



COMPETITION
ECONOMISTS
GROUP

Efficiency of staggered debt issuance

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1 Executive summary

1. This report establishes criteria for assessing potential benchmark debt management strategies that could be used by the AER as the basis for estimating the cost of debt allowance for a regulated business. In making this assessment I have remained conscious that benchmark should seek to promote the National Electricity Objective, and therefore the long term interests of consumers.
2. This paper proceeds on the basis that the AER will specify a benchmark debt management strategy(ies) that would be used by the AER as the basis for estimating debt financing costs of a benchmark efficient entity. The benchmark debt management strategy will specify such factors as: the term of the debt issued; the type of debt issued (fixed/floating/callable etc); the frequency with which debt is issued (e.g., staggered issuance vs once every five years); any derivative contracts that might be used to alter the interest costs associated with the initial issuance; the amount of debt funding (gearing); and the credit rating achievable under the strategy.
3. A benchmark debt management strategy adopted by the AER is said to be implementable/hedgeable¹ if a business could arrange its own debt management strategy to align its costs with those associated with the benchmark. The use of the phrase ‘hedgeable’ in this context should not be confused with a suggestion that business need enter into derivative contracts to align to the benchmark – if there are no derivative contracts built into the benchmark debt management strategy then businesses will be able to ‘hedge’ to that benchmark simply by implementing it (i.e., without entering into derivative contracts).
4. In section 3, I establish, by reference to established finance theory, the following attributes that a benchmark efficient debt management strategy should exhibit:
 - i. **It is able to be implemented by a business** (hedgeable).
 - ii. **Implementation involves low transaction costs for the business** – if there are two equally implementable debt raising strategies then, other things equal, the strategy that involves the lowest transaction costs (direct and indirect) should be preferred.
 - iii. **It minimises the prospect and consequences of estimation error** – a business should be able to be confident that, if it manages to the benchmark strategy, its cost of debt will move with the AER’s estimate of costs – especially during periods in which its costs are rising materially.
 - iv. **It gives rise to relatively low price volatility for customers and does not result in higher prices when customer budgets are under stress** –

¹ If a benchmark debt management strategy is not implementable neither is it hedgeable and vice versa. For this reason, I use these terms interchangeably.

customers are not as well placed to hedge against volatility in network prices and especially do not want to be facing higher prices when they are facing broader budgetary threats, e.g., due to a financial crisis.

v. **It should reflect the standard practice of businesses operating in similar environments to network energy businesses.**

5. Applying these criteria need not involve trade-offs between the criteria. The fifth criteria is, in reality, a means of assessing whether the first two criteria are met. That is, if a debt management strategy is not widely practiced by similar firms it is likely that this is because it is not implementable at low transaction costs.
6. In section 4 I have applied these criteria to the benchmark debt management strategy that underpins the previous NER – based on the raising of 10 year debt once every 5 years in a relatively short window at the beginning of each regulatory period. I find that this benchmark performs poorly against each of the criteria.

Criterion i: it is not hedgeable/implementable by businesses and, therefore, it is not possible to prudently manage a business's actual costs to the benchmark cost allowance.

Criterion ii: if a business nonetheless sought attempted to implement this strategy, it would be impossible for it to do so comprehensively and it would incur extremely high transaction costs;

Criterion iii: the fact that the benchmark would set the cost of debt allowance for 5 years based on market conditions in one 20 day window means that it is especially susceptible to estimation error – and the consequences of those errors were potentially severe;

Criterion iv: it gives rise to highly volatile estimates; and

Criterion v: there is no example of a business actually adopting this strategy – let alone it being a standard business practice.

7. By contrast, in section 5 I have also used these criteria to assess a long term trailing average cost of debt based on a benchmark debt management strategy that involves issuing long term debt at staggered intervals. In my assessment, this potential benchmark performs well against the relevant criteria:

Criterion i: It is hedgeable and in order to implement this benchmark all a business must do is engage in staggered issuance of 10 year debt so that it is refinancing around 10% of its portfolio each year.

Criterion ii: The business must simply issue staggered debt at a rate of about one 10th of their portfolio every year. By spreading refinancing over 10 years this will prudently manage refinancing risk and minimise the associated transaction costs.

Criterion iii: A business can be confident that, if it issues staggered 10 year debt its costs will move with the AER's estimate of costs. This is because a trailing average can be updated regularly. Consequence, any one estimate of the cost of debt will have a weight in the trailing average of 10% if yearly estimates of the cost of debt are made (2.5% if quarterly estimates are made). Consequently, an error in one period's estimate will not have a significant impact on the overall allowance. Only if the cost of debt was repeatedly mis-estimated, and in the same direction each time, would the benchmark estimate depart materially away from the true cost of debt associated with the benchmark.

Criterion iv: The gradual updating of the benchmark estimate means that it is relatively stable. Moreover, this stability has the effect, relative to the past NER benchmark, of preventing cost of debt allowances materially contributing to network price increases at precisely the time that customers would most value lower prices (and vice-versa with respect to cost of debt reductions contributing to price reductions when these are less important to customers).

Criterion v: It is standard practice for infrastructure businesses to engage in staggered issuance of long term debt. This suggests that this approach minimises transaction costs.

8. Section 6 of this report also makes a number of observations about the need for internal consistency between elements of the debt management strategy and other elements of the benchmark use to estimate the cost of debt (such as gearing and credit rating).

2 Introduction

9. My name is Tom Hird. I have a Ph.D. in Economics and 20 years of experience as a professional Economist. My curriculum vitae is provided separately.
10. This report has been prepared for Ausgrid, Endeavour Energy and Essential (the NSW DNSPs). I have been asked to provide a report addressing what should be considered a “benchmark efficient” debt management strategy for the purpose of modelling the rate of return consistent with clause 6.5.2(c) of the NER.

The allowed rate of return 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 allowed rate of return objective).²

11. I am particularly asked to give particular consideration to the efficiency of a debt management strategy that involves issuing staggered 10 year fixed rate debt.
12. The remainder of this report is structured as follows:
 - Section 3 addresses, at a conceptual level, what constitutes an efficient debt management strategy – from the perspective of both an individual business and an industry, i.e., other industry participants including consumers;
 - Section 4 addresses current regulatory practice and explains why the previous method for estimating the cost of debt specified in the NER was problematic as a proxy for the costs associated with a benchmark efficient strategy;
 - Section 5 sets out why a staggered issuance of fixed rate debt is a benchmark efficient debt management strategy and explains that a trailing average of fixed rate debt would provide a good proxy for the costs of such an efficient strategy;
 - Section 6 makes some high level observations related to achieving internal consistency within the definition of the benchmark cost of debt; and

² This is NER clause 6.5.2(c). This objective is also included in the rate of return provisions in chapter 6A of the NER and r. 87 of the National Gas Rules (NGR) – the only differences being sector terminology (such as transmission network service provider instead of distribution network service provider, etc). See: NER, cl. 6A.6.2(c); NGR, r. 87(3).

3 Efficient debt management

13. In this section I begin by examining what finance theory has to say about what constitutes an efficient capital management strategy for an individual business. I then take a broader perspective and address efficient debt management from an industry perspective. In undertaking this latter assessment, I have been mindful of the fact that applying a regulatory methodology has the potential to influence the allocation of risk between investors and consumers, which may affect total industry efficiency.

3.1 Finance theory

14. The cornerstone of modern finance theory on the optimal capital structure for a firm is the work of Modigliani and Miller (1958).³ The following three subsections summarise their results. The first describes the optimal capital structure in the hypothetical context of perfect (zero transaction costs) capital markets. The second describes optimal capital structure in the more realistic context of imperfect capital markets, where “frictions” exist. The third describes the special role of bankruptcy/insolvency costs in determining an optimal capital structure.

3.1.1 Modigliani-Miller with perfect financial markets

15. The principal insight of Modigliani and Miller (1958) is that the level of risk in a firm is rather like the amount of air in a balloon. Squeezing one end of a balloon does not reduce the amount of air that is inside – it just shifts it to “the other end”. In much the same way, issuing debt does not reduce the overall level of risk – it simply shifts it somewhere else – in this case, to equity. Miller (1991) made a similar observation some 30 years later:

Think of the firm as a gigantic tub of whole milk. The farmer can sell the whole milk as it is. Or he can separate out the cream, and sell it at a considerably higher price than the whole milk would bring. (Selling cream is the analog of a firm selling debt securities, which pay a contractual return.) But, of course, what the farmer would have left would be skim milk, with low butter-fat content, and that would sell for much less than whole milk. (Skim milk corresponds to the levered equity.) The Modigliani-Miller proposition says that if there were no cost of separation (and, of course, no government dairy support program), the cream plus the skim milk would bring the same price as the whole milk.

³ Modigliani, F.; Miller, M. (1958). "The Cost of Capital, Corporation Finance and the Theory of Investment". *American Economic Review* 48 (3): 261–297.

16. In this quote Miller notes that issuing low risk debt securities is analogous to a farmer separating out cream from whole milk; namely:
 - the firm gets a good price (low interest rate) for its debt; but
 - the corollary is that the remaining equity is less desirable, and so requires a higher return to attract investors.
17. What Modigliani and Miller demonstrated is that if financial markets are efficient and there are no transaction costs, any reduction in the cost of debt will be perfectly offset by a higher cost of equity. A firm's capital structure therefore has no effect on its weighted average cost of capital (WACC). This "law of the conservation of risk" is comparable to the "law of conservation of energy" from the physical sciences. Like energy, risk cannot be destroyed – it can only be converted from one form to another.
18. It should be noted that Modigliani and Miller do not define "transaction costs" as encompassing simply the direct and observable costs of an activity (such as payments to printers for a prospectus). Rather, transaction costs are defined much more broadly to include costs associated with dealing/trading in imperfect markets. These include, for example, costs associated with imperfect management incentives (agency problems and incentive problems with asymmetric information), and costs associated with trading in illiquid markets and/or with financial constraints that force a business to make suboptimal decisions.
19. A further conclusion that flows from Modigliani and Miller is that, if financial markets are perfectly efficient with zero transaction costs, then no particular debt raising strategy will dominate any other. Irrespective of whether a business issues large or small amounts of debt, short-term debt or very long term debt, callable or puttable debt, etc., its WACC will be the same.

3.1.2 Modigliani-Miller financial markets with frictions

20. Given the finding that, in frictionless financial markets, a business's capital structure simply does not matter then, if capital markets were frictionless, one would expect that firms with very similar attributes (products, competitors, cost structures and so on) would exhibit a great variety of capital structures. For example, some may have short term debt, others long term debt; some may have high gearing and others low gearing, and so on. There would be no 'common' strategy because, in the absence of frictions, there is no advantage from adopting any particular practice.
21. In actuality, businesses with similar attributes will often consistently adopt the same (or similar) debt raising strategies. The insight of Modigliani Miller is that consistently observed debt management strategies must be explained by a desire to minimise transaction costs (broadly defined) associated with less than perfect markets. That is, once one relaxes the assumption that capital markets are efficient, theory suggests that businesses (or subsets of businesses) will often adopt debt

raising strategies that are designed to minimise exposure to those imperfections with a view to reducing transaction costs. Common strategies may therefore start to emerge.

22. A straightforward example is that businesses rarely, if ever, issue public debt at levels below a certain threshold, typically measured in the millions of dollars. This is because there are transaction costs associated with selling debt on both the seller (prospectus/legal fees etc.) and buyer side (becoming informed about the quality of the debt etc.). For this reason, businesses will typically seek to avoid repeatedly incurring the same transaction costs by undertaking a smaller number of large debt issues (as opposed to a large number of small issues).

3.1.3 Special role of insolvency/bankruptcy costs

23. Once the Modigliani-Miller result was understood finance academics immediately attempted to explain, within the paradigm of transaction costs, why high levels of gearing were not common? This question was especially pertinent given that the existence of tax as a transaction cost and the tax deductibility of interest costs would tend to suggest that 99.99% gearing would minimise tax costs (and therefore transaction costs).
24. The generally accepted answer was that there were very high levels of transaction costs associated with insolvency/bankruptcy and this was why firms tended not to adopt high levels of gearing. Baxter (1967)⁴ was one of the first to make this point.

The purpose of the present paper is to explain, in the context of the Modigliani and Miller discussion, how excessive leverage can be expected to raise the cost of capital to the firm. It is argued that when account is taken of the "risk of ruin" a rising average cost of capital is perfectly consistent with rational arbitrage operations. Allowing for the possibility of bankruptcy is tantamount to relaxing the assumption that the anticipated stream of operating earnings is independent of the capital structure

25. Insolvency or near insolvency imposes costs on a range of parties, including:
 - Debt investors: insolvency means that debt holders do not get paid when debts fall due (a technical default). Debt investors will typically incur significant costs to manage that disruption (such as curtailing consumption/investment in other activities or borrowing from third parties – often at penalty rates due to the financial distress of the original technical default). If they cannot manage the technical default then they will themselves be rendered insolvent (unable to pay their debts as they fall due);

⁴ Baxter N., "Leverage, risk of Ruin and the Cost of Capital", The Journal of Finance Vol. 22, No. 3 (Sep., 1967), pp. 395-403

- Equity investors: insolvency (or near insolvency) means that equity investors must stop receiving a dividend on their investment, which they have to manage in the same manner as debt investors and with analogous consequences. Equity investors will also suffer because the businesses reputation as a reliable borrower will be damaged. Moreover, existing equity investors may be forced to participate in a rights issue and/or a public equity raising to address the insolvency. Both of these options are likely to involve substantial transaction costs for equity investors.⁵
26. Depending on the nature of the contracts with debt holders, insolvency may also give rise to debt holders taking full or partial control of the company and, potentially, to bankruptcy proceedings. Protracted legal battles may ensue between debt and equity holders (and between different groups of debt/equity holders) over the future of the firm. This may paralyse management, with the principal focus being on the division of the existing value of the firm (and debt holders attempting to ensure the maximum repayment of their debts) rather than on maximising the total value of the firm (including the equity stake).
 27. These costs can destroy the value of a firm that would, had it adopted a less aggressive capital management strategy, never have become insolvent in the first place. Moreover, the disastrous nature of the potential transaction costs associated with insolvency (and bankruptcy), can see a firm in moderate financial distress quickly spiral into insolvency. This is because debt investors may be unwilling to fund the firm (or only at penalty interest rates) for fear of subsequent exposure to these costs. In other words, if there is perceived to be the potential for insolvency, this can become a self-fulfilling prophecy.
 28. It is for these reasons that transaction costs associated with insolvency/bankruptcy play a key role in the ‘real world’ analysis of optimal capital management plans. Any change to capital management strategy can materially influence the likelihood (or perceived likelihood) of insolvency/bankruptcy, and so the probability of these substantial costs being incurred. It is important to recognise that there does not need to be an imminent threat of insolvency or bankruptcy for these factors to have a material bearing upon a firm’s optimal capital management strategy. What matters is the potential effect of a particular strategy on *expectations*.
 29. If a more aggressive capital management strategy raises the probability of future insolvency/bankruptcy – by any amount – this will reduce the expected (actuarially estimated) value of future cash-flows. This reduction will be equal to the change in

⁵ In the case of a rights issue an investor must either raise the funds to participate (which itself will impose costs of the investor – akin to a negative dividend being “paid”) or forego the ability to participate, which will generally result in a dilution of their ownership stake (given that rights issues will almost certainly be heavily discounted in these circumstances). In the case of a new equity issue the then existing equity holders must bear the direct transaction costs associated with this and must also suffer a dilution in their ownership stake given the virtual inevitability of a public debt raising being deeply discounted.

probability of insolvency/bankruptcy multiplied by the expected additional transaction costs associated with those outcomes.⁶ Given the substantial magnitude of those costs, even small increases in the probability of those outcomes transpiring (e.g., from 0% to 5%) can have a significant effect on expected future cash-flows and, in turn, on the optimal capital structure.

30. Equally, if one aspect of a debt management strategy raises insolvency/bankruptcy risks another aspect of the debt management strategy might need to be made more conservative so that the net impact is reduced. For example, consider a firm exposed to high levels of refinancing risk due to heavy reliance on short term or lumpy debt maturity profile. Such a firm may need to adopt a lower gearing and/or higher level of prefunding than would otherwise be the case. This may manage down the expected transaction costs of insolvency/bankruptcy but at the expense of higher other transaction costs (e.g., higher tax costs associated with lower gearing and line of credit fees/carrying costs associated with prefunding debt maturity).

3.2 Implications for defining a benchmark debt management strategy

31. This section sets out criteria by which an efficient debt management strategy (one that minimises transaction costs) can be appraised.

3.2.1 Why the benchmark needs to be implementable/hedgeable

32. This paper proceeds on the basis that the AER will specify a benchmark debt management strategy(ies) that would be used by the AER as the basis for estimating debt financing costs of a benchmark efficient entity. The benchmark debt management strategy will specify (or imply) such factors as: the term of the debt issued; the type of debt issued (fixed/floating/callable etc); the frequency with which debt is issued (e.g., staggered issuance vs once every five years); any derivative contracts that might be used to alter the interest costs associated with the initial issuance; the amount of debt funding (gearing); and the credit rating achievable under the strategy.

⁶ It may seem obvious that bankruptcy is value destroying and that investors would want to minimise the probability of this outcome transpiring. Of course, investors would always prefer that a business avoided bankruptcy *other things being equal*. However, in the context of choosing a capital management strategy, other things are not equal. Business management must ask themselves, if we adopt a more aggressive capital structure do we care that this increases the probability of bankruptcy in an adverse operating environment. The answer provided by Modigliani and Miller is that they will only care if bankruptcy costs are positive. This is because the existence of those bankruptcy costs multiplied by the costs of bankruptcy (management disruption/legal costs/disruption to investor cash-flows etc.) reduce the value of the firm today.

33. A benchmark debt management strategy adopted by the AER is said to be implementable/hedgeable⁷ if a business could arrange its own debt management strategy to align its costs with those associated with the benchmark. The use of the phrase ‘hedgeable’ in this context should not be confused with a suggestion that business need enter into derivative contracts to align to the benchmark – if there are no derivative contracts built into the benchmark debt management strategy then businesses will be able to ‘hedge’ to that benchmark simply by implementing it (i.e., without entering into derivative contracts).
34. If a firm is able to “match” the incurrence of costs with the receipt of revenue, so that the two monetary streams are broadly “in sync”, this can reduce its exposure to insolvency/bankruptcy costs.
35. Other things equal, it will be efficient for a business to attempt to incur costs in a manner that is matched to their revenue stream. If firms do this they reduce their exposure to expected insolvency/bankruptcy costs.⁸ If the two move together then, during periods in which revenues are lower, costs will also be lower. Similarly, when costs are high, so too will be revenues.
36. Put simply, if costs tend to move in the same proportion and direction as revenues then the potential for an adverse operating environment to lead to insolvency/bankruptcy is reduced. This is because periods when revenues are low will tend to be periods when costs are lower and periods when costs are high will tend to be periods when revenues are high.
37. In the context of debt costs, if a business can, at low transaction costs, manage their debt costs in a manner that gives them a higher correlation with their revenues then they will reduce expected insolvency/bankruptcy costs.⁹
38. This has an important implication in the context of setting a benchmark efficient debt management strategy used to guide how the AER will compensate for the cost of debt. It means that any benchmark strategy applied by the AER to a regulated business should have the property that it is:
- A strategy that the business could actually undertake (such that the businesses debt costs moved in the same direction and proportion to the debt allowance the AER would provide); and

⁷ If a benchmark debt management strategy is not implementable neither is it hedgeable and vice versa. For this reason, I use these terms interchangeably.

⁸ They also reduce exposure to other costs associated with having costs and revenues move out of sync, such as the costs associated with having to raise an unanticipated amount of funding (or unexpectedly cut dividend payments) if revenues fall faster than costs.

⁹ Of course, this doesn’t mean that a business has to mimic the benchmark strategy to achieve this result. They could adopt different strategies that suit their particular circumstances but nonetheless have costs that are correlated with the benchmark strategy.

- A strategy that does not involve material transaction costs to emulate.
39. Put another way, the benchmark strategy should enable the business to manage their debt payments to the regulatory allowance and minimise the transaction costs that it incurs in doing so. The transaction costs that are relevant to this assessment include both the direct costs of debt management as well as indirect costs, such as those associated with trading large volumes in illiquid markets.

3.2.2 Potential to manage to the benchmark with low transaction costs

40. A cost of debt benchmark that is actually implementable by businesses means that transaction costs associated with the potential for insolvency/bankruptcy can be reduced if the business funds itself in accordance with that benchmark strategy.
41. However, two different potential benchmark debt management strategies may both be implementable by businesses but might have different transaction costs associated with each other. In which case, other things equal, the strategy with the lower transaction costs is more efficient and a more suitable benchmark.
42. As an example of two different implementable strategies with potentially different transaction costs consider:
- one strategy involving issuing large parcels of debt relatively infrequently; and
 - another strategy involving issuing smaller parcels of debt more frequently.
43. The first strategy will take advantage of economies of scale associated with each individual debt issuance (such as fixed legal and other fees) and will minimise this transaction costs of this nature. However, the second strategy, by spreading refinancing more evenly through time, reduces the potential for debt issuance by that company to strain the liquidity of the market for its debt.¹⁰ Issuing debt more frequently also limits the potential for the business being ‘caught out’ by particularly poor market conditions coinciding with a need to refinance a large proportion of its debt.
44. Clearly, this example establishes a trade-off to be optimised between the benefit of avoiding incurring ‘too many’ of the fixed costs associated with each debt issue and also avoiding transaction costs associated with having ‘too lumpy’ a debt issuance/refinance program. The most efficient strategy is one that minimises the sum of these transaction costs.
45. It is worth noting that there may be more than one benchmark debt management strategy that has the property of being implementable at low transaction costs.

¹⁰ Put another way, at any given time, attracting enough buyers for a large parcel of debt may involve significant marketing effort and/or dropping the price (raising the interest rate) needed to sell that sized parcel of debt.

Additionally, there may be some benchmark debt management strategies that have this property for one efficient firm but do not have this property for another efficient firm.¹¹

3.2.3 Potential to manage to the benchmark in the presence of measurement error

46. The ability of a firm to feasibly manage to the benchmark debt raising strategy can also be compromised if there is material scope for estimation error by the regulator. If, due to data problems or for other reasons, the AER cost estimates do not reflect actual market costs associated with the benchmark strategy then the benefit to a business from attempting to manage to the benchmark is diminished.
47. This is especially problematic if estimation errors are more likely to occur when the consequences are the most serious – such as in times of financial crisis.
48. This suggests that it is appropriate to include an additional criterion to guide the determination of the benchmark debt raising strategy. Namely, the benchmark debt raising strategy should minimise the potential for estimation error and the impact of such errors if they do occur. In practice, this might mean adopting, say, a benchmark strategy that gives rise to less volatile costs (to the extent that volatility and estimation error are likely to be correlated).

3.2.4 Potential for customers to manage their exposure to the cost of debt

49. Provided that a debt management strategy exhibits the three attributes described above – it is implementable, it is low transaction costs and it has low potential for (impact of) estimation error – it will be efficient from the perspective of businesses. A business will be able to “manage its debt costs to its debt cost allowance”, and do so in a way that does not cause it to incur unnecessary costs (including trading costs). However, this does not necessarily mean that the absolute level of transaction costs has been minimised.
50. Rather, the above scenario may correspond to a scenario in which unnecessarily high levels of volatility (and therefore high levels of transaction costs) are being borne by customers. For example, imagine a benchmark debt strategy that was able to be perfectly implemented by the network business, but gave rise to high levels of volatility in the allowed debt costs. In these circumstances:
 - investors in the business are not troubled. Provided that the volatility in allowances is also reflected in their debt costs – they are “protected” from the

¹¹ For example, where firms’ debt portfolios are of different sizes such that achieving minimum efficient scale per debt issuance requires the smaller firm to have fewer debt issuance than the larger firm. Or, alternatively, some firms are large relative to the imperfectly liquid market making it more efficient to have more frequent debt issuance etc.

potential insolvency/bankruptcy costs that might otherwise flow from volatile allowances; but

- it may well trouble *customers* if they are unable to manage the volatility in network prices and their energy costs resulting from the fluctuating debt costs. That is, if customers income (salaries / government benefits/ business sales) are not correlated with the cost of debt benchmark then volatility in the cost of debt benchmark will flow through into volatility in customers' net cash-flows; and
- this will be especially problematic if the volatility is likely to result in energy costs increasing during periods in which their own budgets are under stress, e.g., during financial crises.

51. Individual consumers have only a limited capacity to enter into arrangements that mitigate such volatility in the prices they pay for delivered energy – especially where that arises from network prices. For this reason, final consumers will generally prefer a benchmark strategy that minimises volatility in network debt costs (and so network prices and energy costs) – even if businesses are themselves indifferent to such fluctuations (due to their ability to manage their debt costs to the benchmark allowance).
52. Retailers may be in a position to hedge some part of debt costs on behalf of final consumers, but not always. For example, volatility in the debt risk premium (DRP) could only be hedged if retailers were able to take out an insurance contract against an increase in the measured DRP benchmark. Although such contracts are certainly conceivable, the market for them would be “thin” at best and the negotiation costs would be material. It would therefore be better, other things equal, for the cost of debt methodology to give rise to a less volatile level of compensation for the DRP, such that this does not need to be separately managed (by either retailers or final consumers).

3.3 Summary of criteria

53. In summary, an efficient benchmark debt raising strategy should exhibit the following four attributes:
 - i. **It is hedgeable and is able to be implemented by a business** – the strategy must be feasible for the business to implement and can be managed to.
 - ii. **Implementation involves low transaction costs for the business** – if there are two equally implementable debt raising strategies, the strategy that involves the lowest transaction costs (direct and indirect) should be preferred.
 - iii. **It minimises the prospect and consequences of estimation error** – a business should be able to be confident that, if it manages to the benchmark strategy, its cost of debt will move with the AER's estimate of costs – especially during periods in which its costs are rising materially.

- iv. **It gives rise to relatively low price volatility for customers and does not result in higher prices when their budgets are under stress** – customers are not as well placed to hedge against the resulting volatility in network prices and especially do not want to be facing higher prices when they are facing broader cost pressures, e.g., due to a financial crisis.
54. In relation to the second criteria, it may not always be possible for any single regulator, academic or business person to fully understand and explain all of the transaction costs that might be relevant to an assessment of the transaction costs (direct and indirect) associated with a particular strategy. This is because capital markets, through the price signal and well understood rules of thumb, may guide business to particular debt management strategies without any one market participant fully understanding why this is the case.¹²
 55. However, it will often be possible to observe whether a particular debt management strategy is widely adopted by businesses in similar operating environments. If that debt management strategy is widely practiced then this will be evidence that it is implementable at low transaction costs. Indeed, this is one of the key contributions of Modigliani and Miller who demonstrated that the only reason for commonly observed debt management strategies must be that these minimise transaction costs (broadly defined).
 56. This suggests a fifth criteria which is, in reality, simply a way of operationalising the first and second criteria above:
 - v. **The benchmark debt management strategy should reflect the standard practice of businesses operating in similar environments to network energy businesses.**

3.4 Long term interests of consumers and a reasonable opportunity to recover costs

57. The NER and NGR require that the allowed rate of return must still be consistent with the National Electricity Objective (NEO) or the National Gas Objective (NGO), and the revenue and pricing principles. More specifically:
 - the rate of return must be set to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers, and
 - a regulated network service provider should be provided with a reasonable opportunity to recover at least the efficient costs the operator incurs.

¹² Just as market forces may distribute capital and labour in an economy without any one market participant fully understanding why.

58. In this context, it is important to demonstrate that applying the above criteria are consistent with achieving these objectives.

3.4.1 Long term interests of consumers

59. Consumers have a long term interest in minimising the costs of funding network businesses including direct and indirect transaction costs. Assuming full compensation is provided to investors for the costs associated with a benchmark efficient strategy,¹³ then customers' total payments will only be minimised if AER chooses a benchmark strategy that minimises those costs. Modigliani and Miller demonstrated that this requires that transaction costs (broadly defined) are minimised.

60. For this reason, meeting criteria i., ii., and v. above is in the long term interests of consumers. For similar reasons, meeting criterion iii. is in consumers long term interests because if this criterion is not met then the business will have unnecessarily high insolvency/bankruptcy risk and the expected transaction costs associated with that. Criterion iv. is in customers long term interest assuming that they prefer, other things equal, less volatile energy prices.

61. I further note that the long term interests of consumers are promoted if the cost of debt allowance does not create an incentive for regulated businesses to over or under invest in the network. This is a further reason why the benchmark debt management strategy should satisfy criteria i., ii., and v. If these criteria are satisfied then the cost of debt allowance associated with any capital expenditure will, over the life of the asset, be expected to reflect efficient costs associated with standard business practice. As such, the level of this allowance will neither promote nor discourage efficient investment.

3.4.2 A reasonable opportunity to recover at least efficient costs

62. In order to support the achievement of the NEO and NGO, the cost of debt benchmark adopted by the AER must :

- be able to be achieved by businesses (criteria i. and iii);
- give rise to an efficient level of debt costs (criterion ii. and v.);

¹³ Of course, if full compensation is not assumed then the long term interests of consumers will not be served because investors will not have an incentive to invest in maintaining and developing the network.

3.4.3 Summary

63. In summary:

- all five criteria support achievement of the NGO and NEO as they relate to the long term interests of customers.
- criteria i. to iv. support achievement of the NGO and NEO as they relate to providing investors with a reasonable opportunity to recover efficient costs.

4 Former NER benchmark

64. In the previous section I identified five criteria that can be used to assess the efficiency of a debt management strategy. In my opinion, the benchmark strategy that previously featured in the NER has problematic performance against all of them. That benchmark strategy formerly embedded in the NER involved resetting the cost of debt once every five years based on the yield on 10 year BBB+ debt estimated over an averaging period of around 20 days. I regard this benchmark as problematic because:
- i. **Criterion i:** it is not hedgeable/implementable by businesses and, therefore, it is not possible to prudently manage a business's actual costs to the benchmark cost allowance;
 - ii. **Criterion ii:** if a business nonetheless sought attempted to implement this strategy, it would be impossible for it to do so comprehensively and it would incur extremely high transaction costs;
 - iii. **Criterion iii:** the fact that the benchmark would set the cost of debt allowance for 5 years based on market conditions in one 20 day window meant that it was especially susceptible to estimation error – and the consequences of those errors were potentially severe;
 - iv. **Criterion iv:** it gave rise to highly volatile estimates; and
 - v. **Criterion v:** there is no example of a business actually adopting this strategy – let alone it being a standard business practice.
65. In the following sections I elaborate on the reasons why the strategy failed to conform to each of these criteria.

4.1 Not implementable at low transaction costs

66. The previous NER method for estimating the cost of debt does not reflect a feasible debt management strategy that would be undertaken by any business (at least not an efficient one). In order for a business to have a cost of debt that conformed to that implied by the benchmark strategy set out in the previous NER, the business would have to:
- refinance all of its debt at the beginning of each regulatory period – all of it with a 10 year term; and
 - because the regulatory period is 5 years, and the business is assumed to issue 10 year debt, it would need to buy back all of the debt that remains outstanding from the previous period.

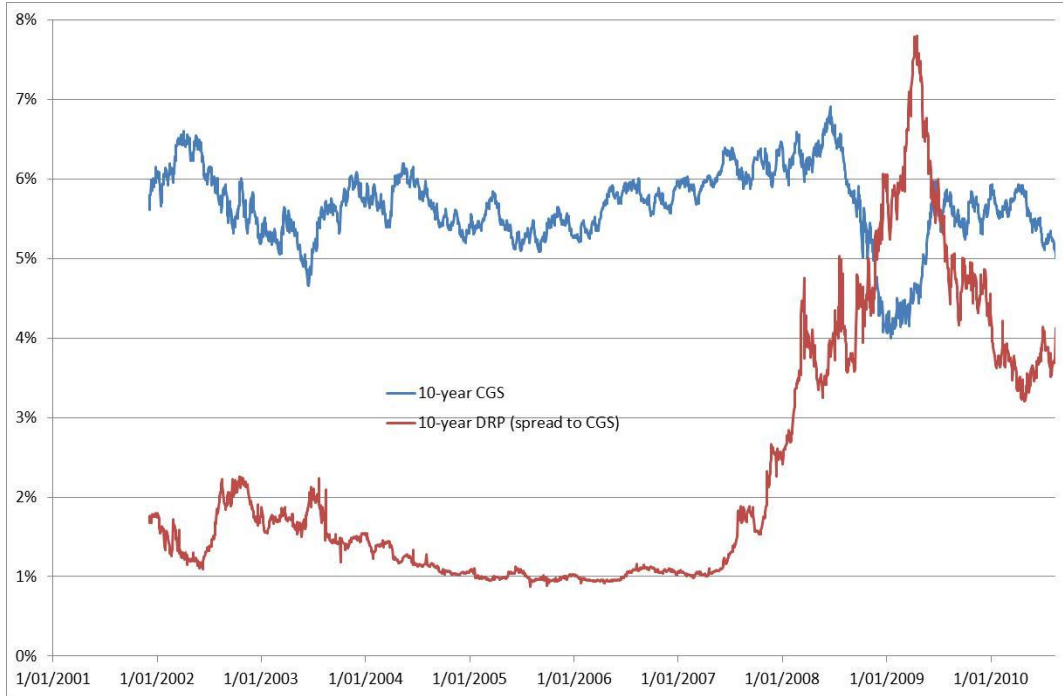
67. To buy back its debt the company would need to trade in an illiquid market (the secondary market for the company's debt) in which it would almost certainly incur an 'illiquidity premium' (a Modigliani Miller 'transaction cost'). In addition to buying back its own debt from bondholders who may not be willing to sell, the business would also have to issue twice as much debt than if it simply let it mature, i.e., if it kept the debt for 10 years rather than 5.
68. Equally, the idea that a business could reliably complete either of these transactions (buying back old debt or issuing 100% of its debt requirements) at anything approaching 'competitive market' prices is unrealistic for any material level of debt. The market for any individual company's debt – even the largest company in the world – tends to be illiquid. Attempting to refinance billions of dollars of debt in the same 20 day period would inevitably place a business at the mercy of an illiquid market.
69. Moreover, debt providers would be very reticent to fund 100% of a business's debt costs with instruments that are all the same maturity within a single 20 day period – even if debt markets are buoyant in that 20 day period. The reason is that the debt providers would know that all of their debt would mature within a future 20 day period (e.g., 10 years in the future if the instrument is 10 year debt). Today's lenders would know that the business can only pay them their principle in 10 years' time if the business is able to once more raise 100% of their debt requirements at the time that all of the debt comes due. Given uncertainty about the state of debt markets in the future, debt investors today would either refuse to lend or charge a penalty interest rate should a business put in place a strategy where 100% of debt needs to be refinanced at the same time.
70. For example, any business attempting to execute such a strategy at the height of the GFC in late 2008 and early 2009 would not have been successful (at least at any interest rate that did not wipe out most of the equity value of the company).
71. Even in a perfect capital market (with perfect liquidity and zero costs of unit debt issuance), the hypothetical business's debt management costs would not be the same as the former NER benchmark because the bonds being bought back need not be purchased at face value. This is because, if interest rates have changed and/or the yield curve is not flat, the value of a 10 year bond half way through its life will not be its face value. Consequently, even in a perfect capital market (with no transaction costs) this strategy is not implementable.
72. In light of this, a business could have decided to issue staggered 10 year debt and to attempt to partially hedge to the benchmark using interest rate swaps. However, that is an imperfect solution. First, the business would remain exposed to variations in the DRP (the spread to Commonwealth Government Securities (CGS)). Moreover, the potential for the DRP to move inversely to the CGS yield means that partial hedging of CGS yields might, even if perfect, increase the difference between a business's cost of debt and the benchmark allowance. Second, the approach does not necessarily

even provide a robust hedge to the risk free rate. The imperfection in the hedge arise due to:

- Transaction costs associated with entering into swap contracts (which were not compensated under the previous NER benchmark).
- Interest rate swaps being set at a variable premium to CGS yields. That is, a fixed swap rate of a given maturity will always be higher than a CGS yield of the same maturity and the difference between these rates is not constant. This means that, even if the DRP relative to CGS remains constant, the spread between interest rate swaps and CGS need not. Consequently, if the spread between swap and CGS yields rose (as it did in the GFC), a business using swap rates to hedge could end up with a higher cost of debt than the benchmark - even if its DRP was exactly equal to the benchmark.
- Over the course of a 5 year regulatory period half of the business's debt would need to be refinanced. There is no liquid futures market in which a business could hedge the cost of debt issued over the regulatory period such that it is equal to the cost of debt at the beginning of the regulatory period (before that debt has been issued).

73. Consider first, variations in the DRP. These variations will commonly be inversely correlated with the risk free rate. This is because the risk free rate (which is approximately what can be hedged) often varies in an inverse manner to the cost of debt (this is why the DRP, which is the difference between these two series, is so unstable). This is illustrated in the below graph where the DRP estimated by CBASpectrum for 10 year BBB+ debt was at its maximum during the GFC while CGS yields were at a minimum.

Figure 1: CBASpectrum DRP vs CGS yields



Source:CBASpectrum, CEG analysis.

74. Consequently, partial “hedging” of the risk free component of debt has the potential to lower/raise a business’s cost of debt when the *regulated* cost of debt is high/low. Thus, “hedging” risk free rates to the benchmark may well serve to make total costs less hedged to the benchmark rather than more. By way of example, consider a business that hedged the risk free component of their debt portfolio to a regulatory averaging period in early 2009 when risk free rates were low but the cost of debt as estimated by CBASpectrum was high:

- that business would have “locked in” low payments on the risk free component of their previously issued (low DRP); but
- it would have received very high compensation for their cost of debt based on the prevailing DRP as estimated by CBASpectrum; and
- rather than reducing volatility in profits, such a ‘hedging’ strategy would have magnified them (to the benefit of the business in this case).

75. Of course, precisely the opposite could (and likely will) occur in the future. That is, if/when heightened investor risk aversion falls away risk free rates can be expected to rise and the cost of debt to fall at the same time, i.e., the DRP will fall by more than the rise in the risk free rate. A business following a risk free rate “hedging” strategy will make losses in that scenario because their hedged interest costs will rise with the higher risk free rate but their regulatory revenue will decrease as a result of the falling cost of debt.

76. Now consider the transaction costs associated with entering into swaps. These include direct charges by banks for entering into swaps (such as charges for counterparty risk) or costs associated with providing collateral to banks in lieu of such charges. However, they also include the costs associated with trading in less than perfectly liquid swap market.
77. While the swap market is a liquid market as far as Australian financial markets go, its liquidity would be sorely tested if, for example, all NSW electricity businesses attempted to enter into 5 year fixed for floating swaps on 60% of their RAB and at around the same time (noting that their regulatory periods are synchronised).
78. The swap market, like any other derivative market, is largely driven by agents on either side of the transaction who have real economic rationales to trade either fixed or floating exposure to interest rates. For example, the natural counterparty to a utility wishing to enter into a pay fixed 5 year swap will be an entity that has receipts that are correlated with the BBSW (such that, in the event its liabilities under the interest rate swap contract rise with rising BBSW then its other income will also rise (and vice versa)). In general, this will be a financial intermediary who has lent (or expects to lend) more to customers at variable rates than it has borrowed at variable rates. Consequently, entering into a receive fixed (pay floating) swap will tend to balance their interest rate exposure.
79. A regulatory regime that sets up an unusually large lump of demand for pay fixed 5 year swaps at the beginning of the NSW businesses' regulatory period would be unlikely to have any natural counterparty. Some financial intermediaries may be prepared take on risk themselves by becoming a counterparty even though doing so increases their interest rate risk rather than reducing it. However, if this is the case they will demand a risk based premium for meeting that demand – a premium that would not exist if parties were simply trading based on hedging their own risk exposure.
80. I am instructed that, were the NSW electricity businesses to attempt to take out pay fixed five year interest rate swaps on their debt portfolios, this would result in a demand for \$20bn in these instruments. This would be demand created by regulation and there would be no natural 'other side' for a transaction of the relevant magnitude. For this demand to be absorbed by the market would be for other counterparties to take on interest rate risk in meeting the demand. In order to entice them to do so they would require a premium level of compensation. As a result, there is a material probability that any attempt by the businesses to enter into such swaps would drive swap rates well above CGS yields.
81. The above is true even in a perfectly competitive market. In reality, an injection of demand of this magnitude over a short period would have the potential to materially create/enhance the market power of the largest Australian financial intermediaries during that period. This enhanced market power can be expected to lead them to, acting independently or in a coordinated fashion, raise pay fixed rates even further

than would be the case if the only motivation were compensation for heightened risk of interest rate mismatch.

4.2 Estimation error and volatility

82. The former NER benchmark involved estimating the cost of issuing 10 year BBB+ debt in a 20 day window. This estimate then set the cost of debt allowance for a business for the ensuing 5 years. The accuracy of the estimate therefore assumes critical importance, because:

- if debt market data in any given 20 trading days gives rise to material uncertainty about the cost of debt in that period, then this uncertainty can lead to estimation error; and
- this estimation error will then be 'locked in' to compensation for a five year period and will consequently have a substantial ongoing impact upon a regulated business.

83. By way of contrast:

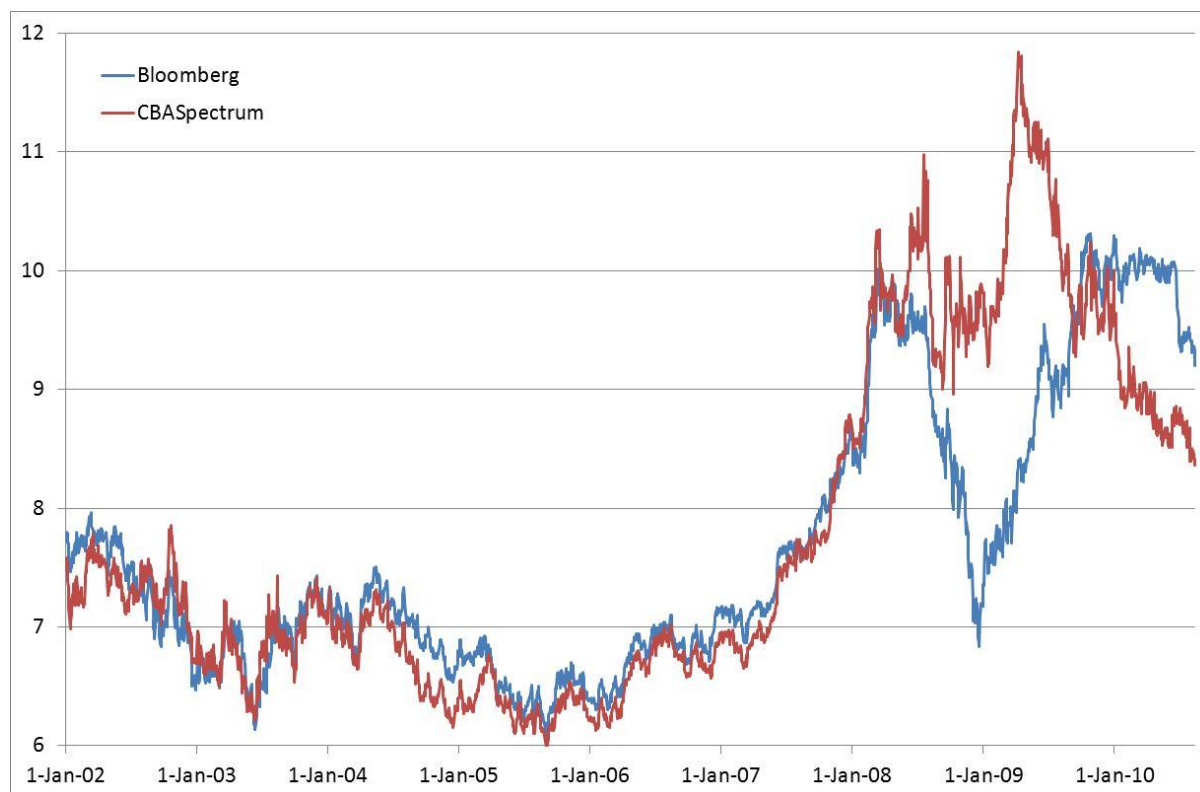
- if a cost of debt strategy required the cost of debt to be estimated each year and that cost was applied to a small percentage of debt costs; then
- any estimation error would impact compensation for a smaller proportion of debt costs.

84. Relative to such a benchmark, the approach previously set out in the NER benchmark created material potential for estimation error that would, in turn, give rise to a heightened probability of incurring insolvency/bankruptcy costs. Moreover, the cost of debt in any short window can be expected to be relatively volatile.¹⁴ It follows that, even in the absence of estimation errors, the former NER benchmark would give rise to high levels of volatility in the estimated cost of debt.

85. This can be seen in Figure 2 below, which shows the estimates of the 10 year BBB+ fixed rate cost of debt (the NER benchmark) published by two independent sources: CBASpectrum and Bloomberg. Both estimates are highly volatile and there is significant divergence between the two series from 2008 onwards. This provides a stark illustration of the potential for estimation error. Simply put, the divergence between these providers suggests significant uncertainty in all estimates over this period.

¹⁴ This reflects the relative illiquidity of the corporate bond market and its sensitivity to disruptions.

Figure 2: Bloomberg and CBA Spectrum fair value yields



Source: CBASpectrum and Bloomberg. CEG analysis

86. It is also worth noting that the average levels of both estimates are much higher post-2008. In other words, the benchmark cost of debt rose materially following the onset of the GFC (and this is reflected in AER decisions of the time). This meant that all businesses having their prices reset in this period – including NSW businesses – had their regulatory cost of debt allowance based entirely on the higher costs of debt that prevailed during the crisis.
87. Of course, in many cases business’ costs of debt largely reflected interest rates locked in prior to the inception of the GFC. Adherence to the then benchmark strategy in the NERs consequently bestowed a windfall gain on those businesses. In different circumstances this could easily have been a windfall loss and, indeed, that is precisely what happened to those businesses that had their cost of debt reset in January 2007 for 5 years but started paying inflated “post crisis” interest rates shortly thereafter.
88. For customers, this volatility could not have been more poorly correlated with their own operating environments or personal circumstances (as the case may be):
- business customers faced higher network prices (driven in large part by escalating cost of debt contributions) at a time when their own debt costs were escalating and when uncertainty about future revenues was likely at a high;

- many households were facing higher prices during a time of heightened uncertainty about their own economic prospects.
89. These outcomes are almost inevitable if a benchmark debt management strategy is based on the spot cost of 10 year BBB+ debt (as observed during a 20 day trading window) – as opposed to long term averages. This is because spot BBB+ debt yields are likely to be negatively correlated with the general state of the economy and economic perceptions. Indeed, the spread between AAA and BBB yields is a commonly used proxy for the level of risk perceptions in the economy.¹⁵ This means that:
- if the economy is traveling smoothly and risk perceptions are low then BBB+ yields are likely to be low; but
 - if the economy is troubled and risk perceptions are heightened, BBB+ yields are likely to be high.
90. Consequently, high levels of BBB+ debt allowances (and therefore higher network prices) will tend to be locked in for five years at precisely the time when customers value steady prices most highly. Similarly, lower prices will tend to be locked in when customers place the least value on such reductions.

¹⁵ For example, see Ravi Jagannathan and Zhenyu Wang, *The Conditional CAPM and the Cross-Section of Expected Returns* The Journal of Finance, Vol. 51, No. 1. (Mar., 1996), pp. 3-53.

5 A 10 year trailing average approach

91. The root of many of the problems with the previous NER benchmark, as identified in the previous section, can be traced to the benchmark strategy of raising 100% of all debt in a relatively short window immediately prior to the beginning of the regulatory period.
92. In reality, almost all businesses, including regulated infrastructure businesses, raise debt in a staggered fashion over time. Moreover, for infrastructure businesses with very long lived assets, the average maturity of this debt at the time of issue tends to be long term (10 years or more).¹⁶ It is very likely that this is a response to a desire to minimise transaction costs, in particular insolvency/bankruptcy costs, that are heightened if too much debt must be refinanced in a short period of time. Consequently, a business's cost of debt at any given time will reflect the costs incurred when issuing debt over the last decade (i.e., not just over the last 20 days).
93. In order for a cost of debt benchmark to reflect this practice it is necessary for it to capture the cost of debt issued a long period into the past as well as more recently. One simple way to do this would be to estimate, and periodically update,¹⁷ a trailing average cost of debt over the last, say, 10 years. This would be updated periodically (either annually within the regulatory period or every five years).
94. In this section I assess the efficiency of a 'trailing average' debt management strategy that involves issuing staggered 10 year BBB+ fixed rate debt.

5.1 Summary of conclusions

95. In my assessment, this potential benchmark performs well against the criteria I set out in section 3.3:
 - i. **It is hedgeable/implementable.** In order to implement this benchmark all a business must do is engage in staggered issuance of 10 year debt so that it is refinancing around 10% of its portfolio each year. Provided that the interest rate the business pays is correlated with the 10 year BBB+ cost of debt, its debt costs will tend to move in line with the benchmark (even if its actual credit rating is not BBB+).

¹⁶ For evidence of this see, for example, section 2.4 of CEG, *Estimating the risk free rate and the debt premium*, A report for QR, February 2010.

¹⁷ The nature of this periodic updating could take several forms. It could be updated each year of the regulatory period and reflected in prices for the next year. Alternatively, it could be estimated annually but only updated every five years – with potential for 'true up' mechanisms to the extent allowances in the previous five years did not adequately reflect estimated benchmark costs.

- ii. **It is low transaction cost for the business.** The business must simply issue staggered debt at a rate of about one 10th of their portfolio every year. This likely to allow all but the very smallest assets (possibly Envestra’s Wagga Wagga asset) to be financed by the issuance of parcels of debt that are above minimum efficient scale. Similarly, by spreading refinancing over 10 years this will prudently manage refinancing risk and minimise the associated transaction costs.
- iii. **The potential cost of estimation error is low.** A business can be confident that, if it issues staggered 10 year debt its costs will move with the AER’s estimate of costs. This is because a trailing average can be updated regularly – at least annually and potentially quarterly. Consequence, any one estimate of the cost of debt will have a weight in the trailing average of at most 10% (2.5% if quarterly estimates are used). Consequently, an error in one period’s estimate will not have a significant impact on the overall allowance. Only if the cost of debt was repeatedly mis-estimated, and in the same direction each time, would the benchmark estimate depart materially away from the actual market cost of debt associated with that benchmark.
- iv. **It gives rise to relatively low cost volatility and does not result in higher costs when their budgets are under stress.** The gradual updating of the benchmark estimate means that it is relatively stable. Moreover, this stability has the effect, relative to the past NER benchmark, of preventing cost of debt allowances materially contributing to network price increases at precisely the time that customers would most value lower prices (and vice-versa with respect to cost of debt reductions contributing to price reductions when these are less important to customers).
- v. **It is consistent with standard business practice.** It is standard practice for infrastructure businesses to engage in staggered issuance of long term debt. Consistent with the reasoning in section 3.1.2 "Modigliani-Miller financial markets with frictions" this suggests that this approach minimises transaction costs.

96. In the following sections I elaborate on the reasons why the strategy appears to be efficient when assessed against each of these conditions.

5.2 Implementable at low transaction costs

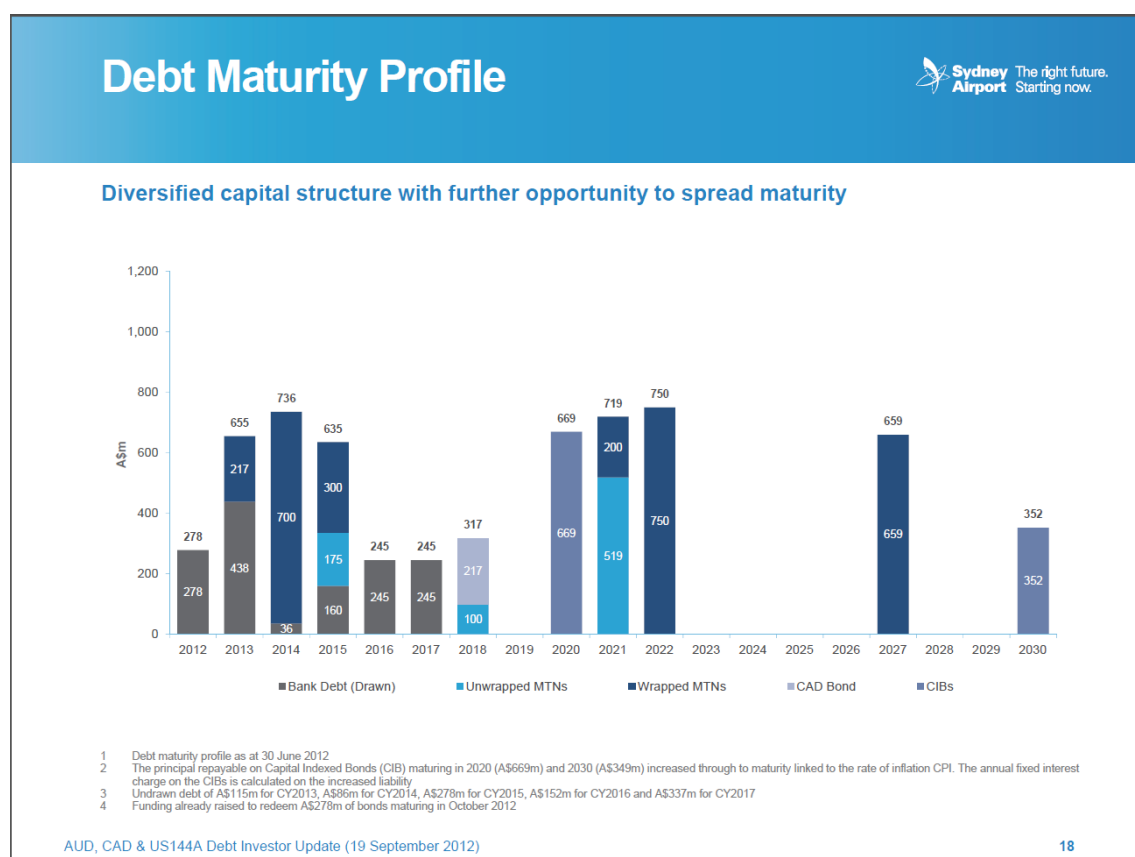
97. A 10 year trailing average approach would largely mimic the debt management strategy employed by infrastructure businesses (regulated and unregulated) around the world.

98. In this regard, it is worth noting that that it is also quite common for infrastructure businesses subject to “lighter-handed” forms of regulation to adopt the same strategy. This is important because regulated business financing activity may well be distorted

by the particular way in which the relevant regulator compensates for the cost of debt. Examining similar infrastructure businesses that are only lightly regulated, such as Toll Roads and Airports, provides an insight into the way in which infrastructure businesses manage their debt absent incentives created by the regulatory regime.

99. Sydney Airport and Transurban provide two examples. Figure 3 illustrates Sydney Airport’s debt maturity profile – which involves an approximately 8 year average maturity profile of the existing portfolio (consistent with a roughly 16 year average maturity for debt at the time of issuance)¹⁸.

Figure 3: Sydney Airport debt maturity profile – as at 30 June 2012



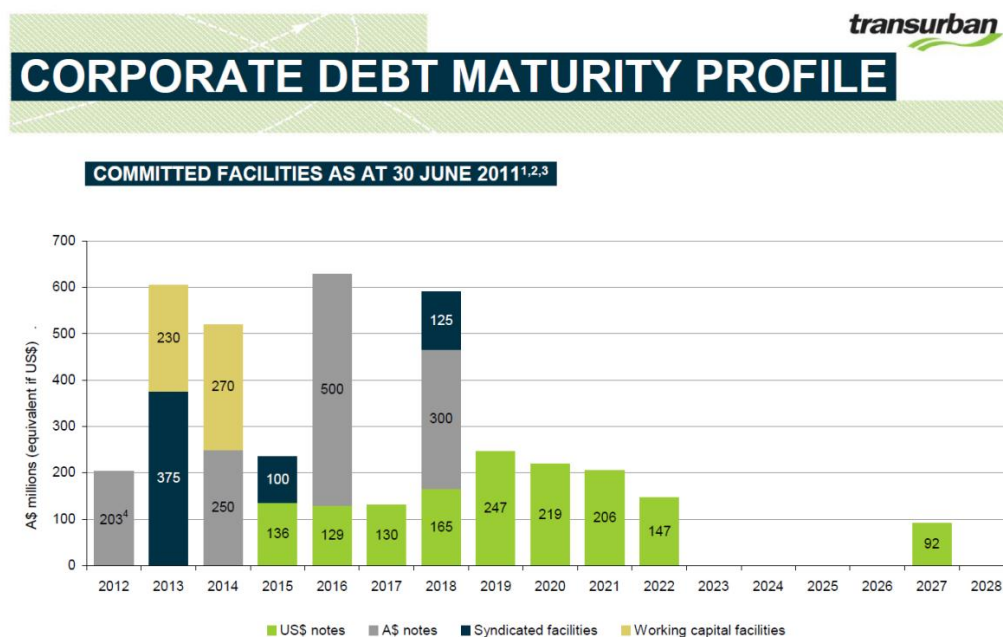
Source: Sydney Airport presentation, *AUD, CAD and US144A debt investor update*, September 2012.

100. Figure 4 shows Transurban’s corporate debt maturity profile – which involves an average time to maturity of slightly over 5 years – consistent with maturity at the time of issue of 10 years. However, this does not include non-recourse debt (debt that is secured over only one of Transurban’s asset where the lender does not have recourse to Transurban’s other assets). When non-recourse debt is included the

¹⁸ Assuming that outstanding debt is, on average, half way to maturity.

average maturity rises to 8.9 years¹⁹ –consistent with an average 17 year maturity at time of issue.

Figure 4: Transurban debt maturity profile – as at 30 June 2011



Source: Transurban, *Debt investor presentation*, October 2011, slide 24.

101. While these debt maturities are not perfectly smooth (i.e., the same amount is not maturing each year) they are consistent with the firms in question having a cost of debt that is consistent with a trailing average based on the assumption of relatively more smooth debt issuance.

102. Consistent with the reasoning I set out in section 3.1.2 ("Modigliani-Miller financial markets with frictions") the near universal adoption of staggered long term debt issuance by infrastructure businesses suggests that such a strategy is efficient (minimises transaction costs). Indeed, the presentations from which these slides are taken make clear that staggered debt issues are an important selling point to investors in terms of reducing refinance risk and transaction costs associated with any consequent disruption to the business.

5.3 Estimation error and volatility

103. Under a trailing average approach debt allowances would be much more stable and less susceptible to systematic material estimation bias. This can be illustrated by

¹⁹ Transurban, *Debt investor presentation*, October 2011, slide 26.

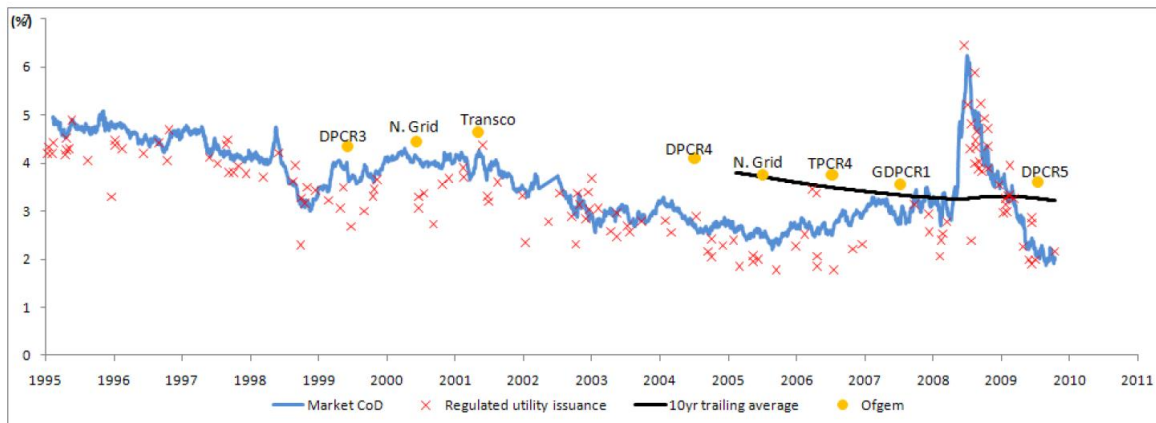
reference to the below Figure, which is taken from a decision of the UK energy regulator's (Ofgem) in which it resolved to adopt a 10 year trailing average approach.

104. Ofgem's benchmark assumes that a business is issuing 10 year debt that is constantly being rolled over. In each year of the regulatory period the cost of debt is therefore equal to a rolling average of the cost of debt over the preceding decade.

105. The below figure compared Ofgem's proposed trailing average approach with its past decisions (which were based on a benchmark similar to that previously in the NER) and with *actual debt raising* by regulated utilities. The smooth black line represents the 10 year trailing average cost of debt (ie, the 10 year average of the more volatile blue line) that Ofgem now proposes to use to compensate regulated businesses. The large yellow dots represent the allowances that Ofgem has set in the past. The red crosses represent debt actually issued by regulated businesses.

Figure 5: Ofgem trailing average

Figure 2: The forward cost of debt (real) vs. regulated utility bond issuance vs. Ofgem's allowed return on debt



106. This chart highlights a number of the issues that I have discussed hitherto. The previous NER and Ofgem benchmark's compensated businesses as if they adopted a different strategy, e.g., refinancing 100% of their debt once every five years. This created a potentially significant mismatch between the compensation those businesses received and the costs they incurred.

107. By way of example consider the above figure. First, ignore the yellow dots that represent actual regulatory decisions by Ofgem. Imagine that Ofgem used an 'on the day' benchmark to set the cost of debt for five years by taking an averaging period from the beginning of 2010. In that case:

- the prevailing real cost of debt is about **2%** (given by the volatile blue line); but

- the 10 year average is around **3.5%**, which implies that a prudently financed business (which I assume would finance consistent with the smooth black line) would be under-compensated by **1.5%**.

108. On the flip side, imagine that an averaging period happened to occur when the prevailing cost of debt was at its peak of 6%. The effect would be to 'lock in' 5 years of compensation at 6% when the cost of debt for a prudently financed firm was around 3.5% (ie, resulting in over-compensation to the tune of 2.5%).

109. It is also interesting to note that Ofgem's cost of debt allowances (the yellow dots) tended to reflect a 'de facto' application of the 10 year trailing average approach, despite the 'benchmark' ostensibly being quite different. Indeed, the benchmark appeared to be "more honoured in the breach than the observance".

6 Internally consistent benchmark

110. While the frequency of debt issuance adopted by any new benchmark, as discussed in the previous section, is an important dimension of any benchmark debt management strategy it is not the only dimension. In this section I make some high level observations about internal consistency of the debt management strategy.
111. In particular, I note that the any benchmark debt management strategy used by the regulator to estimate the cost of debt will require the specification of a benchmark credit rating. This is necessary in order to define the comparable entities/securities from which a benchmark cost of debt can be estimated. This benchmark credit rating should be set consistent with the specified debt management strategy and *vice versa*.
112. In my opinion, the old NER did not do this. In particular, the old NER specified a 60% gearing and a BBB+ credit rating while at the same time adopting a debt management strategy (100% issuance of all debt in a short window) that was inconsistent with achieving a BBB+ credit rating (due to the refinancing risk created by such a strategy).
113. It is important that, going forward, the benchmark gearing, credit rating and debt management strategy are all determined in an internally consistent manner. This may mean that one or more of these parameters needs to be kept flexible. For example, very high levels of debt costs will, if they are not associated with similarly high compensation for the cost of equity, tend to reduce the credit metrics for business.²⁰ In this context, it may be that the benchmark gearing or other aspects of the benchmark debt management strategy must change so that the benchmark credit rating could actually be maintained by the hypothetical benchmark business.
114. Doing so would require that the transaction costs associated with doing so are fully compensated by the regulator. For example, the costs of raising equity to lower gearing and/or the costs associated with raising very long term debt in an attempt to lower refinancing risk.
115. Another important example where this internal consistency is important relates to the pre-funding of debt prior to maturity. It is a common practice for investment grade businesses to raise new debt necessary to fund existing debt coming due several months before that debt actually matures. For example, examination of footnote 4 of the Sydney Airport slide at Figure 3 provides an example of this practice – where Sydney Airport had already raised (sometime before 30 June 2012) \$278m to redeem bonds only maturing in October 2012. This is at least four months early. Similarly, on slide 22 of the Transurban presentation from which Figure 4 is taken, Transurban states “*refinancing actively managed and funds are secured early*”.

²⁰ This is a simple reflection of the fact that the ‘equity buffer’ will be smaller as a proportion of total debt costs debt costs rise relative to equity compensation.

116. This practice gives rise to 'carrying costs' for the business being the difference between the interest paid on the prefunded debt and the interest rate received as a result of investing those funds in risk free assets.²¹ These carrying costs are efficiently incurred because, if they were not, then the businesses credit rating and the interest rate paid on all debt would be threatened. Internal consistency requires that, to the extent the benchmark debt management strategy adopts a credit rating based on this practice being in place it must also compensate for the transaction 'carrying' costs of this practice.

²¹ The funds must be invested in risk free assets otherwise they do not serve the purpose of being available with certainty to ensure the ability to repay debt coming due.