

Cost of Debt Comparative Analysis

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I EXECUTIVE SUMMARY

This review examined a number of estimation mechanisms for the debt component of the rate of return. The six options considered are:

- Option A: Current model – 5 yearly resets using the bond yield approach
- Option B: Annual resets with 1 year swap and medium term Debt Risk Premium (DRP)
- Option C: 5 yearly reset of swap and annual resets of medium term DRP
- Option D: Annual resets with observed bond yields
- Option E: Trailing average
- Option F: Staggered maturities.

Based on the National Gas Objective (NGO) we scored each of the options against agreed criteria. A simple score of “Yes”, “Partially” or “No” was applied. If an option scored a “No” then it invalidated this solution. The key findings are:

1. Options B and C are the best fit compared to Option A, because of the frequency of update of prevailing rates;
2. Options D and E scored at least one “No”;
3. Option F does not score a “No”, and does not provide any stronger outcomes than Options A, B and C;
4. A key decision criterion for determining the mechanism to be adopted is how quickly should movements in interest rates be reflected in the price of gas to consumers;
5. Staggered debt issuance is both an efficient and sound risk management practice;
6. The measurement approaches to DRP and swap rates should be re-examined; and
7. Consideration should be given to adding an adjustment factor for all on-the-day approaches.

2 INTRODUCTION

The Economic Regulation Authority (ERA) is examining a range of matters relating to the determination of the rate of return. Chairmont Consulting (Chairmont) has been engaged to assist in further development of the guidelines for the debt component of that rate.

3 NATIONAL GAS LAW – OBJECTIVES AND CONSTRAINTS

The NGO arises from the National Gas Law (NGL). It is as follows:

“The objective of this Law is to promote efficient investment in, and efficient operation and use of, natural gas services for the long term interests of consumers of natural gas with respect to price, quality, safety, reliability and security of supply of natural gas.”

On reading this objective it can be seen that the interests of the consumer take priority. The objective specifies that these interests cover price, quality, safety, reliability and security.

4 SCOPE OF WORK

Our brief was to assist the ERA to establish the best approach for determining the rate of return for the debt component that will be incorporated into the Rate of Return Guidelines for Gas Network

Operators. Furthermore, the solutions being considered must be consistent with the sub-objectives and work within the identified constraints, both of which are outlined in the next sections.

4.1 OBJECTIVES

It is our understanding that the key objective is to achieve a rate of return for a service provider “commensurate with the efficient financing costs of a Benchmark Efficient Entity (BEE) with a similar degree of risk in respect of the provision of reference services”. There are 3 components to this, they are:

1. Promote economic efficiency. The key elements of economic efficiency include:
 - Adoption of the Net Present Value (NPV) equals 0 principle. There should be no regular windfall gain or loss to the operator arising from the regulator’s estimation approach; and
 - Use of prevailing market rates. The solution should take current market rates and use those to project forward, rather than taking trailing averages as an indicator of future financing costs. The look forward approach is consistent with measuring the opportunity cost of capital and for the typical pressures, including from new entrants, faced by participants in an efficient competitive market.
2. Account for efficient financing costs. The management of financing risks through:
 - Use of readily available products, e.g. issuing bonds, Floating Rate Notes (FRNs);
 - Stagger debt issuances. Operators will apply sound risk management financing techniques, including not issuing debt all at once;
 - Hedge when available; and
 - Minimise transaction costs.
3. Provide a reasonable opportunity to the operator to recover costs. The elements of this are:
 - Regulatory rate fixing timeframe. The on-the-day timeframe should provide an estimate of current market conditions which is not unduly influenced by events over a very short period such as one day or one week;
 - Access to markets and instruments. The methodology must take account of the products and instruments normally available to a BEE for funding and hedging. An operator must have the ability to issue debt in an efficient manner and be able to access hedging products and markets that are liquid;
 - Unbiased estimate of costs, but no certainty of cost recovery. A “reasonable opportunity” means that the calculated cost of debt needs to be achievable through normal efficient treasury activities. The regulatory cost of debt cannot be:
 - too low so it cannot be achieved; or
 - too high therefore providing a windfall gain; or
 - set in such a manner that provides certainty of full cost recovery which would not be available in efficient competitive product markets.
 - No impact from market position taking. There should be no transfer of financing variability risk from operator to the consumer from inappropriate “position” taking in interest rate markets, where poor decision making, e.g. to fix in a falling market, results in a loss that the operator seeks to recover.

4.2 CONSTRAINTS

Gas network operators are faced with a number of key constraints that must be considered when examining solutions. These constraints are:

1. There is a 5 year regulatory access period.
2. Minimisation of re-financing risk. Debt maturities and amounts need to be staggered so as to avoid point in time re-financing risk.
3. Minimisation of transaction costs for both the service provider and regulator.
4. DRP cannot be hedged. The regulatory cost of debt calculation must recognise that DRP cannot be effectively hedged because of the lack of liquid derivatives. An individual issuer's DRP reflects a range of economic, market, industry and individual issuer factors, as well as the product to be issued and its tenor.

5 OUR APPROACH

Based on the scope of work, our approach was to consider solutions based on the objectives and constraints, then to score card those solutions so as to determine which options provide the best fit.

ERA has provided a summary of the issues tabled by industry that we have considered as part of this exercise.

6 BACKGROUND: FINANCIAL MARKETS AND CORPORATES

There are a number of key financial market concepts and practices combined with specific product details which provide an important backdrop to examining the proposed cost of debt setting solutions.

6.1 THE RELEVANT BASE RATE FOR DRP

As explained in more detail in Chairmont's report to ERA in May 2013, the market usually looks at the 'margin' or 'debt risk premium' of corporate debt in relation to the swap rate, not the Commonwealth Government Securities (CGS) rate used in regulatory price setting terminology. Throughout this report the DRP referred to is that over the swap rate of equal maturity, unless otherwise specified.

The margin may vary depending on the term of debt. It is measured as the difference between the total yield of a corporate's debt of any given maturity and the swap rate of the equal maturity. For example, the margin for 12-month fixed rate debt of a corporate would be compared to the 12-month fixed swap rate, with the difference between the two being the margin for a 12-month term. The equivalent calculation for a 5 year bond versus 5 year swap is likely to show a different margin for that term.

6.2 DIFFERENCES BETWEEN DEBT AND HEDGE MARKETS

There are 3 main areas of the financial markets relevant to a corporate managing its debt funding. These are:

- Primary debt raising
- Secondary debt trading
- Derivative hedging.

Primary debt raising can be achieved by a number of instruments, including:

- issuing fixed rate bonds, floating rate notes or hybrid debt in either the domestic or foreign markets;
- taking out bilateral loans with one bank or syndicated loans with a number of banks, which is typically arranged in the domestic market; and
- short term debt funding facilities such as overdrafts and working capital bank facilities.

On fixed rate debt, the fixed rate payable by the borrower is set at the start of the term and remains constant for the life of the instrument. Floating rate funding is usually quoted in terms of the bank accepted bill rate (BBSW) plus a margin. The margin is usually fixed for the entire term of the funding instrument, whereas the BBSW (base component) is the variable part of total borrowing cost. The BBSW is usually either re-set each 3 or 6 months at the market rate for bank bills for the respective term on that re-set date.

Secondary debt trading is where market participants can sell or buy the fixed, variable or hybrid securities issued previously in a primary debt raising. There is less trading of loans, as opposed to securities, although it does occur at times. Both fixed and floating rate instruments will be sold at a discount or a premium to the original face value, depending on prevailing market interest rates and comparative pricing of credit and other risks for the corporate. The discount or premium may represent a different margin over swap than that which originally applied in the primary issuance. While the secondary market margin will not change the borrowing costs for the already issued debt of the corporate, it may be an indicator of changes to the margin which the corporate would face in a new issue of debt. However, that is not necessarily the case. The margin for a corporate raising new debt may be higher or lower than that on its debt trading in the secondary market for a range of factors. These factors include, underlying economic conditions, different investor or lender motivations, the type of instrument and amounts of debt involved.

Derivative hedging can be conducted separately to debt issuance. Using derivatives allows virtually any period and timing of fixed or variable base rates to be created for the debt portfolio, regardless of the term of debt raised or whether it is fixed or floating rate. This means that decisions about timing of debt issuance and the maturity of that debt can be independent of decisions about timing, amount and term of fixing or re-floating the base rate. The short term base rate is represented by the 3 or 6 month BBSW rate, whereas longer term fixed base rates are represented by the swap rates.

6.3 NO ARBITRAGE RULES

Financial markets are some of the closest to fully efficient and fast reacting in the world. They generally do not allow risk-free arbitrage between various financial rates and products, except for very short time frames, such as seconds. Accordingly, observations that longer term interest rates are usually higher than shorter term interest rates does not imply that an entity could achieve lower base rate costs by always borrowing at the lower short term rate. The higher longer term rate reflects a number of factors, with the largest impact at any point in time being interest rate expectations. The more concerned the market is about short term interest rates rising substantially over coming years, the higher the current long term rate is compared to the current short term rate, i.e. a steeply positive yield curve. There are also technical factors such as liquidity, volatility and time value of money which produce a positive sloped yield curve most of the time. The incorporation of these factors into long term interest rates actually removes the ability to consistently profit by choosing between short or long term fixing at any point in time, i.e. ensures no arbitrage.

6.4 FIXED VERSUS FLOATING 5 YEAR COST OF DEBT

Following on from the above no arbitrage explanation, it can be seen that the total cost to a borrower over 5 years will not be higher or lower with certainty just by their choice of fixed or floating rate for the period. Consider the case of fixing the base rate for the entire 5 year period with a 5 year swap, versus fixing the base rate in each year with a 1 year swap. In a typical positively sloped yield curve environment, the base cost for the first year will be lower by using the 1 year fixing. However, when it comes time to fix for the second year, the 1 year rate could be higher or lower than where it was a year before. This uncertainty continues across the 5 years. Only at the end of the 5 years can the two approaches be compared. The average base rate of the corporate that has refixed annually may be higher, lower or the same as for the corporate which fixed the 5 year rate at the beginning of the period.

6.5 INTEREST RATE RISK MANAGEMENT

Interest rate risk is removed when changes in interest rates have an equal impact on cost and revenue. This observation is important to the case of a regulated cost of capital pricing regime, where interest rate changes fully flow through to revenues. The risk neutral approach to managing interest rate risk is to match the interest rate impact on costs to that of the revenue side. The implication of this paradigm is that the operator faces no interest rate risk whether it is given a base rate re-setting period of 1 year, 5 years or anything in between, under one condition. That condition is; the required swaps must be equally available to the operator regardless of the term. For the swaps to be equally available:

- Swap market participants are willing to provide credit approval to the operator for swaps of any maturity up to a least 5 years; and
- Liquidity of swaps trading in the different terms is equivalent.

7 OBSERVATIONS ON INDUSTRY SUBMISSIONS

A number of key industry submissions need to be addressed as part of this exercise.

7.1 CONSIDERATION OF INDUSTRY COMMENTS

Table 1 below contains a brief analysis of industry submissions.

Submission	Topic	Proposed Treatment	Reasoning
DUET page 3	Debt should be longer term, e.g. 10 years for funding of long term assets.	It is possible to incorporate longer term debt into DRP calculation when debt observations are available or can be plausibly extrapolated.	<ul style="list-style-type: none"> Re-financing risk is best managed by spreading debt rollovers over time, not by limiting the maturity to a specific long or short term. Creditors will 'reward' borrowers with lower margins for specific maturities and debt instrument types in demand at that time. This explains the observed behaviour of corporate borrowers to raise funds in the various term segments of markets, typically between 3 and 10 years, and up to 20 years in favourable markets. The cost of completely removing refinancing risk for 70 year assets may be higher than the cost of carrying it. The risk adjusted return to equity holders is therefore likely to be higher when they accept some refinancing risk.
DUET page 4	Hedging costs of DRP to annual resets are significant.	Most of the options examined seek to achieve an unbiased estimator of DRP, but do not aim to make it hedgeable with certainty.	An opportunity cost of capital or new entrant approach to competitive pricing means that incumbent operators may not be able to perfectly hedge the DRP, so they will sometimes make windfall gains and sometimes windfall losses, as in an unregulated competitive market.
DBP page 28	Not enough transparency of bond yield calculation.	Any calculation used should be transparent, which we understand is currently the case.	
DBP page 31	Annual updates are not necessary to reduce mismatch	Options B and C should result in a reduction of mismatch	<ul style="list-style-type: none"> The decision whether to use annual updates of the DRP should be based primarily on

Submission	Topic	Proposed Treatment	Reasoning
	risk. If ERA is of the view that incumbents must accept mismatch risk, then ERA should be consistent in that view.	risk in the DRP.	<p>the objective of economic efficiency, including price signalling to consumers.</p> <ul style="list-style-type: none"> Any chosen methodology should provide for an unbiased opportunity to fully recover DRP costs, but may cause gains and losses in any one period as the actual result differs from the estimate. It is a desirable side-effect when the actual periodical gain or loss can be reduced and remain unbiased.
DBP page 29 and WATC page 4	Consumers should receive smoothed price changes rather than regular volatility.	Most of the approaches considered do not smooth prices. Option B produces the complete opposite where all interest rate changes are passed on annually into prices.	The stated objective of producing economic efficiency is more aligned with 'floating' prices which respond quickly to cost signals in the economy, than to a 'pegged' price setting mechanism. As noted elsewhere, interest rate changes which persist are still passed on fully to consumer prices under the trailing average approach, Option E. Therefore, a key decision criteria for comparing the options is the desired timing response of output prices to input prices.
DBP page 30-36 and GGT page 67	The submissions consider the predictive power of the rate to be important, and disagree with the ERA proposed guidelines.	<ul style="list-style-type: none"> This matter is not examined as part of this comparative exercise. The options which use an annual reset should reduce any variance between predicted and actual value, in addition to the estimate being unbiased. 	It is our understanding that ERA believes that an unbiased predictor is important and guaranteed by the existing methodology.
DBP page 36 and ATCO page 18	The relevant debt portfolio should measure a new debt term instead of average	It is possible to incorporate longer term debt into DRP calculation when debt observations are	Different term portfolios may be desirable depending on whether the economic efficiency argument is focused more on opportunity cost of capital or new entrant

Submission	Topic	Proposed Treatment	Reasoning
	outstanding debt term.	available or can be plausibly extrapolated.	pricing. The former suggests using the outstanding debt whereas the latter suggests using new issue debt. There will typically be some difference between the two terms in practical market activity.
DBP page 37-38	NPV=0 doesn't work in a price cap environment.	As this matter is outside the scope of work, it was not examined.	It is our understanding that ERA has re-examined the topic and has confirmed it believes the condition is applicable.
DBP page 38	A shorter term fixed rate means lower prices most of the time, due to an upward sloping yield curve being the norm.	Options B and F do intend to use short term base rates i.e. 1 year.	Section 6.4 addresses this point.
DBP page 39	Infrastructure businesses are seen to not have very short term average fixed rate debt, such as one year, so ERA should not impose that here.	Options B and F do intend to use short term base rates i.e. 1 year.	The revenue of typical infrastructure assets does not fluctuate on a one-to-one basis with interest rates. Therefore, an infrastructure operator needs to minimise the impact of an increase in interest rates by staggering fixed rates. The regulated gas market is different, because interest rate changes will fully pass through to prices in all cases (even the trailing average approach eventually passes on all rate changes to prices). Accordingly, there is no need for regulated gas operators to have a mix of fixed and floating base rates, as it produces revenues which are 100% correlated to the specified base interest rate.
DBP page 39	The term of the risk free rate in the equity calculation need not be the same as the debt rate resets.	The options presented here agree with and embody that principle.	
GGT page 67-68	The sample bond data does not adequately represent a BEE.	Can incorporate a greater range of debt or a superior calculation	

Submission	Topic	Proposed Treatment	Reasoning
		methodology into the DRP calculation, if shown to be appropriate.	
GGT page 68	Question if the credit rating of the BEE is set correctly.	The options do not consider reviewing the appropriate credit rating, but it could be included in the proposed review of the DRP calculation.	
ATCO page 19	If the aim is to measure a specific maturity DRP, curve-fitting may be better than observing a small number of bonds in the market.	The proposed review of the DRP bond set and calculation method could reconsider if advantages arise from the use of curve fitting, if additional data observations are able to be sourced.	
WATC page 4	The swap market is not liquid enough to hedge all the debt in very large portfolios in a single maturity within the 20 day window.	A lengthening of the observation window should be considered. Options B and F also require the use of shorter term swaps where there is typically greater liquidity. However, the ability to hedge with certainty is not required by the stated objectives.	The looking forward economic efficiency objective does not require certainty of hedge costs for incumbent operators. A perfect hedge is actually out of step with competitive product markets.
WATC page 5	The estimated debt cost does not need to be the best predictor of future rates.	This matter is not examined as part of this comparative exercise.	It is our understanding that ERA believes that an unbiased predictor is important and guaranteed by the existing methodology.

Table 1: Analysis of Industry Submissions

7.2 TRAILING AVERAGES

As many of the industry participants are advocating this approach it is treated as an option in the same way as the other solutions considered. It is noted that there are different ways of measuring trailing averages and Option E only considers a simple calculation, as our brief is to consider the solutions that are a best fit for the NGL objective.

The issue of trailing averages versus prevailing rates from an operator perspective is a timing matter. Specifically, changes in interest rates are recognised sooner through prevailing rate methods than trailing average methods.

7.3 ACCOUNTING TREATMENT

It is recognised that market operators are not in the business of trading or taking positions therefore they will value their debt according accounting standards. Economic efficiency and market based valuations generally use a “mark to market” basis for valuing both assets and liabilities. The impact of using different valuation techniques during the life of an asset or liability is a timing one, as on the maturity date the value of the asset or liability will be its face value.

8 MEASUREMENT OF COMPONENTS

Regardless of the solution to be used decisions will need to be made on the:

- type of debt products, e.g. bonds and floating rate notes;
- type of hedging products, e.g. interest rate swaps; and
- the timeframe.

The measurement approach impacts on the rate of return. This matter crosses many of the items contained in the industry submissions and in the solutions outlined in this paper.

8.1 DRP

It is desirable to measure the DRP by using as close a match as possible to the funding tools actually used by a firm such as a Benchmark Efficient Entity (BEE). For that reason it is worth re-examining if collecting interest rate data for a more representative debt portfolio is possible. Factors which should be considered are:

- Inclusion of more debt types, such as Floating Rate Notes and syndicated bank debt;
- Changing the companies included in the portfolio. This may mean adding companies considered similar enough to a BEE and/or excluding companies which are considered too divergent; and
- Primary market data, such as prevailing syndicated loan margins for relevant issuer types.

The method of calculation can also be revisited. Factors which should be considered, again dependent on data availability, include:

- Focusing more on new issue maturities rather than outstanding secondary market debt, if the portfolio is intended to reflect a new entrant;
- Alternatives for weighting or not weighting terms of outstanding debt;
- Possible curve-smoothing methods to account for data deficiencies; and
- Possible lengthening of the observation time window.

8.2 SWAP RATE

Options B, C, F and potentially E, change the base rate in the cost of debt to be an interest rate swap rather than the rate for a CGS. This change focuses attention on the pricing and hedging used in the market by companies, rather than the theoretical Capital Asset pricing Model (CAPM) focus on a risk-free rate. Swaps are very liquid and their rates are readily available each day.

In the on-the-day rate setting approaches, one variable which should be further considered is the length of the observation window for the swap rate. The length of the window should serve two purposes. If it is consistent with the objectives it should:

- be effective as an unbiased predictor of future interest rates; and
- provide a reasonable opportunity for an operator to transact swaps in the required amount for the fixing option. In the case of Options A, B, C, and F that would be 100% of the debt amount.

Interest rate swaps are much more liquid than corporate bonds, so that even a relatively short window of 20 days would allow a large volume to be hedged in swaps. A longer window could also be considered if the ability to hedge within that time is considered paramount. However, the primary purpose of a prevailing rate approach is to determine where market rates are, rather than to provide full certainty of cost recovery for an operator.

8.3 ADJUSTMENT FACTOR

As previously established DRP is measured from liquid secondary market bonds. Even though it may be the best proxy for the true cost of debt there are 3 potential problems with it:

- Primary versus secondary market differences in margin. The primary market DRP may be higher or lower than the secondary. Therefore, the secondary market rates are not unbiased at any particular point in time;
- Comparative liquidity. All things being equal, liquid debt will usually trade at a lower margin than illiquid debt. Therefore, this is another factor that may bias the measured DRP compared to the true cost of debt; and
- Additional transaction costs. These can arise where an issuer attempts to transact larger volumes than the market normally trades. This may be in the form of brokerage or management fees.

There is a potential for an adjustment factor when determining the total cost of debt. This requires further consideration.

9 SOLUTIONS

The solutions examined are:

- Option A: Current model – 5 yearly resets using the bond yield approach
- Option B: Annual resets with 1 year swap and medium term DRP
- Option C: 5 yearly reset of swap and annual resets of medium term DRP
- Option D: Annual resets with observed bond yields
- Option E: Trailing average
- Option F: Staggered maturities

Each of these solutions is now examined. The primary comparative analysis is between the current approach (Option A) to the other options. There is some comparative analysis of the other solutions to each other, e.g. Option B compared to Option C.

9.1 OPTION A: CURRENT MODEL – 5 YEARLY RESETS USING THE BOND YIELD APPROACH

Explanation

The current model is:

- The cost of debt is fixed using an on-the-day approach of the 5 year CGS, plus a DRP of relevant outstanding corporate debt.
- The on-the-day observation period is 20 business days.
- The relevant bond portfolio is of Australian fixed rate bonds for which there are market quotes and issued by corporates of a similar credit rating to the BEE. There is no fixed or engineered (i.e. hypothetically calculated) term of those bonds. This means that the term underlying the DRP can differ over time and is usually longer than the precise 5 year term of the base rate CGS.
- A cost of debt issuance and hedging allowance is made of 12.5 basis points.

Implications & considerations

There are a number of observations:

- There is no consideration of previously issued debt cost.
- Price adjustments only occur every 5 years, which is a much longer period than in most other markets.
- The breakdown of total cost does not take account of the swap yield curve, hence the DRP referred to is measured over CGS. Market practice usually measures DRP over swap. With the exception of Option A throughout the paper market practice is used.
- The bond portfolio may not be representative of a BEE. Namely:
 - it only includes fixed rate Australian Bonds;
 - many of the bond issuers are from different industries;
 - the weighted average term of the debt fluctuates according to the terms to maturity of existing debt and therefore it may be unduly influenced by short term factors impacting the secondary bond market; and

- it takes liquid bonds which may not represent the new issuances market, that could become illiquid after issuance.

Scorecard

Table 2 below scores the approach against the objectives.

	Objective	Score	Comments
1.	Promotion of economic efficiency		
	<ul style="list-style-type: none"> • Adoption of NPV = 0 	Partially	Achieved for the base rate, but not fully for DRP.
	<ul style="list-style-type: none"> • Use of prevailing market rates 	Yes	
2.	Account for efficient financing costs		
	<ul style="list-style-type: none"> • Use of available products 	Yes	
	<ul style="list-style-type: none"> • Staggered issuances 	Partially	The current approach uses a limited range of maturities of bonds.
	<ul style="list-style-type: none"> • Hedge when available 	Yes	There is no compensation for not hedging as it assumes firms apply sound interest rate risk management techniques.
	<ul style="list-style-type: none"> • Minimising transaction costs 	Yes	There is no compensation for cost inefficiencies.
3.	Provide reasonable opportunity to recover costs		
	<ul style="list-style-type: none"> • Regulatory rate fixing timeframe 	Yes	20 days smooths the effects of daily volatility and illiquid of bond prices.
	<ul style="list-style-type: none"> • Access to markets and instruments 	Partially	No DRP hedge instrument available.
	<ul style="list-style-type: none"> • Unbiased estimate of cost, but no certainty of cost recovery 	Yes	Dependent on the bond portfolio being representative of BEE term and margin and that the 20 day observation period provides an unbiased estimator of future rates.
	<ul style="list-style-type: none"> • No impact from market position taking 	Yes	There is no compensation for non-neutral risk hedging.

Table 2: Scorecard Option A – 5 yearly resets using the bond yield approach

Conclusion

This approach achieves many of the required objectives but should be weighed up against some of the alternatives below which may provide a better outcome.

9.2 OPTION B: ANNUAL RESETS WITH 1 YEAR SWAP AND MEDIUM TERM DRP

Explanation

The basis of this approach is:

- 100% issuance on-the-day, where the observation window could be longer than 20 days, such as 40 or 60 days.
- Annual updates are made to both the swap rate and DRP.
- The base rate for the calculation is the 1 year swap rate.
- Added to the swap rate is the weighted average of a DRP for a term funding portfolio. The portfolio may reflect the outstanding debt of various terms issued by a BEE, on the basis of an opportunity cost of capital approach, or that of a newly issued debt portfolio with various maturities, representing a new entrant BEE.
- The observation portfolio may also include non-securitised debt such as the prevailing margin for bilateral and syndicated loans.
- An additional adjustment factor may be added as described in Section 8.3.
- Cost of debt issuance and hedging allowance is an additional cost. This is expected to be the same as option A, however further work is required to confirm this.

Implications & considerations

There are a number of observations:

One year base rate

- The swap rate usually registers larger changes across time than the DRP. By updating the swap rate annually, changes in market circumstances are passed onto price signals for consumers more regularly.
- Typically annual changes in the 1 year rate are smaller than changes in the 5 year rate after 5 years. Accordingly, the price change to consumers will be more frequent, but smaller than using the current 5-yearly cycle. In very volatile times, such as the Global Financial Crisis (GFC), this situation will reverse, i.e. the annual swings of the 1 year rate were larger than changes to the 5 year rate.
- Generally there is greater liquidity in 1 year swaps than 5 year swaps for operators wishing to hedge the base rate.

Annual updates of the DRP

- As for the swap rate, updating DRP annually passes changes in market circumstances onto price signals for consumers more regularly.
- In all of the proposed forward looking options, the DRP does not reflect margins for pre-issued debt of operators using a staggered debt issuance practice. It is also acknowledged that the mismatch in DRP timing cannot be hedged by derivatives. In this option the DRP is set annually, therefore it will more quickly reflect changes in DRP than under any longer dated refixing period, e.g. Option A. As a result of this feature, in a market where the DRP trends up or down across the 5 years, annual updates will reduce the windfall gain or loss to operators.

Potential improvements in swap rate and DRP measurement

As noted in section 8 above, it may be possible to make changes to the techniques for estimating the components of the cost of debt. This may allow a new method such as Option B to better achieve the stated objectives.

Scorecard

Table 3 below scores the approach against the objectives

	Objective	Score	Comments
1.	Promotion of economic efficiency		
	<ul style="list-style-type: none"> Adoption of NPV = 0 	Partially	Achieved for the base rate. It would not be achieved for the DRP if operators were able to fund themselves at short-term DRPs without incurring additional refinancing risks.
	<ul style="list-style-type: none"> Use of prevailing market rates 	Yes	Stronger fulfilment of this objective than for Option A as it fully updates annually.
2.	Account for efficient financing costs		
	<ul style="list-style-type: none"> Use of available products 	Yes	As for Option A.
	<ul style="list-style-type: none"> Staggered issuances 	Partially	Can allow for a greater range of staggered maturities and slightly longer observation period than Option A.
	<ul style="list-style-type: none"> Hedge when available 	Yes	As for Option A.
	<ul style="list-style-type: none"> Minimising transaction costs 	Yes	As for Option A.
3.	Provide reasonable opportunity to recover costs		
	<ul style="list-style-type: none"> Regulatory rate fixing timeframe 	Yes	May be better than Option A, as it allows for any necessary improvements.
	<ul style="list-style-type: none"> Access to markets and instruments 	Partially	Potential longer observation period and use of shorter term swap should improve ability to hedge swap rate compared to Option A.
	<ul style="list-style-type: none"> Unbiased estimate of cost, but no certainty of cost recovery 	Yes	It reduces the error of forecast in DRP due to annual updates compared to Option A.
	<ul style="list-style-type: none"> No impact from market position taking 	Yes	As for Option A.

Table 3: Scorecard Option B – Annual reset with 1 year swap and medium term DRP

Conclusion

This alternative has some advantages over the existing method but has the significant impact of producing potentially large annual changes in consumer prices. It must be decided whether this 'free-float' approach is preferred compared to some form of 'managed-float' or 'pegged' system.

9.3 OPTION C: 5YEARLY RESET OF SWAP AND ANNUAL RESETS OF MEDIUM TERM DRP

Explanation

This mechanism works on the same basis as Option B except the base rate for the calculation is the 5 year swap rate which remains constant for the 5 year access period.

Implications & considerations

There are a number of observations:

Five year base rate

- As the base rate is usually the major driver of change in the total cost of debt, maintaining a swap rate for the entire 5 years would reduce the volatility in prices experienced by consumers. This may be advantageous if the 1 year rate is too volatile in both directions, sending unnecessary price signals to consumers where the volatility is self-correcting over the longer term.
- Hedging costs should be reduced somewhat compared to the annual swap reset in Option B, as the operator would only need to consider one hedge, or one hedging program, at the start of each 5 year access period. This benefit may however be partly or completely offset if the effective spread in the 5 year swap hedge is larger than that for the 1 year swap hedges.

Other considerations

The following considerations are the same as for Option B:

- Annual updates of the DRP;
- A potential longer observation window for the swap rate; and
- Potential improvements to the composition and calculation of the DRP.

Scorecard

Table 4 below scores the approach against the objectives.

	Objective	Score	Comments
1.	Promotion of economic efficiency		
	<ul style="list-style-type: none"> • Adoption of NPV = 0 	Partially	Achieved for the base rate. It would not be achieved for the DRP if operators were able to fund themselves at short-term DRPs without incurring additional refinancing risks. As for Option B.
	<ul style="list-style-type: none"> • Use of prevailing market rates 	Yes	Stronger fulfilment of this objective than for Option A, but weaker than Option B, as only the DRP updates annually.
2.	Account for efficient financing costs		
	<ul style="list-style-type: none"> • Use of available products 	Yes	As for Option A.

	Objective	Score	Comments
	<ul style="list-style-type: none"> Staggered issuances 	Partially	Can allow for a greater range of staggered maturities and slightly longer observation period than Option A. As for Option B.
	<ul style="list-style-type: none"> Hedge when available 	Yes	As for Option A.
	<ul style="list-style-type: none"> Minimising transaction costs 	Yes	As for Option A.
3.	Provide reasonable opportunity to recover costs		
	<ul style="list-style-type: none"> Regulatory rate fixing timeframe 	Yes	May be better than Option A, as it allows for any necessary improvements. As for Option B.
	<ul style="list-style-type: none"> Access to markets and instruments 	Partially	Potential longer observation period should improve ability to hedge swap rate compared to Option A. As for Option B.
	<ul style="list-style-type: none"> Unbiased estimate of cost, but no certainty of cost recovery 	Yes	It reduces the error of forecast in DRP due to annual updates compared to Option A. As for Option B.
	<ul style="list-style-type: none"> No impact from market position taking 	Yes	As for Option A.

Table 4: Scorecard Option C – 5-yearly reset of swap and annual reset of medium term DRP

Conclusion

This approach is a mix of Option A and Option B. It provides the opportunity to improve the details of the rate setting mechanism and part of the ‘free-float’ impact of Option B. It can therefore be seen as a more ‘managed-float’.

9.4 OPTION D: ANNUAL RESETS WITH OBSERVED BOND YIELDS

Explanation

The calculation is the same as Option A, however it is updated annually using the prevailing bond sample at that time.

Implications & considerations

There are a number of observations:

NPV not equal to zero

The cost of debt compensated to operators would be the 5 year base rate, whereas operators would experience a rate reset each year. On average the yield curve is positively sloped, which leads to the compensation rate being higher than the annual base rate borrowing cost incurred by operators. This violates the NPV=0 objective.

More difficult hedging

The above implication explains that on average over time operators should have a windfall profit from this option, however in any one period the operator may have a windfall gain or loss. This arises because they are unable to hedge the annually changing 5 year rate. To do so would require a type of exotic interest rate swap which is not generally available in Australia. This would be a type of Constant Maturity Swap with non-standard conditions.

Scorecard

Table 5 below scores the approach against the objectives.

	Objective	Score	Comments
1.	Promotion of economic efficiency		
	<ul style="list-style-type: none"> Adoption of NPV = 0 	No	The longer term fixed rates are reset each year.
	<ul style="list-style-type: none"> Use of prevailing market rates 	Yes	Stronger fulfilment of this objective than for Option A. As for Option B.
2.	Account for efficient financing costs		
	<ul style="list-style-type: none"> Use of available products 	Yes	As for Option A.
	<ul style="list-style-type: none"> Staggered issuances 	No	As for Option A.
	<ul style="list-style-type: none"> Hedge when available 	Yes	As for Option A.
	<ul style="list-style-type: none"> Minimising transaction costs 	Yes	As for Option A.
3.	Provide reasonable opportunity to recover costs		
	<ul style="list-style-type: none"> Regulatory rate fixing timeframe 	Yes	As for Option A.
	<ul style="list-style-type: none"> Access to markets and instruments 	Partially	No Constant Maturity Swap hedge or DRP hedge instrument readily available.
	<ul style="list-style-type: none"> Unbiased estimate of cost, but no certainty of cost recovery 	Yes	As for Option A.
	<ul style="list-style-type: none"> No impact from market position taking 	Yes	As for Option A.

Table 5: Scorecard Option D – Annual reset with observed bond yields

Conclusion

This option is problematic and fails a key objective of $NPV = 0$, therefore it should not be considered any further.

9.5 OPTION E: TRAILING AVERAGE

Explanation

A number of variations of this method are possible. The required common features are:

- Inclusion of DRP and possibly base rates from earlier years;
- A range of maturities in the observed debt portfolio; and
- Periodical update of part but not all of the total debt. This means that in any one fixing period the total rate is a weighted average of prevailing and past interest rates.

The key possible variables within this approach are:

- Updates of part of the debt cost annually or each 5 years;
- Trailing average of only the DRP component or the total rate; and
- The observed debt portfolio could include funding instruments of longer, shorter or a wide range of maturities.

Implications & considerations

There are a number of observations:

Smoothing of price changes

All things being equal, the trailing average approach smooths the impact of interest rate changes on consumer prices. This is because partial updates to the total debt cost means that an interest rate change only impacts on a part of the portfolio on any one reset date. The impact of the interest change progressively feeds into consumer prices. This reduces volatility of prices to consumers and provides weaker price signalling of the timing of opportunity cost changes. However, interest rate changes which persist will eventually feed into the price, i.e. the gas price adjusts fully for changes in the cost of debt in this option as it does in all other reset mechanisms under consideration.

This smoothing process may impact on prices in two seemingly opposing ways. On the one hand it can reduce the effect of short term swings in interest rates which later reverse. Alternatively, it can cause price rises (falls) even as market interest rates are currently falling (rising), which consumers may find difficult to reconcile, e.g. interest rates are falling, but energy costs are rising.

Certain cost recovery

The trailing average approach can provide for certainty of cost recovery by an operator. Certainty of cost recovery is inconsistent with:

- the definition of “a reasonable opportunity to recover their costs”; and
- with the situation faced by firms operating in competitive markets.

Scorecard

Table 6 below scores the approach against the objectives.

	Objective	Score	Comments
1.	Promotion of economic efficiency		
	<ul style="list-style-type: none"> Adoption of NPV = 0 	Yes	Subject to defining the method.
	<ul style="list-style-type: none"> Use of prevailing market rates 	No	The portion of the portfolio updated each time would reflect prevailing rates, whereas the portion not being updated (which is likely to be the majority) will continue to reflect historical rates.
2.	Account for efficient financing costs		
	<ul style="list-style-type: none"> Use of available products 	Yes	As for Option A.
	<ul style="list-style-type: none"> Staggered issuances 	Yes	
	<ul style="list-style-type: none"> Hedge when available 	Yes	As for Option A.
	<ul style="list-style-type: none"> Minimising transaction costs 	Yes	As for Option A.
3.	Provide reasonable opportunity to recover costs		
	<ul style="list-style-type: none"> Regulatory rate fixing timeframe 	Yes	Could be defined to comply.
	<ul style="list-style-type: none"> Access to markets and instruments 	Yes	This option would allow full matching of funding to the rate set mechanism.
	<ul style="list-style-type: none"> Unbiased estimate of cost, but no certainty of cost recovery 	No	As it provides certainty of cost, it is not an unbiased estimate, thereby going beyond the reasonable opportunity to recover costs.
	<ul style="list-style-type: none"> No impact from market position taking 	Yes	The method needs to be designed not to compensate for position taking. If the approach is to change then a transition period would be needed to ensure that this criterion is not breached.

Table 6: Scorecard Option E – Trailing average

Conclusion

Option E is the only solution that fully takes into account staggered issuances and allows operators access to all required markets and instruments, which are key objectives. However, this option does not satisfy the NGO's requirement of economic efficiency in price setting to consumers,

because it does not reflect prevailing pricing and it provides certainty of cost recovery for operators. Both of these points are not consistent with the stated objectives of this competitive analysis.

9.6 OPTION F: STAGGERED MATURITIES

Explanation

This solution is based on the concept that a new entrant:

- Issues all its debt at once at the beginning of each 5 year term;
- The debt would be issued with staggered maturities up to and including 5 years;
- There would be staggered issuances during the 5 year period as the shorter tenor debt matures;
- Rate resets on the maturity dates. For example, assuming a 20% allocation of all debt, this would mean that 20% of the debt will be reset:
 - each year;
 - in year 2 for a further 2 years, then reset in year 4 for 1 year;
 - in year 3 for another 2 years;
 - in year 4 for another 1 year; and
 - would be fixed for the entire 5 year period.
- The whole process starts over again after 5 years.

Considerations & implications

Variations of this solution may include:

- Providing an annual menu of reset rates from which the operator could choose;
- Extending the period to 10 years; and
- Further staggering the debt issuances.

Scorecard

Table 7 below scores the approach against the objectives.

	Objective	Score	Comments
1.	Promotion of economic efficiency		
	<ul style="list-style-type: none"> • Adoption of NPV = 0 	Yes	
	<ul style="list-style-type: none"> • Use of prevailing market rates 	Partially	Every 5 years it will fully use prevailing rates, whereas during the period it will use a mixture of trailing and prevailing rates.
2.	Account for efficient financing costs		
	<ul style="list-style-type: none"> • Use of available products 	Yes	As for Option A.
	<ul style="list-style-type: none"> • Staggered issuances 	Partially	Allows for a greater range of staggered maturities and some staggered issue dates. May achieve this objective more than Option A if the use of staggered issue dates outweighs the shorter average maturity.

	Objective	Score	Comments
	<ul style="list-style-type: none"> Hedge when available 	Yes	As for Option A.
	<ul style="list-style-type: none"> Minimising transaction costs 	Yes	As for Option A.
3.	Provide reasonable opportunity to recover costs		
	<ul style="list-style-type: none"> Regulatory rate fixing timeframe 	Yes	Allows for any necessary improvements compared to Option A. As for Option B.
	<ul style="list-style-type: none"> Access to markets and instruments 	Partially	Potential longer observation period should improve ability of operator to initially hedge swap rate compared to Option A. Additional hedge swaps within the 5 year regulatory term should be easier to hedge, as they require only a percentage of the volume.
	<ul style="list-style-type: none"> Unbiased estimate of cost, but no certainty of cost recovery 	Yes	Slightly reduces error of forecast in DRP due to annual partial updates compared to Option A. Alternatively, it may increase forecast error by using shorter term maturities.
	<ul style="list-style-type: none"> No impact from market position taking 	Yes	As for Option A.

Table 7: Scorecard Option F – Staggered maturities

Conclusion

This solution partially satisfies some of the objectives, e.g. prevailing rates, however it would be a major departure from the solutions that have previously been tabled with industry. If it is to be considered further, significantly more work would need to be undertaken to determine whether this is a viable solution.

10 SUMMARY SCORE

Each of the options was scored against agreed criteria. A simple score of “Yes”, “Partially” or “No” was applied. If an option scored a “No” then it invalidated this solution. The key findings are:

- Options B and C are the best fit compared to Option A, because of the frequency of update of prevailing rates;
- Options D and E scored at least one “No”; and
- Option F does not score a “No”, and it does not provide any stronger outcomes than Options A, B and C.

11 CONCLUSION

The NGO through the NGL provides the basis for ERA to determine the mechanism to be used in calculating the rate of return. We examined and then scored a number of solutions for their consistency with the objectives as defined. The conclusions are:

1. The choice of debt data and the DRP calculation method should be re-examined to determine whether superior estimates are achievable.
2. A slightly longer window of observation for the on-the-day approach should be considered, so as to facilitate hedging of the fixed rate.
3. An adjustment factor should be considered to compensate for any difference between the DRP from liquid traded debt and the actual total cost of debt for an on-the-day transaction.
4. Allowing for possible improvements arising from the above three conclusions, the current model Option A supports many of the objectives and works within the constraints.
5. The term of the base rate should be equal to the reset frequency.
6. A decision as to the frequency of reset of the base rate needs to be made. The key driver of this decision is whether regular and complete price changes to consumers are considered more or less supportive of achieving the NGO. The base interest rate can be equally well hedged and the NPV=0 requirement is achieved, whether the reset term is one or five years.
7. A trailing average debt cost approach appears to be inconsistent with competitive market efficiency outcomes but may be attractive as a mechanism to smooth consumer price changes over time.
8. Staggered debt issuance is both efficient and a sound risk management practice.
9. Given the NGO and the sub-objectives and constraints set for this comparison, Options B and C are considered the two most favourable options. The sole difference between the two options is the frequency of resetting the base rate and its corresponding term.

12 DISCLAIMER

Chairmont relied on the materials provided by ERA as time did not allow for the review of all the materials referenced (some 66 documents of which some were over 100 pages and involved complex analysis and mathematical formulae). We have conducted this exercise on a best endeavours basis and acting in good faith while we have been limited by time constraints.