond	Revolver loan	Non-revolver loan	Overall
Number	10	5	2	17
Amount Outstanding ($A Mn)	3,618.39	1,300.00	185.00	5,103.39
Weighted average debt term	8.48	4.69	6.35	7.44
Simple average debt term	9.05	5.00	2.40	7.50
Weighted average time to maturity	4.94	3.00	3.04	4.38
Simple average time to maturity	4.37	2.95	1.13	3.77

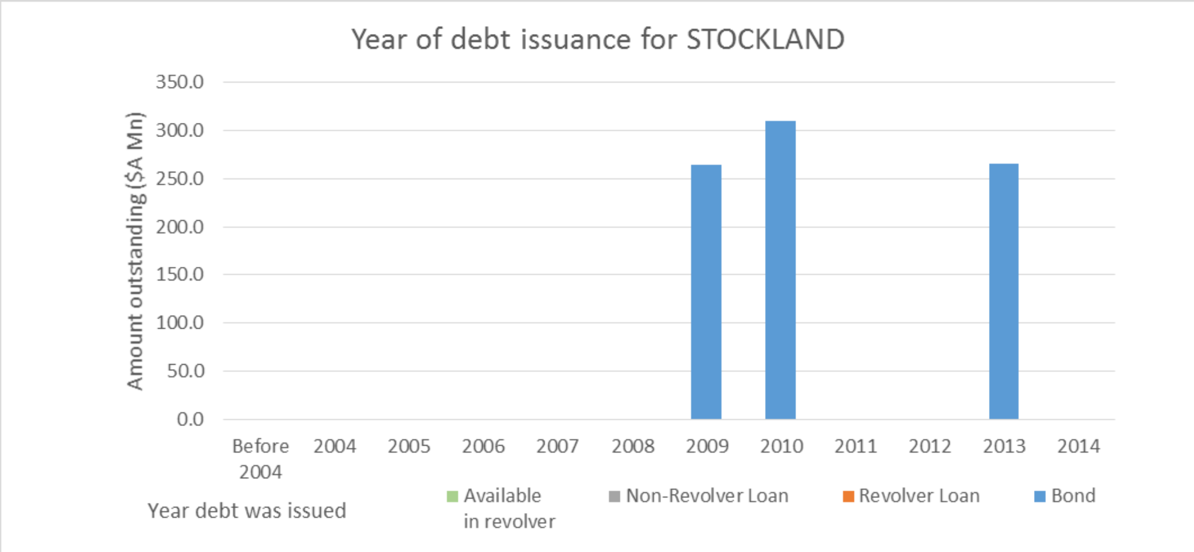
A.1.66 ST BARBARA LTD

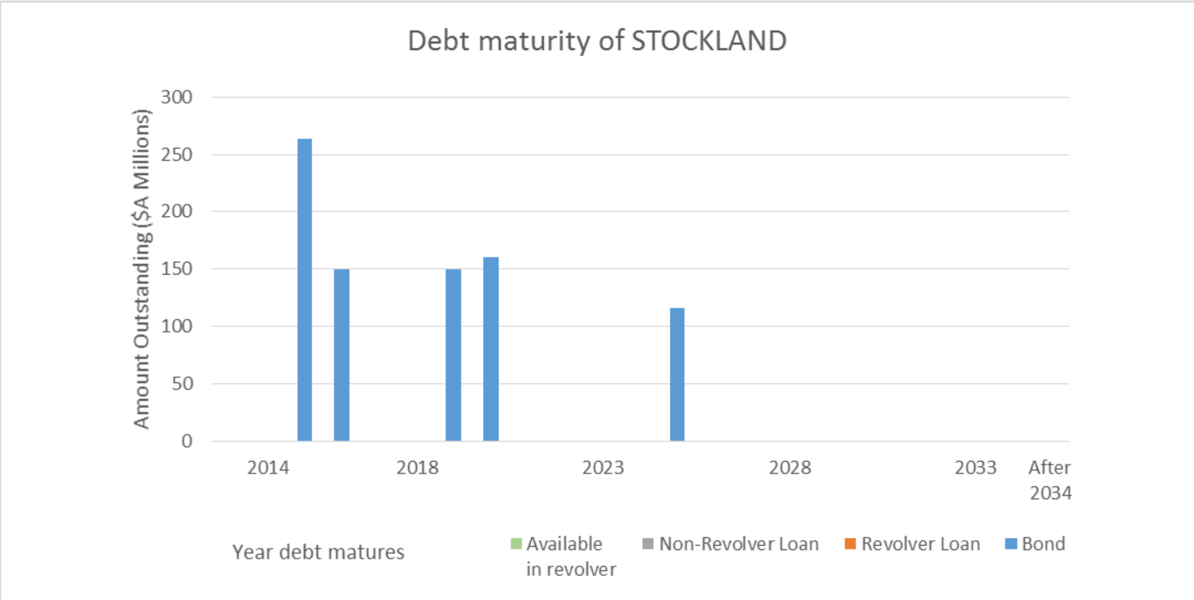




	Bond	Revolver loan	Non-revolver loan	Overall
Number	1	0	2	3
Amount Outstanding ($A Mn)	239.37	0.00	83.16	322.53
Weighted average debt term	5.05	N/A	2.85	4.48
Simple average debt term	5.05	N/A	N/A	3.58
Weighted average time to maturity	3.49	N/A	2.20	3.15
Simple average time to maturity	3.49	N/A	N/A	2.63

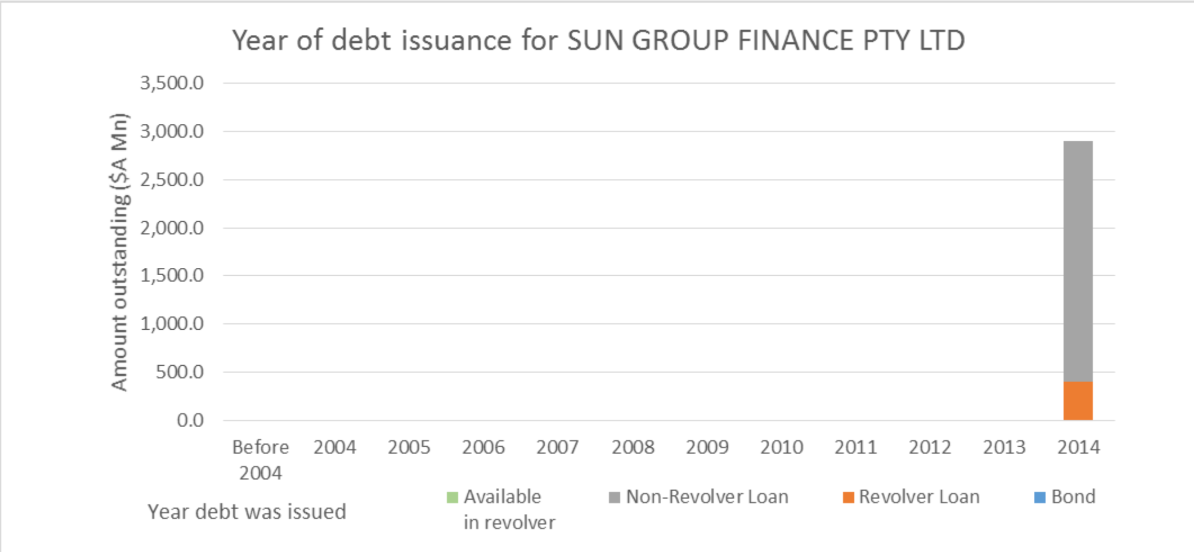
A.1.67 STOCKLAND

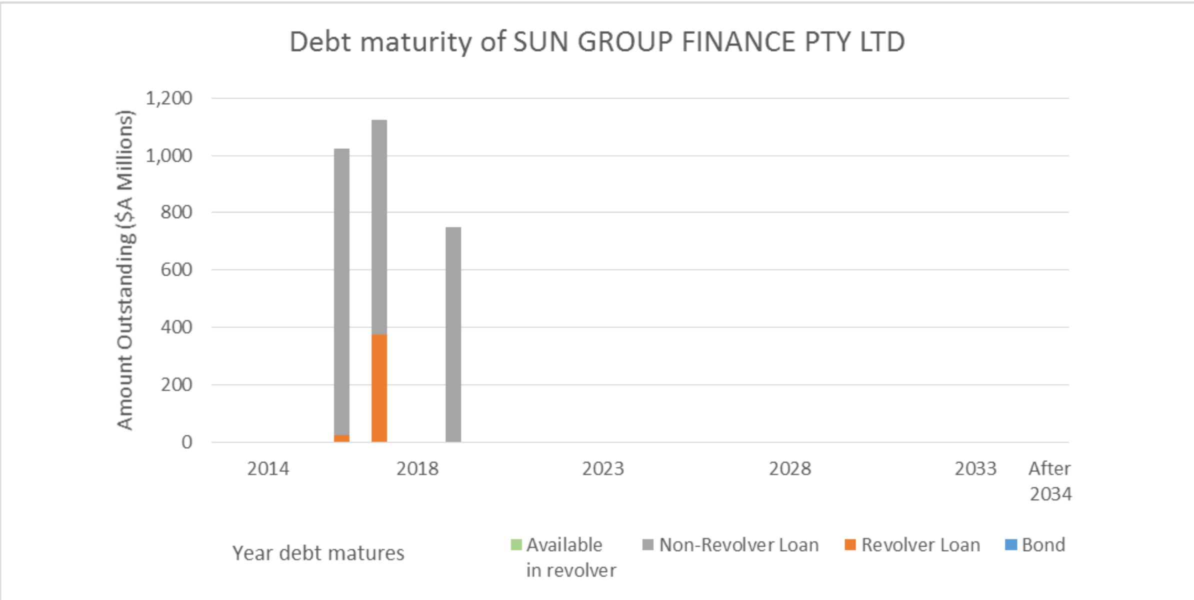




	Bond	Revolver loan	Non-revolver loan	Overall
Number	6	0	0	6
Amount Outstanding ($A Mn)	839.81	0.00	0.00	839.81
Weighted average debt term	7.25	N/A	N/A	7.25
Simple average debt term	8.45	N/A	N/A	8.45
Weighted average time to maturity	3.93	N/A	N/A	3.93
Simple average time to maturity	5.77	N/A	N/A	5.77

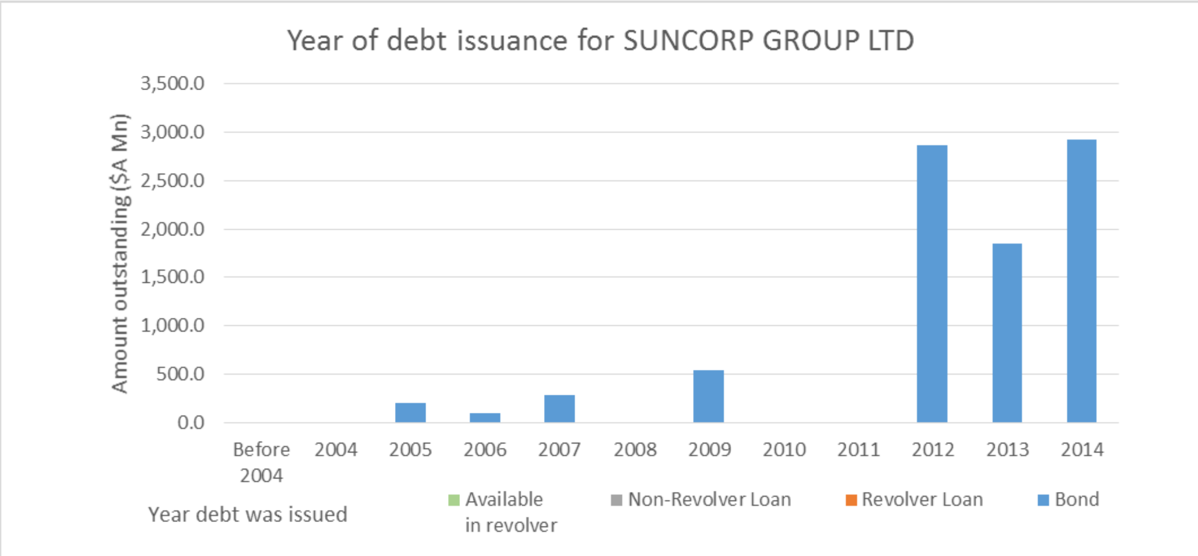
A.1.68 SUN GROUP FINANCE PTY LTD

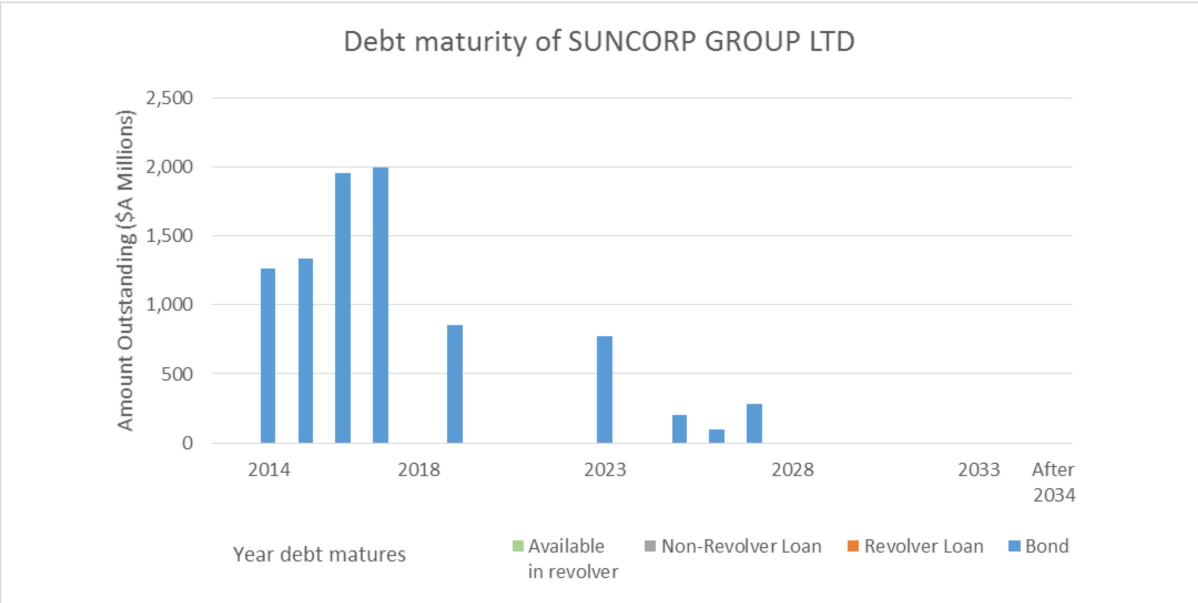




	Bond	Revolver loan	Non-revolver loan	Overall
Number	0	2	3	5
Amount Outstanding ($A Mn)	0.00	400.00	2,500.00	2,900.00
Weighted average debt term	N/A	2.90	3.16	3.13
Simple average debt term	N/A	2.47	4.95	2.97
Weighted average time to maturity	N/A	2.64	2.90	2.86
Simple average time to maturity	N/A	2.20	4.55	2.70

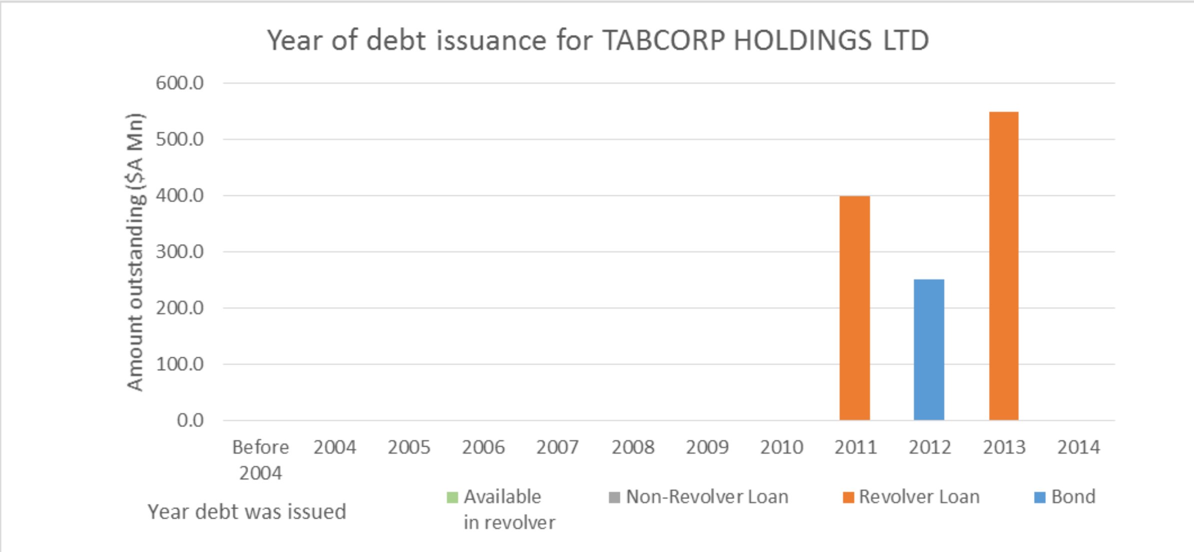
A.1.69 SUNCORP GROUP LTD

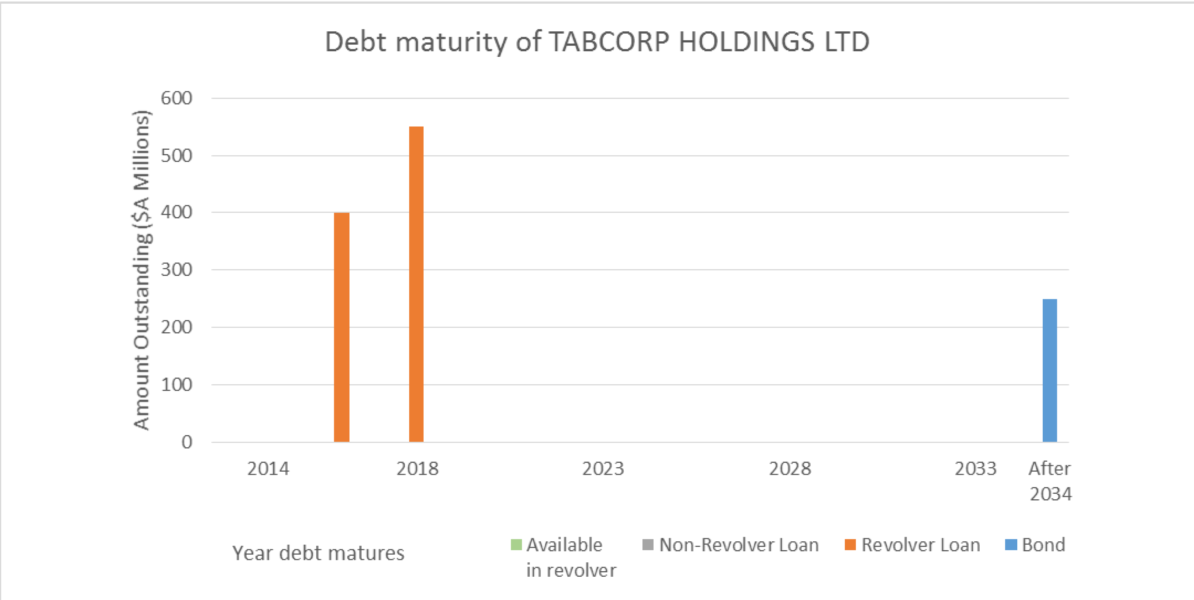




	Bond	Revolver loan	Non-revolver loan	Overall
Number	28	0	0	28
Amount Outstanding ($A Mn)	8,761.31	0.00	0.00	8,761.31
Weighted average debt term	5.22	N/A	N/A	5.22
Simple average debt term	5.38	N/A	N/A	5.38
Weighted average time to maturity	3.19	N/A	N/A	3.19
Simple average time to maturity	3.20	N/A	N/A	3.32

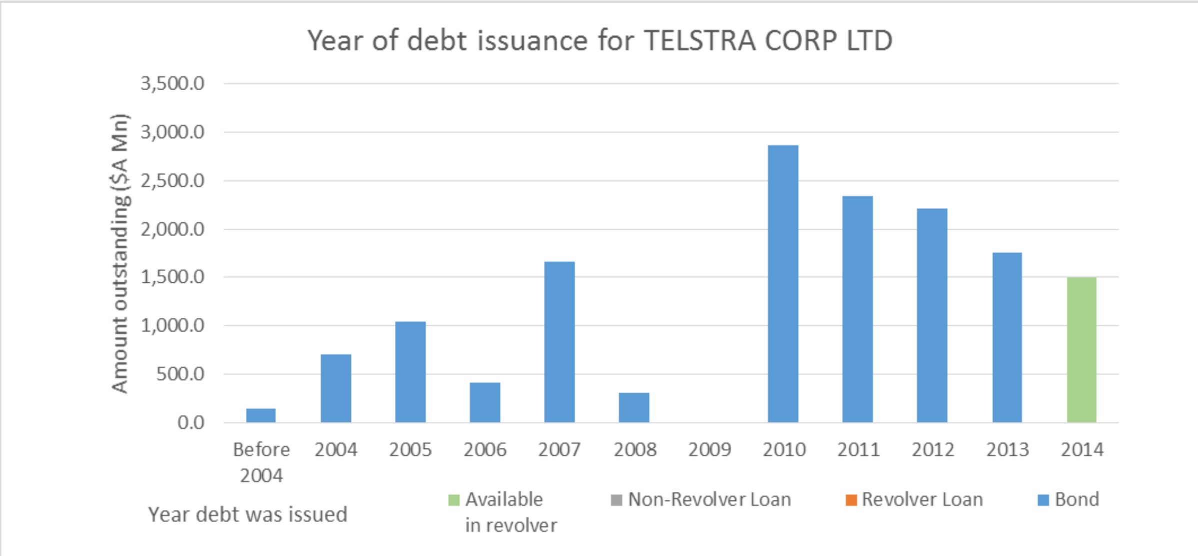
A.1.70 TABCORP HOLDINGS LTD

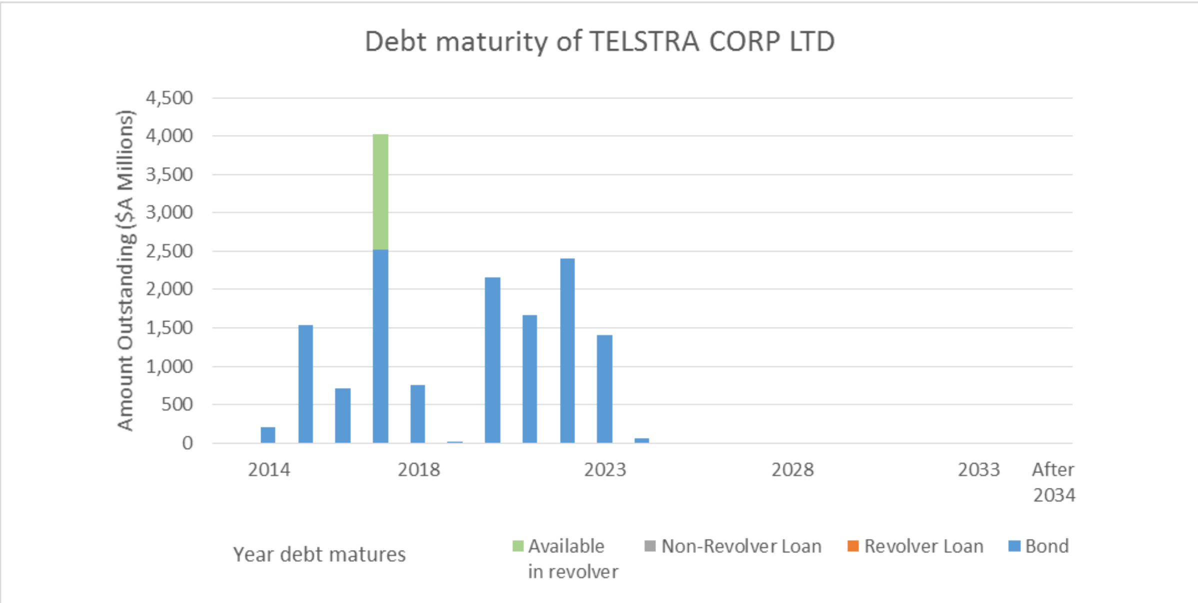




	Bond	Revolver loan	Non-revolver loan	Overall
Number	1	3	0	4
Amount Outstanding ($A Mn)	250.00	950.00	0.00	1,200.00
Weighted average debt term	25.00	4.89	N/A	9.08
Simple average debt term	25.00	4.91	0.00	9.93
Weighted average time to maturity	22.42	2.89	N/A	6.96
Simple average time to maturity	22.42	3.15	0.00	7.97

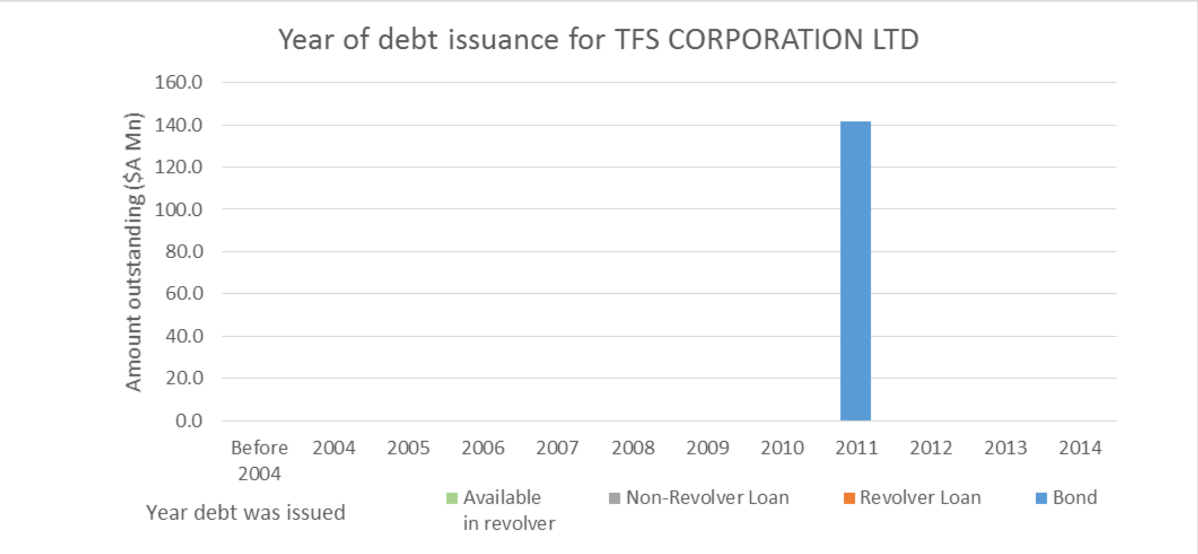
A.1.71 TELSTRA CORP LTD

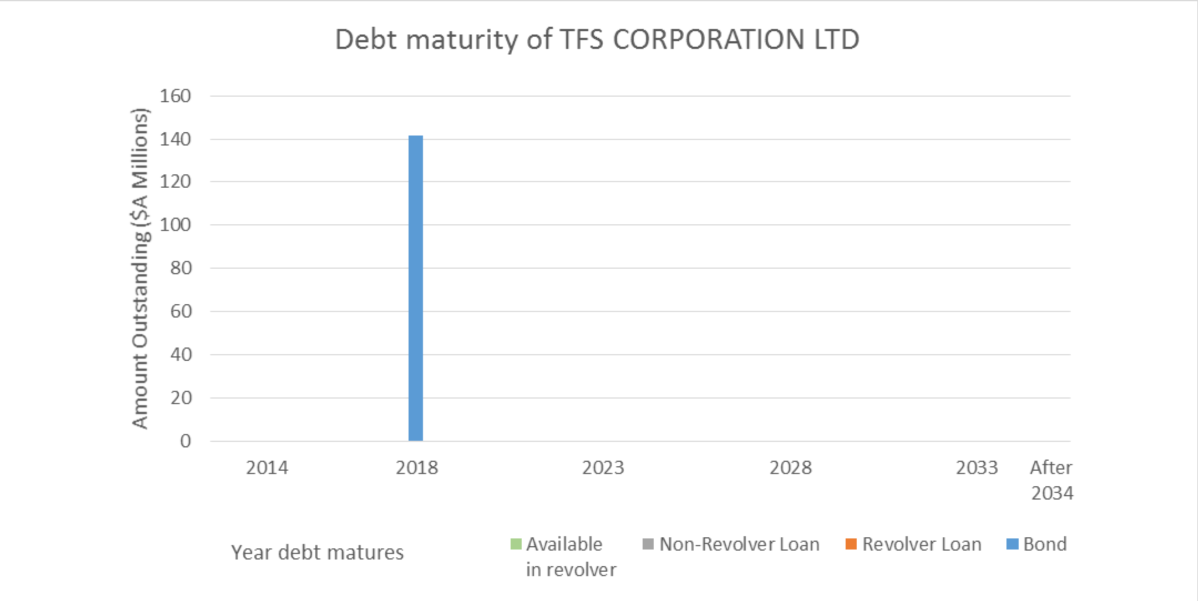




	Bond	Revolver loan	Non-revolver loan	Overall
Number	38	1	0	39
Amount Outstanding ($A Mn)	13,432.26	0.00	0.00	13,432.26
Weighted average debt term	9.82	N/A	N/A	9.82
Simple average debt term	13.55	3.00	0.00	13.28
Weighted average time to maturity	5.00	N/A	N/A	5.00
Simple average time to maturity	4.30	2.72	0.00	4.26

A.1.72 TFS CORPORATION LTD

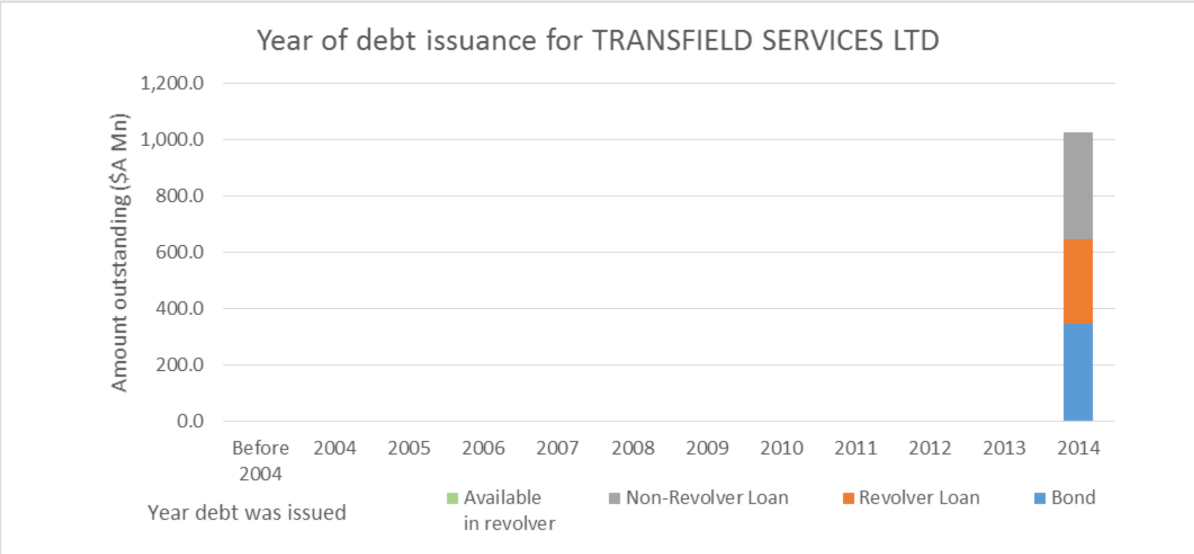


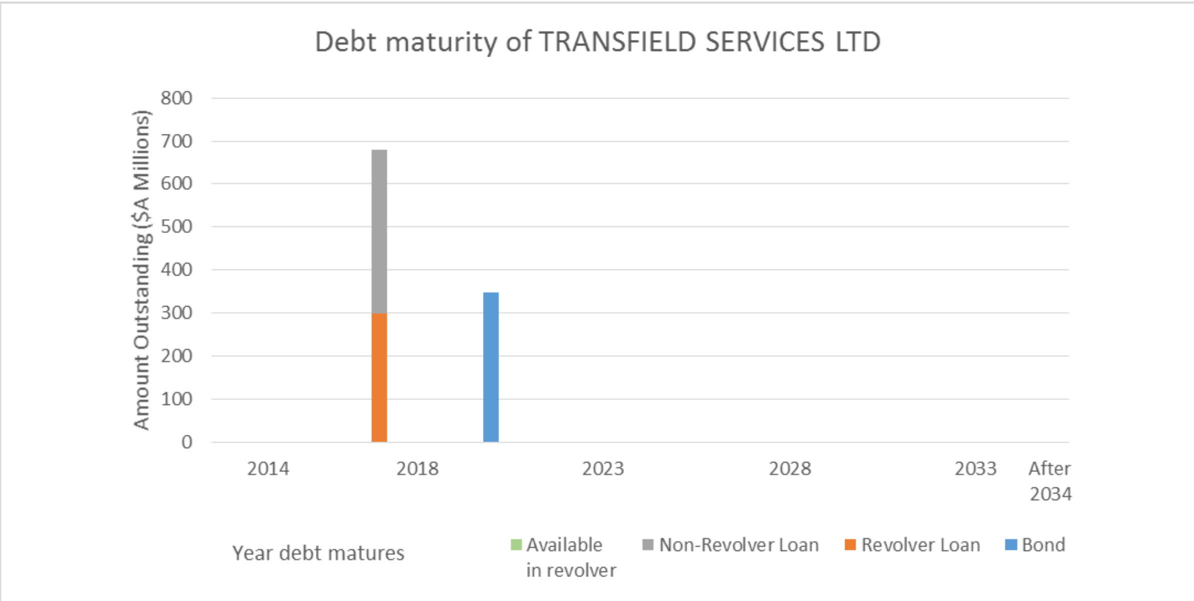


	Bond	Revolver loan	Non-revolver loan	Overall
Number	1	0	0	1
Amount Outstanding ($A Mn)	141.44	0.00	0.00	141.44
Weighted average debt term	7.07	N/A	N/A	7.07
Simple average debt term	7.07	N/A	N/A	7.07
Weighted average time to maturity	3.73	N/A	N/A	3.73
Simple average time to maturity	3.73	N/A	N/A	3.73

**TFS Corporation Ltd has a B credit rating and a low debt-to-equity ratio of 34.14%.*

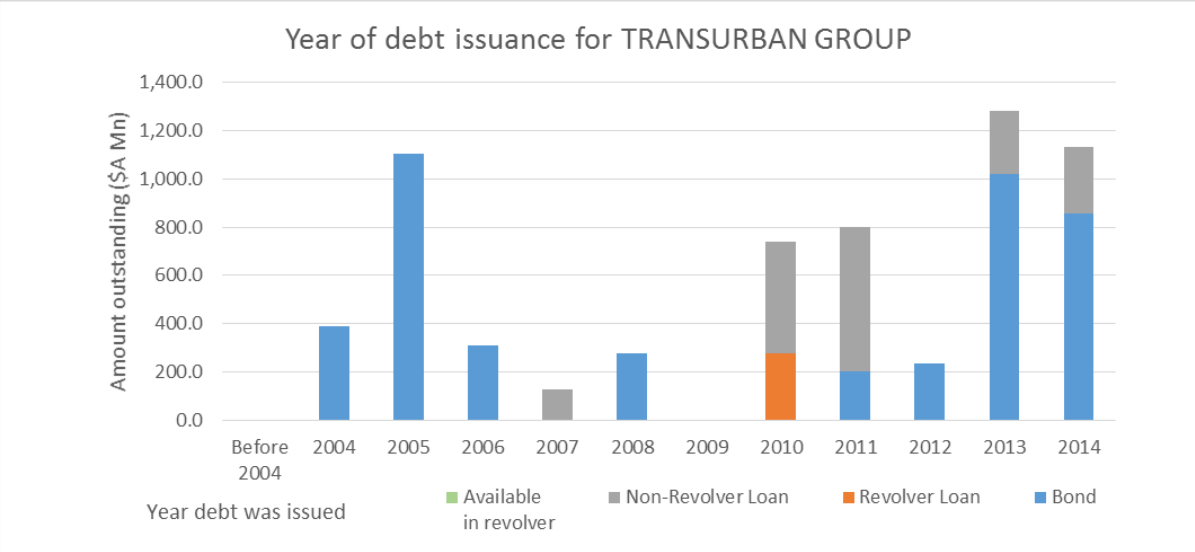
A.1.73 TRANSFIELD SERVICES LTD

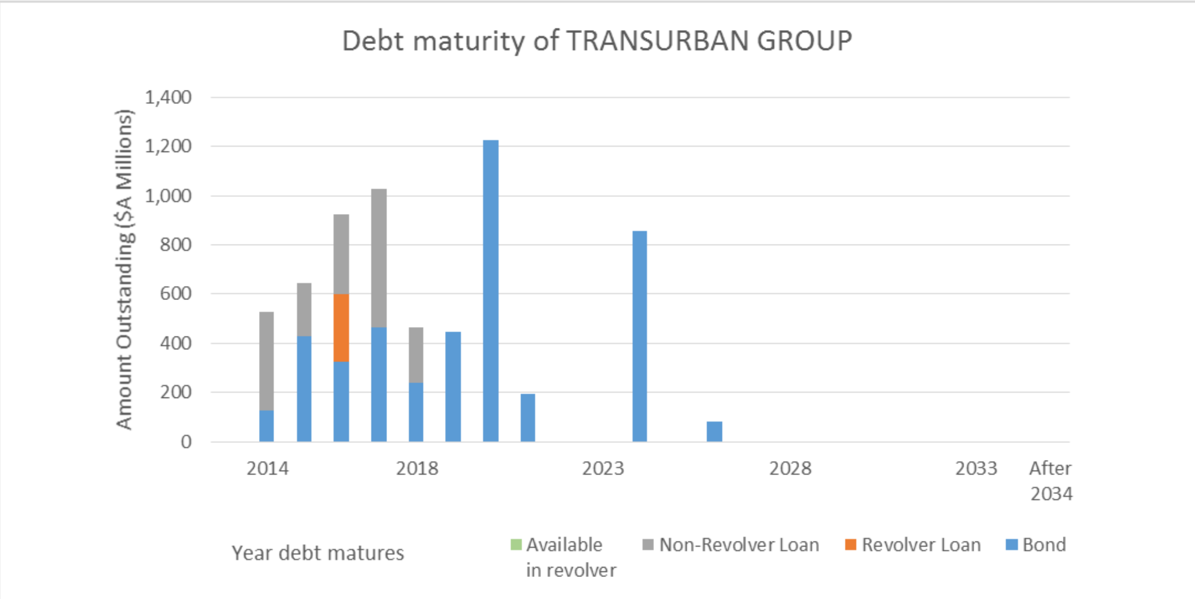




	Bond	Revolver loan	Non-revolver loan	Overall
Number	1	4	2	7
Amount Outstanding ($A Mn)	347.22	297.55	381.20	1,025.97
Weighted average debt term	6.01	3.13	3.13	4.11
Simple average debt term	6.01	3.13	1.57	3.54
Weighted average time to maturity	5.57	2.70	2.70	3.67
Simple average time to maturity	5.57	2.70	1.35	3.11

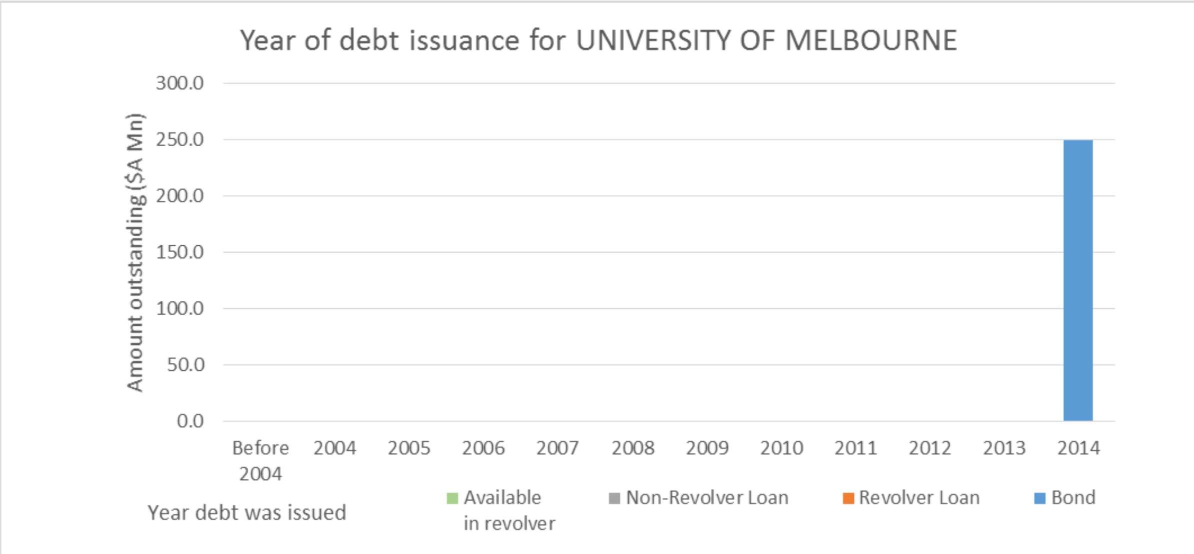
A.1.74 TRANSURBAN GROUP

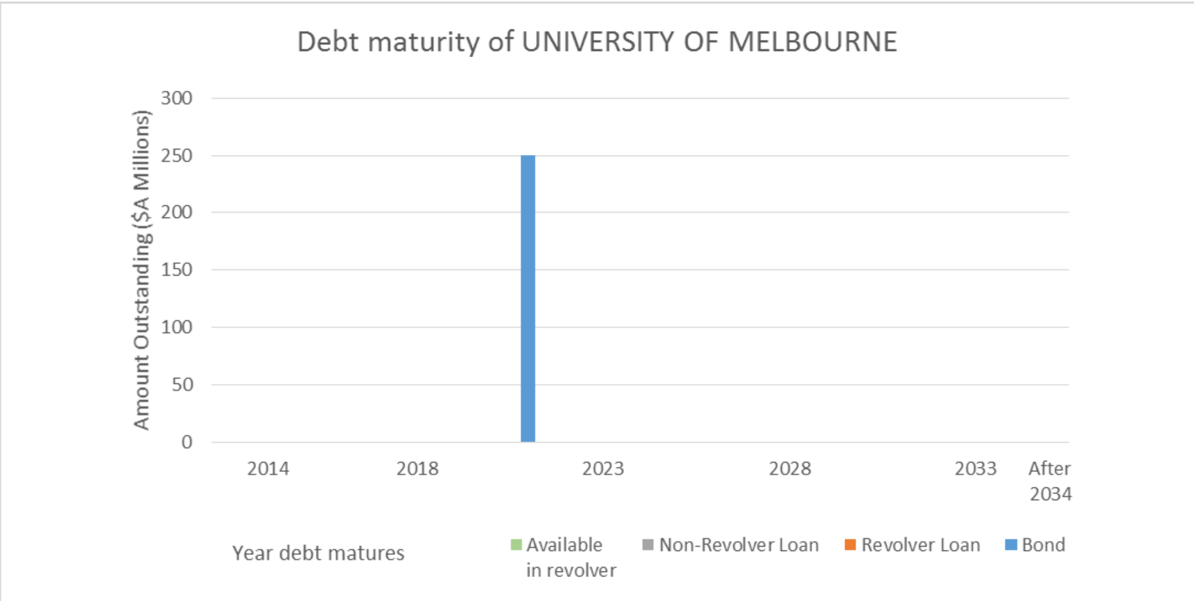




	Bond	Revolver loan	Non-revolver loan	Overall
Number	18	1	8	27
Amount Outstanding ($A Mn)	4,390.20	275.00	1,726.52	6,391.72
Weighted average debt term	10.03	6.00	4.61	8.39
Simple average debt term	11.13	6.00	41.46	9.18
Weighted average time to maturity	5.40	2.08	1.73	4.27
Simple average time to maturity	4.43	2.08	15.76	3.62

A.1.75 UNIVERSITY OF MELBOURNE

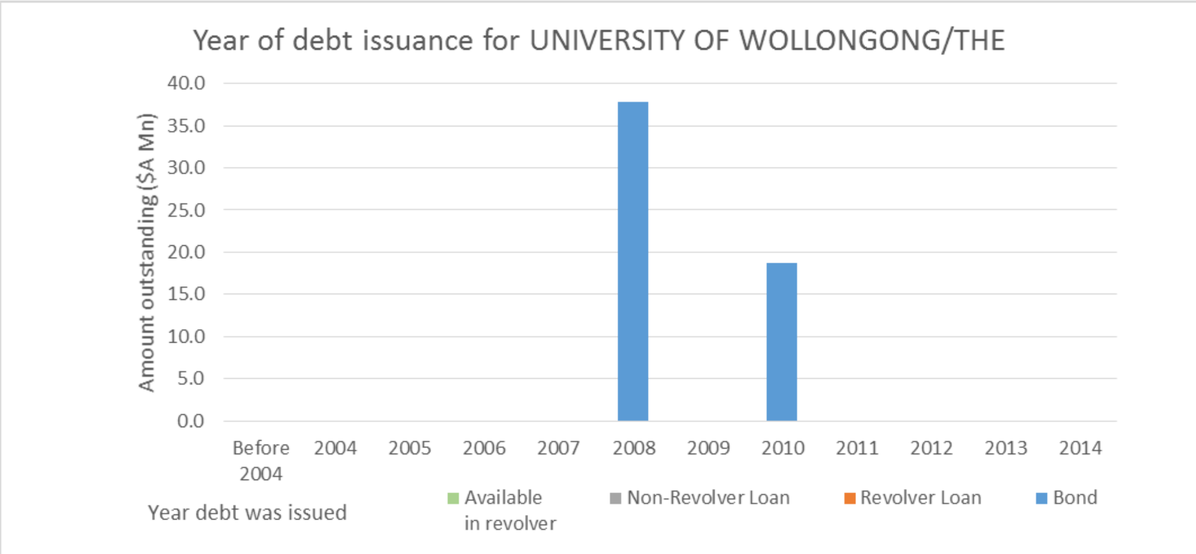


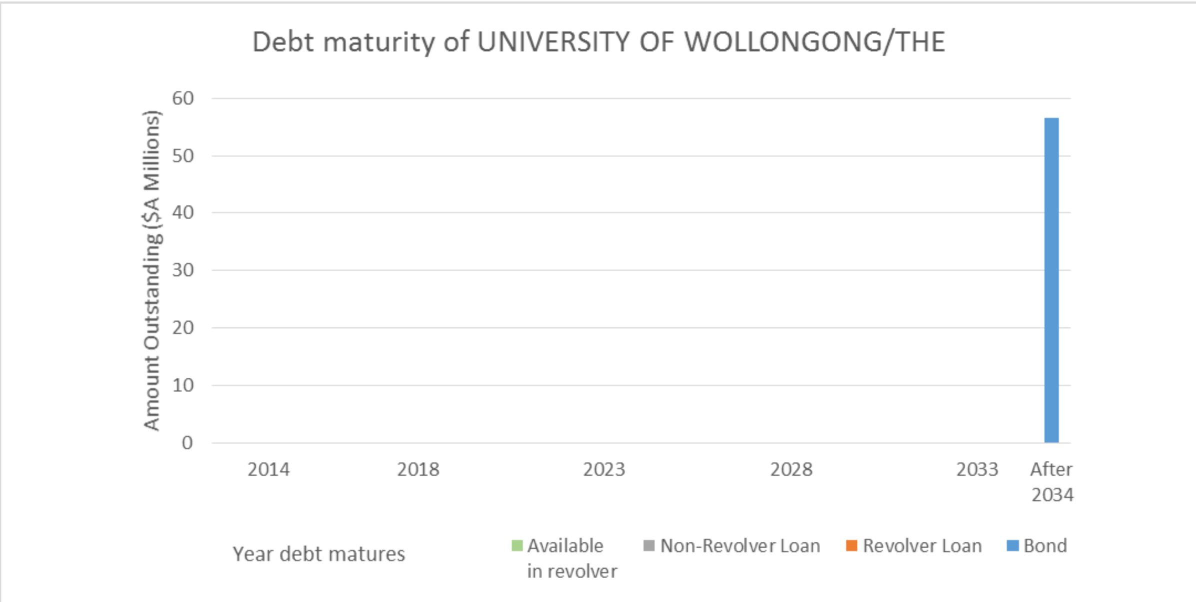


	Bond	Revolver loan	Non-revolver loan	Overall
Number	1	0	0	1
Amount Outstanding ($A Mn)	250.00	0.00	0.00	250.00
Weighted average debt term	7.00	N/A	N/A	7.00
Simple average debt term	7.00	N/A	N/A	7.00
Weighted average time to maturity	6.69	N/A	N/A	6.69
Simple average time to maturity	6.69	N/A	N/A	6.69

**University of Melbourne has a AA+ credit rating. No debt-to-equity ratio available.*

A.1.76 THE UNIVERSITY OF WOLLONGONG

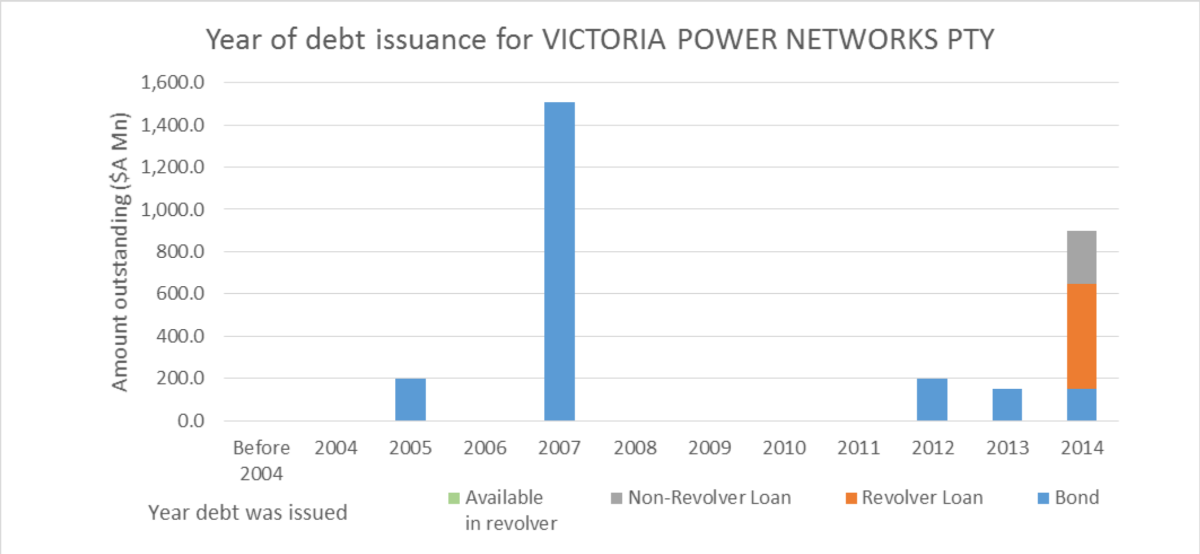


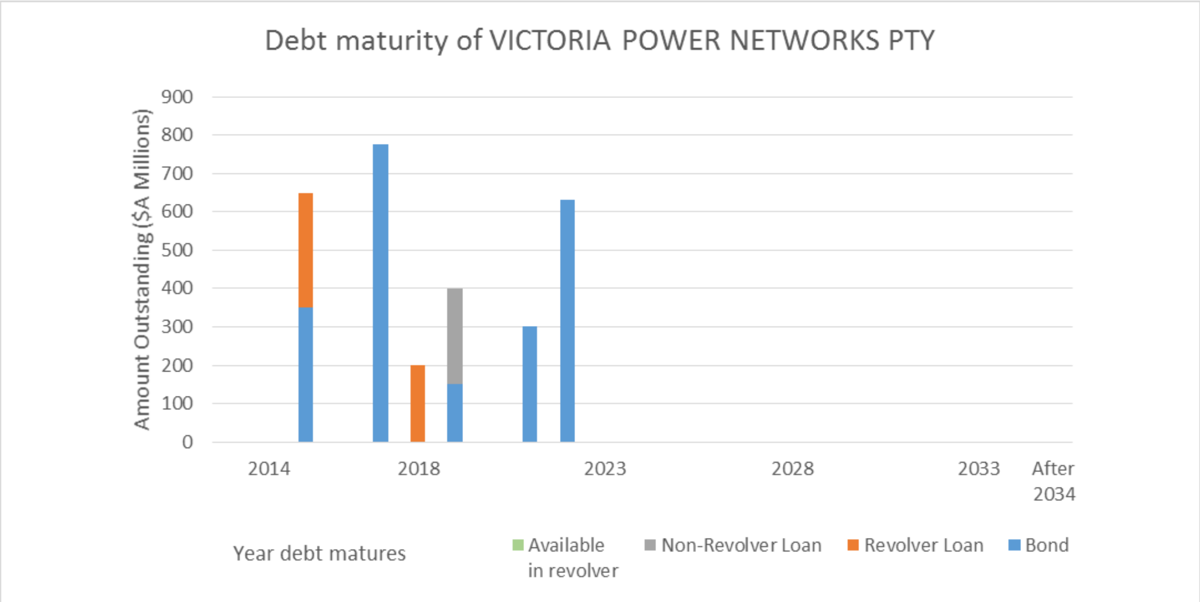


	Bond	Revolver loan	Non-revolver loan	Overall
Number	2	0	0	2
Amount Outstanding ($A Mn)	56.59	0.00	0.00	56.59
Weighted average debt term	28.34	N/A	N/A	28.34
Simple average debt term	27.50	N/A	N/A	27.50
Weighted average time to maturity	22.92	N/A	N/A	22.92
Simple average time to maturity	22.48	N/A	N/A	22.48

**One bond due in 2035 with A$ 18.78 million outstanding, and another due in 2038 with A$37.81 million outstanding.*

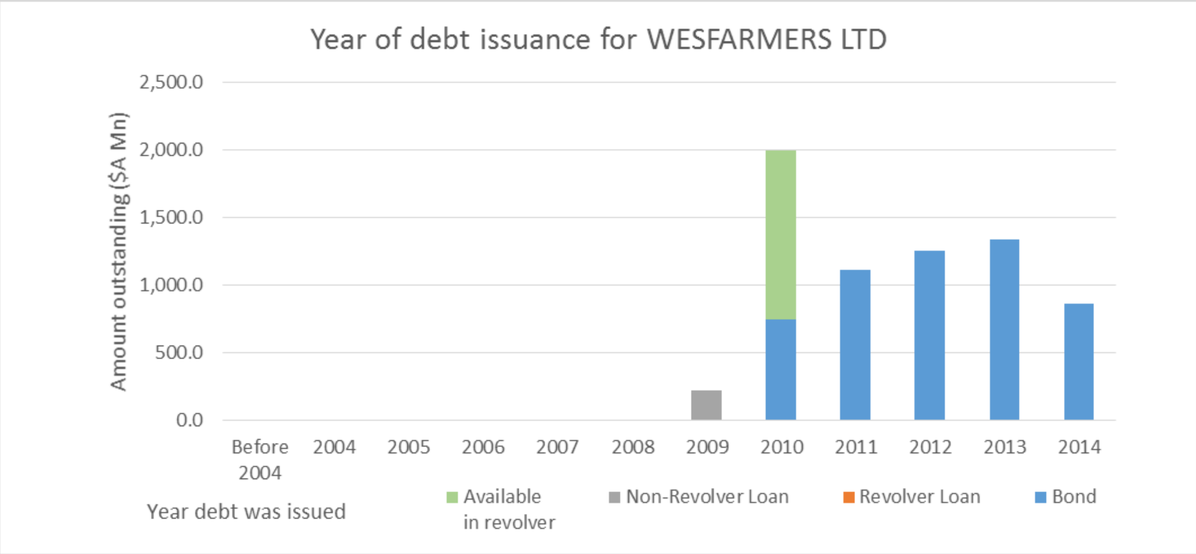
A.1.77 VICTORIA POWER NETWORKS PTY LTD

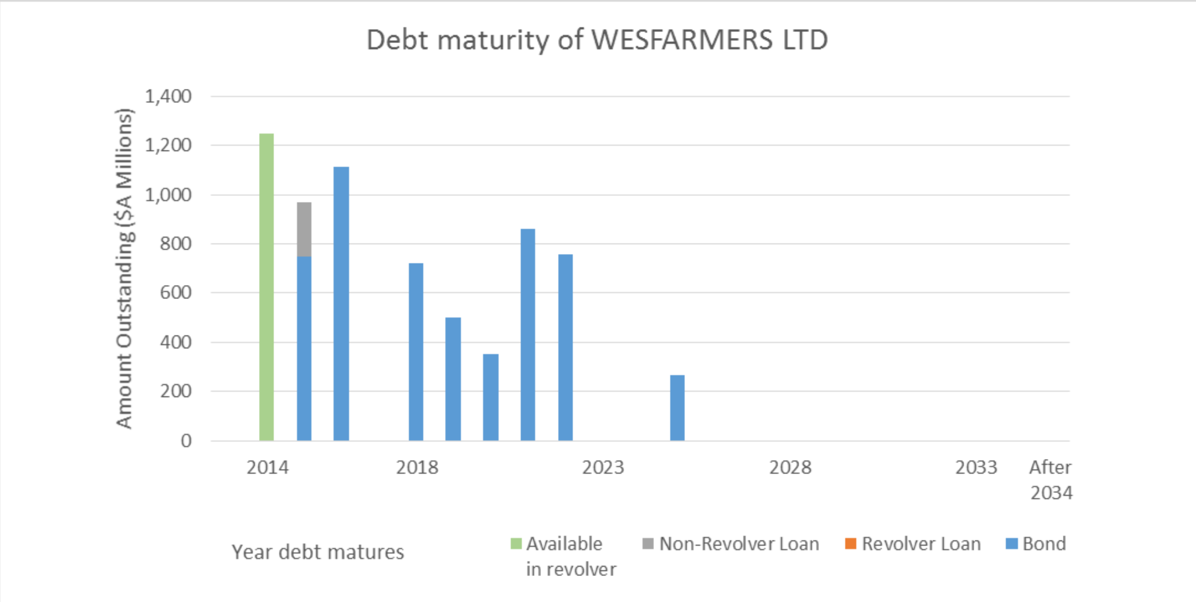




	Bond	Revolver loan	Non-revolver loan	Overall
Number	8	2	1	11
Amount Outstanding ($A Mn)	2,205.00	500.00	250.00	2,955.00
Weighted average debt term	10.65	2.55	5.00	8.80
Simple average debt term	9.02	2.79	2.50	7.52
Weighted average time to maturity	4.41	2.16	4.61	4.05
Simple average time to maturity	3.58	2.40	2.30	3.46

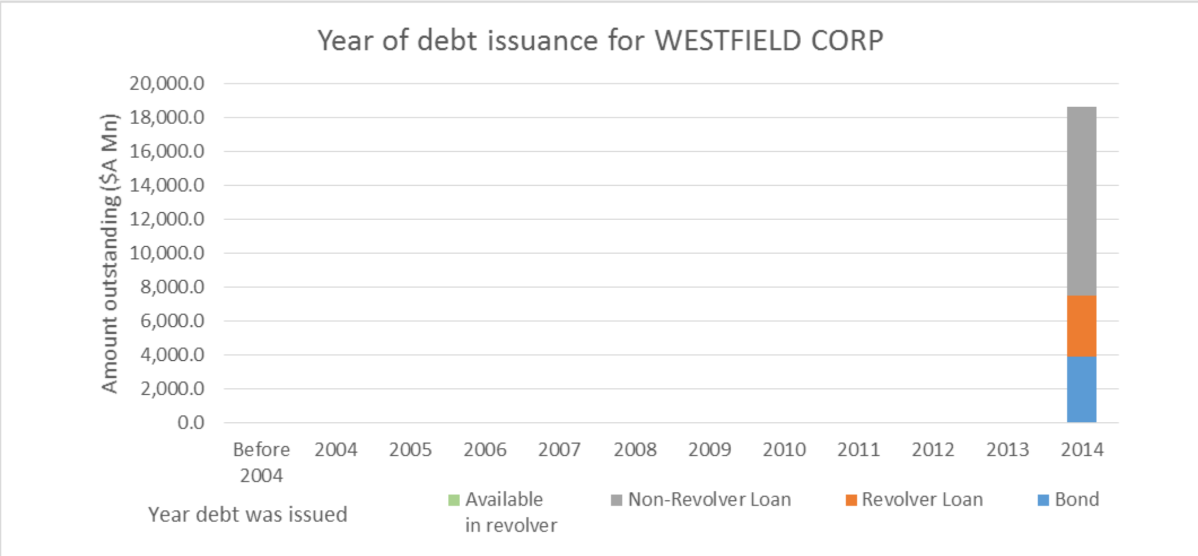
A.1.78 WESFARMERS LTD

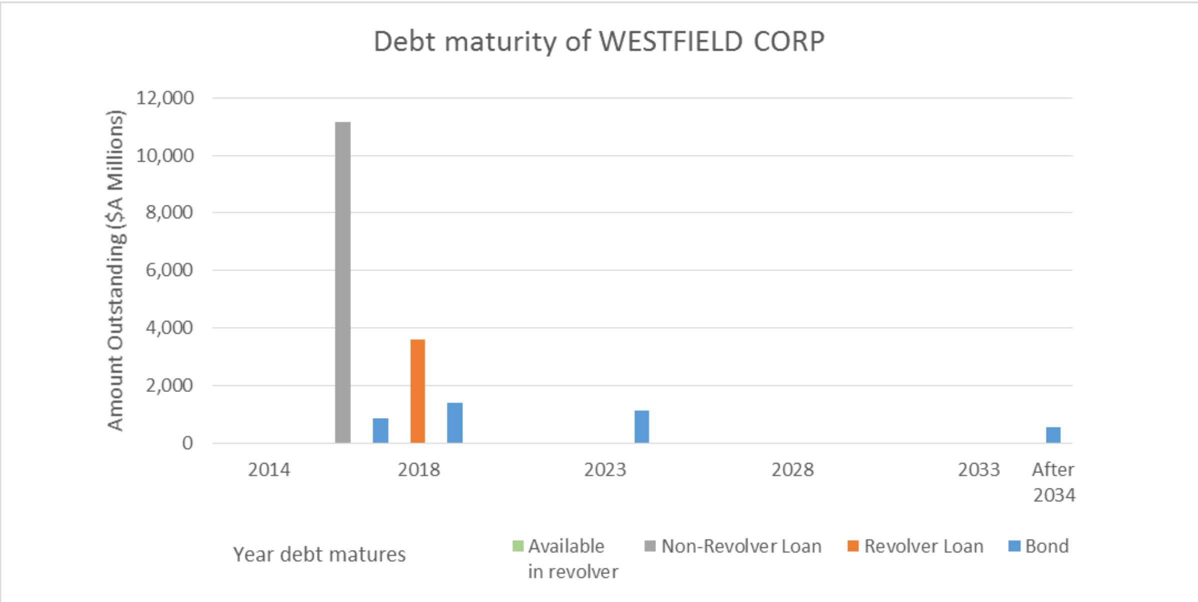




	Bond	Revolver loan	Non-revolver loan	Overall
Number	9	1	1	11
Amount Outstanding ($A Mn)	5,316.51	0.00	222.00	5,538.51
Weighted average debt term	6.76	N/A	6.00	6.72
Simple average debt term	7.04	4.02	6.00	6.67
Weighted average time to maturity	4.50	N/A	0.36	4.33
Simple average time to maturity	4.80	0.20	0.36	3.98

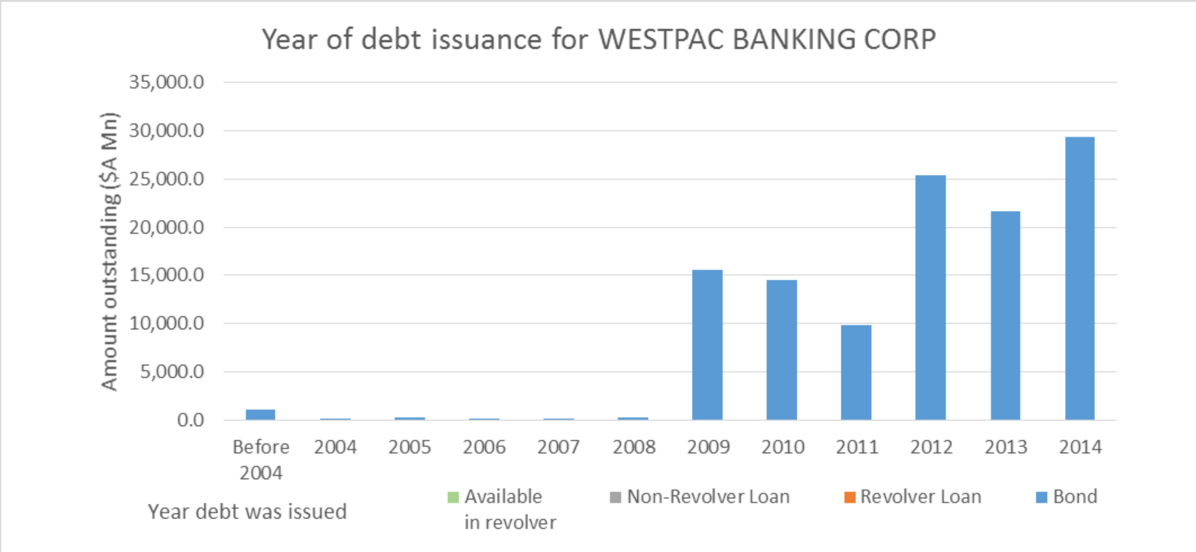
A.1.79 WESTFIELD CORP

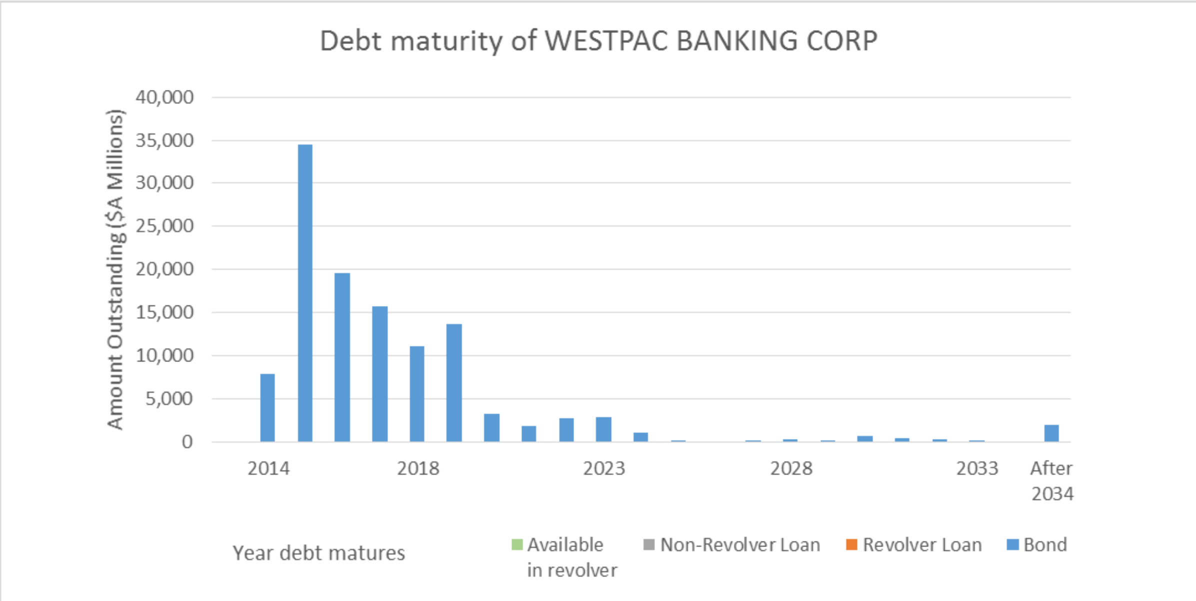




	Bond	Revolver loan	Non-revolver loan	Overall
Number	4	1	3	8
Amount Outstanding ($A Mn)	3,906.69	3,595.53	11,170.93	18,673.14
Weighted average debt term	9.57	4.00	2.00	3.97
Simple average debt term	12.00	4.00	6.00	7.25
Weighted average time to maturity	9.48	3.41	1.42	3.49
Simple average time to maturity	11.91	3.41	4.25	6.91

A.1.80 WESTPAC BANKING CORP

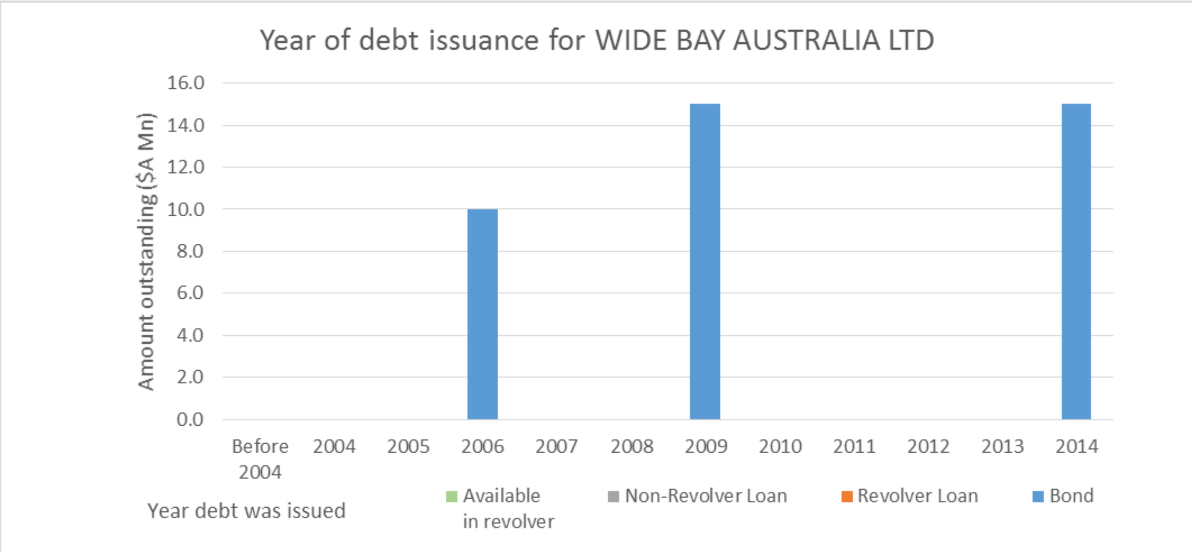


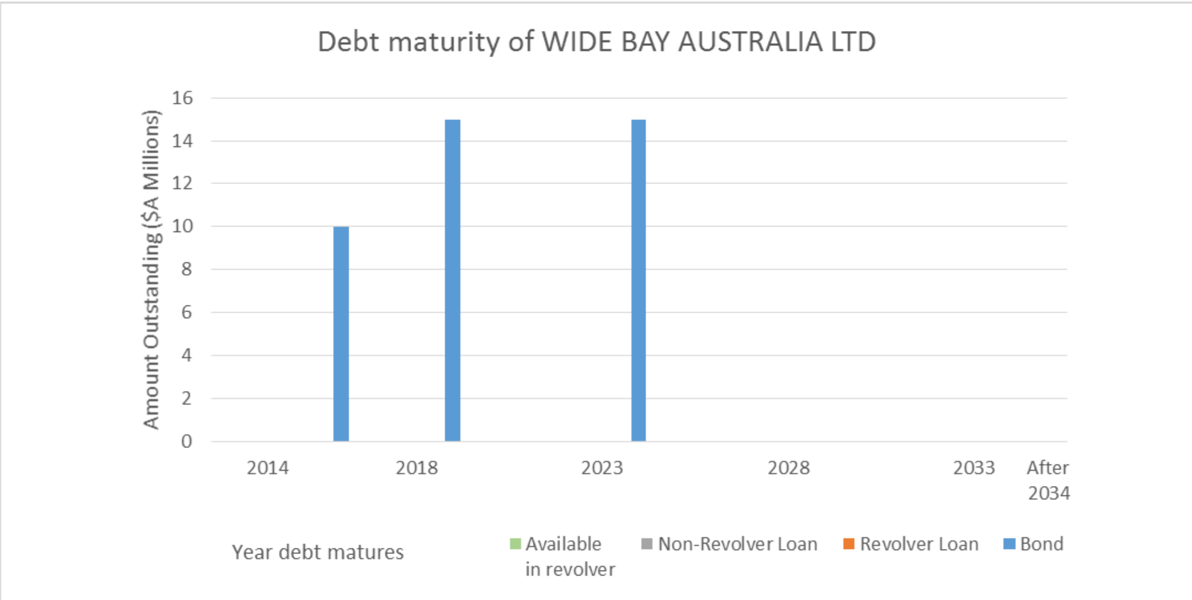


	Bond	Revolver loan	Non-revolver loan	Overall
Number	500	0	0	500
Amount Outstanding ($A Mn)	118,111.06	0.00	0.00	118,111.06
Weighted average debt term	5.65	N/A	N/A	5.65
Simple average debt term	8.93	N/A	N/A	8.93
Weighted average time to maturity	3.17	N/A	N/A	3.17
Simple average time to maturity	6.49	N/A	N/A	6.52

COMPETITION ECONOMISTS GROUP

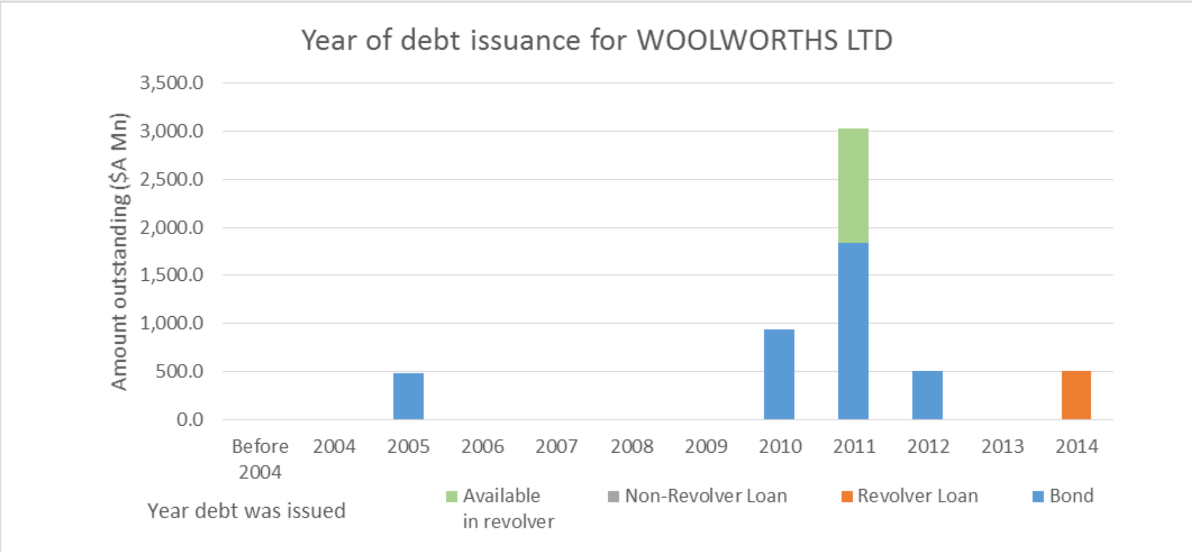
A.1.81 WIDE BAY AUSTRALIA LTD

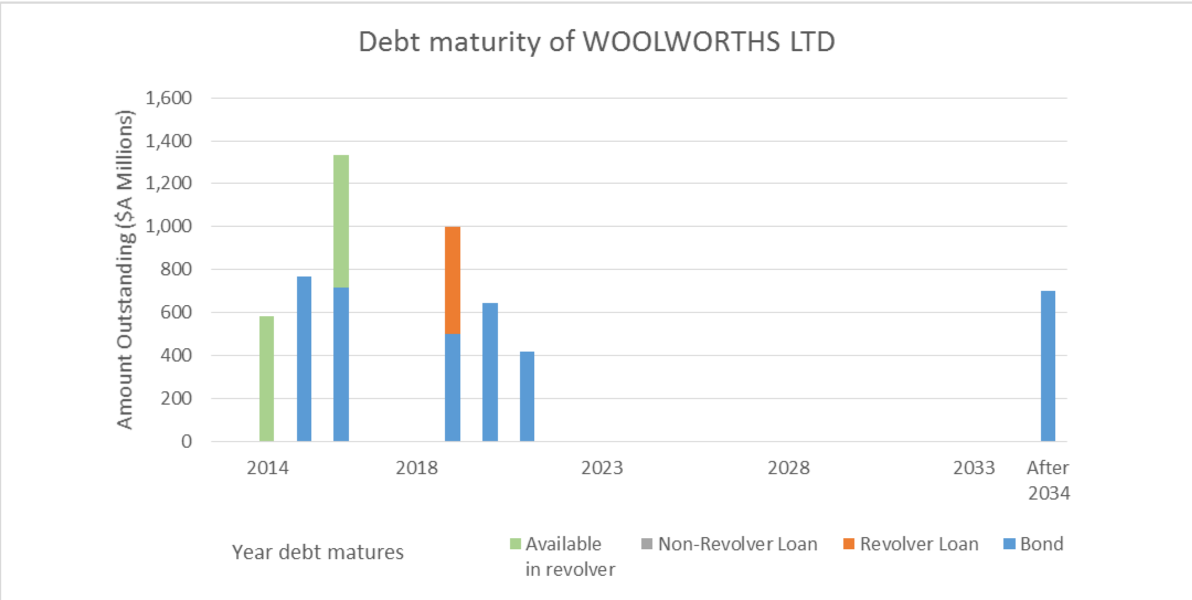




	Bond	Revolver loan	Non-revolver loan	Overall
Number	3	0	0	3
Amount Outstanding ($A Mn)	40.00	0.00	0.00	40.00
Weighted average debt term	10.00	N/A	N/A	10.00
Simple average debt term	10.00	N/A	N/A	10.00
Weighted average time to maturity	5.89	N/A	N/A	5.89
Simple average time to maturity	5.47	N/A	N/A	5.47

A.1.82 WOOLWORTHS LTD





	Bond	Revolver loan	Non-revolver loan	Overall
Number	8	3	0	11
Amount Outstanding ($A Mn)	3,748.38	500.00	0.00	4,248.38
Weighted average debt term	11.06	5.00	N/A	10.34
Simple average debt term	9.62	4.34	0.00	8.18
Weighted average time to maturity	6.94	4.87	N/A	6.70
Simple average time to maturity	5.48	2.30	0.00	4.61

**One bond due in 2036 with A$ 700 million outstanding.*

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Table 72: Measures of debt staggering for parent companies with at least one credit-rated debt

Parent company	Number	Max	Min	Range	WMAD	SSD
ACS ACTIVIDADES CONS Y SERV	16	8.07	0.03	8.03	2.12	1,346.97
AGL ENERGY LTD	5	24.63	0.16	24.47	9.66	2,599.64
ALINTA HOLDINGS	4	4.81	3.81	1.00	0.33	6,487.21
ALUMINA LTD	4	3.16	1.06	2.10	0.95	3,468.31
AMCOR LIMITED	5	8.42	0.80	7.61	1.61	3,120.70
AMP CAPITAL SHOPPING CENTRE	2	2.11	0.52	1.59	0.75	5,312.50
AMP CAPITAL WHOLESALE OFFICE	3	6.97	0.08	6.88	2.46	3,764.33
AMP LTD	23	9.16	0.11	9.05	2.04	672.64
APA GROUP	22	57.95	0.89	57.06	9.73	785.44
APN NEWS & MEDIA LIMITED	1	3.26	3.26	0.00	N/A	10,000.00
ARISTOCRAT LEISURE LTD	4	6.94	1.03	5.92	1.94	5,942.16
ATLAS IRON LTD	1	3.14	3.14	0.00	N/A	10,000.00
AURIZON HOLDINGS LTD	7	9.91	1.69	8.23	2.40	1,940.75
AUSDRILL LTD	4	5.03	0.96	4.07	2.04	3,900.02
AUSNET SERVICES	29	14.68	0.02	14.66	2.74	626.99
AUST AND NZ BANKING GROUP	448	29.35	0.00	29.34	3.60	112.84
AUST CENTRAL CREDIT UNION LT	2	0.42	0.15	0.27	0.13	5,200.00
AUSTRALIA PACIFIC AIRPORTS	8	9.99	1.15	8.84	3.12	2,435.61
AUSTRALIAN NATIONAL UNIVERSI	1	14.97	14.97	0.00	0.00	10,000.00
AUSTRALIAN PRIME PROPERTY FD	7	8.04	0.17	7.87	1.67	1,902.09
AUSTRALIAN UNITY GROUP SERVI	2	8.72	1.48	7.24	2.32	6,800.00
BAC HOLDINGS LTD	5	6.00	0.94	5.06	1.59	2,559.99
BANK OF QUEENSLAND LTD	21	8.17	0.08	8.08	1.72	1,091.82
BENDIGO AND ADELAIDE BANK	35	9.28	0.29	8.98	1.94	1,130.68
BIS INDUSTRIES GROUP LTD	7	4.45	1.48	2.97	0.61	2,223.39
BORAL LTD	2	5.34	2.09	3.24	N/A[13]	10,000.00
BROADCAST	4	4.72	0.88	3.84	0.50	3,863.76

[13] BORAL LTD has two debts – a bond with A$ 157.78 m outstanding, and a revolver loan of amount A$ 500 m, but $0 outstanding. The range statistic takes the revolver loan into account, but the WMAD and SSD assign no weight to it, which leads these two measures to conclude that no debt staggering had occurred.

AUSTRALIA FINANCE PT						
BROOKFIELD INFRASTRUCTURE PA	9	11.64	1.38	10.26	2.74	1,380.44
BWP TRUST	7	4.60	2.26	2.34	0.77	1,853.62
CALTEX AUSTRALIA LTD	2	22.90	4.09	18.81	6.33	6,632.65
CFS RETAIL PROPERTY TRUST GR	11	5.16	0.17	4.99	1.37	1,947.75
CLP HOLDINGS LTD	11	4.17	0.69	3.48	0.58	2,046.45
COCA-COLA AMATIL LTD	15	21.67	0.04	21.63	3.15	1,119.45
COMMONWEALTH BANK OF AUSTRAL	917	32.69	0.00	32.69	2.82	96.97
COMMONWEALTH PROPERTY OFFICE	4	8.15	1.39	6.76	1.46	3,083.38
CONSOLIDATED PRESS HOLDINGS	13	57.90	1.13	56.77	15.55	1,089.40
CREDIT UNION AUSTRALIA LTD	2	3.17	2.41	0.76	0.33	5,629.55
DEXUS WHOLESALE PROPERTY FUN	2	4.70	1.04	3.66	1.49	5,918.37
DUET GROUP	24	5.95	0.00	5.95	1.22	551.72
ELECTRANET PTY LTD	3	2.77	0.28	2.48	1.08	3,469.39
GENWORTH FINANCIAL INC-CL A	1	6.69	6.69	0.00	N/A	10,000.00
GOODMAN AUSTRALIA INDUSTRIAL	3	3.41	0.94	2.47	0.96	3,408.00
GPT WHOLESALE SHOPPING CENTR	1	3.07	3.07	0.00	N/A	10,000.00
GREATER BUILDING SOCIETY LTD	7	2.35	0.01	2.34	0.60	1,487.89
HSBC HOLDINGS PLC	33	11.45	0.26	11.19	1.39	3,102.66
IMB	2	7.69	6.91	0.78	0.35	5,555.56
INCITEC PIVOT LTD	5	5.14	1.13	4.01	1.68	4,240.27
INSURANCE AUSTRALIA GROUP	4	25.41	12.17	13.24	4.96	3,428.42
INVESTA OFFICE FUND	1	3.05	3.05	0.00	N/A	10,000.00
LOYVIC PTY LTD	1	2.69	2.69	0.00	N/A	10,000.00
MACQUARIE GROUP LTD	124	42.67	0.01	42.66	2.24	323.71
MEMBERS EQUITY BANK PTY LTD	5	9.86	0.37	9.49	3.12	2,449.97
MIRVAC GROUP	10	5.91	0.40	5.51	1.25	1,237.25
NATIONAL AUSTRALIA BANK LTD	388	29.58	0.01	29.58	3.26	100.71
NEWCASTLE PERMANENT	2	0.57	0.41	0.15	0.08	5,000.00

BUILDING						
NEWCREST MINING LTD	14	27.07	2.24	24.84	4.69	917.16
NEXTGEN NETWORKS PTY LTD	2	6.61	4.61	2.00	0.39	8,035.85
NUFARM LTD	5	4.99	0.09	4.90	1.45	3,719.13
ORIGIN ENERGY LTD	15	59.91	2.84	57.07	18.36	1,094.99
PERTH AIRPORT DEVELOPMENT GR	5	6.43	2.06	4.37	1.56	2,520.61
QANTAS AIRWAYS LTD	12	7.58	0.49	7.09	2.18	1,135.35
QBE INSURANCE GROUP LTD	5	26.59	0.94	25.65	12.32	2,710.02
QPH HOLD TRUST	6	6.71	1.11	5.60	1.74	2,198.30
SA POWER NETWORKS	5	4.99	0.73	4.25	1.16	2,126.20
ST BARBARA LTD	3	3.49	2.20	1.29	0.49	5,895.70
STOCKLAND	6	11.01	0.33	10.67	3.06	2,084.96
SUN GROUP FINANCE PTY LTD	5	4.70	1.70	3.00	0.95	2,694.71
SUNCORP GROUP LTD	28	12.65	0.02	12.63	2.47	671.96
TABCORP HOLDINGS LTD	4	22.42	1.62	20.80	6.44	2,812.50
TELSTRA CORP LTD	39	9.76	0.04	9.72	2.45	708.08
TFS CORPORATION LTD	1	3.73	3.73	0.00	0.00	10,000.00
TRANSFIELD SERVICES LTD	7	5.57	2.70	2.87	1.29	2,290.21
TRANSURBAN GROUP	27	12.07	0.08	11.99	2.61	581.20
UNIVERSITY OF MELBOURNE	1	6.69	6.69	0.00	N/A	10,000.00
UNIVERSITY OF WOLLONGONG/ THE	2	23.79	21.17	2.62	1.16	5,565.37
VICTORIA POWER NETWORKS PTY	11	7.24	1.07	6.17	2.06	1,110.88
WESFARMERS LTD	11	10.89	0.20	10.69	2.55	1,144.76
WESTFIELD CORP	8	29.91	1.42	28.50	2.56	1,776.48
WESTPAC BANKING CORP	500	29.95	0.00	29.95	2.48	100.41
WIDE BAY AUSTRALIA LTD	3	9.65	2.09	7.56	2.81	3,437.50
WOOLWORTHS LTD	11	22.10	0.02	22.08	5.07	1,214.20
SGSP AUSTRALIA ASSETS PTY LTD	17	8.47	0.81	7.66	2.37	2,435.61

COMPETITION ECONOMISTS GROUP

The AER's current interpretation of the ARORO

Dr. Tom Hird

September 2016

COMPETITION
ECONOMISTS
GROUP

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Executive summary

1. The allowed rate of return objective (ARORO) in r6A.6.2 (for electricity transmission service providers)[1] states:

> *The allowed rate of return objective is that the rate of return for a Transmission Network Service Provider is to be commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the Transmission Network Service Provider in respect of the provision of prescribed transmission services*

The AER's pre 2016 interpretation

2. Prior to 2016 the AER had interpreted the ARORO as requiring that the allowed rate of return is commensurate with the financing costs that a benchmark efficient entity, following an efficient debt management strategy, would actually incur. It was on this basis that the AER's rate of return guideline considered that adopting a trailing average was consistent with the ARORO.[2]

   - *We consider that holding a portfolio of debt with staggered maturity dates is likely* ***an efficient debt financing practice of the benchmark efficient entity*** *operating under the trailing average portfolio approach.*

   - *We consider that the regulatory return on debt allowance under the trailing average portfolio approach is,* ***therefore****, commensurate with the efficient debt financing costs of the benchmark efficient entity.* [Emphasis added.]

3. That is, the AER took the view that because businesses could efficiently fund themselves following a trailing average debt management strategy the adoption of the trailing average was consistent with the ARORO.

4. Similarly, the AER has previously used the same interpretation of the ARORO (i.e., interpreting 'efficient financing costs' as relating to an efficient debt management practice) to justify applying a transition to a trailing average. This was on the basis that the AER believed a benchmark efficient debt management strategy for the (assumed to be regulated) benchmark efficient entity (BEE) would have been to use

[1] The ARORO is effectively the same for electricity distribution and gas service providers.

[2] AER, Better Regulation | Explanatory Statement | Rate of Return Guideline, December 2013, , p. 102.

interest rate swaps to reset 100% of its base interest costs at the beginning of each regulatory period.[3]

5. On this basis the AER rejected the immediate adoption of a historical trailing average (immediate transition), the AER stated that such a transition:[4]

> *...does not approximately match the allowed return on debt with* ***the efficient financing costs of a benchmark efficient entity*** *over the 2016–20 period* ***as it transitions its financing practices to the trailing average approach****. Given a benchmark efficient entity will already have financing practices in place it entered into in the past, it needs time to unwind these practices and gradually adopt practices that match the trailing average approach.* [Emphasis added.]

6. That is the AER believed that compensating for historical average base rates of interest would not be commensurate ("approximately match") with the efficient financing costs of a benchmark efficient entity (as defined by it) whom it believed would have used interest rate swaps to reset its base rate of interest.

Our interpretation

7. Our interpretation is, at least at the high level, the same as the AER's pre 2016 interpretation. That is, the plain economic interpretation is that efficient (debt) financing costs of a BEE referred to in the ARORO related to the costs a BEE would incur following a benchmark efficient debt management strategy. We differed with the AER primarily on the issue of:

   - whether the BEE is a regulated entity; and
   - even if the BEE is a regulated entity, whether BEE would have used swap rates in the manner argued by the AER to reset 100% of its base rate every year; and
   - whether it was reasonable for the AER to ignore the historically incurred debt risk premium costs that a BEE could not have reset at each regulatory reset.

The AER's 2016 interpretation of the ARORO

8. The AER's new interpretation of the ARORO is encapsulated in the below quote from AusNet Services' electricity *distribution* final decision.

[3] AER, preliminary decision, AusNet electricity distribution, October 2015, p. 3-185 to 3-186.

[4] AER, preliminary decision, AusNet electricity distribution, October 2015, p. 3-165.

> *"We do not consider a benchmark efficient entity's past financing practices determine its efficient financing costs..."*[5]

9. Notably this direct language is not repeated in AusNet Services' draft electricity *transmission* decision – although the interpretation is the same. The AER's new interpretation is that "efficient financing costs" have nothing to do with how a business would actually efficiently finance itself.

10. The AER's new view is that the ARORO requires an interpretation of efficient financing costs as being the rates prevailing at the beginning of a regulatory period. The AER states that the use of prevailing rates in this fashion will satisfy the NPV=0 criteria whereby the present value of cash-flows (*before* efficiently incurred debt financing costs are removed) will be equal to the statutory value of the RAB. The AER defines this criterion as synonymous with the ARORO.[6] This position is most clearly stated as set out in the following quote:[7]

> *We note that given the ARORO is standalone, the ARORO will be achieved if the present value of expected return on (and of) capital cash flows equal the start-of-period opening RAB.*

Critique of the AER's 2016 interpretation

11. We do not believe that that AER's 2016 interpretation is consistent with a reasonable economic interpretation of the ARORO. The AER's change in interpretation is not explicitly conceded and, consistent with that, is not explained. The AER does attempt to provide a rationale for its new interpretation (as opposed to an explanation for its change in interpretation). We consider that this rationale is flawed. In support of this view we note:

    - The AER's new interpretation relies on treating the ARORO as synonymous with what the AER, and its new experts (Partington and Satchell), describe as the "zero NPV investment criterion". However, there is not a single unique version of the zero NPV investment criterion. Indeed, the AER's pre 2016 interpretation of the ARORO was justified as consistent with a different form of "the" zero NPV investment criterion – one which required compensation to match efficient costs of an efficient debt management strategy. Indeed, Lally's advice wat the use of prevailing rates to compensate a business violated this version of "the" NPV=0 criterion.

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5 AER, SP AusNet, Final Electricity Distribution Determination, 3-316. .

6 See AER, AusNet Draft Transmission Determination, p. 3-95 first paragraph under the heading "Approaches that contribute to the achievement of the ARORO".

7 AER, AusNet Draft Transmission Determination, p. 3-278.

- The AER does not acknowledge that the pre 2016 interpretation was supported by a different NPV=0 criterion. Rather, the AER proceeds 'as if' there is only one version and, therefore, only one regulatory policy that is consistent with it (the use of prevailing rates). This substitution of (a version of) the NPV=0 criterion for the ARORO leads to a failure to properly grapple with the important economic issues of interpretation. These issues are discussed in section 3.
- Apart from relying on (the new version of) the NPV=0 criterion as paramount when interpreting the ARORO, the only other justifications provided for the new interpretation are that:
  - The market for capital finance is competitive and, therefore, the regulator should compensate based on prevailing rates; and
  - The AER considers that economic efficiency is advanced by having sole reliance on prevailing rates when compensating for the cost of debt.

  The first of these is a non-sequitur. In our view, there is no reason to infer that the existence of competitive financial markets implies the AER's (new) interpretation of the ARORO is appropriate. The second of these relies on a premise that we strongly disagree with as a matter of economic analysis. In fact, compensating based on the basis of costs incurred under an efficient debt management strategy will best promote efficient investment. However, even if it were the case that setting compensation purely based on prevailing rates promoted economic efficiency, it is not obvious that this is relevant to the ARORO which requires compensation to be commensurate with "efficient financing costs" not "efficient financing incentives". These issues are discussed in section 4.

- If the AER was correct that the sole reliance on prevailing rates when setting compensation promoted economic efficiency then this might imply that there is a tension between the National Electricity Objective's (NEO's) focus on promoting efficient incentives and ARORO's focus of compensating based on efficient costs. However, in our view the AER is not correct with respect to the promotion of efficient incentives and there is no tension between the NEO and the ARORO. (Moreover, given the AER is proposing to transition to a trailing average then, on its logic, the end point of its transition would be inconsistent with both the NEO and the ARORO). These issues are discussed in section 5.
- The AER has also inconsistently applied its new interpretation of the ARORO. In particular, the AER slips between its new and old interpretations when discussing: how its proposed transition is NPV=0; why it is adopting a trailing average in the long run; and why it adopts a 10 year term for the cost of debt. These issues are discussed in section 6.
- The AER also relies in places on a number of other analytical/factual statements that we consider are clearly wrong or without foundation. These are discussed in Section 8.

12. Finally we note that under both our and the AER's pre 2016 interpretation of the ARORO one must determine what the benchmark debt management strategy of the BEE is. The answer to this may be different depending on whether the BEE is deemed to be regulated or not. Section 9 addresses some facts relevant to an assessment of an unregulated BEE' debt management strategy.

1 Introduction

13. I have been asked by Johnson Winter & Slattery to provide a report advising on the AER's interpretation of the ARORO in the AER's recent Draft Decision for AusNet Services transmission determination.

14. The remainder of this report has the following structure:

- Section 2 provides CEG's economic interpretation of the ARORO and contrasts the AER's/AER's experts' previous interpretation of the ARORO with the AER's new interpretations of the ARORO;
- Section 3 contrasts the AER's/AER's experts' previous interpretation of the NPV=0 criterion with the AER's new (and AER's new expert's) interpretation of the NPV=0 criterion;
- Section 4 explores how the AER justifies its new interpretation of the ARORO;
- Section 5 explores whether there is any tension between the NEO and the ARORO;
- Section 6 describes the inconsistent application of the AER's new interpretation of the ARORO
- Section 7 discusses potential inconsistencies in the AER's approach to ARORO and other requirements/objectives in the NER/NEL;
- Section 8 provides a critique of other statements the AER relies on to justify the continued use of 100% weight to prevailing estimates of the cost of debt; and
- Section 9 provides a discussion of facts relevant to any assessment of the debt management strategy for an unregulated BEE.

15. I acknowledge that I have read, understood and complied with the Federal Court of Australia's Practice Note CM 7, "Expert Witnesses in Proceedings in the Federal Court of Australia". I have made all inquiries that I believe are desirable and appropriate to answer the questions put to me. No matters of significance that I regard as relevant have to my knowledge been withheld.

Thomas Nicholas Hird

COMPETITION ECONOMISTS GROUP

2 Contrasting the AER's old and new interpretation of the ARORO

16. The allowed rate of return objective (ARORO) in r6A.6.2 (for electricity transmission service providers)[8] states:

> *The allowed rate of return objective is that the rate of return for a Transmission Network Service Provider is to be commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the Transmission Network Service Provider in respect of the provision of prescribed transmission services*

2.1 CEG's plain economic interpretation of the ARORO

17. In our view, the natural economic meaning of the ARORO's reference to *the efficient financing costs of a benchmark efficient entity* is a reference to a 'financing cost' that has been, or is forecast to be, incurred by a "*benchmark efficient entity*".[9] Given that the AER's previous interpretation, as outlined in the previous section, shared this same premise, we consider that the AER's interpretation was correct (at least in this respect).

18. The instruments by which efficient financing takes place are, broadly speaking:

- Debt instruments. All parties, the AER included, believe that a BEE efficiently raises debt finance by issuing debt contracts with staggered issue date/maturity and where the contracts involve a legally binding promise to pay a fixed nominal rate of return over a maturity horizon of around 10 years;
- Equity instruments which have no contractually fixed/promised rate of return.

19. Efficient financing costs incurred by a BEE will reflect the weighted average cost of these instruments. The cost of the debt financing incurred by a BEE reflects the average interest rate paid on debt contracts that a BEE has efficiently entered into in order to fund the RAB and these will reflect, at least in part, investors' required returns at the time that funding contract was entered into. The cost of equity financing does not involve any binding historically entered into nominal contractual

8 The ARORO is effectively the same for electricity distribution and gas service providers.

9 Equivalently, a 'financing cost' is an amount that must be paid to investors in return for the use of their capital to fund an investment (and any subsequent refinancing of that investment). In the current context, that is the *historical investments* that are reflected in the statutory value of the RAB. The RAB reflects the accrued value of all past investment that have yet to be returned to investors via regulatory depreciation.

payments to equity investors and, therefore, can be presumed to reflect the prevailing rate of return required by equity investors at any given time.

20. Our interpretation was broadly the same as the AER's. We differed with the AER primarily on the issue of:

- whether the BEE is a regulated entity; and
- even if the BEE is a regulated entity, whether the BEE would have used swap rates in the manner argued by the AER to reset 100% of its base rate every year; and
- whether it was reasonable for the AER to ignore the historically incurred debt risk premium costs that a BEE could not have reset at each regulatory reset.

2.1.1 Implementing the ARORO

21. In our view, there are two distinct steps involved in estimating the return on debt (cost of debt) for any entity – including the 'benchmark efficient entity' envisaged in the ARORO. The basis for this conclusion is the view that, before one can embark on an estimation process, one must define what it is that is being estimated. To define what is being estimated, it is necessary to:

- define a financing strategy for a *"benchmark efficient entity with a similar degree of risk as that which applies to the service provider in respect of the provision of reference services"*; and
- estimate the *"efficient financing costs"* of implementing that strategy.

22. The second step cannot proceed without the first step.

23. Once a benchmark efficient debt management strategy is defined, the next step is to estimate the financing costs associated with that strategy. This step requires the collection and analysis of financial market price/yield information relevant to determining the costs incurred in implementing the benchmark efficient financing strategy at the relevant times. This step focuses on data collection, interpretation and manipulation, to arrive at an estimate of the costs of implementing the benchmark efficient strategy defined in the first step. Relevant decisions that must be made are:

- whether and how to use third party estimates of the yields on broad categories of corporate debt. This might include estimates of the yields on bonds of particular maturities/credit ratings, as published by Bloomberg, RBA, and Reuters;
- whether and how to use third party estimates of the yield on specific debt instruments (e.g., a specific bond issued company "X", another bond issued by company "Y", etc.); and
- what sources for these data should be used and what, if any, differential weighting should be applied to the data sources.

24. The ARORO envisages that:

- it is possible to define a *"benchmark efficient entity with a similar degree of risk as that which applies to the service provider in respect of the provision of reference services"*;
- *"efficient financing costs"* for that entity can be estimated; and
- the service provider should receive compensation that is *"commensurate"* with this.

25. In the context of setting the allowed cost of debt, we consider that this requires:

- a benchmark efficient debt financing strategy to be defined;
- the costs of efficiently implementing that strategy to be estimated; and
- compensation commensurate with this to be provided to the service provider.

26. In our view, the definition of a benchmark efficient financing strategy must be such that it would be possible for a benchmark efficient entity to undertake that strategy. This does not necessarily mean that a specific regulated entity must actually implement or be able to implement that strategy, or that it must be the most efficient strategy for that entity. However, it must be conceivable that this strategy would be efficient for a benchmark entity facing the same risks.

27. By way of specific examples:

- if it is not possible to issue 100 year debt, or it is known to be prohibitively expensive to attempt to do so, then issuing 100 year debt should not be included in the definition of a benchmark efficient debt financing strategy;
- if it is inefficient to refinance 100% of all debt each year then the assumption of 100% refinancing each year should not form part of the definition of benchmark efficient debt financing strategy; and
- if it is impossible to trade certain derivative contracts, or if it is known to be prohibitively costly to do so, then the trading of such derivative contracts should not be included in the definition of benchmark efficient debt financing strategy.

28. To define and cost a debt management strategy that includes one or more activities that are inefficient, even for the benchmark efficient entity, would, in my view, be inconsistent with attempting to estimate compensation that "*is commensurate with the efficient financing costs of a benchmark efficient entity*".

29. The Australian Energy Market Commission's (AEMC) Final Rule Determination suggests that it envisaged its Rule change would require that the regulator clearly

define a benchmark debt financing strategy and then estimate the costs of implementing that strategy:[10]

> *While the Commission considers that allowing the regulator to estimate the return on debt component of the rate of return using a broad range of methods represents an improvement to the current approach, it is a separate issue from that of benchmark specification and measurement.* ***A historical trailing average approach still requires the regulator to define a benchmark and use appropriate data sources to measure it. Arguably, it is even more important that the benchmark is defined very clearly and can be measured, because it needs to be estimated periodically in the future****.* [Emphasis added.]

30. Similarly, the AEMC clearly envisaged that the definition of an efficient benchmark entity would include a definition of that benchmark entity's efficient debt financing strategy:[11]

> *The first factor in the rule requires the regulator to have regard to the characteristics of a benchmark service provider and how this influences assumptions about* ***its efficient debt management strategy****.* [Emphasis added.]

2.2 AER's previous interpretation of the ARORO

31. In our view, a plain reading of the ARORO requires the regulator to form a view of what financing costs would be incurred by a benchmark efficient entity and to provide compensation, in the form of the allowed rate of return, that was commensurate with those costs.

32. Until relatively recently, the AER appeared to adopt this interpretation. For example, in its 2015 preliminary decision for AusNet Services electricity distribution, the AER stated:[12]

> *In determining our approach to estimate the return on debt, we make a series of underlying decisions about the characteristics of the benchmark efficient entity. Having done so, we then design an approach that will*

10 AEMC, *National Gas Amendment (Price and Revenue Regulation of Gas Services) Rule 2012*, 29 November 2012, p. 90

11 AEMC, *National Gas Amendment (Price and Revenue Regulation of Gas Services) Rule 2012*, 29 November 2012, p. 84

12 AER, preliminary decision, AusNet electricity distribution, October 2015, p. 3-153

reasonably reflect these benchmark characteristics and promote the objectives in the law and the rules.

33. The AER went on as follows: [13]

The ***allowed rate of return objective*** *is that the rate of return for a service provider is to be commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the service provider in respect of the provision of regulated services.*

We consider ***the efficient debt financing costs of a benchmark efficient entity*** *as those which are expected to minimise its debt financing costs over the life of its assets, while managing refinancing risk and interest rate risk:*

- *Refinancing risk—the risk that a benchmark efficient entity would not be able to refinance its debt when it matures.*
- *Interest rate risk—the risk associated with a mismatch between the allowed return on debt and a benchmark efficient entity's actual return on debt.*

Our approach to the meaning of efficient financing costs was broadly supported by expert advice commissioned by us (Chairmont, Lally), and by advice commissioned by the service providers in recent regulatory processes (Frontier, SFG).

34. In this passage, the AER was explicit that the efficient financing cost of a benchmark efficient entity related to the costs that it would incur in managing both refinance and interest rate risk for its debt portfolio. The AER went on to define precisely what it believed the appropriate proxy for this efficient debt management strategy was: [14]

We consider an ***efficient financing practice of a benchmark efficient entity*** *under the on-the-day approach would have been to borrow long term and stagger the borrowing so only a small proportion of the debt matured each year. We consider a benchmark efficient entity would have combined this practice with interest rate swap contracts to broadly match the base rate component of its actual return on debt to its return on debt allowance. Specifically, we consider an efficient financing practice would have been to:*

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13 AER, preliminary decision, AusNet electricity distribution, October 2015, p. 3-166

14 AER, preliminary decision, AusNet electricity distribution, October 2015, p. 3-185 to 3-186.

- *borrow long term (10 year) debt and stagger the borrowing so only a small proportion (around 10 per cent) of the debt matured each year*

- *borrow using floating rate debt, or borrow fixed rate debt and convert it to floating rate debt using fixed-to-floating interest rate swaps at the time of the debt issue, which extended for the term of the debt (10 years)*

- *enter floating-to-fixed interest rate swaps at, or around, the time of the service provider's averaging period, which extended for the term of the access arrangement period (typically five years).*

Our reasoning is that this financing strategy:

- *compared with the alternative broad debt financing strategies, would have more effectively managed refinancing risk and interest rate risk, and resulted in a lower expected actual return on debt;*

- *was generally adopted by most privately owned service providers under the on-the-day approach.*

Under this financing strategy, the base rate component of a benchmark efficient entity's actual return on debt would have broadly matched the on-the-day rate, while the debt risk premium component each year would have reflected the average of the previous 10 years.

The staggering of debt under this strategy would have lowered the refinancing risk, compared with the risk if a benchmark efficient entity had issued all its debt during the averaging period. Adopting a staggered debt portfolio with interest rate swaps, compared with a staggered debt portfolio without interest rate swaps, would have led to the same degree of refinancing risk. However, the former strategy would also have resulted in:

- *lower interest rate risk—this is because interest rate risk would have been borne on only the debt risk premium component of the return on debt, rather than on the total return on debt*

- *a lower actual return on debt—this is because hedging via interest rate swaps would have reduced the effective term of the debt. Because longer term debt is typically more expensive than otherwise equivalent shorter term debt (given the holders of long term debt face greater risks), reducing the effective term would have likely reduced the actual return on debt, on average.602*

Our assessment that the above strategy was an efficient financing practice of a benchmark efficient entity under the on-the-day approach is supported by expert advice from both an academic perspective (Dr Lally) and a financial market practitioner perspective (Chairmont). [Emphasis added.]

35. Similarly, in section 7.3.3 of its Rate of Return Guideline the AER states:[15]

> *Given the observed practices of regulated network businesses and the definition of the benchmark efficient entity, we consider that the following practice is likely to constitute an efficient debt financing practice of the benchmark efficient entity under current 'on the day' approach:*
>
> - *holding a debt portfolio with staggered maturity dates and using swap transactions to hedge interest rate exposure for the duration of a regulatory control period.*

36. The adoption of this assumed efficient financing practice of a benchmark efficient entity underpinned the AER's analysis of why its proposed transition to a trailing average was consistent with the ARORO and why other approaches were not. For example, in rejecting the immediate adoption of a historical trailing average (immediate transition), the AER stated that such a transition: [16]

> *does not approximately match the allowed return on debt with **the efficient financing costs of a benchmark efficient entity** over the 2016–20 period **as it transitions its financing practices to the trailing average approach**. Given a benchmark efficient entity will already have financing practices in place it entered into in the past, it needs time to unwind these practices and gradually adopt practices that match the trailing average approach.* [Emphasis added.]

37. That is, given that the AER defined a benchmark efficient entity's debt management practice as having used interest rate swaps to reset base rates of interest every five years (in the manner set out in the quote at paragraph 34 above), the AER believed that compensating for historical average base rates of interest would not be commensurate ("approximately match") with the efficient financing costs of a benchmark efficient entity (as defined by it).

38. In summary, the AER's previous interpretation of the ARORO (and the interpretation of its experts and all other stakeholders) was that:

> *"…efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the service provider in respect of the provision of reference services"*

is meant to be interpreted according to its plain economic meaning. Specifically, these costs refer to such costs that would be <u>incurred</u> by an entity when implementing an efficient financing strategy, including debt management strategy, in order to

15 AER, *Explanatory Statement: Rate of Return Guideline*, December 2013, p. 107.

16 AER, preliminary decision, AusNet electricity distribution, October 2015, p. 3-165.

finance assets used to provide services with a similar degree of risk as that which applies to the service provider in respect of the provision of reference services.

2.3 The AER's new interpretation of the ARORO

39. The AER's new interpretation of the ARORO is encapsulated in the below quote from AusNet's electricity *distribution* final decision.

> *"We do not consider a benchmark efficient entity's past financing practices determine its efficient financing costs…"*[17]

40. Notably this direct language is not repeated in AusNet's draft electricity *transmission* decision – although the interpretation is the same. Here the AER clearly and explicitly states its position that "efficient financing costs" have nothing to do with how a business would actually efficiently finance itself. Rather, efficient financing costs are a hypothetical/conceptual concept that is not determined by reference to actual financing practices, and associated costs, efficiently incurred by a benchmark efficient entity.

2.3.1 The AER's new interpretation is that the ARORO is synonymous (a version of) with an NPV=0 criterion

41. The AER's new view is that the ARORO requires an interpretation of efficient financing costs as being the rates prevailing at the beginning of a regulatory period. The AER states that the use of prevailing rates in this fashion will satisfy the NPV=0 criteria whereby the present value of cash-flows (*before* efficiently incurred debt financing costs are removed) will be equal to the statutory value of the RAB. The AER

17 AER, SP AusNet, Final Electricity Distribution Determination, 3-316. In the same decision the AER also states (at 3-316):

> *We do not consider 'efficient financing costs' in the ARORO refers to historical costs, requiring compensation for losses (or gains) from unhedged mismatch with the previous regulatory allowance. Rather, achieving the ARORO requires a benchmark efficient entity be ex-ante appropriately compensated in present value terms and for the allowance to lead to efficient compensation (see section H.2.1). If provided with ex-ante efficient compensation, then a benchmark efficient entity has a reasonable opportunity to recover its efficient debt financing costs.*
>
> *The on-the-day rate is an appropriate measure of 'efficient financing costs' and reflects the prevailing cost of debt in the capital market near the commencement of the regulatory period. This is consistent with the cost of capital being a forward-looking opportunity cost (see section H.1.1).*

defines this criterion as synonymous with the ARORO.[18] This position is most clearly stated as set out in the following quote:[19]

> *We note that given the ARORO is standalone, the ARORO will be achieved if the present value of expected return on (and of) capital cash flows equal the start-of-period opening RAB.*

42. Here the AER is claiming that a sufficient condition for the satisfaction of the ARORO is that the NPV=0 criterion (as now defined by it) is satisfied. It is clear that the AER also regards this as a necessary condition.[20]

2.3.2 The AER's new NPV=0 criterion assumes zero debt financing

43. The AER's new version of the NPV=0 criterion involves a very specific thought experiment. It imagines that a potential investor is valuing access to a benchmark efficient entity's expected future revenues net of efficient operating expenditures and taxes *but before efficiently incurred debt financing costs*. In that case, an investor would value this (hypothetical) cash-flow stream at RAB if, and only if, the AER uses the investor's prevailing discount rate (used in the valuation) to set the allowed return on capital.

44. The cash-flow being valued in the above paragraph is hypothetical in that it is *before efficiently incurred interest costs*. A valuation of cash-flow before interest only has any relevance to an entity that has not already engaged in debt financing. In the AER's hypothetical valuation the entity performing the valuation is not the BEE that is actually providing (and therefore has already financed) assets necessary to provide

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18 See AER, AusNet Draft Transmission Determination, p. 95 first paragraph under the heading "Approaches that contribute to the achievement of the ARORO".

19 Ibid, p. 278.

20 Ibid, p. 95. "*We consider the ARORO requires that the allowed rate of return appropriately compensates investors for capital investments (in an ex-ante sense) and aims to minimise the long run cost of capital (all else being equal).381 We consider ex-ante efficient compensation should result in the ex-ante allowed return on capital cash flows having a present value equal to the present value of the ex-ante efficient cost of capital cash flows required to finance the RAB.* ***This means the allowed return on and of capital cash flows should have a present value equal to the statutory value of the RAB. This is a zero NPV investment condition, as discussed in section 3.3.3***"

Ibid, p. 102. "*As the services providers operate under an ex-ante regulatory regime, we consider the ARORO requires us to provide ex-ante efficient compensation. This does not entail compensating for historically incurred costs.*"

Ibid, p. 270. *"As discussed in section H.6.1, we consider the ARORO requires us to set an allowed rate of return for a benchmark efficient entity such that the return on its investment in its RAB equals its efficient cost (that is, the zero NPV investment condition****). The prevailing market cost of capital is the only discount rate that sets the present value of expected future cash flows equal to the RAB****."*

services with a similar degree of risk as that which applies to the service provider in respect of the provision of reference services.

45. Rather, the AER's hypothetical valuation only makes sense from the perspective of an entity that has not financed any assets but, instead, is interested in purchasing the assets using finance available at current market rates. (In fact, even in this hypothetical the AER's logic is unsound – as we demonstrate in sections 6and 7.)

46. That is, the AER's hypothetical present value thought experiment is relevant **if, and only if,** it can be assumed that the ARORO's reference to "*efficient financing costs of a benchmark efficient entity*" assumes that the entity has no pre-existing debt finance or relates to an entity that is not currently providing any service but is interested in acquiring the assets of a company that *is* currently providing the services.

47. In effect, the AER is assuming what it sets out to prove by hypothecating a valuation of a BEE where the BEE has no historically incurred debt costs. In that circumstance, and only in that circumstance, can it be assumed that efficient debt financing costs consist of purely prevailing debt financing costs. Of course, this effectively defines a BEE as an entity that has never actually financed any of its assets through debt – only hypothetically being available to do so at prevailing rates. Moreover, as soon as such a hypothetical BEE did actually finance any assets with debt, it must immediately cease to be a BEE because, from that moment on, its financing costs would include some historically incurred costs.

3 Contrasting the AER's old and new NPV=0 criteria

3.1 NPV=0 has multiple meanings

48. The concept of an NPV=0 criterion has multiple meanings. Importantly, it can be said to support a view that:

- NPV=0 requires that allowed revenues have the same present value as efficiently incurred costs – including efficient staggered debt financing costs that have already been incurred by the BEE in the past and are forecast to be incurred in the future; or
- NPV=0 requires that a third party that has not previously financed any assets (and therefore has no pre-existing debt financing costs) would value the regulated assets at their statutory RAB value.

49. These are very different, but equally valid, possible definitions of the NPV=0 criterion. However, stating that one or the other of these criterions satisfies the ARORO, without acknowledging that the other exists, tends to obscure rather than enlighten the interpretation of the ARORO. This conclusion applies doubly so, given that different interpretations of the NPV=0 criterion have been said to be consistent with the ARORO at different times by the AER and its experts – but the AER has failed to clearly acknowledge this change.

50. Specifically, up until the end of 2015 the AER and its experts adopted the first interpretation of the NPV=0 criterion – which was consistent with the AER's old interpretation of the ARORO. In 2016 the AER and its (new) experts have adopted the second interpretation of the NPV=0 criterion consistent with the AER's new interpretation of the ARORO.

51. The continual reference back to the NPV=0 criterion, as is done throughout the AER's July 2016 draft decision for AusNet, actually disguises the important issues of interpretation because it allows the AER to repeatedly posit a 'short-hand' interpretation of the ARORO that is presented as being uncontentious but is, in reality, ambiguous.

3.2 The AER's old vs new NPV=0 criteria

52. In its preliminary decision for AusNet Services electricity distribution, the AER also took the view that its (old) interpretation of the ARORO was equivalent to an "NPV=0" criterion. Specifically, the AER defined the NPV=0 criterion as being satisfied if the present value:

- of revenues; less
- efficiently incurred cost (including staggered debt financing costs efficiently <u>incurred by the BEE</u>

is equal to zero.

53. For example, the AER's October 2015 preliminary decision for AusNet Services states:[21]

> *The NPV principle is a fundamental principle of economic regulation. The NPV principle is that the expected present value of a benchmark efficient entity's regulated revenue should reflect the* ***expected present value of its expenditure****, plus or minus any efficiency incentive rewards or penalties…*
>
> …
>
> *Accordingly, there is a strong connection between the NPV principle, the allowed rate of return objective and the NGL revenue and pricing principle of providing service providers with a reasonable opportunity to recover at least efficient costs.* ***Lally advised that each of these principles or objectives are equivalent.*** *We therefore consider it is useful to assess the four return on debt approaches for consistency with the NPV principle. It follows that providing service providers with a reasonable opportunity to recover their efficient costs will also provide effective incentives for efficient investment. And if service providers are fairly compensated for their efficient costs, but not over-compensated, then consumers will not pay more than necessary for a safe and reliable network.* [Emphasis added.]

54. The emphasis added in the first paragraph of the above quote draws attention to the fact that historically incurred debt financing costs are a component of the benchmark

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[21] AER, preliminary decision, AusNet electricity distribution, October 2015, p. 3-173 to 3-174. Note that the We also note that the ACCC has, similarly, expressed the NPV=0 condition on the same terms. That is, the ACCC has stated that the NPV=0 condition is met if the business's actual debt costs match the regulatory allowance. (ACCC, Estimating the Cost of Debt, April 2013, see: first paragraph on page 5 and more generally pages 5 to 7. Last paragraph of section 5.2 on page 19.) The ACCC Regulatory development branch, clearly states that the NPV=0 condition cannot be achieved if the AER sets the cost of debt allowance based on prevailing 'on the day' rates (at least not unless businesses were to issue five year debt once every 5 years). (Ibid, pages 6 to 7.) The ACCC acknowledged that such a debt management strategy would not be efficient and that, in order to manage refinance risk, businesses issue debt in a staggered manner. The ACCC proposed that compensation be set on a trailing average basis in order that the regulatory allowance would more closely match efficient debt costs – which was the ACCC's interpretation of the requirements under the rules. (First two full paragraphs on page 14.)

As a regulator is ***required to model the cost of debt using efficient debt profiles*** *it can estimate the cost of debt using a portfolio approach. (Emphasis added)* efficient entity's expenditure and, therefore, in order to satisfy this version of the NPV=0 criterion the allowed regulated revenue must be commensurate with these costs.

55. The emphasis added in the second paragraph of the above quote draws attention to the fact that, in this passage, the AER draws no distinction between the concept of efficient financing costs in the ARORO and the concept of efficient costs in the revenue and pricing principles. It says that the NPV=0 criterion satisfied both.

56. However, the AER's new view, as set out in section 2.3, is that 'efficient financing costs' referred to in the ARORO are purely prevailing while 'efficient costs' referred to in the revenue and pricing principles refers to actual historically incurred financing costs (see section X). Clearly, a single NPV=0 criterion cannot satisfy both the ARORO and the revenue and pricing principles.

57. We also note that Lally's advice to the AER was, very clearly, applying the AER's old version on the NPV=0 criterion. That is, the NPV=0 criterion that Lally advised was consistent with the ARORO was very clearly inconsistent with the AER's new interpretation of the ARORO (and the associated new version of the NPV=0 rule). This is evident from the following advice Lally gave the AER in 2015:[22]

> *In summary, the legal requirement for the allowed cost of debt to be* ***commensurate with the costs of a BEE*** *is formalized through the NPV = 0 principle. … Given that firms stagger their debt, regulatory use of the prevailing cost of debt (the on-the-day regime)* ***will not satisfy the NPV = 0 principle due to mismatches between the allowed and incurred costs of debt at the commencement date of the regulatory business****.*

58. That is, Lally is quite clear that using prevailing rates to set compensation violates the NPV=0 criterion because it does not reflect the actual efficient staggered debt

[22] Lally, *Review of submissions on the cost of debt*, 21 April 2015, p. 25. See also page 22 where Lally states.

However, in the presence of debt, there are a range of policies that a BEE might pursue and the regulator's choice of regime might lead the BEE to change its policy, leading to a further change in regulatory action, and so on. Under such conditions, the NPV = 0 principle should be viewed not simply as a regulatory policy that gives rise to NPV = 0 but a compatible combination of regulatory policy and BEE actions that satisfies the NPV = 0 principle; this compatible combination must involve a course of action by a BEE that is feasible in the absence of regulation and a regulatory regime whose imposition would not cause the BEE to change this behavior ("matching" regulatory policy). There may be more than one combination that satisfies this definition.

See also Lally, *Review of Submissions on Transition Issues for cost of debt*, October 2015, p. 7

*I favour continued use of the on-the-day regime because its disadvantages (****violation of the NPV = 0 principle****, greater bankruptcy risk, and greater output price variation) are minor and less significant than its advantages, which are ease of implementation and lesser incentive problems for capex and new entrants (or lesser complexity if these incentive problems are addressed).*

financing costs a BEE actually has incurred (in past and forecast future financing of the RAB). This is, of course, the exact opposite of the AER's new interpretation of the NPV=0 criterion (as applied to the ARORO at least). This old version of the NPV=0 criterion was accepted by the AER up to and including AusNet's electricity distribution preliminary decision – which quoted extensively from the same Lally report quoted from above.

3.3 The AER has substituted Partington and Satchell's NPV=0 criterion for Lally's NPV=0 criterion

59. The AER's draft decision for AusNet Services electricity transmission no longer references Lally's advice on the equivalence between the ARORO and "the" NPV=0 criterion. Instead, the AER now references advice from Partington and Satchell:[23]

> *Similarly, Partington and Satchell consider the rule requirements are consistent with the zero NPV investment condition, stating:*
>
>> *The national electricity and gas objectives are to achieve efficient investment and efficient operation in the long term interest of consumers, while the revenue and pricing principles allow for the recovery, by the regulated businesses, of efficient costs including a return on capital and having regard for the costs and risks of overinvestment. There is very clear criterion that can be applied to meet these requirements.* ***That criterion is that investment in regulated assets should be a zero NPV activity***. [Emphasis added.]

60. We do not necessarily disagree with the last sentence of the quote (that investment in regulated assets should be a zero NPV activity). The problem is that, contrary to the second last sentence, this does not have a 'very clear' meaning – two of which are discussed in section 3.2. Indeed, the fact that the AER and its experts have adopted two diametrically opposed versions highlights the problem.

3.4 The AER's new/old view is that the new/old NPV=0 criterion must/must not be applied purely prospectively

61. The AER's October 2015 preliminary decision for AusNet Services was explicit in rejecting the application of the NPV=0 criterion purely for an assessment of future compensation compared to future costs (i.e., a purely prevailing approach). This rejection of a purely prevailing application was made in the context where:

- given the old interpretation of the NPV=0 criterion; and

23 AER, AusNet Transmission draft decision, July 2016, p. 3-265

- the AER's interpretation of a benchmark efficient debt management strategy;
- only the "hybrid" transition satisfied the NPV=0 criterion based on a prevailing application.

62. The hybrid transition sets the cost of debt allowance based on the benchmark efficient entity resetting its base interest rate costs in the swap market but still incurring historical debt risk premium (DRP) costs (on the basis that the DRP could not be hedged to the regulatory cycle). The AER accepted that the "hybrid" transition to a trailing average provided compensation that was closest to its assumed prospective efficient financing costs of a benchmark efficient entity.[24]

> *We consider the hybrid transition (Option 3) may be a reasonable approach and contribute to the achievement of the allowed rate of return objective, but it is not our preferred approach. The benefits of this approach are that it:*
>
> - *maintains the outcomes of service provider's past financing decisions consistent with the principles of incentive regulation by continuing to apply the on-the-day rate to the component of the debt which service providers had most control over (the base rate component)*
> - ***provides a good match between the allowed return on debt and a benchmark efficient entity's financing costs over the period it takes a benchmark efficient entity to transition its financing practices to the trailing average approach.*** [Emphasis added.]

63. However, the AER immediately proceeded to qualify this support for the hybrid on the basis that historical differences between allowed revenues and financing costs were relevant to the application of the NPV=0 criterion 'over the life of the assets'.

> *The downside of the hybrid transition includes:*
>
> - *Transitioning from the on-the-day approach using the hybrid transition can create a mismatch between the allowed return on debt and the efficient financing costs of a benchmark efficient entity* ***over the life of its assets****. The change in the regulatory regime can therefore create windfall gains or losses to service providers or consumers. Windfall gains or losses do not result from a service provider's efficient or inefficient decisions. In effect, they are a side effect of changing the methodology for estimating the return on debt at a particular point in time. They should be avoided, so that economic*

24 AER, preliminary decision, AusNet electricity distribution, October 2015, p. 3-163.

> *regulatory decisions deliver outcomes based on efficiency considerations, rather than timing or chance.*

64. It is clear that if the hybrid matched compensation to costs prospectively then the only way that one could conclude that it did not do so 'over the life of the assets' must be because there was a belief that there are relevant historical differences between allowed and efficient costs. The AER elaborates on this point: [25]

> *In other words, we are satisfied that the rules require us to consider whether the regime change results in a benchmark efficient entity being over or under compensated over the life of its assets. That is, we consider another relevant impact is on whether the NPV principle is satisfied or not, in light of the regime change.*

65. By contrast, now that the AER has adopted its new version of the NPV=0 criterion, its position has also changed. The AER's new position is that the NPV=0 criterion must be applied purely prospectively using prevailing rates at the beginning of the regulatory period, and the only question that is relevant is whether future revenues have an NPV (when evaluated by a party with no pre-existing debt financing costs) equal to the value of the RAB.

[25] AER, preliminary decision, AusNet electricity distribution, October 2015, p. 3-175

4 How does the AER justify its new interpretation

66. Recall that the NPV=0 criterion can be, validly, defined to mean two different things:

- NPV=0 requires that allowed revenues have the same present value as efficiently incurred costs – including efficient staggered debt financing costs incurred by the BEE in the past and forecast to be incurred in the future; or
- NPV=0 requires that a third party that has not previously financed any assets (and therefore has no pre-existing debt financing costs) would value the regulated assets at their statutory RAB value.

67. The following quote is extracted from the AER's June 2016 draft decision for AusNet Services transmission. In it the AER is implicitly defining the "NPV=0 criterion" to mean the second of the above definitions. However, the importance of what the AER is doing is, in our view, disguised by the use of ill defined 'jargon', such as the use of the "zero NPV investment condition", as well as the repeated use of "ex-ante" as an adverb:[26]

> *We consider a rate of return that meets the ARORO must provide* ***ex-ante*** *compensation for efficient financing costs (we refer to this as* ***ex-ante*** *efficient compensation).*
>
> *We consider ex-ante efficient compensation should result in the ex-ante allowed return on capital cash flows having a present value equal to the present value of the ex-ante efficient cost of capital cash flows required to finance the regulatory asset base (RAB). This means we must set, ex-ante, an allowed rate of return for a benchmark efficient entity such that the return on its investment (in its RAB) equals its efficient cost.* ***This is a zero net present value (NPV) investment condition****, which is a forward looking concept that shows a benchmark efficient entity is provided with a reasonable opportunity to recover at least efficient financing costs over the life of its investment (in its RAB). Partington and Satchell described it as follows:*
>
>> ***The zero NPV investment criterion*** *has two important properties. First, a* ***zero NPV investment means*** *that the ex-ante expectation is that over the life of the investment the expected cash flow from the investment meets all the operating expenditure and corporate taxes, repays the capital invested and there is just enough cash flow left over to cover investors' required return on the capital invested. Second, by*

26 AER, draft decision, AusNet Transmission, July 2016, p. 3-259

> *definition **a zero NPV investment** is expected to generate no economic rents. Thus, ex-ante no economic rents are expected to be extracted as a consequence of market power. The incentive for investment is just right, encouraging neither too much investment, nor too little.*
>
> *As discussed in section 3.3.3 and H.5.1, we consider efficient financing costs, for debt and equity, should be based on (appropriately benchmarked) prevailing market rates. This reflects the current opportunity cost of capital for investments of similar risk to a benchmark efficient entity in the position of a service provider supplying regulated services. The opportunity cost of capital is the rate used to discount firms' expected future cash flows in NPV calculations.*
>
> *Under the ex-ante regulatory regime, we reset the allowed rate of return (through the returns on debt and equity) at the commencement of each regulatory period (or annually for the allowed return on debt if we use a trailing average). If the allowed rate of return is reset to reflect the prevailing market cost of capital, it provides ex-ante efficient compensation over each reset period.*

68. The first three paragraphs of the quote do not advance the interpretation of the ARORO in any way. Two individuals could agree that the ARORO requires a "zero NPV investment criterion" to be satisfied but disagree on which of the previously outlined definitions is appropriate. Nothing in the first three paragraphs (including the quote from Partington and Satchell) sheds any light on these critical issues of interpretations.[27] The AER fails to set out these interpretations side-by-side, and does not make it clear that it is (now) choosing the second over the first. Naturally, this means that there is no clear explanation of why the AER has changed its views.

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27 The same two individuals could both agree with the AER's statement that:

> "...ex-ante efficient compensation should result in the ex-ante allowed return on capital cash flows having a present value equal to the present value of the ex-ante efficient cost of capital cash flows required to finance the regulatory asset base (RAB). This means we must set, ex-ante, an allowed rate of return for a benchmark efficient entity such that the return on its investment (in its RAB) equals its efficient cost.

But they could both disagree on what constitutes "ex-ante efficient cost of capital cash flows required to finance the regulatory asset base". Specifically the AER's use of this phrase could mean:

- the estimated efficient financing costs actually payable by an benchmark efficient entity that has actually financed the RAB (including costs associated with debt financing that would already be efficiently in place).
- the ex ante efficient financing costs that would be incurred by hypothetical benchmark efficient entity purchasing the RAB today and financing this purchase using prevailing rates of interest.

69. The AER's new views are only clearly enunciated in the last two paragraphs of the above quote. But the reasons for these views are not explained. Instead, the reader is referred back to "section 3.3.3 and H.5.1".

4.1 Explanation provided in section 3.3.3 and H.5.1

70. Most of the section 3.3.3 in the AER's draft decision is devoted to interpreting whether or not a benchmark efficient firm is regulated. This is, in itself, peculiar because this would only seem to be a relevant consideration under the AER's old interpretation of the ARORO - where the AER believed that it was relevant to ask how a BEE would have responded to regulation. Under the AER's new interpretation of the ARORO, this is irrelevant because the AER now believes that how a BEE would actually have financed itself is irrelevant.

71. The only space provided to the AER's rationale for its new interpretation of the ARORO is on pages 3-17 to 3-18. We repeat this discussion in full below. However, we break it up into two sections (before and after the AER sub-heading "Elements of the ARORO—efficient financing costs").

> *We are to determine the allowed rate of return such that it achieves the ARORO. The objective is:*
>
> > *...that the rate of return for a distribution network service provider is to be commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the distribution network service provider in respect of the provision of standard control services.*
>
> *The regulatory regime is an ex-ante (forward looking) regime. As such, we consider a rate of return that meets the ARORO must provide ex-ante compensation for efficient financing costs. This return would give a benchmark efficient entity a reasonable opportunity to recover at least its efficient financing costs. This is a zero net present value (NPV) investment condition, which can be described as follows:*
>
> > *The zero NPV investment criterion has two important properties. First, a zero NPV investment means that the ex-ante expectation is that over the life of the investment the expected cash flow from the investment meets all the operating expenditure and corporate taxes, repays the capital invested and there is just enough cash flow left over to cover investors' required return on the capital invested. Second, by definition a zero NPV investment is expected to generate no economic rents. Thus, ex-ante no economic rents are expected to be extracted as a consequence of market power. The incentive for investment is just right, encouraging neither too much investment, nor too little.*
>
> *Under our regulatory framework, a benchmark efficient entity's assets are captured in its RAB. The return on capital building block allows a benchmark efficient entity to finance (through debt and equity) investment*

in its network. Because investments usually carry a degree of risk, to satisfy the zero NPV condition the allowed rate of return must be sufficient to compensate a benchmark efficient entity's debt and equity investors for the risk of their investment.

72. This discussion is, like the quote provided in the previous section, devoid of any content that might explain why the AER now believes that the ARORO requires it to only use prevailing rates. Indeed, it repeats the same discussion of the ambiguous "NPV investment criterion". If anything the statement that:

> *The return on capital building block allows a benchmark efficient entity to finance (through debt and equity) investment in its network*

suggests that a focus on actual debt financing costs incurred in funding investment in the network would be appropriate (inconsistent with the AER's new view of the ARORO).

73. It is only after the heading "Elements of the ARORO—efficient financing costs" that the AER explains why it believes the ARORO requires it to use purely prevailing rates.

> <u>Elements of the ARORO—efficient financing costs</u>
>
> *A key concept in the ARORO is 'efficient financing costs'. Because the market for capital finance is competitive, a benchmark efficient entity is expected to face competitive prices in the market for funds.* ***Therefore****, we consider efficient financing costs are reflected in the prevailing market cost of capital (or WACC) for an investment with a similar degree of risk as that which applies to a service provider in respect of the provision of regulated services. As Alfred Kahn stated, 'since the regulated company must go to the open capital market and sell its securities in competition with every other would-be issuer, there is clearly a market price (a rate of interest on borrowed funds, an expected return on equity) that it must be permitted and enabled to pay for the capital it requires'.*
>
> *We consider employing a rate of return that is commensurate with the prevailing market cost of capital (or WACC) is* ***consistent with the zero NPV investment condition (see above)****. We also consider* ***economic efficiency more generally is advanced by employing a rate of return that reflects rates in the market for capital finance.*** *Similarly, Partington and Satchell interpret efficient financing costs as the opportunity cost of capital, which is a market rate of return for assets with a given level of risk.* [Emphasis added.]

74. In short, despite conceding that if a BEE actually financed the RAB it would do so with staggered debt issuance, the AER believes that the ARORO requires it to only compensate for efficient financing costs on the basis of prevailing rates because:

a. The market for capital finance is competitive;

b. Prevailing rates are consistent with the “zero NPV investment condition”; and

c. The AER considers that economic efficiency is advanced by sole reliance on prevailing rates.

75. We now address each point in turn. First, the AER does not actually explain why a competitive financial market implies that it should interpret “efficient financing costs of a BEE” as referring to prevailing rates (or, indeed, why this would not be true if financial markets were not competitive). The use of the word “therefore” to begin the second sentence is *therefore* a non-sequitur. In our view, there is no reason to infer that the existence of competitive financial markets implies the AER’s (new) interpretation of the ARORO is appropriate.

76. Second, the use of prevailing rates is consistent with one definition of the “zero NPV investment condition” and inconsistent with another. In order to justify the use of prevailing rates, the AER needs to justify the new interpretation of that criterion over the old interpretation. No such justification is provided (nor is it even acknowledged explicitly that the interpretation has changed).

77. Third, we disagree with the AER that setting the allowed rate of return on the basis of prevailing rates promotes economic efficiency (see section 5). However, even if this were true, the AER fails to explain how this is relevant to the interpretation of “efficient financing costs of a BEE”. That is, even if it were true that setting the allowed rate of return equal to prevailing rates promoted economically efficient investment (or other economically efficient outcomes), it does not follow that this implies anything about the “efficient financing costs of a BEE”.

78. In our view it is clear that the ARORO is referring to efficient financing *costs*. However, the AER appears to be interpreting the reference to “efficient financing *costs*” as being equivalent to “efficient financing *incentives*”. That is, the AER’s final justification for setting the allowed rate of return only holds if the ARORO can be interpreted as stating:

> *The allowed rate of return objective is that the rate of return for a service provider is to be commensurate with the efficient financing ~~costs~~ incentives of a benchmark efficient entity with a similar degree of risk as that which applies to the service provider in respect of the provision of reference services.*

79. This, in our view, is clearly not a valid economic interpretation of the ARORO. Of course, having regard to promoting efficient incentives is consistent with the National Electricity Objective (NEO).[28]

[28] The National Gas Objective expresses the same objectives or gas services.

> *The National Electricity Objective is to promote efficient investment in, and efficient operation and use of, electricity services for the long-term interests of consumers of electricity with respect to price, quality, safety, reliability, and security of supply of electricity; and the reliability, safety and security of the national electricity system.*

80. If there was a tension between the ARORO and the NEO (which we do not believe that there is), the AER could conceivably rely on its unsubstantiated views about efficient incentives to favour a policy that serves the NEO even if it is inconsistent with the ARORO. However, the AER cannot interpret, at least on a plain economic reading, the ARORO as requiring the AER to set the rate of return based on prevailing rates purely on the basis that the AER believes this promotes economically efficient outcomes.

81. The AER's section H.5.1 essentially repeats the same logic (and much of the same text) as section 3.3.3 of its decision. The main difference is that the AER goes into (slightly) more detail in relation to its views on the efficient incentive properties of using prevailing rates (we deal with this issue in the next section).

4.2 Summary

82. In summary, the AER has, in our view, not provided any well-reasoned justification for why it is interpreting the ARORO to require that it sets the allowed rate of return based on prevailing estimates of the cost of debt.

5 Is there a tension between the NEO and the ARORO

83. The NEO, as set out in the NEL, is:

> *...to promote efficient investment in, and efficient operation and use of, electricity services for the long-term interests of consumers of electricity with respect to price, quality, safety, reliability, and security of supply of electricity; and the reliability, safety and security of the national electricity system.*

84. The NEO and the revenue and pricing principles (RPP) in the NEL apply more broadly than to just the cost of debt and equity funding. However, in our view, the requirements set out in the NEL are consistent with our interpretation that the NER requires an estimate of the allowed return on debt to be based on an estimate of the cost of following a benchmark efficient debt financing strategy.

85. In our view, if the allowance for the return on debt is based on a benchmark financing strategy that is consistent with the strategy that a benchmark efficient entity would undertake, then the regulated entity will:

   - have appropriate incentives to invest and maintain its assets in a manner that promotes the NEO;
   - have *"a reasonable opportunity to recover at least the efficient costs the service provider incurs in providing reference services"* - consistent with the RPP;
   - be provided with effective incentives in order to promote economic efficiency – consistent with of the RPP;
   - have tariffs that allow for a return commensurate with the regulatory and commercial risks involved in providing the reference service – consistent with the RPP; and
   - have appropriate incentives to invest in the network - consistent with the RPP.

86. Similarly, setting tariffs to reflect the cost of debt associated with a benchmark efficient debt financing strategy is consistent with promoting efficient utilisation of gas networks by customers. In fact, in our view, achieving the allowed rate of return objective is an important foundation for achieving the NEO and the RPP.

87. Only if the cost of debt allowance is set consistent with a well-defined benchmark efficient debt management strategy can a business attempt to replicate that strategy such that its own efficient costs are commensurate with the allowance. If a business cannot do this because the cost of debt allowance is not based on a well-defined debt management strategy, then a gap between the allowed and achievable cost of debt can potentially be created. The effect of this gap can be to:

- weaken incentives to invest and maintain its assets in a manner that fails to promote the NEO;
- deny *"a reasonable opportunity to recover at least the efficient costs the service provider incurs in providing reference services"* - inconsistent the RPP;
- weaken incentives for efficient investment and thereby fail to promote economic efficiency – inconsistent with the RPP;
- result in tariffs that do not allow for a return commensurate with the regulatory and commercial risks involved in providing the reference service – inconsistent with the RPP; and
- fail to provide appropriate incentives to invest in the network - inconsistent with the RPP.

88. Consistent with the above, it is our view that promotion of the ARORO also promotes the NEO and helps achieve consistency with the RPP.

5.1 The AER's views to the contrary

89. In section H.5.1 of the AER's July 2016 draft decision for AusNet Services transmission, the AER sets out its views on economic efficiency and the "application to debt financing". It does so in the context of interpreting the ARORO. We have already explained why we do not regard this as appropriate - because the ARORO does not directly reference promoting efficient outcomes but rather setting compensation commensurate with efficient costs. We have also, immediately above, explained why we believe that setting compensation commensurate with efficient costs (actually incurred) will promote efficient outcomes.

90. However, the AER expresses the view that:[29]

> *We consider that productive, allocative and dynamic efficiency are advanced by employing a return on debt that reflects prevailing rates in the market for funds. This will also promote the long term interests of consumers in line with the National Electricity Objective / National Gas Objective (NEO/NGO).*

91. If the AER was correct about this, and if it was the case that compensating based on actually incurred efficient debt financing costs would not promote the NEO, then there would be a tension between achieving the NEO and the ARORO (as we interpret it).

92. Unfortunately, the AER never provides a cogent explanation of why it believes that compensating based on 100% of the prevailing cost of debt (even if actual efficiently

[29] AER, draft decision, AusNet Transmission, July 2016, p. 3-255.

incurred cost of debt by a BEE in financing the RAB is different) will promote efficient investment. We provide below the extracts that are most informative in attempting to determine why the AER holds this view.[30]

> *An on-the-day approach better reflects the prevailing cost of debt in the capital market near the commencement of the regulatory control period. Due to this, it:*
>
> - *Better reflects investors' opportunity cost of debt and expectations of future returns near the commencement of the regulatory control period. It therefore provides a better signal for efficient investment decisions that increase dynamic efficiency. This is consistent with the AEMC's view that the return on debt framework should minimise the risk of creating distortions in service providers' investment decisions.*

93. This is as close as the AER gets to explaining its view. There are other places where such claims are made, such as:[31]

> *We consider an allowed return on debt that reflects the prevailing market cost of debt promotes efficient investment decisions. When firms make investment decisions, they estimate the cost of capital based on prevailing market rates. This is important because the cost of capital is based on investors' expectations of future returns. Firms then use this estimate to set a discount rate at which they discount the expected future cash flows of the proposed investment in order to determine its viability (that is, whether the NPV of the expected cash flows is greater than or equal to zero).*

5.2 Critique of the AER's views to the contrary

94. The above is as detailed a justification for the AER's views as is available. While this is a somewhat sparse discussion of investment incentives it does appear to have in common views that were, at one time, expressed by the West Australian Economic Regulatory Authority (ERA). Specifically, the ERA was of the view that using prevailing rates (and indeed resetting prevailing rates every year on 100% of the debt portfolio) would promote efficient investment.

95. The ERA's basis for this view was that:

- A business must finance incremental investment at prevailing rates; and
- If the businesses is always being compensated based on prevailing rates it will always expect to earn its cost of a new investment.

30 AER, draft decision, AusNet Transmission, July 2016, p. 3-98

31 AER, draft decision, AusNet Transmission, July 2016, p. 3-270

96. We pointed out to the ERA that this logic was only true if the life of the asset had the same term as the cycle used by the regulator to reset prevailing rates.[32] If this was not the case, as indeed it is not, then the logic did not hold. A business investing in a 50 year asset regulated under a regime of annually resetting prevailing rates will be certain that:

- Compensation in the first year of the asset's life will match costs;
- Compensation in the remaining 49 years of the asset's life will not (unless by pure chance).

97. The same logic applies with a 5 year reset (as envisioned by the AER). A business investing in a 50 year asset regulated under a regime that resets at prevailing rates every 5 years will be certain that:

- Compensation in the first year of the asset's life will match costs if that compensation is undertaken at the beginning of the first of the 5 year regulatory period; and
- Compensation will not match costs (unless by pure chance) for:
  - the remaining 49 years of the investment envisioned in the first dot point;
  - any of the investment undertaken at any time later in the regulatory period.

98. We pointed out to the ERA that adopting a trailing average[33] would actually substantially improve the incentives for efficient investment by better matching compensation to efficient costs over the life of the assets. Moreover, we pointed out to the ERA that if the trailing average was weighted by the amount of financing (and refinancing) occurring in each year then this would perfectly match compensation to costs. That is, only a trailing average (not a prevailing) approach could achieve the incentive properties of matching marginal financing costs to marginal investment decisions over the life of the assets.

99. The ERA ultimately adopted a trailing average approach[34] and, in doing so, it conceded the veracity of these views.[35]

> *ATCO's consultant CEG argues that firms consider interest rates over the life of an investment project, not just the prevailing rate, when making*

32 For example, see ATCO Gas Australia, Response to the ERA's Draft Decision on required amendments to the Access Arrangement for the Mid-West and South-West Gas Distribution System, 27 November 2014, Appendix 9.2.

33 This could be a trailing average of the whole cost of debt or a trailing average of the DRP with compensation for the base rate of interest based on an assumed ("hybrid") swap overlay

34 The ERA adopted the hybrid trailing average approach.

35 ERA, Estimating the return on debt, 4 March 2015, pp. 10 to 14.

investment decisions (see discussion of this point below). If one agrees with such a longer term perspective, then the differences between the present value of the trailing average and the on the day approach at any point in time become less important, while the superior performance of the trailing average in terms of the present value condition would tend to favour the trailing average (see next section below on the present value issues).

Further, it is possible to weight the trailing average approach to ensure that new investment faces a marginal cost of debt that is based on the prevailing rate (see below). This attenuates the shortcomings of the trailing average that relate to prediction performance.

…

A weighted trailing average approach, annually updated, can be implemented to remove distortions for new investments, as compared to the simple (equal weighted) trailing average approach. Weighting the trailing average can restore the marginal cost of debt back to the on the day prevailing rate of the immediate annual update

…

This adds some complexity. However, it is not insurmountable. Indeed, QTC and DBP both demonstrate that the spreadsheet calculation relating to weights would be straightforward, at least for the PTRM approach

100. In short, if there really was an incentive problem of the type raised by the AER then the best solution (better than retaining an 'on the day' prevailing rate approach) would be move to a trailing average immediately – and weight the trailing average by incremental financing activity (a relatively trivial spread-sheeting exercise).

101. Our view is that the AER's implied analysis of efficiency incentives is overly simplistic. Were the AER to continue to hold that view, the internally consistent approach would be to *reject* the sole reliance on prevailing rates and instead adopt a weighted trailing average.

5.3 Summary

102. There is no tension between the ARORO and the NEO/RPP. All of the objectives in the NEL and the NER are internally consistent and are promoted by setting the allowed rates of return commensurate with efficient financing costs that a BEE would incur were it to actually finance investments in regulated assets.

6 Inconsistent application of the AER's new interpretation of the ARORO

103. The AER's new interpretation of the ARORO is that you must not have regard to actual efficient debt management practices when determining the efficient financing costs of a BEE. However, the AER, unsurprisingly, finds it difficult when drafting its decision to truly divorce an interpretation of 'efficient financing costs' from the actual efficient practice of a BEE. This section highlights some examples of where the AER slips between its old and new interpretations of the ARORO.

6.1 Discussion of transition

104. Under the heading 'transition into the staggered portfolio' the AER puts its position in terms of what a business would actually do:[36]

> *On the first year of a trailing average, a business would either:*
>
> - *Raise an equal-weighted portfolio of 1, 2, 3 … 9, 10 year debt. Each year 10 per cent of this would expire and the business would replace this with 10 year debt.*
> - *Raise 10 year debt. Each year it would refinance 10 per cent of this and replace this with more 10 year debt.*
>
> *We have calculated the return on debt allowance assuming the latter option.* *We have calculated the return on debt allowance assuming the latter option.* *Since we expect this would be the higher cost option given interest rates on longer-term debt securities are often higher than those on shorter-term debt securities, our debt allowance should be conservative in the service providers' favour.*

105. Here the AER is justifying its approach on the basis of what a business would actually do and the interest costs it would actually pay during a transition to a trailing average. This focus on the financing actions of a business is anathema to its stated interpretation of the ARORO, which rejects the relevance of actual financing strategies.

36 AER, AusNet Transmission draft decision, pp. 279-280.

106. However, this focus on what a business would actually do is entirely consistent with CEG's plain economic interpretation of the ARORO (and the AER's previous interpretation and the advice of its previous experts as well as the ACCC). [37]

107. The fact that the AER 'slips' back into a focus on what a business would actually do is inconsistent with its new interpretation of the ARORO and, in our view, evidence of how powerful the plain economic interpretation of the ARORO is

6.1.1 The AER reconciles using prevailing rates even though its example is framed on what a business would actually do

108. It is notable that in the AER's analysis, discussed above, the AER manages to conclude that the use of prevailing rates is consistent with an NPV=0 criterion *despite* framing the problem in terms of what a business would actually do. As described in section

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37 As set out in sections 2 and 3 above. As also noted by the AER noted in its October 2015 preliminary decision for AusNet For example, see AER, preliminary decision, AusNet electricity distribution, October 2015, p. 3-174.

> *Lally advised that the NPV principle should be viewed as a compatible combination of regulatory policy and service providers' actions that satisfy the NPV principle.*

That is, Lally's advice, accepted by the AER, was that satisfying the NPV=0 criterion required the regulator to set the allowed rate of return in a manner that was compatible with the efficient financing costs that a business would actually incur. That is why Lally advised:

> *Given that firms stagger their debt, regulatory use of the prevailing cost of debt (the on-the-day regime) will not satisfy the NPV = 0 principle due to mismatches between the allowed and incurred costs of debt at the commencement date of the regulatory business. (*Lally, Review of submissions on the cost of debt, 21 April 2015, p. 25.*)*

Specifically, efficiently managing refinancing risk means that a business cannot be expected to reset all of its debt financing costs at the beginning of the regulatory period. Therefore, setting a regulatory allowance 'as if' they did fails to satisfy the NPV=0 criterion - as defined by Lally and previously accepted by the AER. See also page 22 of the same Lally report where Lally states

> *However, in the presence of debt, there are a range of policies that a BEE might pursue and the regulator's choice of regime might lead the BEE to change its policy, leading to a further change in regulatory action, and so on. Under such conditions, the NPV = 0 principle should be viewed not simply as a regulatory policy that gives rise to NPV = 0 but a compatible combination of regulatory policy and BEE actions that satisfies the NPV = 0 principle; this compatible combination must involve a course of action by a BEE that is feasible in the absence of regulation and a regulatory regime whose imposition would not cause the BEE to change this behavior ("matching" regulatory policy). There may be more than one combination that satisfies this definition.*

See also Lally, *Review of Submissions on Transition Issues for cost of debt*, October 2015, p. 7

> *I favour continued use of the on-the-day regime because its disadvantages (**violation of the NPV = 0 principle**, greater bankruptcy risk, and greater output price variation) are minor and less significant than its advantages, which are ease of implementation and lesser incentive problems for capex and new entrants (or lesser complexity if these incentive problems are addressed).*

2.3.2, this is only possible if it is assumed that the business has zero debt financing in place. This is, indeed, what the AER implicitly assumes when it set out to 'mathematically' prove that only compensation based on prevailing rates can deliver an NPV=0 result.

109. When the AER states:[38]

On the first year of a trailing average, a business would either:

- *Raise an equal-weighted portfolio of 1, 2, 3 ... 9, 10 year debt. Each year 10 per cent of this would expire and the business would replace this with 10 year debt.*
- *Raise 10 year debt. Each year it would refinance 10 per cent of this and replace this with more 10 year debt.*

both courses of action clearly imply no (zero) pre-existing debt financing exists. If a business has already debt financed its investment (which obviously it must have done given that the assets, in the main, were put in place in the past) then that debt (or the subsequent refinancing of that debt) remains a liability for the business. Only if all pre-existing debt expired on the same day that the trailing average began could either of the posited options be plausibly undertaken. Of course, this would be inconsistent with the AER's view that actual efficient debt financing practice involves a staggered maturity profile to manage refinance risk.

110. Moreover, it is relevant to note that the second option (the one that actually matches the AER transition) is not a plausible strategy even if the firm had zero debt at the start of the transition. This is because if the firm issued only 10 year debt at the start of the transition it would have to wait 10 years to refinance that debt. It could not refinance 10% of this debt each year because none of it actually comes up for refinance until 10 years after it was first issued.[39]

6.2 The AER's interpretation of the ARORO when adopting a trailing average

111. In the AER's rate of return Guideline explanatory statement the AER states:

The allowed rate of return objective requires us to set a rate of return commensurate with the efficient financing costs of the benchmark efficient

38 AER, AusNet Transmission draft decision, pp. 279-280.

39 The business could conceivably attempt to buy back 10% of its initial issuance after one year (if they could convince the debt holders to sell their debt). However, because of the transaction costs (and interest rate risk) involved no business would issue 10 year debt with the intention buying back 10% of it in each subsequent year.

> *entity.* ***We do not consider this to be only a theoretical proposition****. Rather, it should be* ***consistent with observable good practice in efficient businesses.*** [40]

112. This is consistent with our interpretation of the ARORO but not the AER's new interpretation. Similarly, the AER directly linked the adoption of a trailing average (i.e., a move away from prevailing rates) in its Rate of Return Guideline to the actual debt financing costs of a BEE as follows (emphasis added).[41]

> *In summary:*
>
> - *We propose to use a single definition of a benchmark efficient entity and specify a single approach to estimating the return on debt.*
> - *We consider that holding a portfolio of debt with staggered maturity dates is likely* ***an efficient debt financing practice of the benchmark efficient entity*** *operating under the trailing average portfolio approach.*
> - *We consider that the regulatory return on debt allowance under the trailing average portfolio approach is,* ***therefore****, commensurate with the efficient debt financing costs of the benchmark efficient entity.*
> - *We further consider that the trailing average portfolio approach is consistent with other requirements of the rules, RPP, and the objectives.* [Emphasis added.]

113. The AER's current position is that the above logical statement is wrong. The AER's current position is that the efficient debt financing strategy of the BEE is irrelevant to an assessment of whether the allowed rate of return is commensurate with efficient costs.

114. Notably, the AER acknowledges that its (new) NPV=0 criterion will be violated by the adoption of a trailing average – because future allowed rates of return will reflect, in part, historical interest costs. The AER does not provide a satisfactory explanation for why this permanent violation of (what it defines as) the ARORO is acceptable. The AER simply states that:[42]

> *"Despite this*, we can show the service provider would have a reasonable opportunity to recover at least efficient costs over the term of the RAB."*

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40 AER, Better Regulation | Explanatory Statement | Rate of Return Guideline, December 2013, p. 28

41 AER, Better Regulation | Explanatory Statement | Rate of Return Guideline, December 2013, , p. 102.

42 AER, AusNet Transmission draft decision, p. 279.

(*Asterisk is not in original but is inserted for context. Specifically, the AER is referring to the failure of a trailing average to be consistent with the AER's NPV=0 criterion.)

115. The AER's reasoning in the above quote is internally inconsistent. On one hand, the AER strenuously rejects any transition other than one that starts with prevailing rates of return on the basis that using historical rates of return is inconsistent with the ARORO (i.e., inconsistent with the AER's new version of the NPV=0 criterion). However, diametrically opposed to this position, the AER accepts the adoption of a trailing average cost of debt, which would mean, if ne accepted the AER's new interpretation of the ARORO, that the ARORO would be permanently violated into the future.

116. It is striking that the AER is only applying its version of the NPV=0 criterion to the issue of a return on debt transition, but has made no serious attempt to apply this criterion to determine any other aspect of the regulatory framework – including the ultimate post-transition structure of regulation (and the term of debt issuance as discussed in section 6.3 immediately below). No adequate explanation is provided as to why the AER considers that the ARORO requires the sole reliance on prevailing rates at the beginning of a transition but not at the ultimate end point of the transition.

117. We make this point purely to highlight internal inconsistencies in the AER's current position. We agree with the AER's old position that, as expressed in the Rate of Return Guideline and set out above, that the trailing average "more closely aligns with the efficient debt financing practices of regulated businesses"[43] and:[44]

- *We consider that the regulatory return on debt allowance under the trailing average portfolio approach is, **therefore**, commensurate with the efficient debt financing costs of the benchmark efficient entity.* [Emphasis added.]

6.3 The AER's interpretation of the ARORO when adopting a 10 year term for debt issuance

118. The AER states in the AusNet Services transmission draft decision:[45]

*We are satisfied that measuring the allowed return on debt by reference to a **10 year benchmark term is commensurate with the efficient***

43 AER, Better Regulation | Explanatory Statement | Rate of Return Guideline, December 2013, p. 12

44 Ibid, p. 102.

45 AER, AusNet Transmission draft decision, p. 105.

> ***financing costs of a benchmark efficient entity****. Our reasons for adopting a 10 year benchmark debt term are:*
>
> - *A long debt tenor is consistent with* ***the long lived assets*** *of a benchmark efficient entity and reduces refinancing risk.*
> - *A 10 year term is similar to (though somewhat longer than) the* ***industry average term at issuance*** *of a sample of firms that are comparable to the benchmark efficient entity.*
>
> *Regulated network assets are long lived, and have asset lives that are longer than the terms commonly available for debt.* ***Refinancing risk is the risk that a firm would not be able to refinance its debt at a given point in time due to this mismatch in terms.*** *…*

119. The AER's reasoning in this regard is, in our view, correct. However, it is clearly based on the actual efficient financing practice of a BEE. That is, the interpretation of 'efficient financing costs of a BEE' here is the costs that a BEE incurs in actually efficiently financing its assets given its real world constraints (including managing refinance risk).

120. Having regard to this consideration is, once more, anathema to the AER's interpretation of the ARORO as being synonymous with its (hypothetical) NPV=0 criteria (whereby the present value of revenues net of operating costs/tax but before interest costs equal the value of the RAB).

121. Under the AER's interpretation of the ARORO, the term of debt used to estimate 'prevailing rates' must match the term at which the regulator will reset allowed rates of return. (Under a continuation of the on-the-day approach this is 5 years.) This has nothing to do with the term at which a BEE will efficiently borrow. If this is not the case then the present value of cash flows (as defined by the AER to ignore efficiently incurred interest costs) will not be equal to the RAB.

122. The AER attempts to step around this issue in its mathematical appendix by couching its proof in the following manner.[46]

> ***For simplicity****, assume the term of the risk free rate matches the regulatory period (five years) under the on-the-day approach.*[1106] (Emphasis added.)

123. However, it is not 'for simplicity' that the AER makes this assumption, which is not consistent with actual AER practice. Rather, it is because the mathematical proposition that the AER is attempting to demonstrate does not hold if this assumption is not made.

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46 Ibid, 276.

124. It is standard practice in mathematical expositions for the author to use the phrase ‘for simplicity’ to denote an assumption that, while not always true, simplifies the exposition of the fundamental point being made without any, or substantial, loss of generality of the conclusion. However, the AER’s assumption that allowed rates of return are based on a 5 year horizon does not fit into this category because the ‘proof’ is invalid whenever the assumption is violated (which it is in the current context given that the AER (correctly) compensates on a 10 year horizon for the cost of debt).

125. Moreover, it is not just the ‘risk free rate’ for which this assumption must be true but also the DRP and the MRP. All of these parameters must be estimated on a 5 year horizon in order for the AER’s mathematical results to hold.

126. If this is not the case, then under the AER’s own logic, the rate of return will be based on a 10 year horizon while the discount rate that the AER alleges a third party entity would use to value cash-flows would be based on a 5 year horizon. These would not match and the AER’s NPV=0 criteria would not be met.

127. It is important to reiterate that we do not accept the AER’s proposition that the ARORO requires (or even allows) it to assume that the relevant financing costs are those of a hypothetical investors that has not, as yet, actually financed any regulated assets. The point we are making is that the AER’ approach is not actually consistent with what it says is the correct interpretation of the ARORO.

128. The AER attempts to elaborate on its ‘simplifying’ assumption at footnote 1106 which is repeated below (emphasis added).

> *In practice, we have used a 10 year term to estimate the allowed rate of return. Given interest rates on longer-term debt securities are often higher than those on shorter-term debt securities,* ***this would lead to overcompensation all else being equal.*** *However, we assume no material overcompensation given this excess allowance on the return on debt may compensate service providers for their* ***hedging costs in relation to debt capital****. And, in relation to the return on equity, we assume no material overcompensation given we use a MRP estimate which is partly reliant on historical MRP estimates, which are estimated using the yield to maturity on 10 year Commonwealth Government Securities (CGS).*

129. However, in this justification the AER is adopting a definition of ‘overcompensation’ that is not by reference to prevailing rates (as per its interpretation of efficient financing costs of a BEE) but which is, rather, made relative to the costs <u>incurred</u> by a BEE given an actual efficient debt management practice. That is, the AER is justifying its adoption of a 10 year term for the cost of debt (which is reset every 5 years in the AER’s mathematical calculations) rather than a 5 year term for the cost of debt (which its interpretation of the ARORO requires) on the basis that a businesses will actually incur costs associated with a 10 year term.

130. We completely agree with this observation and conclusion. However, the same logic suggests that the AER should (or, at least, on its own logic could) have regard to other costs that a BEE would efficiently incur when managing its debt portfolio facing real world constraints. That is:

- If the fact that businesses efficiently issue 10 year debt justifies the AER departing from adopting a 5 year tenor (which would otherwise be suggested by its NPV=0 interpretation of the ARORO); then
- the same considerations also justify the AER incorporating historical efficiently incurred debt financing costs into its allowed rate of return.

131. That is, the AER here slips between different interpretations of the ARORO – relying in part on the correct plain economic interpretation that efficient costs reflects efficient practice – even during the process of attempting mathematically justify its alternative interpretation. Doing so invalidates the AER's alleged 'proof' that setting compensation based on prevailing rates satisfies its new NPV=0 criterion. If the AER has regard to actual efficient practice by a BEE to justify a departure from its interpretation of the ARORO in relation to one aspect of debt management (efficient term of debt issued) then the same logic implies a departure to accommodate other aspects of efficient practice (i.e., efficient use of staggered debt maturity).

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7 Inconsistent approach to ARORO and other objectives

132. The AER argues that the use of prevailing rates in its transition is also appropriate on the basis that doing so fulfils other requirements/contributes to other objectives in the NER/NEL. We address these arguments individually in this section.

7.1 Reasonable opportunity to recover at least efficient costs

133. The AER states that a continuation of the on the day regime provides service providers with the reasonable opportunity to recover at least efficient costs over each regulatory period and over the term of the RAB.[47] The AER argues that this is consistent with NEL s.7A(2).

134. However, in arriving at this conclusion the AER interprets "efficient costs" referred to in s.7A(2) to have the same interpretation the AER gives to "efficient financing costs" in the ARORO (i.e., the prevailing rates).[48]

> *We set a rate of return that is commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as the service provider in respect of the provision of prescribed transmission services.* ***This provides a reasonable opportunity to recover at least the efficient financing costs of providing those services****. The service providers' actual returns could differ from those of a benchmark entity depending on how efficiently it operates its business. This is consistent with incentive regulation. That is, our rate of return approach drives efficient outcomes by creating the correct incentive by requiring service providers to retain (fund) any additional income (costs) by outperforming (underperforming) the efficient benchmark.*

135. Even if one accepted the AER's ARORO interpretation, this interpretation of NEL s.7A(2) appears problematic because s.7A(2) refers to the costs a service provider <u>incurs:</u>

> *A regulated network service provider should be provided with a reasonable opportunity to recover at least the efficient costs* ***the operator incurs*** *in*

47 For example, see ibid, p. 275 first dot point. Similarly, the AER argues that its transition to a trailing average provides service providers with a reasonable opportunity to recover at least efficient costs *over the term of the RAB*.

48 AER, AusNet Transmission draft decision, p. 3-37.

(a) providing direct control network services; and

(b) complying with a regulatory obligation or requirement or making a regulatory payment. (Emphasis added.)

136. The AER's position that it should ignore efficiently incurred staggered debt financing costs when interpreting the ARORO is, at best, tenuous. Making the same claim in relation to s.7A(2) would appear to be even more at odds with the plain wording of s.7A(2).

137. Notably, the AER states in relation to its position that:

> *This is consistent with NEL s.7A(2). Lally advised that this principle in the NEL is 'equivalent' to the NPV principle. See Lally, The risk free rate and the present value principle, 22 August, 2012. SFG also appears to support using the NPV principle to assess rate of return approaches. SFG, Preliminary analysis on rule change proposals: Report for AEMC, February 2012, p. 47.*

138. However, as we have already seen in section 3, when Lally most recently "advised that this principle in the NEL is 'equivalent' to the NPV principle", he was **not** using the AER's definition of the NPV=0 criterion. Rather, he was using the definition we propose, which is based on recovery of efficiently incurred staggered debt issuance. Thus, the reference that the AER attributes to Lally actually contradicts with the AER's position.[49]

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[49] At least, the reference that the AER provides would be against itself if the AER had correctly referenced Lally's advice. However, the 22 August 2012 Lally paper referenced makes no reference whatsoever to the NEL or to the NER for that matter. Moreover, it does not even mention 'debt'. It would appear that the AER has misstated the correct source of the Lally advice that s.7A(2).

In any event, the correct references are easily located simply by going back to the AER's draft decision for AusNet electricity distribution – recalling that in that draft decision the AER had not posited its new interpretation of the ARORO/NPV=0 principle. In that decision the AER stated:

> *Accordingly, there is a strong connection between the NPV principle, the allowed rate of return objective and the NGL revenue and pricing principle of providing service providers with a reasonable opportunity to recover at least efficient costs. Lally advised that each of these principles or objectives are equivalent. We therefore consider it is useful to assess the four return on debt approaches for consistency with the NPV principle.[568]*
>
> [568] *Lally advised that the NPV principle should be viewed as **a compatible combination of regulatory policy and service providers' actions that satisfy the NPV principle**. For more details on the NPV principle in respect of the return on debt, see: Lally., Trailing average cost of debt, 19 March 2014, pp. 8–9; Lally, Transitional arrangements for the cost of debt, November 2014, pp. 22-25; and Lally, Review of submissions on the cost of debt, November 2014, pp. 18-37.* [Emphasis added.]
>
> AER, AusNet Electricity distribution preliminary decision, October 2015, p. 174.

The compatibility between the regulatory policy and the service providers' actions are precisely at the core of the plain economic interpretation of the ARORO set out in section 2.1 which, as we have already

7.2 AER's reconciliation of the ARORO and 6A.6.2(k)(1)

139. This section attempts to set out the economic tension in the AER's attempt to reconcile its new interpretation of the ARORO to 6A.6.2(k)(1) – noting that the latter refers back to the ARORO. These economic tensions raise seeming tensions of legal interpretation which we note but do not attempt to resolve.

140. Specifically, the AER interprets the reference in 6A.6.2(k)(1) to "*the return on debt of a benchmark efficient entity* ***referred to in the allowed rate of return objective***" (emphasis added) to mean a return on debt that has efficiently staggered (historical) debt financed costs (for an elaboration of why this is clear see the discussion below under in section 7.2.1.). However, this is clearly not the same as the AER's interpretation of "efficient financing costs of a BEE" within the ARORO (which the AER interprets as meaning prevailing rates.

141. It follows that, for the AER's interpretation of the rules to be internally consistent it must be the case that:

> "*the return on debt of a benchmark efficient entity referred to in the allowed rate of return objective*" (as used in 6A.6.2(k)(1));

is not the same as

> the efficient (debt) financing costs of a BEE (as referenced in the ARORO).

142. There is not, in our view, a plain economic reading that would justify such a distinction. However, the AER may be interpreting the reference back to the ARORO as purely restricted to a reference to the BEE mentioned in the ARORO (not a reference to the efficient financing costs of a BEE mentioned in the ARORO).

143. In this case, it may be logically possible to distinguish the reference in 6A.6.2(k)(1)) back to the ARORO as not actually referencing the concept of 'efficient financing costs' referred to in the ARORO. This may, as a matter of legal logic, allow the AER to hold a different interpretation of "*the return on debt of a BEE referred to in the ARORO*" and *"the efficient* (debt) *financing costs of a BEE*" actually set out in the ARORO.

144. However, as a matter of economic logic this would be a peculiar reading. The return on debt of a BEE referenced in 6A.6.2(k)(1) is clearly a debt financing cost of a BEE. Referring back to the ARORO would, on a plain economic reading, simply make clear that the debt financing cost referred to in 6A.6.2(k)(1) is the debt portion of the BEE's overall financing cost referred to in the ARORO. There does not seem to be any reason to refer back to the BEE in the ARORO other than to make this point clear

explained is also consistent with Lally's version of the NPV=0 test – which is what is referenced in the immediately above quote.

(noting also that in other contexts the BEE is mentioned in the rules without a reference back to the ARORO (i.e., 6A.6.2(j) and 6A.6.4)

7.2.1 AER interpretation of 6A.6.2(k)(1)

145. The following quotes (all emphasis added) relate to the AER's interpretation of 6A.6.2(k).

> *In determining the allowed return on debt, we are required to have regard to the 'mismatch' between a benchmark efficient entity's* ***actual debt cost outcomes*** *(or cash outflows) and the return on debt allowance. (3-263)*
>
> *The desirability of minimising any difference between the return on debt and the return on debt of a benchmark efficient entity referred to in the ARORO. We understand this factor to mean the difference between the return on debt allowance and* ***the cost of debt a benchmark efficient entity would incur.*** *However, we do not consider that this permits us to set a rate of return that will not meet the ARORO or will not achieve the NEO/NGO. (First dot point on page 3-29)*
>
> *Further, the trailing average approach may have particular benefits that an on-the-day approach cannot achieve. For instance, when it advised the AEMC, SFG stated that 'if it can be demonstrated that the benefits of a regulated rate of return which is less variable over time outweigh the costs associated with investment distortions, then a trailing average should be considered'. The potential benefits mainly relate to smoother prices and* ***a potentially reduced mismatch between a benchmark efficient entity's actual debt cost outcomes (or cash outflows) and the allowed return on debt*** *(see section H.6.1), which we discuss further below. (3-273)*

146. These quotes make clear that the AER is interpreting 6A.6.2(k)(1) as referring to a mismatch between allowance and actually incurred (staggered issuance) cost of debt rather than prevailing rates.

7.3 Limiting the impact on a BEE of a change in regulatory methodology

147. The AER's view is that the initial use of prevailing rates for 100% of the cost of debt in the AER's transition to a trailing average is consistent with having regard to any impact that a change in regulatory methodology would have on a benchmark efficient entity of a change in regulatory methodology. In doing so, the AER assumes that the relevant 'impact' is minimised by retaining the use of prevailing rates in the transition.

148. In our view, the correct approach to this assessment is to ask whether the impact of changing the methodology is to results in a better match to the BEE's efficiently incurred financing costs. If so, then the change in methodology requires no transitional arrangements.

149. We agree with the AER in general terms that, if the BEE is a regulated firm, a change in regulatory methodology implemented by the regulator such that regulated businesses will rationally respond to the change in methodology by changing their debt management practices, should be associated with a transition in circumstances where:

- The current regulatory methodology is based on compensating a specific replicable (efficient) debt management strategy; and
- The new methodology is based on compensating a different replicable (efficient) debt management strategy.

150. In which such cases, a transition that appropriately takes into account the costs that a BEE will incur in modifying their debt management strategy may be necessary.

151. However, we would characterise the current circumstance as one where the current regulatory methodology has an error (it does not compensate based on any replicable (efficient) debt management strategy). In which case this error should be corrected immediately so that the method does reflect a replicable (efficient) debt management strategy – thereby immediately minimising the extent of mismatch.

152. Put simply, there is no basis for imposing a transition process for the correction of an error.

7.4 Mismatch between prevailing rates and actual debt costs

153. The AER's approach to the 'mismatch' issue provides another example of where the AER slips between the competing interpretations of efficient financing costs. The rules refer to '*the desirability of minimising any difference between the return on debt and the return on debt of a benchmark efficient entity referred to in the allowed rate of return objective*'. On page 264 the AER states:

> *Moreover, the desirability of minimising* ***(ex-post) debt cash flow mismatch*** *is not the only type of interest rate mismatch risk we consider relevant.* ***The rules require us to have regard to the desirability of minimising this type of mismatch for a benchmark efficient entity.***

154. Here the AER is conceding that the reference to "the return on debt of a benchmark efficient entity **referred to in the allowed rate of return objective**" in the Rules is a reference to the '**cash' historical** cost of debt, since ex-post cash flows would,

by definition, refer to historical values. This is, obviously, internally inconsistent with the AER's more general position that the ARORO is referring only to prevailing rates.

8 Other views expressed by the AER

8.1 Interest rate risk and windfall gains

155. The AER argues that it is irrelevant that the use of prevailing rates may result in windfall gains or losses to a benchmark efficient entity relative to the interest costs that they are actually paying. It is argued that any assessment of windfall gains/losses must be carried out by reference to a departure from prevailing rates.[50]

156. The AER argues that a difference between prevailing rates and efficiently incurred historical rates reflects past exposure to 'interest rate risk'. The AER states that using historical rates in the cost of debt allowance 'removes realised losses or gains from interest rate risk' and this is an undesirable outcome because: [51]

    a. regulated businesses have been appropriately compensated for bearing interest rate risk in the past; and

    b. it would amount to 'cost of service' regulation and would be inconsistent with 'incentive regulation'. (The AER describes this exposure to interest rate risk as "...regulated firms should be required to bear the consequences of their chosen financing approach..."[52]

157. We first note that the use of the term 'interest rate risk' is misleading. The correct characterisation of the relevant risk is 'regulatory risk' arising from the failure of the regulator to set compensation for the cost of debt based on a replicable (efficient) staggered debt issuance strategy.

158. By way of analogy, imagine that the regulator had in the past set the cost of debt based on an estimate of the efficient costs that a BEE would actually incur plus a random number, generated once every 5 years, of between -3% and +3%. Let the current application of this methodology result in the random number being -2%. This would mean that continued application of the method would result in the business being undercompensated by 2% on its efficiently incurred cost of debt.

159. This is, in fact, not dissimilar to what is actually the case given the past sole reliance on prevailing rates (both base rate and DRP). When prevailing rates happened to be higher/lower than the average cost of efficiently staggered debt issuance the business would benefit by a more or less random amount. However, to describe this as

50 AER, AusNet Transmission draft decision, 3-100 last paragraph

51 AER, AusNet Transmission draft decision, p. 102.

52 AER, AusNet Transmission draft decision, p. 268 and similar statement on p. 101.

'interest rate risk' is unhelpful. It is, in fact, regulatory risk created by the regulator not compensating based on efficiently incurred staggered debt finance costs.

160. The statement regarding past compensation for bearing this risk is demonstrably wrong. It relies on a presumption that measured equity betas capture all risks and provide all necessary compensation for those risks. This is simply not correct. The cost to a business of a regulator compensating based on prevailing rates that do not adequately reflect their actual efficient costs has little, if anything, to do with beta risk. Not all risks have a beta component to them (indeed most do not).[53] If a service provider stands to lose $50m in the next regulatory period as a result of undercompensating their efficient debt costs there is no reason to believe that this is offset by $50m of additional compensation built into the cost of equity allowance via a higher equity beta.

161. Moreover, any impact on measured equity betas as a result of past exposure to this regulatory risk is likely to be to negative rather than positive. If risk premiums rise in a depressed economy (and fall in a booming economy) then service providers under the on the day regime will tend to make windfall gains (losses) in a depressed (booming) economy (because prevailing risk premiums compensated by the AER will be above (below) trailing average levels at which service providers fund themselves). This implies reduced beta risk because the service providers are making gains when most other asset classes are depressed (depressed economy) and making gains when the economy is booming and most other asset classes are performing well. This means that service providers' betas have, if anything, likely been depressed in the past by exposure to this 'regulatory risk'. Certainly, there is no reliable basis to argue that the potentially very large losses that would be suffered as a result of the AER not removing this regulatory risk have in any way been compensated in the form of a higher beta in the past.

162. The same point we have made above applies here. If the previous regulatory regime incorporated an error in accurately compensating for efficient financing costs there is no basis on which to impose a transition to remove that error rather than simply eliminating the error immediately. By way of example, there would be no basis to 'transition out' the 'random number error' we hypothesise above as being equivalent to the use of 'on the day' rates.

163. The statement regarding cost of service regulation is also demonstrably wrong. The use of benchmarked estimates of historical cost of debt does not constitute cost of service regulation. Cost of service regulation is where a firm is able to pass on its own costs to customers. The use of benchmarked historical estimates of the cost of debt

53 By way of example, terrorist acts tend to be both low in frequency and unrelated to the state of the stock market (beta equals zero) – yet the cost of a terrorist act on a service provider's network could still be material. One cannot assume that because the service provider was previously exposed to the risk of terrorist attack that, therefore, they have been adequately compensated in the past via the measured equity beta and, therefore, no compensation is required for an actual terrorist attack.

from Bloomberg/RBA/Reuters does not constitute "cost of service" regulation in the way the AER is inferring it does.

8.2 Service providers hedged 'nearly their entire' base rate

164. The AER states that it believes that the best evidence is that businesses hedge close to 100% of their portfolio to prevailing rates and, by implication, are little affected by current low rates.[54]

> *Further, we consider a full transition necessary to satisfy the ARORO and NEO/NGO even if firms partially hedged. It is also worth noting that service providers proposing this transition did not appear to hold the view that hedging one third of the base rate was optimal ex-ante because they appeared to have hedged* ***nearly their entire base rate in practice.*** [Emphasis added.]

165. It is important to note that, as per the first sentence in the above quote, the AER's new interpretation of the ARORO is that *efficient financing practices* are irrelevant to determining the *efficient financing costs* of a BEE. Therefore, the AER's views on what service providers actually did is provided as an aside.

166. Of course, actual financing practice (both of service providers and the hypothetical BEE) was previously central to the AER's views on satisfying the ARORO (and still is in relation to, for example, debt term as per discussion in section 6.3). In this context it is relevant to note that, immediately prior to the AER's change in interpretation of the ARORO (and change in experts advising it on this interpretation), CEG provided a detailed and comprehensive rebuttal[55] of:

    - The AER's views that 100% hedging reflected actual practice (which is repeated more or less unchanged in the AusNet Services transmission draft decision); and
    - The AER and its then experts' (Lally and Chairmont) views that 100% hedging was theoretically efficient.

167. Subsequent to receiving that submission the AER did not commission any further advice from Lally or Chairmont in response to CEG's critique. The AER did alter its theoretical interpretation of the ARORO in such a manner to allow it to reach the conclusion that 100% weight to prevailing rates should be used even if:

    - The weight of evidence was that actual hedging by regulated service providers was much less than 100%; and

54 AER, AusNet Transmission draft decision, p. 103.

55 CEG, Critique of the AER's approach to transition, January 2016. In particular, see sections 4 and 6.

- The theoretical/empirical evidence overwhelmingly supported a view that much less than 100% hedging was efficient.

168. Our view is that our January 2016 report established both of the above contentions as reliable facts.

COMPETITION ECONOMISTS GROUP

9 Debt management strategy for an unregulated BEE

9.1 Unregulated businesses also stagger their debt portfolios

169. In a previous report for DBP, the owner and operator of the Dampier to Bunbury Natural Gas Pipeline (DBNGP) in Western Australia, CEG submitted empirical evidence that majority of firms in Australia – both regulated and unregulated – practice some form of debt staggering instead of structuring all of their debt to fall due at the same time.[56]

170. We have not repeated the study with more recent data, but a cursory examination of selected firms suggests that the conclusions from our previous report as set out above are likely to remain unchanged.

171. Our present analysis covers the following five firms from the ASX 20, selected as the five largest firms in different industries. That is, we begin at the largest firm in the ASX 20 and select it (the Commonwealth Bank). We then select the next largest firm that is from a different industry (not a bank) and so on until we have five firms from five different industries. These five firms are:

- Commonwealth Bank;
- BHP Billiton Ltd;
- Telstra Corporation;
- Wesfarmers Ltd; and
- CSL Ltd.

172. The debt maturity profiles of each of the above five firms are shown in Figure 9-1 and Figure 9-5, where it can be seen that all five firms stagger their debt to various degrees. Three of the five firms have debt maturing in 2026 and beyond, while Wesfarmers has debt falling due up to 2023, and Commonwealth Bank combines its long term debt into a "> Jun 21" category.

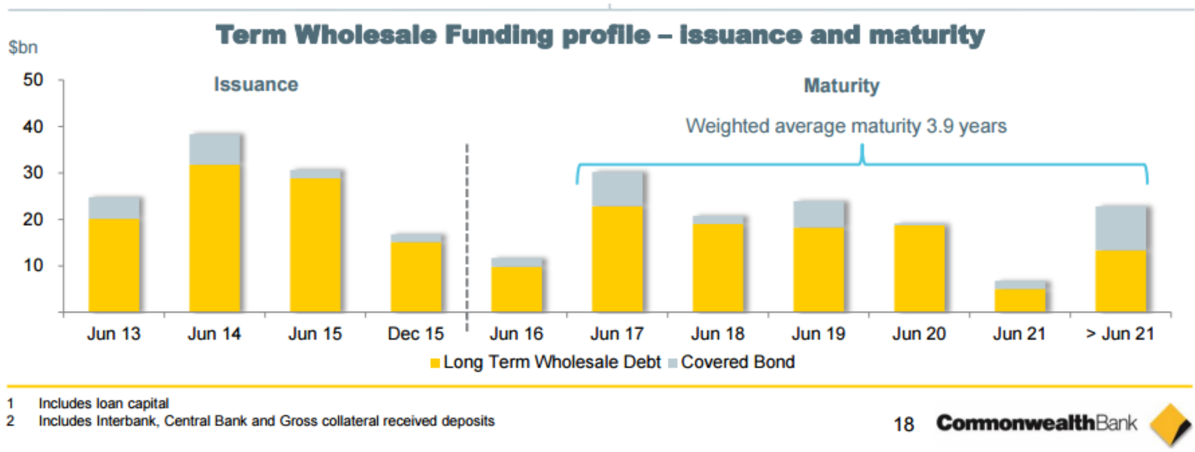
173. Notably, BHP Billiton explicitly states that it aims to maintain a maturity profile that is "well balanced with low refinancing risk", while Wesfarmers explains that its debt management strategy includes "[c]ontinued focus on maturity profile". These

56 CEG, Debt staggering of Australian businesses, December 2014. Available at: https://www.erawa.com.au/cproot/13288/2/Submission%2012%20-%20Appendix%20G%20-%20Efficient%20Debt%20Stagering%20By%20Competitive%20Firms.pdf

comments suggest that the staggered debt profiles of these businesses are the result of intentional debt management practices that the businesses consider to be strategically beneficial to themselves, and do not occur as a random result.

9.1.1 Commonwealth Bank

Figure 9-1: Commonwealth Bank debt profile



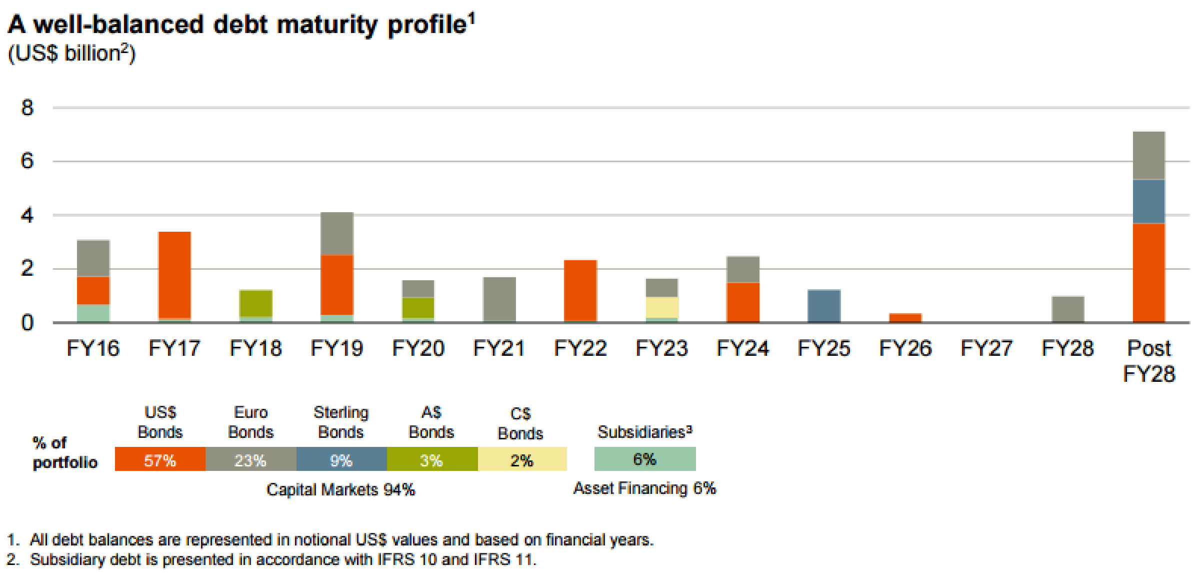
Source: Commonwealth Bank, Debt Investor Update for the half year ended 31 December 2016, February 2016, p. 18.

9.1.2 BHP Billiton Ltd

174. On the same slide from which the chart on Figure 9-2 below was taken, BHP Billiton emphasised the following point, which show that the company views a staggered debt portfolio as a way to reduce refinancing risk:

> *We continue to optimise our balance sheet*
>
> *• The Group's maturity profile is well balanced with low refinancing risk*
>
> *• The debt portfolio is diversified across currency and tenor*
>
> *• Central funding allows the Group to efficiently balance liquidity and financing costs*
>
> *• Cash and cash equivalents US$6.8 billion plus US$6.0 undrawn committed facility*

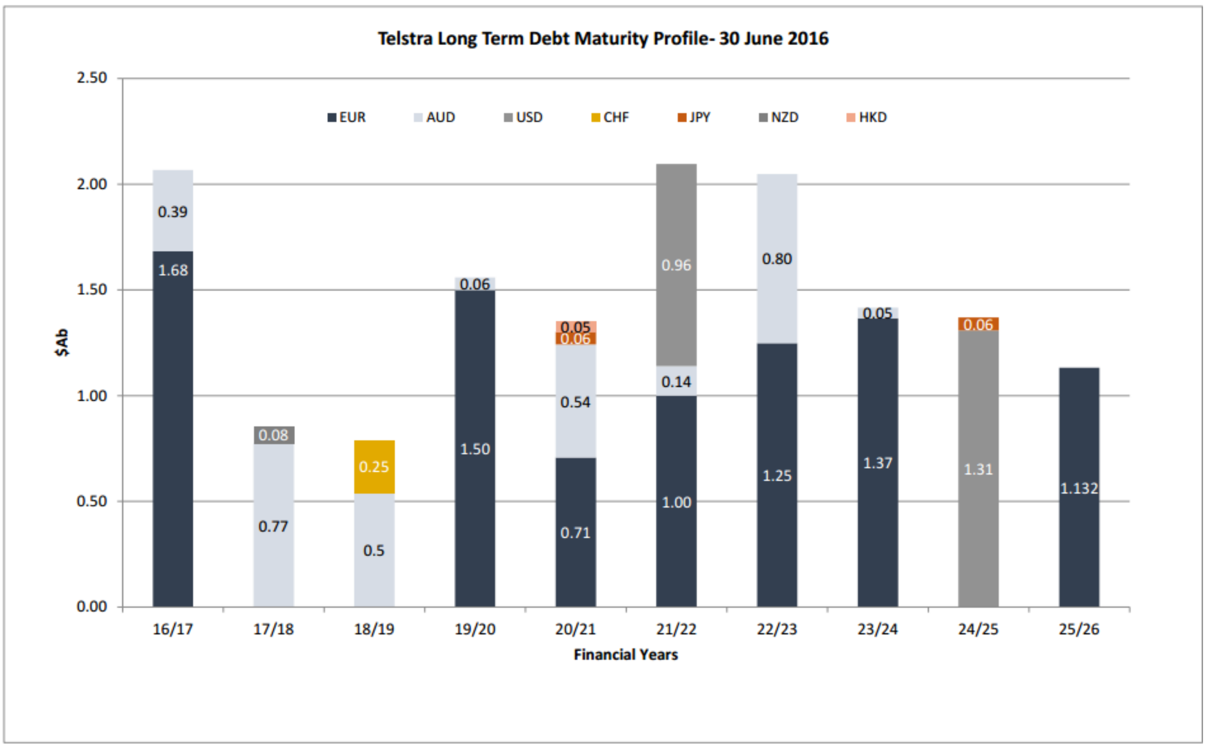
Figure 9-2: BHP Billiton debt profile



Source: BHP, Debt investor presentation, 2015 financial year, slide 9.

9.1.3 Telstra Corporation

Figure 9-3: Telstra debt profile



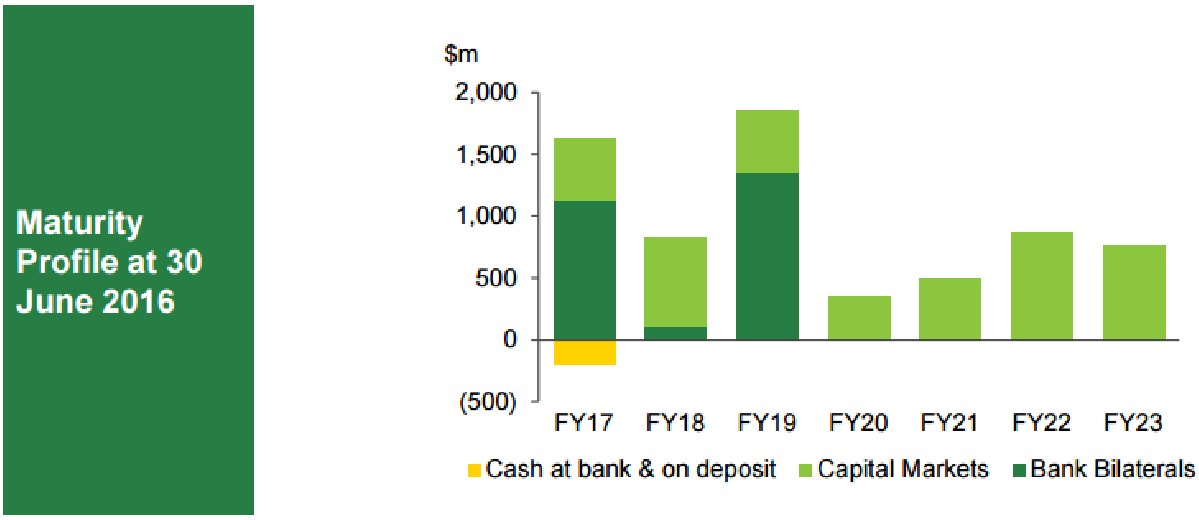
Source: Telstra, Debt Maturity Profile (Currency), June 2016; available at
https://www.telstra.com.au/content/dam/tcom/about-us/investors/pdf-e/debt-maturity-profile-300616.pdf

9.1.4 Wesfarmers Ltd

175. It is relevant to note that Wesfarmers explicitly listed the following refinancing objectives as part of their pro-active debt management strategy:[57]

- Continued focus on maturity profile and maintaining liquidity headroom in revolving bilateral bank facilities;
- Commitment to maintain diversity of funding sources including the domestic and international debt capital markets; and
- Standard terms and conditions across all DCM programmes, with a common guarantee structure that applies to all funding arrangements.

Figure 9-4: Wesfarmers Ltd debt profile

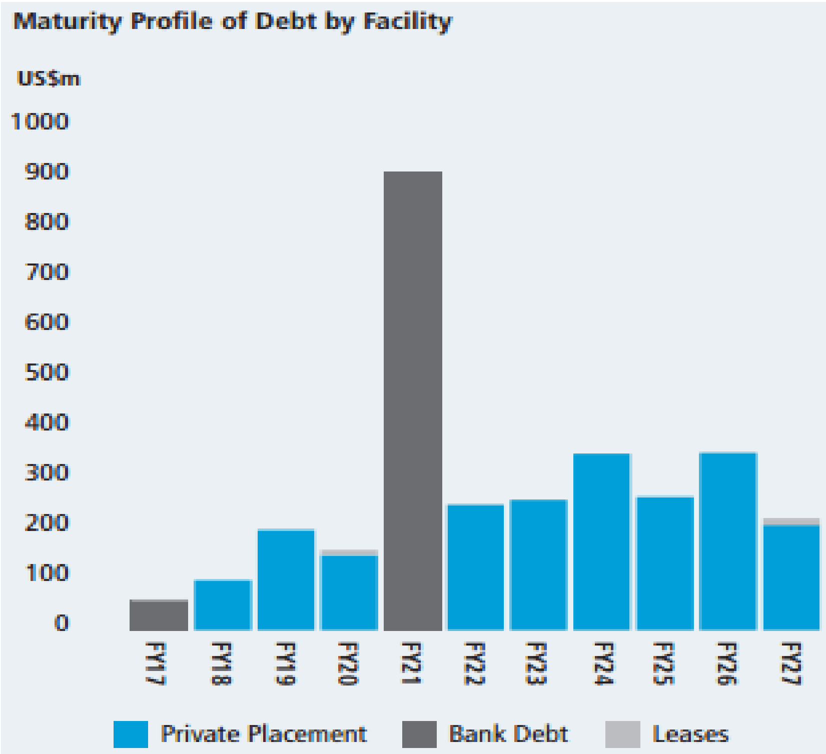


Source: Wesfarmers, 2016 Full-year Results: Debt Investor Update, p. 40.

[57] Wesfarmers, 2016 Full-year Results: Debt Investor Update, p. 39.

9.1.5 CSL Ltd

Figure 9-5: CSL Ltd debt profile



Source: CSL, CSL Limited Annual Report 2015-16, p. 103.

9.2 Unregulated firms do not hedge base rate to the regulatory period

176. It is, by definition, true that unregulated firms do not hedge their base rate to the regulatory reset of the allowed rate of return – because they do not face any regulatory resets.

COMPETITION ECONOMISTS GROUP

Criteria for assessing fair value curves: an update

Dr. Tom Hird

September 2016

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1 Introduction

1. CEG has been asked by AusNet Services to consider the appropriateness of the available third party data curves as a source for estimating the DRP that applies to a benchmark efficient firm. This request was made as an update to our previous report,[1] in which we evaluated the BBB DRP curves published by Bloomberg (BVAL curve), RBA, and Reuters.

2. One material change in the BVAL curve is its recent addition of a 7-year bond issued by Jemena (LW474837), which was added to the BVAL sample on 29 June 2016. Given the sparsity of long-maturity bonds in the BVAL sample, it is important to carry out analysis regarding whether the Jemena bond had undue impact on the 10-year BVAL estimate. In particular, we analyse whether the BVAL curve was more consistent with the debt characteristics of a benchmark efficient firm, in light of the analysis carried out in our previous report.

3. In the time period since AusNet Services made its request, the BVAL sample subsequently added another 7-year bond issued by Mirvac Group (QZ330503). The bond was first added to the sample on 1 September 2016, but was then omitted from the sample on 7 September 2016.

4. This report therefore analyses the impact of the bonds issued by Jemena and Mirvac, paying particular attention to how they impact the levels and shapes of the BVAL and Reuters curves. Our analysis suggests that the conclusions drawn in our previous report continue to hold, and have, in fact, been further affirmed by the recent developments in the BVAL curve in response to the bonds issued by Jemena and Mirvac.

5. Specifically, we find that the RBA curve has the most desirable properties for estimating the DRP applicable to a benchmark efficient firm, and that if multiple data sources are to be selected, then there is no reason to include the BVAL curve without also including the Reuters curve, given that there is no basis to conclude that the BVAL curve is superior to the Reuters curve (if anything a more robust response of the Reuters curve to the Jemena and Mirvac bonds suggests that the opposite may be true).

6. The rest of this report is structured as follows:

   - Section 2 reviews the criticisms of the BVAL curve as set out in our previous report;

[1] CEG, Criteria for assessing fair value curves, January 2016.

- Section 3 discusses the recent changes in the BVAL curve as a result of the inclusion of the Jemena and Mirvac bonds, and contrasts them against the changes in the Reuters curve; and
- Section 4 concludes.

7. I acknowledge that I have read, understood and complied with the Federal Court of Australia's Practice Note CM 7, "Expert Witnesses in Proceedings in the Federal Court of Australia". I have made all inquiries that I believe are desirable and appropriate to answer the questions put to me. No matters of significance that I regard as relevant have to my knowledge been withheld.

8. I have been assisted in the preparation of this report by Johnathan Wongsosaputro in CEG's Sydney office. However, the opinions set out in this report are my own.

Thomas Nicholas Hird

2 Previous criticisms of the BVAL curve

9. The AER's current approach towards estimating the cost of debt that applies to a Benchmark Efficient Entity (BEE) makes use of a simple average of Bloomberg's AUD broad BBB BVAL curve and the RBA's broad BBB curve, both of which are calculated at a 10-year tenor.[2]

10. CEG has previously evaluated both the BVAL and RBA curves, along with Reuters' AUD broad BBB corporate credit curve, in the context of estimating the cost of debt for a BEE.[3] In that report, we evaluated the curves according to the following five criteria:

    a. Dataset that best matches the characteristics of debts issued by a BEE;

    b. A large dataset that is consistent with criterion (a);

    c. Derived from a transparent and robust method;

    d. Regularly published by an independent reputable organisation; and

    e. Track record of accuracy.

11. Our analysis found that the RBA curve fulfilled all five criteria, while the Bloomberg and Reuters curves only fulfilled criteria (d). We therefore concluded that the RBA curve had superior properties compared to the BVAL and Reuters curves. To the extent that curves had to be selected in advance, we advised that it would be appropriate to give 100% weight to the RBA curve. We also advised that, given the BVAL and Reuters curve had similar performance against the criteria, if one were to be given weight then the same weight should be given to the other. On the other hand, if there was a possibility of carrying out statistical testing to identify the most appropriate curve in any given period then this may suggest different weights to those that would be optimal if the weights had to be determined in advance.

12. There has been no change in the facts that would cause us to alter these recommendations.

13. In our other reports, we further identified a number of problematic issues with the 10-year estimates obtained from the BVAL curve. First, the 10-year BVAL estimate was, at the time of writing, disproportionately influenced by the yield of a single bond

2 The RBA curve is extrapolated to 10 years, while the BVAL curve is extrapolated if no 10-year estimate is available. See: AER, AusNet Services transmission determination 2017-18 to 2021-22, Draft Decision, Attachment 3 – Rate of Return, July 2016, p. 3-328.

3 CEG, Criteria for assessing fair value curves, January 2016.

issued by Asciano (EK907291), which had a residual maturity of 9 years, while the next highest residual maturity was only 6.2 years as at February 2016.[4]

14. Although, the addition of the Jemena bond to the BVAL sample has reduced the influence of the Asciano bond, it has done so in a manner that further exacerbates the problematic issues associated with the BVAL curve. Specifically, the reduction in influence of the Asciano bond was matched with disproportionate influence being assigned to the Jemena bond, whose yields are clearly not in line with the rest of the bonds in the sample. This observation is supported by the fact that the Mirvac bond had similar yields to the Jemena bond, but the former was removed for being an outlier with respect to the rest of the sample.

15. Second, since none of the underlying bonds had residual maturities exceeding 10 years, the BVAL estimates for tenors at 10 years and longer had to be obtained via extrapolation. Our analysis of historical BVAL estimates and conversations with Bloomberg representatives suggested that the extrapolation was carried out using Bloomberg's Australia Government Bonds Generic Yield Curve – an approach that would likely underestimate the yields at longer maturities (we note that the BVAL spread to CGS curve is still fairly flat or even negatively sloped beyond 10 years).

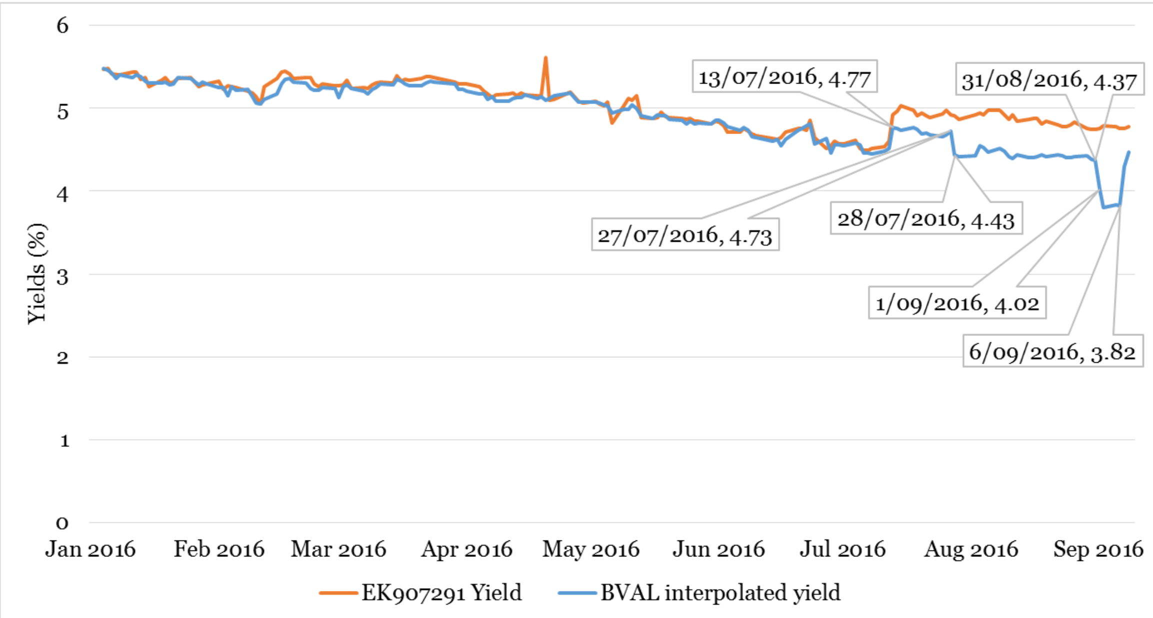
4 CEG, Recent financial market conditions and the BVAL curve – updated to 19 February 2016.

3 Recent changes in the BVAL curve

16. The BVAL curve has recently undergone a substantial change after a bond issued by Jemena (LW474837) was added to its underlying sample on 29 June 2016. This can be seen in Figure 3-1, in which the yield of the Asciano bond (EK907291) appears to move in lock-step with its associated BVAL interpolated yield up until 13 July 2016, after which the two series appear to diverge. In addition, there appears to be a substantial 32 bp downward spike in the BVAL interpolated yield on 29 July 2016, which was not matched by Reuters estimates (noting RBA estimates are not available on a daily basis).

17. Another fairly odd development can be observed on 1 September 2016, when the BVAL interpolated yield declined by 35 bp compared to its estimate on the previous day. This was followed by a corresponding upward shift of 45 bp between 6 September 2016 and 7 September 2016. Both of these shifts match with the inclusion of a bond issued by Mirvac Group (QZ330503), which was briefly included in the BVAL sample from 1 September 2016 to 6 September 2016, before being removed as of 7 September 2016.

Figure 3-1: Comparison of Asciano bond yield against BVAL yield

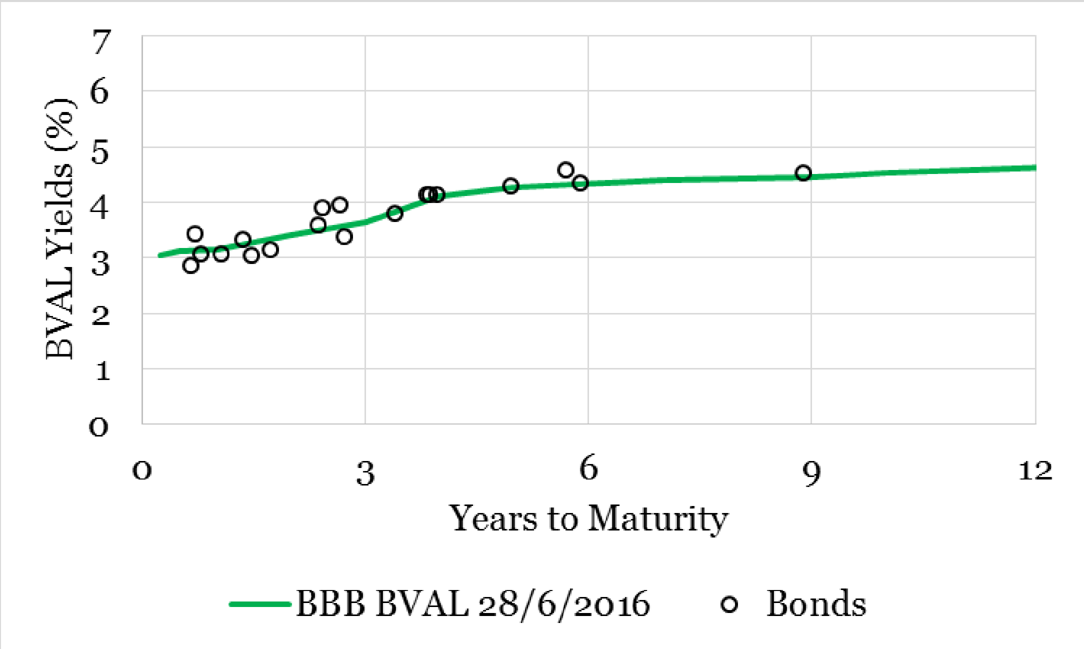


Source: Bloomberg, CEG analysis

18. Further insights can be drawn by examining the BVAL curve and its underlying bond constituents on specific dates. As seen from Figure 3-2 and Figure 3-3, the 7-year bond issued by Jemena was first included in the BVAL sample on 29 June 2016. It can also be seen that the inclusion of the Jemena bond (the yield on which is

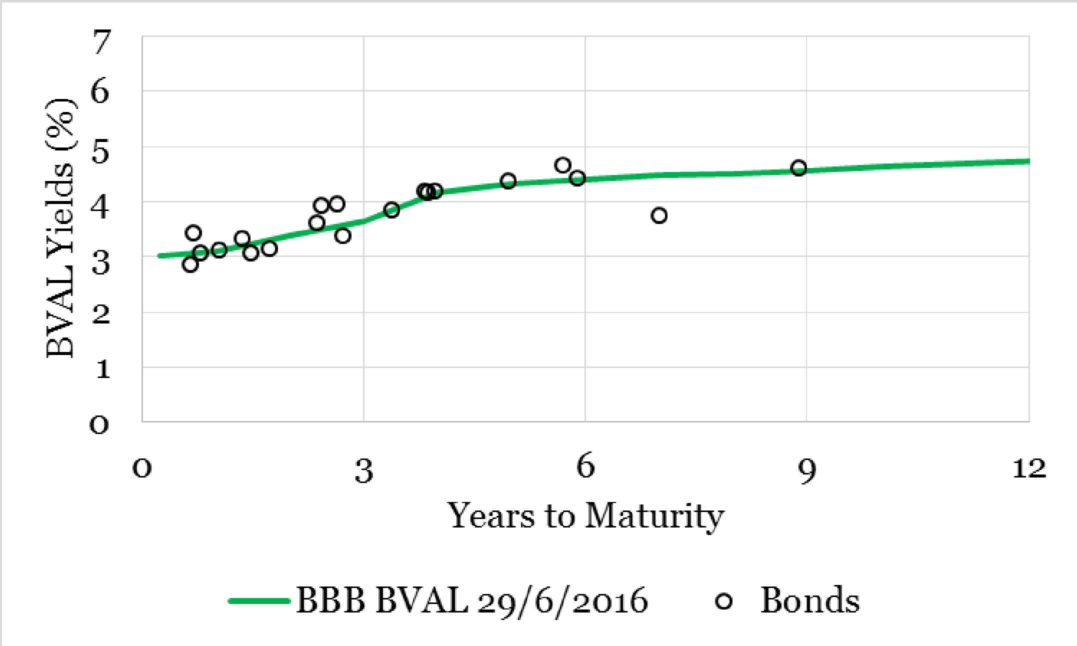
represented by the dot at 7 year maturity in Figure 3-3) did not initially appear to have a material impact on the longer end of the BVAL curve, which continued to pass very close to the Asciano bond, which has the longest residual maturity in the sample.

Figure 3-2: BVAL curve and bond constituents, 28 June 2016



Source: Bloomberg, CEG analysis

Figure 3-3: BVAL curve and bond constituents, 29 June 2016

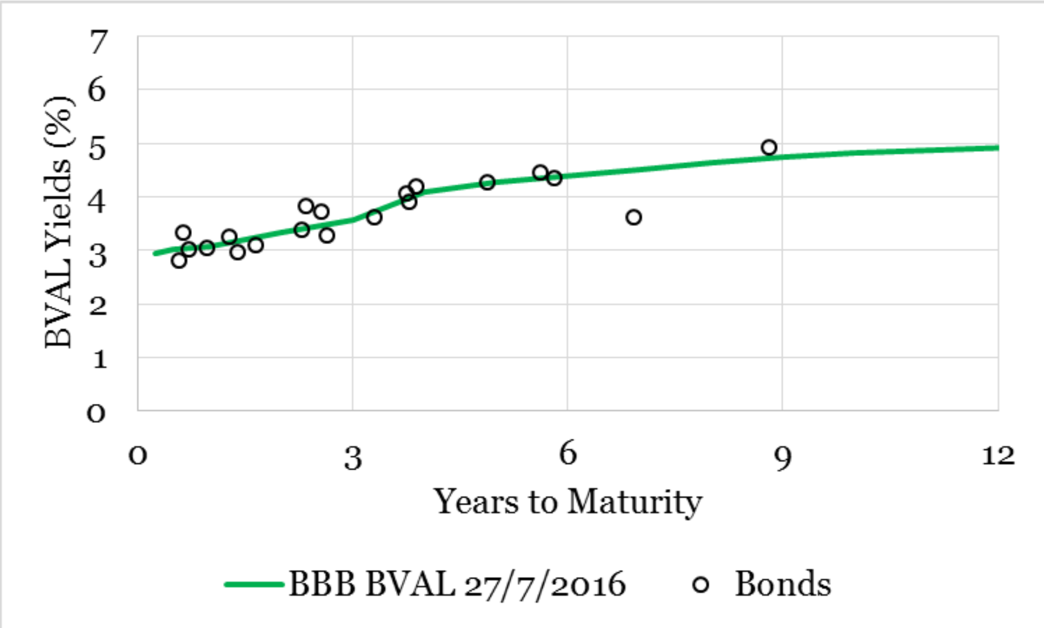


Source: Bloomberg, CEG analysis

19. Coincident with the sharp decline of the BVAL interpolated yield on 28 July 2016 (shown in Figure 3-1), Figure 3-4 and Figure 3-5 show that there was no corresponding reduction in yields of the underlying bonds on that day. In particular, the largest decrease in yields on that day was only 5.5 bp, which cannot explain the 31 bp decrease in the 10-year BVAL estimate.

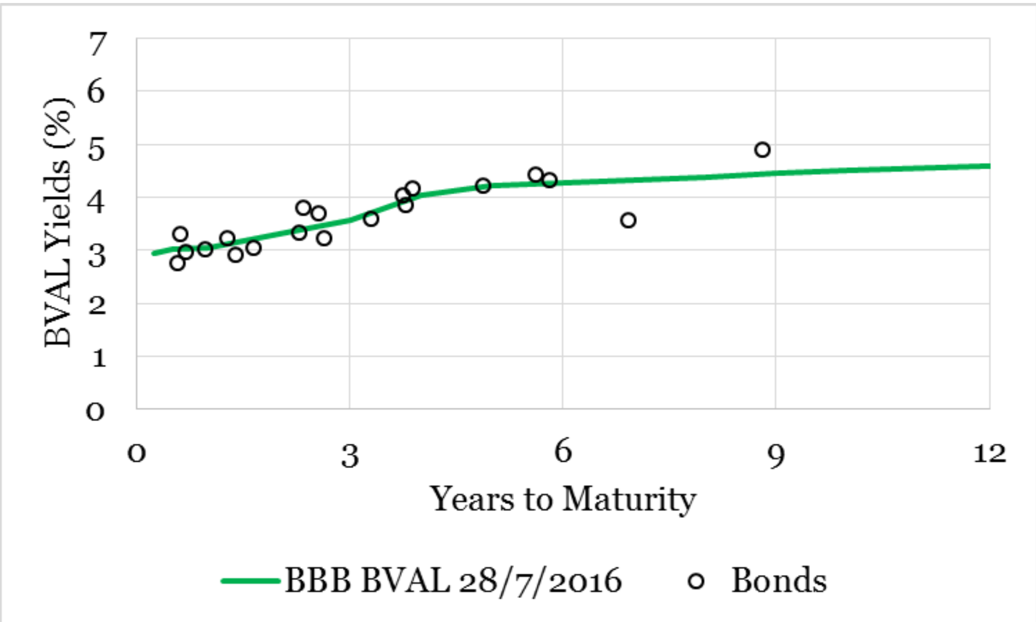
20. Instead, Figure 3-4 and Figure 3-5 suggest that the sharp decline was most likely due to an increase in the weight assigned to the Jemena bond that has an exceptionally low yield, causing the BVAL curve to pivot downwards between the Jemena and Asciano bonds instead of simply being guided by the Asciano bond alone in an almost one-to-one manner.

Figure 3-4: BVAL curve and bond constituents, 27 July 2016



Source: Bloomberg, CEG analysis

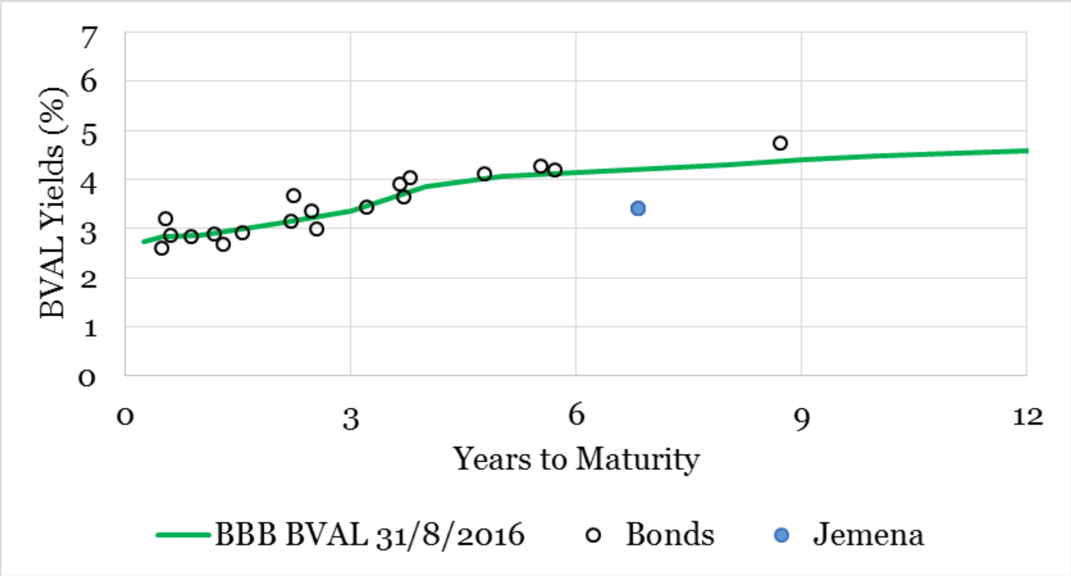
Figure 3-5: BVAL curve and bond constituents, 28 July 2016



Source: Bloomberg, CEG analysis

21. Figure 3-6 shows the BVAL curve and its constituents as at 31 August 2016, and it can be seen that the BVAL curve continues to fall below the Asciano bond and above the Jemena bond.

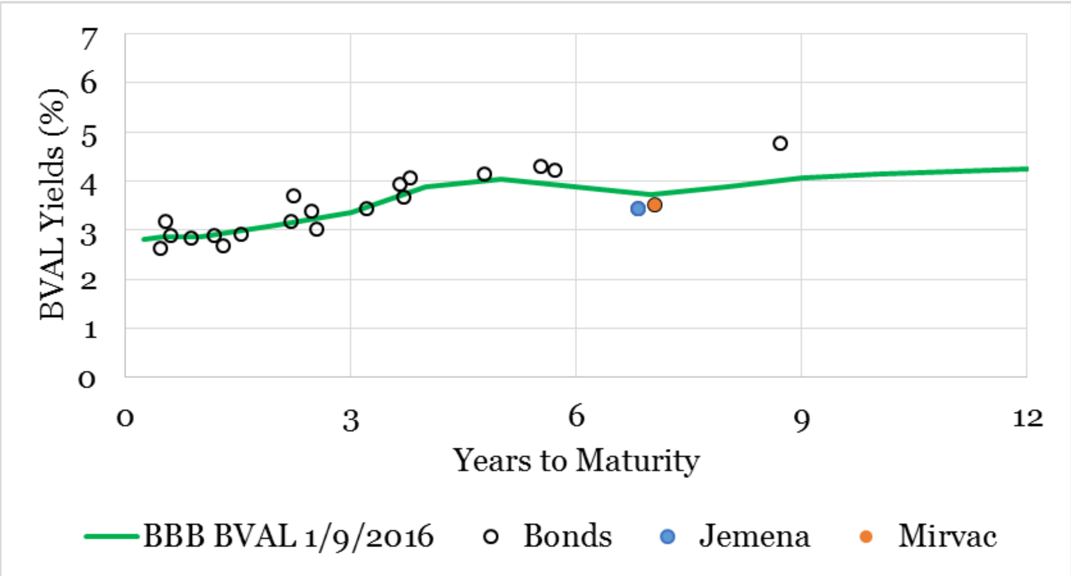
Figure 3-6: BVAL curve and bond constituents, 31 August 2016



Source: Bloomberg, CEG analysis

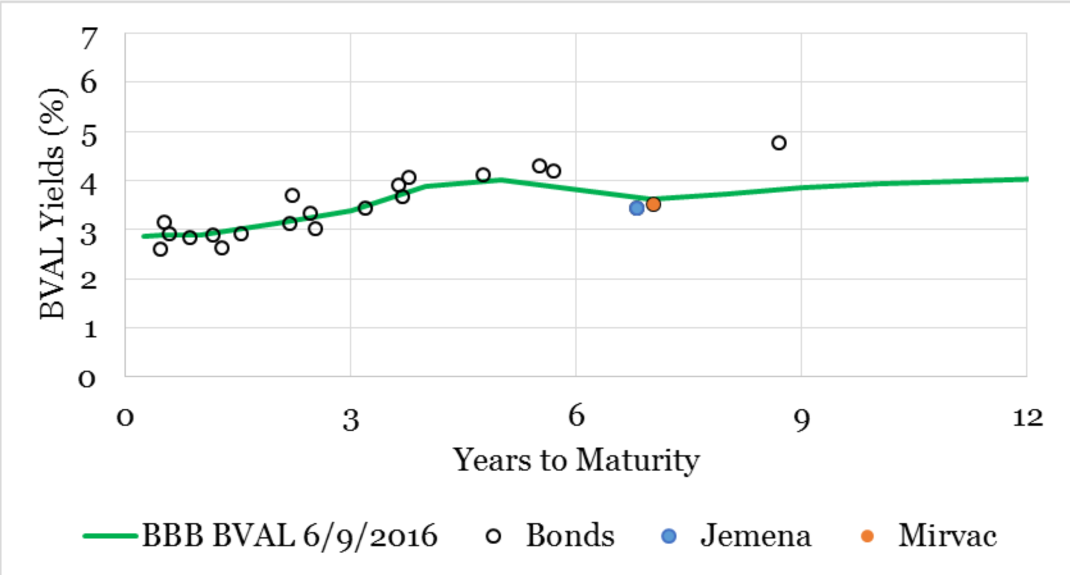
22. Figure 3-7 shows the BVAL curve as at 1 September 2016, in which the Mirvac bond was first included in the BVAL sample. This caused a kink in the BVAL curve between 5 and 9 years, which continued until 6 September 2016, as seen in Figure 3-8.

Figure 3-7: BVAL curve and bond constituents, 1 September 2016



Source: Bloomberg, CEG analysis

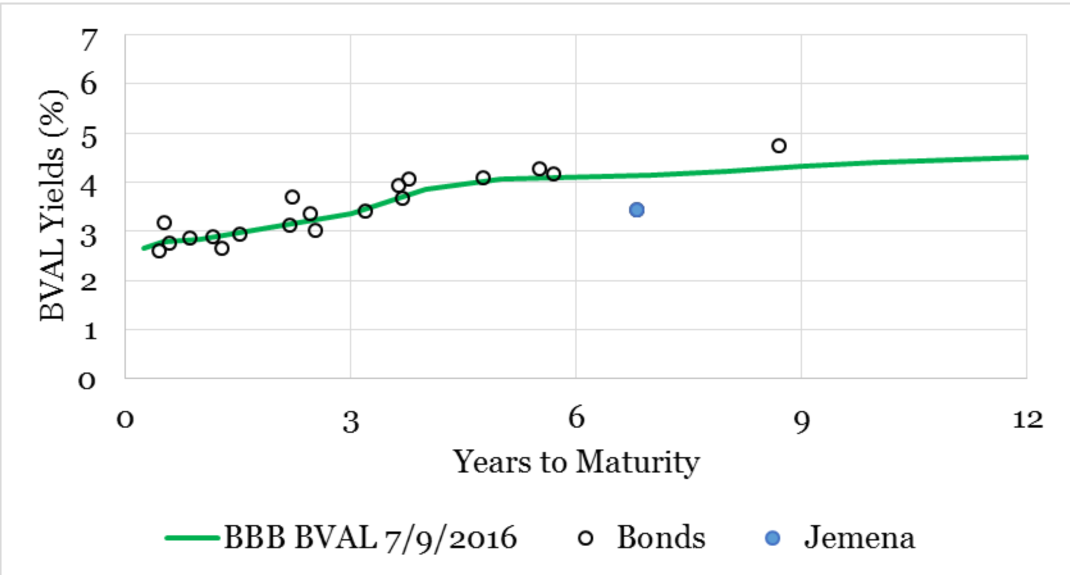
Figure 3-8: BVAL curve and bond constituents, 6 September 2016



Source: Bloomberg, CEG analysis

23. The Mirvac bond was removed from the BVAL sample on 7 September 2016. It can be seen from Figure 3-9 that the omission of the Mirvac bond also removed the kink at 7 years, resulting in the curve taking on a similar shape to that observed on 31 August 2016 (Figure 3-6), before the Mirvac bond was included.

Figure 3-9: BVAL curve and bond constituents, 7 September 2016



Source: Bloomberg, CEG analysis

3.1 Problems with the inclusion of the Jemena bond

24. As discussed in section 2, one of our criticisms of the BVAL curve concerned the lack of long-maturity bonds in its underlying sample. In light of this, the inclusion of a bond with seven years maturity would, other things equal, be a welcome addition. However, the specific Jemena bond in question has some undesirable properties that are inconsistent with the rest of the curve, in our view inappropriate for the purpose of fitting a broad BBB curve.

25. As seen in Figure 3-3 to Figure 3-6, the yields of the Jemena bond are consistently and materially below the yields of other bonds with considerably shorter residual maturities. Consistent with this, the Jemena bond has conflicting credit ratings across rating institutions, with S&P assigning a BBB+ rating, while Moody's assigned it a rating of A3. It is, therefore, not obvious that the Jemena bond should be included in the construction of a BBB curve. Consistent with this Reuters includes the same bond in its AUD broad A credit curve instead of its broad BBB curve. Overall, this suggests that the Jemena bond is straddling the boundary between a BBB+ rating and an A- rating, which could result in yield estimates that are biased downwards.

26. While the RBA, like Bloomberg, includes the Jemena bond in its BBB sample, it must be reiterated that the Jemena bond receives a much smaller weight in the RBA estimate given the much larger number of long term bonds in the RBA sample (28 bonds with greater than 6 years maturity in the RBA's August estimate). This means that any potential downward bias associated with the inclusion of the Jemena bond in the RBA sample is mitigated.

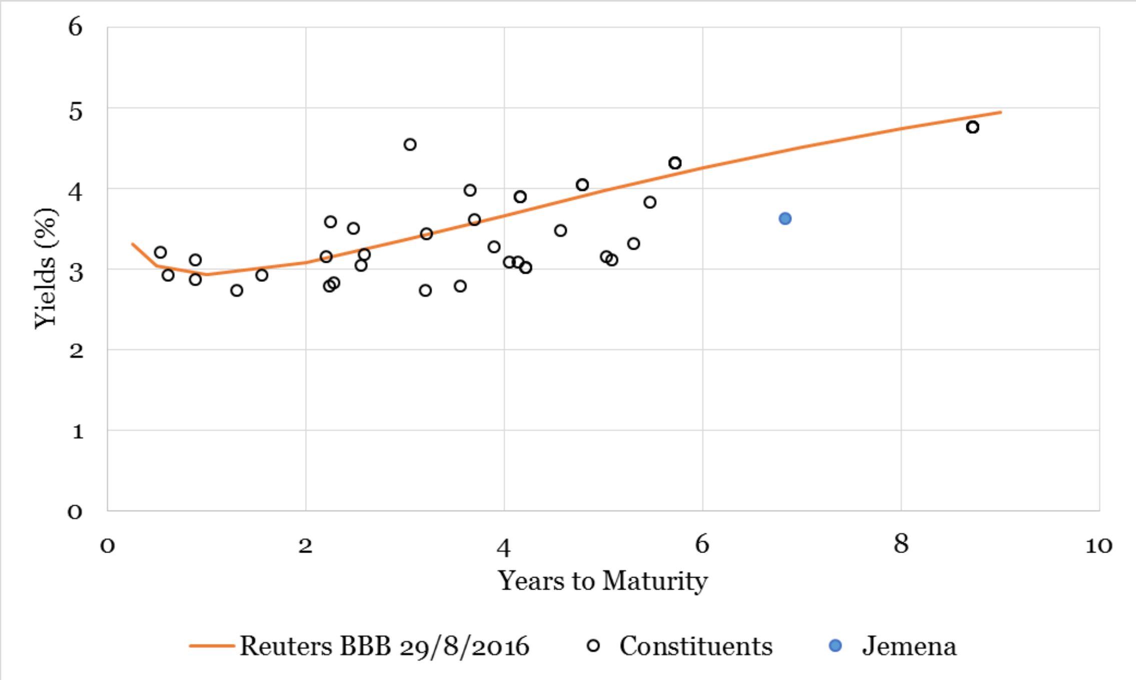
27. However, this assumption does not hold for the BVAL sample which consists of a small number of bonds that are mostly clustered around the lower tenors. In the BVAL sample, the Jemena bond is one of only two bonds with residual maturities exceeding 6 years (the other being the Asciano bond).

3.1.1 Reuters' classification of the Jemena bond

28. Figure 3-10 shows the Reuters broad BBB curve as at 29 August 2016, along with its bond constituents.[5] The figure further includes the yield of the Jemena bond, which is not part of Reuters' BBB sample. A visual inspection of the figure suggests that, had the Jemena bond been included in the sample, it would have been at the very low end of the expected range for its tenor, relative to the rest of the bonds in the sample.

5 The yields shown are collected from Reuters instead of Bloomberg.

Figure 3-10: Reuters broad BBB curve



*Source: Reuters, CEG analysis; *The Jemena bond is not part of Reuters' BBB sample, and is only included for comparison*

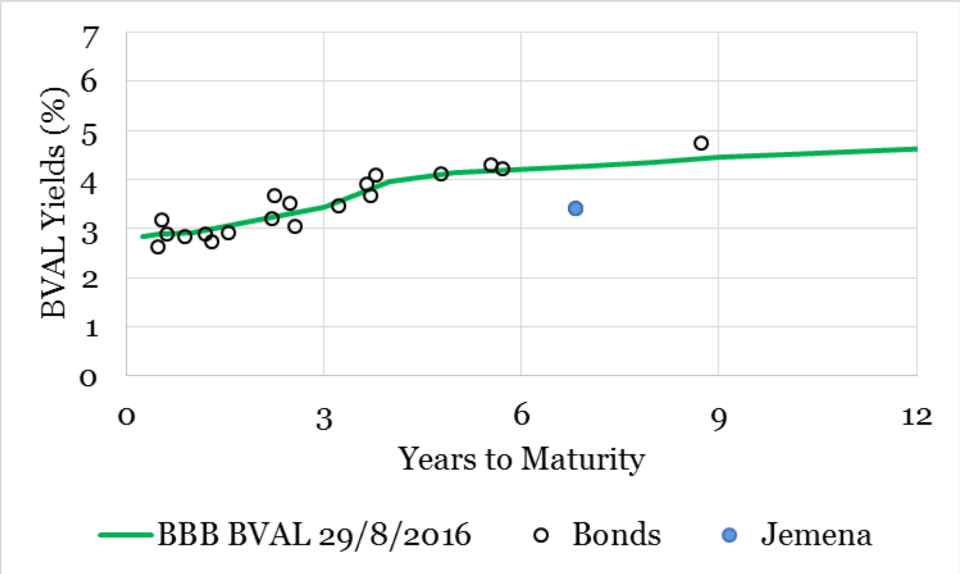
29. Figure 3-11 shows the Reuters broad A curve as at 29 August 2016 and its bond constituents, which includes the Jemena bond. Compared to the broad BBB curve in Figure 3-11, the Jemena bond appears to be in line with the broad A curve compared to other bonds with long maturities, which suggests that it would be more appropriate for the Jemena bond to be placed in the A sample instead of BBB.

Figure 3-11: Reuters broad A curve

*Source: Reuters, CEG analysis; *The Jemena bond is part of Reuters' A sample*

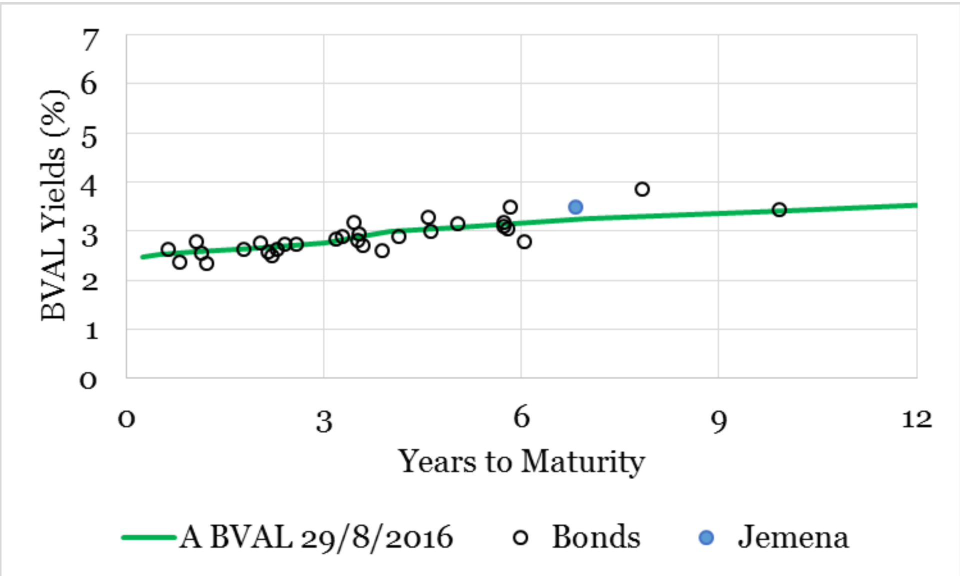
30. Similar observations can be made with the samples of the BVAL broad BBB and broad A curves, as shown in Figure 3-12 and Figure 3-13 respectively. While the Jemena bond has an exceptionally low yield relative to all of the other bonds in the broad BBB sample, it appears to fit well with the rest of the broad A sample.

Figure 3-12: BVAL broad BBB curve



*Source: Bloomberg, CEG analysis; *The Jemena bond is part of the BVAL broad BBB sample*

Figure 3-13: BVAL broad A curve



*Source: Bloomberg, CEG analysis; *The Jemena bond is not part of the BVAL broad A sample, and is only included for comparison*

31. In our view, given that the Jemena bond straddles the A/BBB credit rating bands its placement in either band should be informed by whether its yield is more consistent with the yield of bonds that are more clearly in one or the other credit rating band. When we perform this analysis we find that the Jemena bond should be assigned to the A curve for the purpose of determining a curve fitting exercises. That is, we find

that Reuter's assignment of this bond is more appropriate than Bloomberg's assignment.

3.1.2 Jemena bond and Bloomberg's bond selection criteria

32. Bloomberg's bond selection criteria for the BVAL curve is proprietary and cannot be determined conclusively, although it is known that the BVAL methodology excludes "call/put/convertible options and/or sinking/amortizing/inflation linked structures".[6]

33. Analysis of the historical sample of bond constituents also indicates three further restrictions. Namely, that the bonds must be issued by firms incorporated in Australia, must be denominated in AUD, and must have credit ratings that fall within the broad BBB band.

34. The Jemena bond is a fixed-rate AUD bullet bond issued by a firm incorporated in Australia. As pointed out in section 3.1, however, the bond has conflicting credit ratings, with S&P assigning it a BBB+ rating, while Moody's rated it A3, and no rating was assigned by Fitch.

35. We note that Bloomberg's methodology has historically incorporated some elements of subjective judgement in similar circumstances. For example, there are a number of AUD bonds issued by Coca Cola Amatil that were assigned BBB+ ratings by both S&P and Fitch, while being rated A3 by Moody's. However, these bonds were included in the broad A BVAL curve instead of the broad BBB curve, on the basis that:[7]

> *The reason that some coca cola bonds appeared in the AUD BBB curve in April but not anymore is because of internal changes we made. We assessed the AUD BBB curve and, whilst these coca cola bonds are indeed BBB rated, they were much richer than other BBB rated AUD bonds (see attached file). As such, we decided that the A rated curve (BVSC0160 Index) is more appropriate for these bonds and better represents their yields, which is where you will be able to find them now.*

36. While Bloomberg is not bound by their previous decisions concerning the curve that bonds with conflicting credit ratings should be classified under, application of the same logic to the Jemena bond would suggest that Bloomberg has misclassified the Jemena bond.

6 Bloomberg, BVAL: BVAL Curves, p. 3.

7 Quoted by ACCC Regulatory Unit, Return on debt estimation: a review of the alternative third party data series, August 2014, p.32.

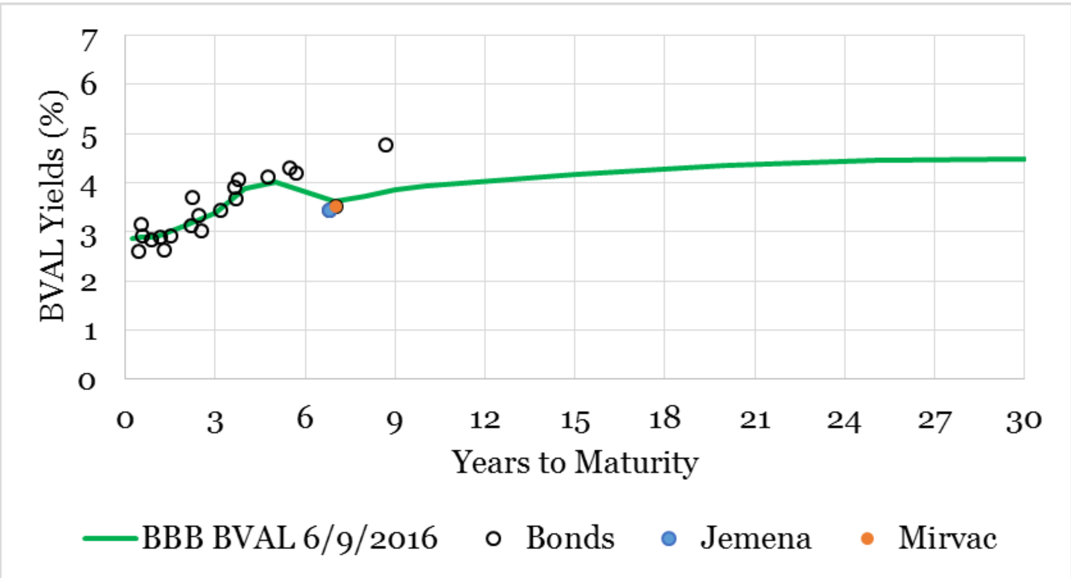
3.2 Issues with the inclusion of the Mirvac bond

37. The inclusion of the Mirvac bond from 1 September 2016 to 6 September 2016 further emphasises the problematic nature of the small sample size of the BVAL curve. As seen in Figure 3-6 to Figure 3-9, the inclusion of the Mirvac bond from 1 September 2016 to 6 September 2016 resulted in a substantial change in the shape of the BVAL curve.

38. This is even more clearly seen in Figure 3-14 and Figure 3-15, when the full BVAL yield curve and spread to swap curve are shown. Both figures show that the resulting curves exhibit a considerable shift in level, and that the BVAL extrapolation methodology is clearly unable to accommodate the said change in level when extrapolating the curve to longer maturities.

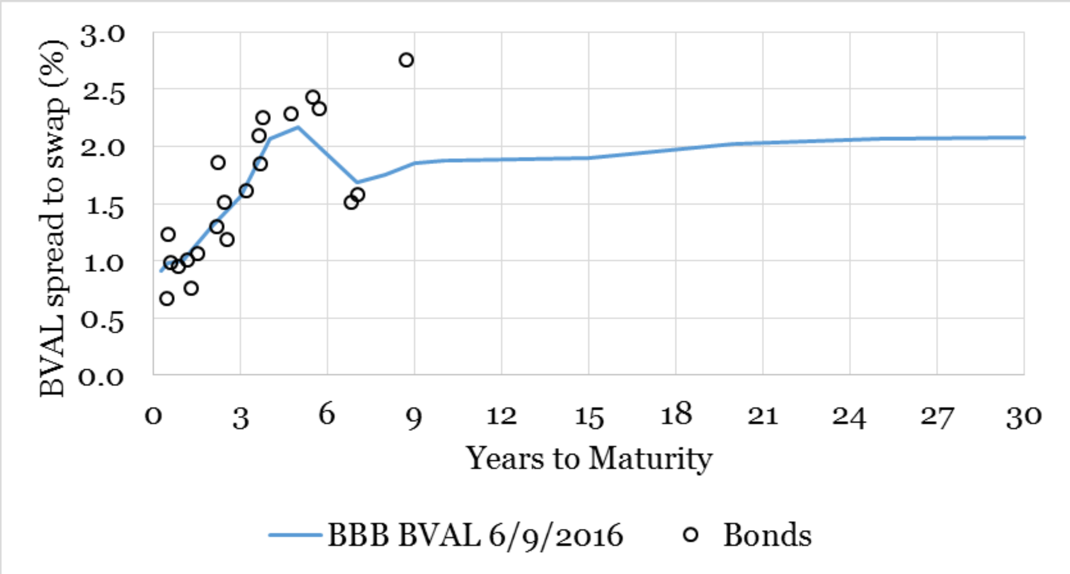
39. These are worrying results because they indicate that the BVAL estimates are not robust to shifts in the yields and spreads of individual bonds. Including the BVAL estimates in the calculation of benchmark cost of debt would thus result in considerable uncertainty because a single rare issuance of a long-maturity AUD bond by a domestic firm could have a sizable impact on the 10-year BVAL estimates.

Figure 3-14: BVAL yield curve and bond constituents, 6 September 2016



Source: Bloomberg, CEG analysis

Figure 3-15: BVAL spread to swap curve and bond constituents, 6 September 2016



Source: Bloomberg, CEG analysis

3.2.1 Response of the Reuters curve to the Mirvac bond

40. As mentioned in section 3.1, the Jemena bond has BBB+ S&P rating and A3 Moody's rating, with Reuters ultimately classifying the bond as part of its broad-A sample. In contrast, the Mirvac bond is rated BBB+ by S&P and Baa1 by Moody's. The Mirvac bond is therefore classified as part of the Reuters broad-BBB sample.

41. Figure 3-16 and Figure 3-17 show the Reuters broad BBB curve as at 31 August 2016 (before the Mirvac bond was included) and 1 September 2016 (after the Mirvac bond was included) respectively.[8]

42. As seen in the charts, although the inclusion of the Mirvac bond did result in a small decline in the level of the curve – as would be expected whenever a low-yield observation is included in the sample – the magnitude of the decline is much smaller compared to the changes observed with the BVAL curve. In addition, unlike the BVAL curve, whose shape changed dramatically when the Mirvac bond was included, the Reuters curve has shown greater robustness in terms of broadly maintaining its shape before and after the inclusion of the Mirvac bond.

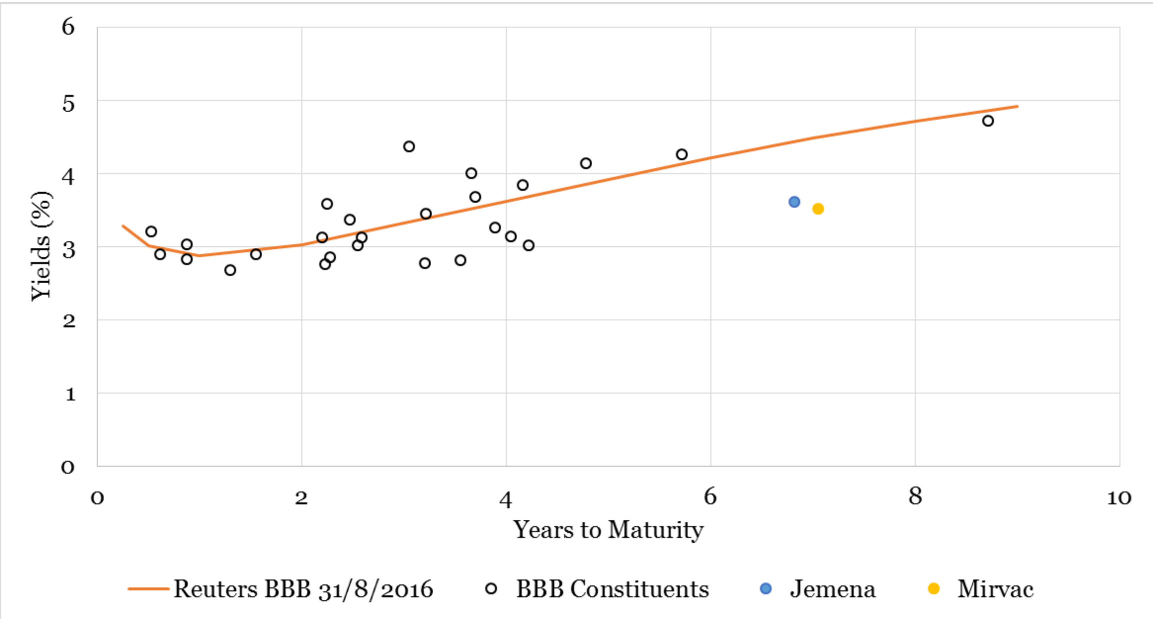
8 Reuters representatives confirmed that the Mirvac bond was first added on 31 August 2016, but could not confirm whether it was added during the opening or closing of the market. Since the bond did not show up on our sample when collected at mid-day on 31 August 2016, it was most likely added at the close of trading on that day.

43. The greater robustness of the Reuters curve to the addition of the Mirvac bond can partially be attributed to its slightly larger sample size. Between 31 August 2016 and 9 September 2016, the BVAL curve had 20-21 bonds, while the Reuters curve had 26-27. It is further known that Reuters uses a cubic spline when fitting its curve, while comparatively little is known about the approach used for estimating the BVAL curve, other than the fact that Bloomberg utilises a set of reference curves (particularly Bloomberg's Australia Government Bond Generic Yield Curve).

44. Given that little is currently known about the proprietary BVAL curve-fitting methodology, we do not attempt to draw any general conclusions regarding the superiority of the curve-fitting approaches used by the BVAL and Reuters curves. Nevertheless, it is fairly clear that the Reuters curve has responded more robustly to the inclusion of the Mirvac bond as compared to the BVAL curve.

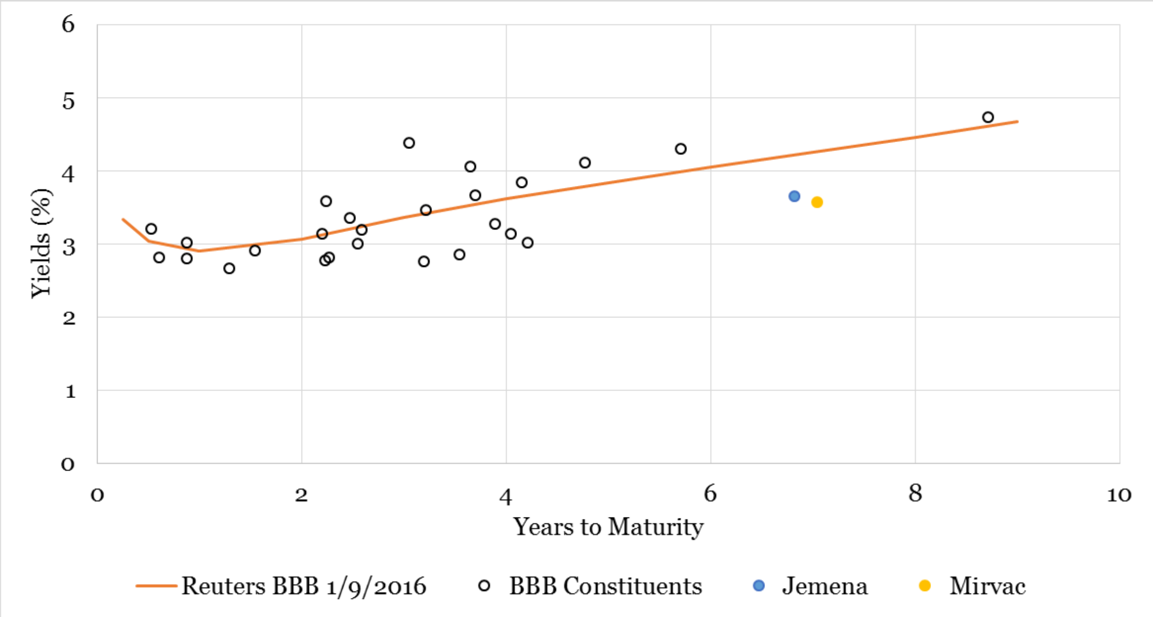
45. These findings affirm our earlier arguments that should the BVAL estimates be used as part of the calculation of the benchmark DRP, then there is no reason not to give at least equal weight to the Reuters estimates.

Figure 3-16: Reuters curve, Jemena and Mirvac included, 31 August 2016



*Source: Reuters, CEG analysis; *The Jemena and Mirvac bonds were not in the sample on 31 August 2016 and are only shown for comparison*

Figure 3-17: Reuters curve, Jemena included, 1 September 2016



*Source: Reuters, CEG analysis; *The Mirvac bond was in the sample on 9 September 2016, but the Jemena was not, since Reuters classifies it as part of its broad-A curve. The Jemena bond is only shown for comparison.*

3.2.2 Arbitrary removal of the Mirvac bond and retrospective deletion of earlier estimates

46. The Mirvac bond was removed from the BVAL sample on 7 September 2016. As of 12 September 2016, Bloomberg has also retrospectively deleted the 7- to 10-year estimates for the 1 September 2016 through 6 September 2016 period. That is, the historical BVAL series now omit the 7- to 10-year estimates over this period, although they had been available if the series were downloaded before 12 September 2016 (as we did).

47. We have communicated with a representative from Bloomberg's Global Data Team in order to clarify their reasoning for removing the Mirvac bond and for retrospectively deleting the 7- to 10-year estimates over the corresponding period.

48. Bloomberg confirmed that it considered the Mirvac bond to be an outlier compared to the rest of the sample and not because the yields of the bond were incorrectly reported:

> *[S]ome data is missing because there was bad data being fed into our pricing algorithms. The values on those dates are not affirmed and therefore they are removed from our system…*
>
> *We can confirm that QZ330503 is correct. It was just simply an outlier to the rest of the constituents*

49. We also enquired as to why the Jemena bond had not been removed as well, even though its reported yield was broadly similar to that of the Mirvac bond, to which Bloomberg responded:

> *[Y]ield level is one of the factors, but not the only, when we determine whether a bond should be used as a constituent…*
>
> *We are not allowed to disclose more information on our outlier detection mechanism*

50. The discussion above affirms the criticism set out in paragraph 10.c, that the BVAL estimates do not appear to be derived from a robust and transparent method. While no information is known about the factors that Bloomberg takes into account for identifying and omitting outliers, there are nonetheless two factors that are likely to be fairly important in detecting outliers.

51. First, as seen in Figure 3-7 and Figure 3-8, the Mirvac bond has a slightly higher yield compared to the Jemena bond, while maturing approximately three months later. Both bonds therefore appear to be fairly similar in terms of their magnitudes of deviation from the rest of the sample.

52. Second, in terms of credit ratings, the Jemena bond deviates further from the broad-BBB range that the BVAL curve seeks to model. While the Mirvac bond is rated BBB+ by S&P and Baa1 by Moody's, the Jemena bond has a Moody's rating that falls outside the target broad-BBB range.

53. Taken together, these two factors suggest that the justifications for omitting the Mirvac bond apply at least as strongly (or slightly more strongly) to the Jemena bond, such that both bonds should have been removed from the sample. Bloomberg's decision to only omit the Mirvac bond without removing the Jemena bond therefore appears somewhat arbitrary and questionable.

54. It is particularly notable that Reuters did not omit the Mirvac bond from their sample, perhaps because there is less necessity for doing so, given that their curve-fitting approach appears to be more robust to the inclusion of the Mirvac bond. This robustness is a potentially desirable property of a DRP source, since it reduces reliance on subjective judgement when selecting outliers.

55. The RBA's sample for August 2016 did not include the Mirvac bond. The RBA might have omitted the Mirvac bond based on subjective judgement, but it is also plausible that the bond might not have been picked up in their search, given that it was issued on 30 August 2016. In either case, the RBA's large sample of bonds, coupled with its parametric Gaussian kernel approach, suggest that its 10-year estimate is likely to be robust to the inclusion of a single outlier bond.

56. The properties of the three curves therefore require different approaches to be taken in response to outliers such as the Mirvac bond. The RBA curve can rely on its large

sample for robustness, while the Reuters curve is fitted in a manner that appears robust to the inclusion of the Mirvac bond. Meanwhile, the BVAL curve required subjective judgement for removing outliers, without which the level and shape of the resulting curve would change substantially.[9]

57. It may be reasonable to conclude that robust methods that are less reliant on subjective judgement are more desirable for the purpose of regulatory benchmarking, as opposed to methods that rely heavily on subjective judgement.

Table 3-1: Comparison of approaches required for addressing outliers

Curve	Approach to outliers as observed with Mirvac bond
BVAL	Relies heavily on subjective judgement to identify outliers and omit them
RBA	Not currently known, but large sample size and Gaussian kernel approach result in lower weight on single bonds further away from the 10-year target tenor
Reuters	Curve fitting approach appears fairly robust to the inclusion of the single Mirvac bond

3.3 Extrapolation of the BVAL curve

58. In its Draft Decision, the AER stated its position that if the BVAL 10-year estimate were found to be inappropriate, it would not discard the BVAL curve entirely, and would instead extrapolate outwards from the BVAL 7-year estimate:[10]

> *Finally, even if we were not to adopt the BVAL 10 year estimate, our final decision would be to adopt the BVAL 7 year estimate extrapolated as per the methodology set out in our contingencies. We are not satisfied that any information submitted by stakeholders raises material new concerns with the BVAL's 7 year estimate that were not considered in previous decisions. Therefore, we remain satisfied that the reasons underlying our choice of approach, as upheld by the Tribunal, remain valid.[1176] To the extent that there are shortcomings in the BVAL curve beyond its 7 year published estimate, we are not persuaded it is appropriate to discard the BVAL curve altogether. We consider it would remain an important and robust source of information, and would adopt the approach that we used in decisions prior to Bloomberg's publication of a 10 year estimate.*

9 This is not to say that the RBA and Reuters curves do not ever omit outliers. As discussed earlier, the RBA and BVAL curves both omitted a number of bonds issued by Coca Cola Amatil on the basis that they were not representative of the sample. However, the RBA and Reuters curves appear to be more robust to individual outliers such as the Mirvac bond, such that whether or not the bonds are removed will result in changes that are less material compared to the BVAL curve.

10 AER, AusNet Services transmission determination 2017-18 to 2021-22: Attachment 3 – Rate of return, Draft Decision, July 2016, p. 3-302.

59. We note that the evidence surveyed in this report suggests that not just the BVAL 10 year but also the BVAL 7 year estimate is unduly influenced by a single bond (the Jemena bond). The AER's contingency in this case would imply extrapolating from 5 years. In our view, there is dubious merit in using the RBA curve to extrapolate the BVAL curve from 5/7 years as opposed to just ceasing to use the BVAL estimate in favour of the RBA estimate.

60. For the reasons discussed below, attempting to combine two different curves in this simplistic way may make matters worse than better – and would have done so at the time that the AER first made the proposal.

61. The AER determined that such an approach would lead to a 55 bp decrease in the BVAL estimate when calculated over AusNet Services' averaging period (25 January 2016 to 19 February 2016).[11]

Table 3-38 Extrapolation margins—Final decision approach compared to the contingency approach

Approach	BVAL extrapolation formula	BVAL extrapolation margin
Final decision approach	Uses published BVAL 10 year yield estimate	+39 basis points
Contingency approach— where BVAL 10 year published estimate is unavailable	BVAL 10 year yield = BVAL published 7 year yield + RBA 10 year yield – RBA 7 year yield	–16 basis points

Source: AER, RBA, Bloomberg.

62. As shown in the second and third columns of Table 3-2, such a result occurred because the RBA curve was downward sloping between the 7- and 10-year tenors from January 2016 to March 2016. From April 2016 onwards, however, the RBA curve has resumed exhibiting a positive slope between the 7- and 10-year tenors, as well as between the 5- and 10-year tenors.

[11] AER, AusNet Services transmission determination 2017-18 to 2021-22: Attachment 3 – Rate of return, Draft Decision, July 2016, Table 3-38, p. 3-302.

Table 3-2: BVAL DRPs extrapolated from 5 and 7 years (semi-annual)

	RBA margin		RBA	BVAL	BVAL SAPN (extrapolated from)		BVAL AER (extrapolated from)	
	5 to 10	7 to 10	10 year	10 year	5	7	5	7
29/1/16	-0.38	-0.39	2.86	2.64	3.92	3.27	1.95	2.15
29/2/16	-0.32	-0.31	3.09	2.80	4.16	3.39	2.17	2.34
31/3/16	-0.25	-0.20	2.69	2.69	3.68	3.08	2.07	2.27
29/4/16	-0.03	-0.06	2.43	2.51	3.76	3.04	2.28	2.36
31/5/16	0.05	-0.01	2.49	2.52	3.72	3.06	2.31	2.39
30/6/16	0.33	0.24	2.68	2.46	3.95	3.08	2.65	2.63
29/7/16	0.23	0.19	2.41	2.44	4.01	3.09	2.58	2.57
31/8/16	0.40	0.27	2.31	2.43	3.88	3.03	2.65	2.59

*Source: AER, Bloomberg, RBA, CEG analysis; *RBA margin has not been applied for the BVAL AER estimate as at 19 August 2016.*

63. The overall effect of replacing the BVAL 10-year estimated DRP with the AER's extrapolated DRP depends on the relative slopes of the BVAL and RBA curves. Comparing the last two columns of Table 3-2 with the values in the middle column (BVAL (10 year)) suggest that the AER's contingency method lowers the BVAL 10-year estimates from January 2016 to May 2016 but raises it in June and July. This is consistent with the Jemena bond depressing the slope of the BVAL curve beyond 7 years and the former negative slope in the RBA curve being reversed.

64. In relation to the last point we note that the BVAL spread to CGS is currently flat/negative beyond 5 years – consistent with the Jemena bond biasing down DRP estimates for long term bonds.

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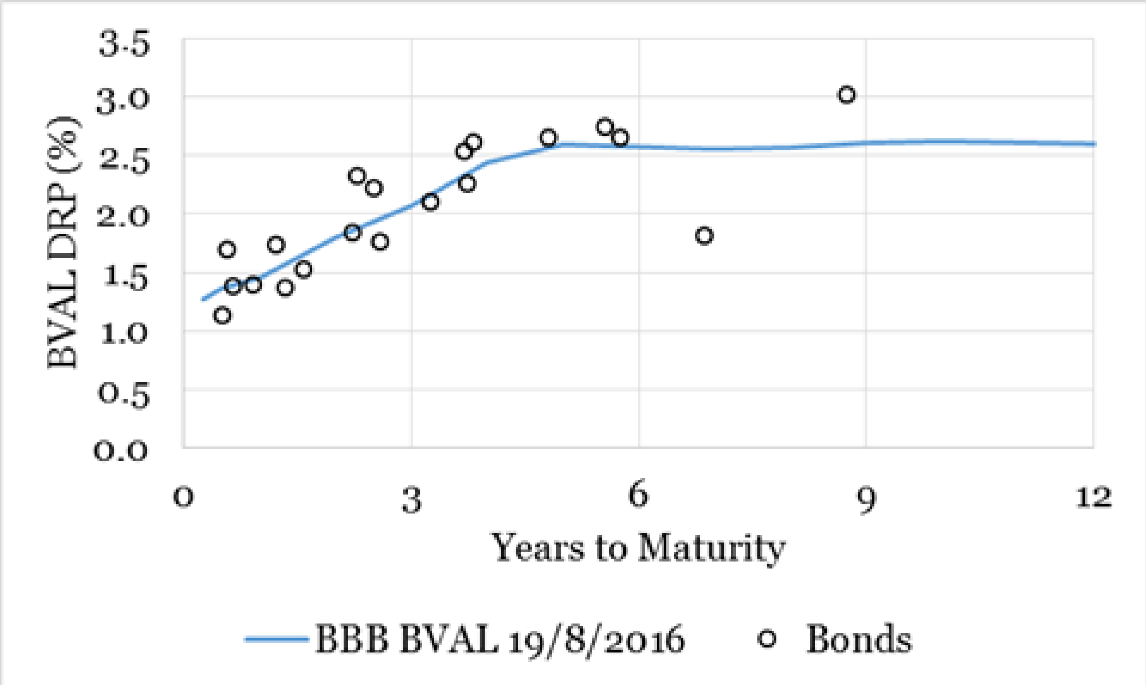
Figure 3-18: BVAL Spread to CGS on 19 August 2016



Source: Bloomberg; CGS yields obtained from Bloomberg's AUD Australia Government Bond BVAL Yield Curve

65. More generally, we note that extrapolating the BVAL curve from 5 or 7 years using the shape of the RBA/Reuters DRP curve can be problematic for a number of reasons. First, the slope of the RBA/Reuters DRP curve beyond 5/7 years is a function of the level of the curve at 5/7 years. Specifically, a higher DRP level at 5/7 years is likely to, other things equal, be associated with a lower DRP slope beyond 5/7 years.

66. Therefore, an internal inconsistency can be created if the level of the BVAL curve at 5/7 years is not similar to the level of the RBA/Reuters curve at 5/7 years. By way of example, this was clearly the case when the AER first put forward its 'contingency'. At the end of February 2016 the RBA 7 year estimate was 3.40% while the BVAL 7 year estimate was 2.65% (i.e., 0.75% difference).

67. In this circumstance, the reason that the RBA curve had a negative DRP slope between 7 and 10 years was precisely because its 7 year estimate was so high. Taking the associated negative slope and applying it to a (much lower) BVAL 7 year estimate would be internally inconsistent. It would amount to subtracting a negative slope associated with a very high RBA 7 year estimate from a much lower BVAL 7 year estimate.

68. This example highlights why the AER's proposed style of extrapolation is not generally reliable and especially where the level of the curve being extrapolated (e.g., the BVAL curve) is materially different to the level of the curve doing the

extrapolation (e.g., the RBA/Reuters curves) at the maturity from which extrapolation is being applied (e.g., 5/7 years).

69. To the extent that extrapolation of the BVAL curve is to be applied (to give an estimate of the cost of debt that is independent from those already available from RBA/Reuters) then the methodology should, in our opinion, be independent of the RBA/Reuters curves. The SAPN extrapolation method provides this independence and the results of applying this methodology are set out in Table 3-2 above.

4 Conclusion

70. Our January 2016 report concluded that if weights given to different data sources must be predetermined then 100% weight should be given to the RBA curve. We also advised that if weight was to be given to the BVAL curve then the same weight should be given to the Reuters curve. There has been no new evidence that would cause those conclusions to be altered.

71. There is new evidence, surveyed in this report, which strengthens those conclusions. Most notably in relation to the impact on each curve as a result of two newly issued bonds (Jemena and Mirvac) that have yields that are outliers for the broad BBB rated category of bonds (and, in the case of the Jemena bond, is actually an A rated category bond based on Moody's rating). These bonds will not materially affect the RBA estimate due to its large sample size.

72. However, they do have the potential to affect the curves with smaller samples size (BVAL and Reuters) more materially. Of these two curves it is our view that the BVAL curve has adapted to these new issues least well – with erratic movements in yield estimates and inappropriate categorisation of the Jemena bond to the BBB band.

73. The Reuters curve has reacted in a more robust manner to the addition of the Mirvac bond, but we note that this property may not necessarily generalise to future possible bond additions. This contrasts with the RBA curve with its considerably larger sample size, which would more reliably remain robust to individual bond outliers.

74. For the above reasons, the recent developments in the BVAL curve, as well as the corresponding developments in the Reuters and RBA curves, do not change the conclusions that we arrived at in our previous report. Instead, we consider that these developments lend support to those conclusion: that the RBA curve has the most desirable properties for estimating the DRP applicable to a benchmark efficient firm; and that if multiple data sources are to be selected, then there is no reason to include the BVAL curve without also including the Reuters curve, given that there is no basis to conclude that the BVAL curve is superior to the Reuters curve.