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# Review of Lally and Oxera reports on the cost of capital

Draft, privileged and confidential

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# Executive summary

1. The New Zealand Commerce Commission is currently conducting price reviews for the unbundled local loop (UCLL) and unbundled bitstream access (UBA) services. In the context of these reviews, the Commission is required to set cost-based prices using a TSLRIC methodology. One of the key inputs into this process is the cost of capital, or WACC.

2. On 23 June 2014, the Commission made public two expert reports on the cost of capital for UCLL and UBA price reviews. The Commission sought expert reports from Oxera and Dr. Martin Lally respectively.

3. Oxera, in its report, specifically reviewed the asset beta, gearing and long-term credit rating for a fixed access telecommunications operator, the debt and equity beta that would be assumed for the hypothetical operator, and whether the UCLL and UBA services should have a different beta to the hypothetical operator as a whole.

4. Oxera propose, based on its analysis, a range for the equity beta of 0.55 to 0.85. This assumes an asset beta in the range of 0.33 to 0.51 together with a gearing of 40% and a debt beta in the range 0.05 to 0.10. Oxera suggests that, if the Commission were to give equal weight across the equity beta range, then this would indicate an appropriate point estimate of around 0.7. Oxera separately concludes that it would appear reasonable to make no adjustment to the Chorus beta analysis when deciding on a beta for UCLL and UBA.

5. Lally, in his report, reviewed several aspects of the cost of capital. Specifically, Lally reviewed recent submissions to the Commission – including a submission by CEG – on the Commission's methodology for the debt risk premium (DRP) and the tax-adjusted market risk premium (TAMRP). Lally also provided his own estimates for the TAMRP over both five and ten year periods.

6. CEG has been asked by Chorus to provide a report in response to these two expert reports. In this report, I respond to the critiques raised by Oxera and Lally, and consider their alternative proposals.

## Conclusions in my previous report

7. In my previous report for Chorus, I followed the practice of the Commission in its Input Methodologies (IMs) Final Reasons Paper in relation to estimating the parameters of the WACC. Specifically, I proposed:

   - A lower boundary of 0.58 for the asset beta. I arrived at this value by estimating 5 year betas for four over-lapping periods spanning 14 March 1994 to 13 March

2014 for each firm in the sample (albeit using exclusively daily betas), and taking the average.

- A range of between 40% and 60% for the benchmark level of gearing. The bottom end of this range was informed by the gearing of the comparator businesses in the sample examined for the purposes of estimating the asset beta. The upper end of the range was informed by Chorus' own gearing and regulatory precedent from Australia and the UK.
- A target credit rating of BBB-, based on analysis of comparable businesses and regulatory precedent.
- A DRP estimate based on a large dataset of bonds issued by New Zealand issuers, including bonds denominated in New Zealand dollars and foreign currencies (swapped into New Zealand dollar terms). I also proposed the use of a curve fitting approach to estimate DRP.
- A cost of debt estimate based on an efficient debt management strategy that could feasibly be undertaken by a regulated business. I also proposed that international evidence of telecommunications service providers suggests that a term in excess of 10 years is appropriate.
- A prevailing estimate of TAMRP generated using dividend growth model analysis. My calculation of a current estimate of the TAMRP implied by dividend forecasts for New Zealand equity markets and the current risk free rate was slightly over 8%.

## Asset and equity beta

8. Oxera, based on its analysis, propose a range for the asset beta of 0.33 to 0.51 (based on an equity beta range of 0.55 to 0.85, a gearing of 40% and a debt beta in the range 0.05 to 0.1). Oxera conclude that if the Commission were to give equal weight across the equity beta range, then this would indicate an appropriate point estimate of around 0.7 – equivalent of an asset beta of about 0.42.

9. In my view, Oxera's estimate of asset beta is likely to be too low. This is because it is anchored in estimates of Chorus' own beta, it excludes relevant comparators (and thereby relevant information) from the international comparator sample, and it places too much weight on recent beta estimates.

10. I maintain my view from my previous report that it is preferable to have regard to a larger sample of comparators when estimating the asset beta, rather than placing an unreasonable amount of weight on the results from less than three years of trading data from a single firm. This is because beta is subject to very significant measurement error and can change materially over time. This makes it preferable to have regard to asset beta estimates from a large sample of companies.

11. I also do not agree with Oxera's exclusion of businesses from my broader sample, considering that all businesses in the sample have operational differences from Chorus, and therefore in making these exclusions Oxera is disregarding potentially useful information.

12. Further, Oxera's arguments for preferring short-term betas are in my view are speculative and do not provide a persuasive base of theory or empirical evidence to justify a change in practice from using a long-term average. As such, I maintain my view that the Commission should estimate the asset beta having regard to the methodology in its Input Methodologies Reasons Paper.

## Gearing and credit rating

13. Oxera proposes a benchmark gearing level of 40% based on the average gearing across its preferred sample of comparators and regulatory precedent in New Zealand, Australia and the United Kingdom, and a target credit rating of BBB+ or A- (this time without regard to its preferred sample).

14. I agree with Oxera that the average level of gearing across its preferred sample is 40%. However, I believe the Commission should choose to give weight to achieving consistency by determining key parameters such as asset beta, debt term, gearing and credit rating by having regard to the same group of comparable businesses, and not "mix and match" estimates from different sources, including various regulatory precedent. In my view, having regard to the wide set of available information from the comparable businesses suggests that 40% gearing is associated with a BBB- average credit rating across the telecommunications infrastructure businesses, not with Oxera's proposed benchmark credit rating of BBB+ or A-.

## Estimating the cost of debt and debt risk premium

15. Lally argues in his report that, in estimating the DRP, the inclusion of foreign currency bonds is problematic for a number of reasons, and therefore such bonds should be excluded from the estimation sample. He also notes that if foreign currency bonds are taken into consideration, then it is also relevant to consider bank debt, at least if the aim is to better reflect a firm's average debt finance. Further in regards to cost of debt, Lally considers that using curve fitting approaches is problematic.

16. In my opinion, Lally's arguments for the exclusion of foreign currency bonds in estimating the DRP are not substantiated. Issuing bonds in foreign currencies continues to be common practice amongst large New Zealand businesses, particularly infrastructure businesses. Increasing the data set which is used to estimate the DRP is desirable to increase accuracy and precision in the assessment of the cost of debt, especially at longer maturities where the number of bonds is low. I expect that yields on foreign currency bonds be commensurate with yields on

domestic currency bonds (as does Lally, over time), and do not believe that any potential differences between foreign and local borrowing provide grounds for exclusion from the sample. In this regard, I note that the author quoted by Lally to highlight the possible differences between local and foreign borrowing, Professor Kevin Davis, concludes that any such differences should not preclude using this data from estimating the cost of debt for, in this case, Australian companies. I further note that the Reserve Bank of Australia includes foreign issued bonds in its sample used to estimate corporate bond spreads and yields for Australian corporations.[1]

17. I also disagree with Lally's position that curve fitting is problematic because it requires choosing between various models and suffers from the need to obtain high quality DRP data from all maturities. My view continues to be that curve fitting is well suited to combine the richer data at low maturities with the sparse data at high maturities, and that the existence of competing models merely reflects the richness of the literature in the area – something which cannot be considered a 'problem'.

## Debt management strategies

18. My previous report for Chorus argued that the Commerce Commission should set the cost of debt based on the costs of implementing an efficient debt management policy. I also argued that an efficient debt management strategy involves the issuance of staggered debt in order to limit refinance risk. It follows that the Commission should cost a staggered debt management strategy and that, therefore, there were two broad options that the Commission should choose from:

- A historical trailing average of the cost of debt - with the length of the trailing average reflecting the term of the debt businesses actually issue (e.g., "Y years" if businesses issue debt with a maturity of "Y years").
  - This reflects the cost of a debt management strategy that simply involves issuing evenly spaced fixed rate debt of a particular maturity such that when one "Y-year" bond matures it is replaced by another "Y-year" bond in the portfolio.
- A prevailing base (risk free) rate of interest plus a historical average DRP with a term of "Y years".
  - This reflects the cost of a debt management strategy that is the same as above but, in addition, includes an assumed derivative contract 'overlay'

[1] The RBA states: "*The NFC statistical table provides aggregate measures of corporate bond spreads and yields for Australian resident non-financial corporations. The estimates are derived from the spreads to swap of a sample of fixed-rate bonds issued in Australian dollars, US dollars and euros, where the foreign currency-denominated bond spreads of individual bonds are hedged into their Australian dollar-equivalent spreads using cross-currency basis swaps and other relevant interest rate adjustments.*" Source: http://www.rba.gov.au/statistics/tables/index.html#interest-rates Table F3.

the effect of which is to reset the base rate of interest every 5 years but to leave the firm with a historical average DRP on their staggered debt portfolio.

19. Much of Lally's report agrees with and follows the logic of my earlier report. For example, Lally proposes that the cost of debt allowance is reset at the beginning of each regulatory period but accepts that efficient debt management practices involve the staggered issuance of debt in order to limit the amount of debt falling due in any one period. Consequently, it would involve inefficiently high refinance risk to have all, or even most, of a business's debt mature at the beginning of each regulatory period. Given this constraint, Lally accepts that the efficient debt management practice will not automatically reflect the interest rates prevailing at the beginning of the regulatory period. This will only be the case if the business engaged in a debt management practice of entering into a series of interest rate swap contracts. Therefore, consistent with my logic, Lally proposes compensating for the transaction costs of such a strategy.

20. Similarly, Lally rejects the Commission's current practice of using the term of the regulatory period to set the term of the DRP for which businesses are compensated. This is because Lally recognises that, once more, in order to manage refinancing risk, there is evidence that businesses issue debt at a longer term than the usual term of the regulatory period (5 years). Consequently, Lally argues that businesses should be compensated based on what is observed efficient practice.

21. However, Lally's recommendations are not always true to the above logic. As stated above, Lally recognises that an efficient debt management practice involves the issuance of staggered debt. Lally also recognises that this means that a business's efficient DRP costs will be a trailing average of the historical DRPs at the time it issued its staggered debt (there being no equivalent of interest rate swaps when it comes to the DRP).

22. Nonetheless, Lally does not propose that businesses are compensated based on an estimate of their efficiently incurred DRP (i.e., an historical average) but, instead, based on the prevailing DRP at the beginning of each regulatory period (albeit with a term that is longer than the standard regulatory period).

23. Lally acknowledges that this is a departure from the principle that the cost of debt allowance should be based on efficient business practice but justifies this on the grounds that empirical evidence suggests that the difference between the prevailing and historical average DRP are not material and that using a historical average DRP would involve the need for 'transition arrangements' and other complexities.

24. In my view Lally's empirical analysis is problematic and correcting flaws in this analysis demonstrates a material difference between the historical and prevailing DRP through time. I also describe why I consider that there is no greater complexity associated with compensating businesses based on a historical average

DRP. Certainly, the scope of any such complexity is outweighed by the potential magnitude of the error in compensating the efficient historical average DRP if the cost of debt allowance is based on the prevailing DRP.

## TAMRP

25. Lally contests my view that DGM estimates provide the best methodology for estimating the forward-looking TAMRP. Lally estimates a TAMRP by taking the median over a sample of five estimates including:

- three measures of TAMRP calculated using historical average data;
- one DGM estimate of prevailing TAMRP; and
- one survey estimate of TAMRP.

26. He concludes on the basis of these estimates that the TAMRP is 7%, whether estimated at a term of 5 years or a term of 10 years.

27. My view that DGM estimates of the TAMRP should be used is unchanged by Lally's report. I find that Lally raises an evidentiary hurdle for accepting my DGM estimates that, if applied consistently, his alternative estimates of TAMRP (historical and survey TAMRP estimates) would be unable to meet.

28. I consider that Lally's methodology gives almost exclusive weight to estimates of the TAMRP derived from historical averages. Historical estimates account for three out of the five estimates in Lally's sample, from which he takes the median value, ensuring that the value that is selected will almost always be in line with an estimate of the historical average TAMRP. Furthermore, I do not consider that Lally provides clear evidence in support of his use of survey data that would establish that it can reliably be used as a predictor of forward-looking TAMRP.

# 1 Introduction

29. The New Zealand Commerce Commission is currently conducting price reviews for the unbundled copper local loop (UCLL) and unbundled bitstream access (UBA) services. In the context of these reviews, the Commission is required to set cost-based prices using a TSLRIC methodology. One of the key inputs into this process is the cost of capital, or WACC.

30. On 23 June 2014, the Commission made public two expert reports on the cost of capital for UCLL and UBA price reviews. The Commission commissioned the expert reports from Oxera and Dr. Martin Lally respectively. CEG have been commissioned by Chorus to provide a report in response to these expert reports.

31. The remainder of this report is set out as follows:

- **Section two** responds to points raised by Oxera in relation to the formation of a sample of comparator firms and estimation of equity and asset betas;
- **Section three** addresses issues about benchmark gearing and credit rating raised by Oxera and Lally;
- **Section four** considers the arguments raised by Lally in the context of the estimating the cost of debt and the DRP;
- **Section five** analyses the framework for assessing the cost of debt; and
- **Section six** reviews Lally's arguments in respect of the TAMRP.

# 2 Asset and equity beta

32. My previous report for Chorus calculated asset betas for a sample of 31 telecommunications firms. I assessed a range of reasonable estimates of asset beta for Chorus on the basis of this sample.

33. I followed the Commission's practice in its Input Methodologies (IMs) Final Reasons Paper of estimating asset betas over five year periods. Taking into account comments made by the High Court appearing to critique the Commission over its use of overlapping five year periods, for each firm in the sample I estimated 5 year betas for four non-overlapping periods spanning 14 March 1994 to 13 March 2014.

34. My exclusive use of daily betas varied from the approach applied by the Commission in its IMs Final Reasons Paper due to the size of the task involved in giving appropriate treatment to weekly and monthly betas. In preparing this report I have been able to revisit this and estimate weekly and monthly betas as well as daily betas.

35. I found that over the four periods, the average 5 year asset beta:

    - over the entire sample was 0.58;
    - over the seven firms with only fixed-line businesses was 0.66; and
    - for BT Group, likely the closest comparator to Chorus, was 0.76.

36. On this basis, I concluded that an estimate for asset beta bounded below by 0.58 was likely to be appropriate.

## 2.1 Oxera's estimated asset beta

37. Oxera proposes, based on their analysis, a range for the equity beta of 0.55 to 0.85. This is based on an asset beta in the range of 0.33 to 0.51 together with a gearing of 40% and a debt beta in the range 0.05 to 0.10. Oxera suggests that, if the Commission were to give equal weight across the equity beta range, then this would indicate an appropriate point estimate of around 0.7 – equivalent to an asset beta of about 0.42.

38. Oxera's range for asset beta is substantially lower than the asset beta range that I previously estimated. In my opinion, Oxera's estimated range for asset beta is likely to be too low to provide appropriate compensation for the risk of providing UCLL and UBA services. This is because:

    - the analysis which generates the estimates is focused on Chorus' own beta and only relies upon benchmarking to further inform this estimate;

- it excludes relevant comparators (and thereby relevant information) from the international comparator sample; and
- it places too much weight on recent observations relative to long-term averages, particularly given the history of regulatory precedent in New Zealand.

39. Finally, I provide asset beta estimates on a daily, weekly and monthly basis to estimate an asset beta using the complete IMs approach. Based on this updated analysis of my wider sample, I consider that a reasonable estimate of Chorus' asset beta lies in the range from 0.57 to 0.62. A focus on the sub-sample of fixed only businesses suggests that this range is likely to be a lower bound for a beta that appropriately captures the risks of providing the UCLL and UBA services.

## 2.2 Focus on Chorus' beta estimate

40. Oxera states that an estimate of Chorus' own beta is *"used as a focal point for our analysis"*.[2] This is manifested in Oxera's approach to assessing a range for the beta, which is to:

- first estimate Chorus' beta;
- assess whether that evidence is robust; and
- compare and supplement the Chorus beta information with beta estimates sourced from international comparators.

41. I agree with Oxera that Chorus' observed beta is a relevant observation for assessing the beta to apply to UCLL and UBA services. However, it is only a single observation. In my previous report I specifically addressed the relevance of beta estimates derived from Chorus' financial information:[3]

42. Having regard to only a single observation for Chorus' beta may be unbiased but is likely to provide a very imprecise estimate. Beta estimates for a single firm exhibit significant variability depending on the vagaries of the data. Random movements in a firms' share price on days of particularly large market shifts may have significant effects on its estimated beta. Using Chorus' empirically estimated beta as the 'focal point' gives it significantly more weight than individual observations from international benchmarking. In my opinion reliance to this extent on the results from less than three years of trading data on a single firm is unreasonable.

43. Oxera's attempt to establish the 'robustness' of the Chorus estimate does not achieve this. Examining the standard deviation of daily beta estimates provides a

[2] Oxera, *Review of the beta and gearing for UCLL and UBA services: Evidence and recommendations*, June 2014, (hereafter "Oxera report") p. 2

[3] CEG, *Response to Commerce Commission UCLL/UBA WACC consultation paper*, March 2014, p. 14

measure of how precise an estimate this is of the average beta over the period. It provides no clear indication of whether this value will also be an accurate or precise estimate for beta over a future period. As I show with time series estimates of beta for different companies, estimates of beta is subject to very significant measurement error and can change materially over time.

44. Statements made by Oxera in its report indicate that it does not understand or does not choose to consider this distinction. For example, it claims that:[4]

> *It can also be argued that the robustness of regression analysis is directly proportional to the number of observed datapoints, which would point to the use of daily betas* [in preference to weekly or monthly betas].

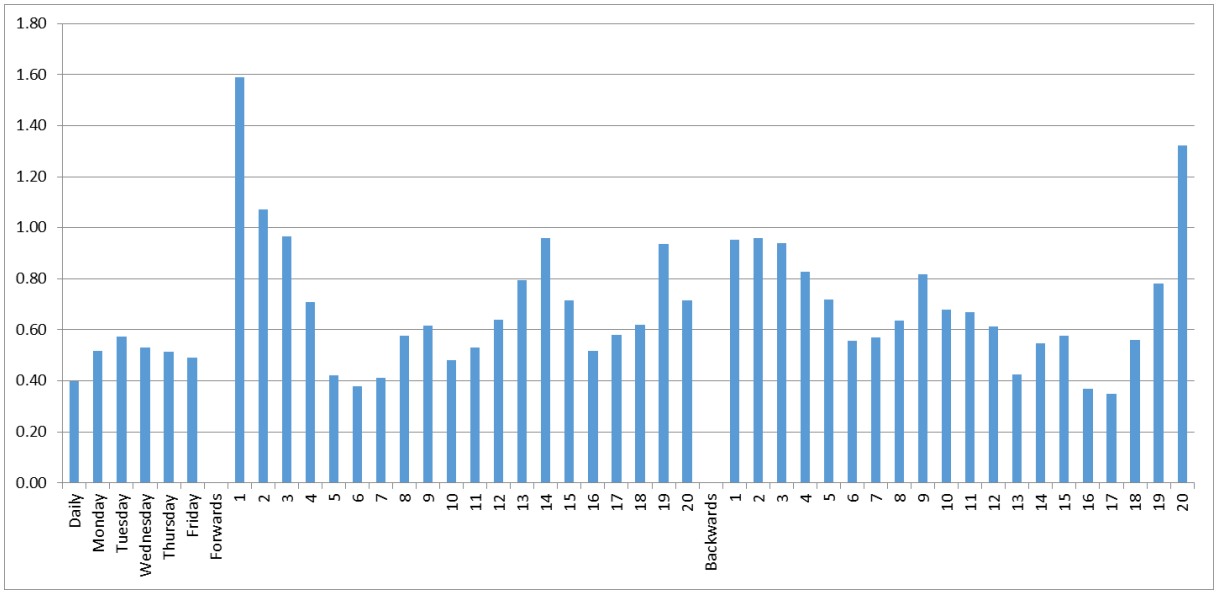
45. This statement fails to note that the increased number of observations obtained from the use of daily returns data do not necessarily provide any more information than weekly or monthly returns that is relevant to the purpose of estimating betas to apply over a future period. The increase in precision associated with estimating daily betas over weekly or monthly betas relates only to the precision of estimating an average beta over a given period and not the desired purpose of estimate the beta for a future period, or proxying the beta that investors will rationally assess the company to have in the future.

46. Oxera also examines sensitivities where it further excludes data from an already short series of Chorus data – variations that in my opinion do nothing to establish the reasonableness of placing significant weight on Chorus' beta.

47. As one example of potential variation that may be experienced in measuring Chorus' asset beta, consider asset betas calculated for Chorus since its listing. Figure 1 below demonstrates the significant variation that may potentially be achieved through different ways of measuring beta over the same period. One might use a seven calendar day period (weekly data) and take different days (e.g., Mondays, Tuesdays, Wednesdays, etc.) as the start of the set of seven day periods. Alternately, one might consider month-long periods and take different days of the calendar month as the start of each month-long period (e.g., starting from the third day of the calendar month or starting from the 13th day of the calendar month).

4 Oxera report, p. 26

## Figure 1: Chorus asset betas from listing to 27 June 2014




*Source: Bloomberg data, CEG analysis*

48. While Chorus' average daily asset beta is 0.40, its weekly betas are uniformly higher, ranging from 0.49 for Friday asset betas to 0.57 for Tuesday asset betas. As would be expected, there is even greater variance in the range of monthly asset betas. I investigate measures of monthly asset betas counting from the first, second, third etc. day of the month (counting forwards), but also the last, second last, third last etc. day of the month (counting backwards). The measured asset betas range from as little as 0.35 (17th last day of the month) to 1.59 (based on the first day of the month). The average across all measures of Chorus' asset beta is 0.68.

49. In my view, there is no particular reason to suppose that any of these estimates is a significantly better predictor of forward-looking asset beta than any other. Some are particularly affected by one or two market 'events', such as those caused by reaction to proposed changes in the regulation of Chorus. However, it would not necessarily be reasonable to set these estimates aside for that reason. If one were to focus predominantly on the Chorus' beta, the range of asset betas calculated above should be considered. It would be unreasonable to focus solely on one of these estimates, such as the 0.40 asset beta associated with a daily return sampling periods.

50. I note that the variation illustrated in Figure 1 is greatly alleviated when averaged over a large sample of firms. This is demonstrated in greater detail at Table 2 below. This provides compelling evidence of the need to place weight on a wide sample of comparators, rather than focusing on an estimate of equity beta for a single firm, in determining a reasonable estimate of asset beta.

## 2.3 Information from international comparators

51. Oxera conducts analysis on a sub-set of the sample of my previous report responding to the Commerce Commissions UCLL/UBA WACC consultation paper. Oxera refines my preferred comparator set by testing each company against four criteria, including:[5]

    - availability of data – data needs to be available at least since 25 November 2011;
    - nature of network – comparators with no copper assets are excluded;
    - liquidity – only companies with non-zero trading volumes on at least 80% of all trading days were included; and
    - share of revenues in country of main operations – comparators with a majority of revenues from overseas are excluded.

52. The companies excluded from my comparator sample by Oxera are summarised in Table 1 below.

**Table 1: Firms excluded from the comparator analysis**

| Firm | Reasons for exclusion |
|---|---|
| Cogent Communications | Primarily fibre optic network |
| Colt Group | Primarily fibre optic network providing business communication services |
| Lumos Networks | Primarily fibre optic network |
| Telecom Corp New Zealand | No copper wire core network assets; does not pass liquidity threshold |
| Telefonica | Approximately 22% of revenues from Spanish operations |
| Telenor | Approximately 24% of revenues from Norwegian operations |
| TeliaSonera | Approximately 35% of revenues from Swedish operations |
| TW Telecom | Primarily fibre optic network servicing metropolitan areas in the USA |

*Source: Oxera (2014)*

53. My preference is to form a large and more inclusive sample given that *all* comparators have significant operational differences to Chorus. Oxera's criteria are not reasonable and have the effect of excluding from consideration information that would otherwise be informative in estimating an asset beta that takes into account the risks in providing UCLL and UBA services.

54. Oxera requires data to be available at least since Chorus' listing. This criterion appears to be redundant since Oxera does not exclude any business on this basis. However, I do not consider that this is a reasonable basis upon which to set aside potentially relevant information. If a firm that was a very close comparator to

5 Oxera report, p. 25

Chorus was only available over the past two years, this would still be an observation that was relevant to assessing Chorus' beta. No purpose is served by drawing 'bright lines' in relation to this point.

55. Similarly there is no reason to draw a bright line excluding businesses without copper assets. The fibre businesses that Oxera excludes represent most of the fixed-only network businesses from the original sample of businesses. As such, these may well be superior comparators to Chorus than many of the businesses that Oxera retains in its restricted sample that operate large international mobile businesses in addition to their fixed line copper businesses.

56. In particular, Oxera's assertion that owning "copper" rather than "fibre" assets gives rise to a fundamental difference in the nature of systemic risk is not justified. This is particularly the case when one considers that the Commission's consultation paper proposes to model the costs of building and operating a copper network by reference to the costs of a fibre network. I therefore consider that Oxera has erred in excluding Cogent Communications, Colt Group, Lumos Networks and TW Telecom from its preferred sample.

57. In addition, Oxera has excluded Telecom New Zealand for two reasons, one of which being that it does not own copper wire network assets. While this may be true at the current time, it was certainly not the case prior to November 2011. It seems inconsistent that Oxera can place such importance on Chorus' current asset beta estimate whilst ignoring the history captured within previous estimates of Telecom New Zealand's asset betas. Indeed, in analysis elsewhere in its report Oxera specifically uses Telecom's beta estimates to assist in establishing the robustness of the Chorus beta estimate.[6] Oxera could not reasonably do this unless it believed that Telecom's beta estimates provided a reasonable starting point for assessing Chorus' beta estimates. I do not consider the current lack of copper assets to be a compelling reason to exclude Telecom from the sample of firms considered in the analysis.

58. Oxera also identifies a secondary reason for the exclusion of Telecom New Zealand – namely that it is illiquid and had zero trading volumes on at least 20% of all trading days. This finding appears at face value to be inexplicable. Telecom is currently the second largest listed company on the New Zealand Stock Exchange by capitalisation.[7] At various points in its history it has been by far the largest listed company, to the point where it dominated the exchange. Oxera does not provide a clear explanation as to how Telecom does not pass its liquidity threshold. It states:[8]

6 Oxera report, pp. 14-15

7 https://www.nzx.com/markets/nzsx/indices/NZ50

8 Oxera report, p. 26

*The liquidity threshold is passed on a short-term basis—i.e. five years. However, on a longer-term basis, the liquidity threshold is not passed.*

59. This statement does not provide full transparency over the criterion used by Oxera to exclude Telecom New Zealand from its sample on this basis. My own analysis of Telecom's trading does not reveal any period of time in which Telecom has been thinly traded. Since Bloomberg data for Telecom begins in July 1992, Telecom has experienced trading on every day that the exchange was open. Oxera does not provide details of the period over which it concludes that Telecom New Zealand has zero trading volumes for 20% or more of the time. In my opinion, no such period exists and Telecom New Zealand should not be excluded from the sample of comparators on the basis of illiquidity.

60. Finally, Oxera excludes comparators for which the majority of revenues are earned outside their home markets. This is not the most relevant or appropriate basis for which to exclude businesses. A much more relevant consideration would be the proportion of income derived from fixed-line businesses – a consideration that Oxera effectively ignores by excluding four fibre firms on the basis that they do not own any copper assets. Oxera's proposed criterion will:

- retain firms with very large domestic mobile businesses; whilst
- exclude firms with fixed line businesses across multiple jurisdictions.

61. However, I note that Oxera's criterion may have the effect of screening out firms whose domestic fixed line business is dominated by domestic and international mobile businesses. Application of this criterion ultimately results in the exclusion of three firms from my preferred sample, being Telefonica, Telenor and Telesonera.

## 2.4 Weight placed on recent estimates

62. In its IMs Final Reasons Paper the Commission relied on 5 year asset betas estimated over the last 20 years to determine its preferred estimate of asset beta. The reasons given by the Commission for its reliance on such long term data relate to ensuring that its preferred estimate is as robust as possible, reducing the weight given to anomalous data or to unrepresentative periods.[9]

63. The effect of the decision to give weight to such a long time series of data was to include observations of beta from prior to 2000, in which average asset betas were very low. Reliance on more recent periods of data resulted in an average asset beta significantly higher than the estimate of 0.34 ultimately preferred by the Commission for EDBs and Transpower.

9 Commerce Commission, *Input Methodologies (Electricity Distribution and Gas Pipeline Services) Reasons paper*, December 2010, pp. 518-519

64. Subsequently the High Court concurred with the Commission on this point:[10]

> *The underlying basis of Vector's proposition is not clear to us. One might have thought that the longer the period the better. In any event, as we pointed out earlier, choosing the most recent five-year period and weekly sampling produces an estimate of 0.39. Higher estimates are found only in less recent data (which incidentally was more affected by the GFC). And we have rejected the argument against using the monthly data. Indeed, as we shall see later, MEUG argues for reducing the estimate of 0.34, which had its origins less recently in the May-June 2010 Draft Reasons Papers.*
>
> *Moreover, we think it is fair to say that at any one point in time it would be unwise to place too much weight on the most recent estimates. As the Commission pointed out, data in the period to 2000 indicated estimates of asset beta of less than 0.20. If those estimates had been relied upon in or around 2001, as being the most recent estimates, the resulting asset betas would have been too low. This is very much a question of judgement, and we are not persuaded that a materially better asset beta estimate would be arrived at by limiting the analysis in the manner suggested by Vector.*

65. The Commission's IMs Final Reasons Paper reported only monthly and weekly betas. In relation to daily betas which were not reported, but which were disclosed to be higher in the IM appeal process, the Commission stated:[11]

> *The advantage of shorter (e.g. daily) periods is that they provide more observations, and potentially increase the statistical robustness of estimating beta. The disadvantage of shorter periods include that beta can be distorted if stocks trade infrequently. Shorter periods are also further removed from the concept that is being estimated (i.e. how stocks perform relative to significant market movements) and may therefore be misleading if share prices do not follow a purely random walk.*

66. Vector's appeal of the IMs process proposed the adoption of the higher daily betas. The High Court referred directly to the above passage in rejecting Vector's appeal.[12]

67. In its paper Oxera seeks to limit or reject the practice of giving the weight to long-term asset betas that was established by the Commission in its IMs Reasons Paper

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[10] Wellington International Airport Ltd & Ors v Commerce Commission [2013] NZHC [11 December 2013], paras. 522-523

[11] Commerce Commission, *Input Methodologies (Electricity Distribution and Gas Pipeline Services) Reasons paper*, December 2010, p. 158, fn 327.

[12] Wellington International Airport Ltd & Ors v Commerce Commission [2013] NZHC [11 December 2013] para. 1517

and confirmed by the High Court. I discuss below the reasons that Oxera provides in support of this view and also an assessment of the consistency of this with current regulatory practice in New Zealand.

### 2.4.1 Basis for preferring short-term betas

68. Oxera states that whilst long-term average asset betas may be relevant in the energy sector which has long term assets and experiences modest innovation, the telecommunications industry has witnessed more rapid innovation (particular in the last 20 years). Oxera argues that the long term average asset beta may be more relevant in the energy industry than in the telecommunications industry.[13]

69. I disagree with Oxera's analysis. In my opinion, its arguments do not provide a reasonable basis for deciding to have regard to long-term asset betas in the context of the regulation of energy and airport businesses but to propose otherwise in the context of telecommunications regulation.

70. I note that the reasons given by Oxera for why long-term asset betas may be reasonable for the energy sector are not reasons that were considered by the Commission in its IMs Final Reasons Paper or considered by the High Court in the context of the IMs appeal. As noted above, reliance on long-term asset betas was considered reasonable purely from the perspective of obtaining a more robust estimate of beta. Arguments relating to long asset lives or a comparative lack of innovation in the energy sector were not raised.

71. Furthermore, in my opinion the arguments raised by Oxera in support of consideration of recent asset betas are not made out. Specifically:

- asset lives in the fixed line telecommunications sector are also long; while
- innovation of the type identified by Oxera in the telecommunications sector should, if anything, tend to give rise to *increasing* beta, rather than lower beta as claimed by Oxera.

72. Most of the assets in fixed access networks of any technology have long asset lives; for example trenching, ducting and cables tend to have asset lives of at least 20 years and sometimes many more. These assets make up a large proportion of the asset base for a fixed access network. Oxera's arguments that long lived assets in energy networks support reliance on long-term asset betas in that industry are also an argument to have regard to long term estimates of asset beta in the telecommunications industry.

[13] Oxera report, p. 26

73. Figure 3.2 of Oxera's report identifies a declining average asset beta for the comparator set over time. The existence of the claimed downward trend is questionable since it is based on only four observations of 5 year daily asset betas.

74. In addition, Oxera itself states that its observed trend may be due to increasing gearing over time. If the leverage formula used to derive asset betas from equity betas was accurate then the level of gearing should not affect the measured asset beta. Oxera appears to be arguing that the leverage formula is less than perfect and that, as a consequence, a higher gearing leads artificially reduced estimates of asset beta. That is, imperfections in the leverage formula cause the estimated asset beta to decrease over time (as firms increase gearing) even though the true underlying asset beta has not fallen, or has not fallen as far.

75. Of course, this explanation suggests that Oxera's claimed reduction in average asset betas is explained by measurement imperfections rather than being a true underlying economic trend. This runs contrary to Oxera's reliance elsewhere on alleged falls in asset beta as a justification for focussing only on the most recent estimates.

76. I also note that the opposite measured trend existed for EDBs in the IMs process - where the Commission's measured asset betas was increasing through time. However, the idea that this was evidence to the effect that asset betas were changing was rejected (by both the Commission and the High Court).

77. Oxera observes that:[14]

> *...the telecommunications industry has witnessed a rapid pace of innovation in the last 20 years, and the tariff norms across all markets have shifted their emphasis from user charges to access charges. These factors would suggest that any historical data needs to be interpreted with caution. While, in a stable long-term industry such as energy, the long-term asset beta may be a relevant datapoint, the telecommunications industry continues to develop, and the longer-term data is likely to be less relevant within the telecommunications industry.*

78. I consider that Oxera's observation that technological change particularly affects telecommunication asset betas does not seem consistent with its empirical findings shown in Figure 3.2, which indicates a decrease in asset beta over time.

79. Technological change in the telecommunications industry is driving the availability of substitutes for traditional copper-based fixed line networks. Mobile networks have for some time offered realistic alternatives for voice carriage and with the introduction of 4G/LTE networks may also increasingly provide alternative options

[14] Oxera report, pp. 34-35

for the provision of broadband as well. The increased proliferation of competition in the telecommunications sector is a development that might be expected to increase beta, other things being equal. That is, if innovation exposes a business to competition it can make its value more sensitive to the performance of the wider economy.

80. To the extent that Oxera was particularly interested in forming a view of the asset beta of a business that relied mostly on earnings from providing copper services such as UCLL and UBA, this would be a compelling reason for giving more weight to older estimates of asset beta rather than current estimates of asset beta from Oxera's sample that are affected by ownership of mobile networks.

81. In my view, the reasons provided by Oxera in support of recent asset beta estimates in the telecommunications sector are largely speculative. They do not establish a reasonable basis on which to depart from current regulatory precedent and they do not establish a reason to conclude that current (lower) asset betas represent a better estimate of forward-looking asset betas than a long-term average.

### 2.4.2 Consistency with regulatory precedent

82. The reasons given by the Commission and the High Court in favour of relying on long-term asset betas relate to the robustness of the beta estimate. They are not in any way specific to the energy industry and would apply equally to the telecommunications industry.

83. In the case of the energy companies, the Commission's reliance on long-term data resulted in it selecting a significantly lower asset beta than it would have chosen had it only had regard to more recent estimates of asset beta. This was preferred by the Commission (and the High Court) solely on the basis that this would result in a more robust estimate of beta. No material weight was given to arguments that market circumstances, and therefore beta, may have changed over time and that this should cause the Commission to give more weight to recent estimates of beta.

84. In the telecommunications sector, the Commission faces a test of its commitment to these principles. An asset beta that provides compensation for the risks of providing UCLL and UBA services based on regulatory precedent established by the IMs Final Reasons Paper will, in my view, be around or in excess of 0.57 (see section 2.6 below for more detail). However, an asset beta that relies only upon the most recent five years of data would be significantly lower, around or in excess of 0.46 based on my preferred sample of firms.

85. In my view, consistent and credible regulatory practice requires the Commission to maintain the practice that it has established for regulating energy businesses in application to telecommunications businesses. The arguments made by Oxera in favour of limiting analysis to recent estimates of beta for the telecommunications sector are speculative and do not provide a persuasive base of theory or empirical

evidence to justify a change of practice from the approach applied by the Commission in the IMs Final Reasons Paper.

## 2.5 European regulatory precedent

86. Oxera have reviewed regulatory precedent in eleven European jurisdictions. The regulatory precedent suggests a range for asset beta range from 0.4 to 0.7, with an average of approximately 0.5.

87. This precedent does not support Oxera's proposed position, which is:[15]

> *...to use a range for the asset beta (with zero debt beta) of 0.30-0.45, which is consistent with both the Chorus beta analysis and supported by the international precedent.*

88. Oxera also makes extensive commentary on my view that BT Group is the closest comparator to Chorus within the sample. In particular, Oxera notes that there are significant differences between Chorus and BT Group.[16]

89. I agree that there are important differences between BT Group and Chorus. However, this does not detract from my general point, which Oxera appears to agree with, that the two are the closest comparators within the dataset.

90. This is a view that is shared by Ofcom. It specifically identifies Chorus as a close comparator and discusses the similarities between BT Group's network business Openreach and Chorus in its 2014 fixed access markets review.[17]

91. Oxera also claims that the comparability of BT's asset beta to Chorus is affected by the impact of pension risk, which it states increases BT's risk exposure.[18] Oxera does not provide any references supporting its view for this belief or set out an argument for why BT's pension risk would be expected to increase BT's asset beta.

92. I note that Oxera's view on the effect of pensions on BT's asset beta is not supported by Ofcom's own consultants, The Brattle Group. In its recent report for Ofcom, The Brattle Group states that:[19]

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15 Oxera report, p. 39

16 Oxera report, pp. 24-25

17 http://stakeholders.ofcom.org.uk/binaries/telecoms/ga/fixed-access-market-reviews-2014/draftstatement/annexes.pdf

18 Oxera report, pp. 24, 38

19 The Brattle Group, *Estimate of BT's equity beta*, March 2014, p. 13

*We ignore BT's pension fund deficit in part because the potential impact on the beta is not at all obvious.*

## 2.6 Updated beta estimates reflecting daily, weekly and monthly estimates

93. In its IMs Final Reasons Paper, the Commission estimated 5 year weekly and monthly asset and equity betas on overlapping five year periods beginning from the five years to 31 May 1995. The Commission sourced its beta estimates from Bloomberg.

94. My previous report used only daily betas due to the limited time available for its preparation. I stated:[20]

> *Weekly and monthly betas may have a high degree of variability associated with them depending on how they are measured – e.g., Monday betas may be very different to Friday betas, etc. I consider that weekly and monthly betas are best used in a context where such variation is estimated and taken into account to ensure that a representative basis has been used to estimate beta.*

95. I note that Oxera presents daily, weekly and monthly betas. However, it does not explain the basis on which these are measured (i.e., there are many alternative ways that a weekly or monthly beta could be measured), or consider the variation that the arbitrary selection of a start date may potentially give rise to.

96. In section 2.2 above I show that the variation between various estimates of beta over the same period for Chorus may be very significant. Based on different monthly betas, I generate estimates of monthly asset betas over the same period ranging from 0.35 to 1.59. The extent of this type of variation is much less when the various measures of beta are averaged over a larger sample of firms.

97. Table 2 compares long-term asset betas (ie, averaged across all firms in the sample and over four 5-year periods) and the most recent 5-year asset betas (measured to 27 June 2014) for my preferred sample and the Oxera sample. The table shows much less variation across the different measures once averaged across a larger sample.

98. For example, long-term average betas on my preferred sample vary between 0.51 and 0.68 depending on how they are measured, but most are in the relatively narrow range from 0.57 to 0.62. Similar patterns (but with different levels) can be shown for other samples and other measurement periods.

[20] CEG, *Response to Commerce Commission UCLL/UBA WACC consultation paper*, March 2014, p. 17

## Table 2: Long-term and 5-year asset betas on CEG and Oxera samples

| | Long-term average | | | Last 5 years | | |
|---|---|---|---|---|---|---|
| | *CEG sample* | *Oxera sample* | *Fixed only* | *CEG sample* | *Oxera sample* | *Fixed only* |
| Daily | 0.57 | 0.52 | 0.58 | 0.46 | 0.36 | 0.51 |
| Weekly - Monday | 0.58 | 0.52 | 0.65 | 0.46 | 0.37 | 0.58 |
| Weekly - Tuesday | 0.59 | 0.53 | 0.66 | 0.46 | 0.38 | 0.54 |
| Weekly - Wednesday | 0.60 | 0.52 | 0.67 | 0.46 | 0.36 | 0.54 |
| Weekly - Thursday | 0.58 | 0.51 | 0.67 | 0.46 | 0.36 | 0.56 |
| Weekly - Friday | 0.55 | 0.49 | 0.59 | 0.45 | 0.37 | 0.50 |
| Monthly – Forwards from start of the month | | | | | | |
| 1 | 0.62 | 0.56 | 0.77 | 0.42 | 0.41 | 0.55 |
| 2 | 0.61 | 0.55 | 0.75 | 0.42 | 0.37 | 0.53 |
| 3 | 0.60 | 0.53 | 0.76 | 0.44 | 0.40 | 0.56 |
| 4 | 0.59 | 0.52 | 0.79 | 0.44 | 0.37 | 0.58 |
| 5 | 0.58 | 0.50 | 0.76 | 0.45 | 0.36 | 0.58 |
| 6 | 0.59 | 0.51 | 0.77 | 0.44 | 0.35 | 0.58 |
| 7 | 0.51 | 0.41 | 0.77 | 0.45 | 0.34 | 0.59 |
| 8 | 0.61 | 0.54 | 0.75 | 0.45 | 0.35 | 0.60 |
| 9 | 0.62 | 0.55 | 0.74 | 0.45 | 0.35 | 0.58 |
| 10 | 0.60 | 0.54 | 0.70 | 0.43 | 0.36 | 0.56 |
| 11 | 0.61 | 0.55 | 0.69 | 0.43 | 0.36 | 0.55 |
| 12 | 0.60 | 0.54 | 0.69 | 0.43 | 0.38 | 0.53 |
| 13 | 0.59 | 0.52 | 0.72 | 0.43 | 0.36 | 0.56 |
| 14 | 0.59 | 0.52 | 0.73 | 0.45 | 0.38 | 0.60 |
| 15 | 0.58 | 0.51 | 0.69 | 0.46 | 0.40 | 0.55 |
| 16 | 0.57 | 0.51 | 0.65 | 0.43 | 0.36 | 0.51 |
| 17 | 0.57 | 0.49 | 0.67 | 0.42 | 0.35 | 0.47 |
| 18 | 0.60 | 0.52 | 0.73 | 0.43 | 0.36 | 0.49 |
| 19 | 0.60 | 0.52 | 0.75 | 0.43 | 0.35 | 0.53 |
| 20 | 0.61 | 0.54 | 0.74 | 0.43 | 0.35 | 0.53 |
| Monthly – backwards from end of the month | | | | | | |
| 1 | 0.63 | 0.56 | 0.79 | 0.42 | 0.37 | 0.54 |
| 2 | 0.68 | 0.64 | 0.74 | 0.42 | 0.36 | 0.51 |
| 3 | 0.63 | 0.56 | 0.78 | 0.43 | 0.37 | 0.52 |
| 4 | 0.61 | 0.53 | 0.76 | 0.45 | 0.39 | 0.54 |
| 5 | 0.59 | 0.51 | 0.72 | 0.44 | 0.36 | 0.52 |
| 6 | 0.57 | 0.49 | 0.68 | 0.42 | 0.35 | 0.47 |
| 7 | 0.57 | 0.51 | 0.68 | 0.43 | 0.36 | 0.51 |

| | Long-term average | | | Last 5 years | | |
|---|---|---|---|---|---|---|
| | *CEG sample* | *Oxera sample* | *Fixed only* | *CEG sample* | *Oxera sample* | *Fixed only* |
| 8 | 0.60 | 0.54 | 0.71 | 0.45 | 0.37 | 0.59 |
| 9 | 0.60 | 0.53 | 0.73 | 0.44 | 0.38 | 0.59 |
| 10 | 0.59 | 0.51 | 0.73 | 0.42 | 0.34 | 0.54 |
| 11 | 0.61 | 0.54 | 0.70 | 0.43 | 0.36 | 0.54 |
| 12 | 0.62 | 0.56 | 0.70 | 0.45 | 0.38 | 0.58 |
| 13 | 0.60 | 0.54 | 0.66 | 0.44 | 0.35 | 0.56 |
| 14 | 0.61 | 0.54 | 0.75 | 0.46 | 0.37 | 0.60 |
| 15 | 0.61 | 0.54 | 0.74 | 0.45 | 0.35 | 0.61 |
| 16 | 0.52 | 0.44 | 0.71 | 0.44 | 0.34 | 0.54 |
| 17 | 0.61 | 0.53 | 0.80 | 0.47 | 0.37 | 0.61 |
| 18 | 0.59 | 0.53 | 0.78 | 0.44 | 0.38 | 0.58 |
| 19 | 0.59 | 0.53 | 0.76 | 0.44 | 0.36 | 0.57 |
| 20 | 0.56 | 0.50 | 0.74 | 0.42 | 0.38 | 0.53 |
| **Average** | **0.59** | **0.53** | **0.72** | **0.44** | **0.37** | **0.55** |

*Source: Bloomberg data, CEG analysis*

99. I note that the long-term estimate of daily asset beta on my preferred sample has changed since my previous report from 0.58 to 0.57 in Table 1. In addition there have been other changes to the average asset beta for fixed-only firms. This is due to two changes in my analysis:

- the long-term estimate of daily asset betas in Table 1 above is based on data over 20 years to 27 June 2014 whereas my previous report used data over the 20 years to 13 March 2014; and
- in my previous report I excluded estimates of beta where there was not enough data to generate a full five years of data. In generating the estimates in Table 1 above, I include estimates of beta that use less than five years of data when data is available to calculate it. I consider that this is a more robust methodology and makes reasonable use of all information that is available to me over this 20 year period.

100. As I previously predicted, the use of daily betas over a large sample provides a robust estimate. I consider that my previous recommendation of an asset beta of no less than 0.58 based on my preferred sample remains reasonable in the context of the information in Table 1 above. For the reasons discussed earlier, I do not believe that regard should be had to average estimates of asset beta derived from Oxera's sample or average estimates of asset beta derived only over the past five years.

101. In respect of the sub-sample of fixed-only firms, I note that there is more variability across the different measures of asset beta. This is to be expected given the smaller numbers of firms in that sample (ten) and the shorter period of share market data

available for some of them. In general, the data for fixed-only firms support a view that these firms face greater systemic risks than diversified telecommunications firms and indicate that the average asset beta based on the wider sample is likely to be a lower bound estimate for a reasonable estimate of the forward-looking asset beta for a UCLL and UBA service provider.

# 3 Benchmark gearing and credit rating

## 3.1 Benchmark level of gearing

102. In my previous report I proposed a level of gearing within a range from 40% to 60%. The bottom end of this range was informed by the gearing of the comparator businesses in the sample on which I based my analysis of asset beta. The top end of the range was informed by Chorus' own gearing and regulatory precedent in Australia and the United Kingdom where gearing for determining the WACC is based on the actual gearing of the regulated business.

103. Oxera proposes benchmark gearing of 40%, based on:

- average gearing across its preferred sample of comparators; and
- regulatory precedent in New Zealand, Australia and the United Kingdom.

104. In general, I agree with Oxera that a gearing of 40% is supported by average gearing across the sample of comparators.

105. Based on my preferred sample of firms, I calculate average gearing of 38% based on the most recent five year period and 34% based on the full 20 year period. These estimates are dragged down by a number of estimates of negative gearing. By comparison I calculate the equivalent gearing estimates on Oxera's preferred sample of 45% and 38% respectively, and 40% and 41% for the smaller sample of fixed-only firms. I consider that a 40% estimate of gearing is reasonable and representative of this information.

106. However, Oxera's analysis of regulatory precedent examines only the gearing assumptions used by each regulator and not the process employed to arrive at that estimate. As I stated in my previous report, employing the same approach as used by the Australian and United Kingdom regulators to Chorus would give gearing of approximately 60% based on Chorus' average gearing since its listing. I do not believe that it is reasonable to rely on regulatory precedent without explaining that the reasons given by the regulator for arriving at its parameter value would give rise to a very different parameter value for Chorus.

107. Oxera mentions the prospect of perverse incentives should the Commission set the benchmark gearing for determining the WACC for providing the UCLL and UBA services based upon Chorus' own gearing.[21] I do not consider that this is a material concern:

[21] Oxera report, p. 42

- in a world with zero transactions costs (such is implicitly assumed by the Commission's failure to compensate for the expected costs of financial distress) the estimated WACC is independent of the level of gearing; and
- if one seeks to properly taking into account transaction costs, as I consider the Commission should, a UCLL/UBA service provider would need to increase its exposure to financial distress now in order to receive higher compensation for financial distress in a future regulatory regime. Even if the Commission did propose to accurately compensate for these costs, a policy which it to date has not implemented, the business would not be made any better off in the future (future compensation would be equal to higher costs) and would be made worse off in the short term (costs of financial distress would be borne now but not compensated until the future). This is the standard mechanism through which 'incentive regulation' seeks to control all costs.

108. In practice the prospect of Chorus sending itself into financial distress in the hope of achieving a higher allowance for the cost of financial distress is remote. As clearly set out by Professor Grundy in his report, the very real expected costs of financial distress are not currently taken into account at all in determining the regulatory WACC but would certainly be accounted for by Chorus in meeting its funding needs.[22]

109. Oxera further attempts to link Chorus' gearing with the prospect of its credit rating falling below investment grade.[23] This is highly speculative. The implication appears to be that 60% gearing is inappropriate for use as a benchmark gearing in a regulatory context. I note that in Australia, 60% gearing is the established norm that is applied to regulated electricity and gas networks in conjunction with a BBB+ target credit rating. While the ACCC uses a rating of A for Telstra, this is Telstra's actual credit rating and is used in conjunction with Telstra's actual gearing of 40%.

110. In summary, internally consistent reliance upon the wider sample of comparators used in the equity beta analysis gives rise to an estimate of gearing of approximately 40%. Reliance on Chorus' own gearing, in line with international precedent, gives rise to a gearing of 60%.

111. If the Commission decides to follow Oxera's advice to focus its considerations of asset beta on Chorus' financial information then it should similarly adopt a gearing level that is primarily based on Chorus' gearing level during the period of beta estimation. However, if the Commission follows Oxera's advice to base gearing on a wide sample of comparators then it should use the same sample to determine asset beta.

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22 Grundy, *Response to the 13 June 2014 Review of Submissions on the Cost of Debt and the TAMRP For UCLL and UBA Services by Dr Martin Lally*, July 2014, paras. 11-20

23 Oxera report, pp. 40-41

112. Oxera's current proposal involves 'mixing and matching' estimates from different sources, including (incorrect interpretations of) regulatory precedent. The alternative approaches achieve consistency by determining key parameters such as asset beta, debt term, gearing and credit rating by having regard to the same group of comparable businesses.

113. My strong recommendation is that it adopts an approach based on a consistent use of parameters. In my view, the alternative gives rise to considerable risks of inconsistencies and consequently bias in determining the overall WACC.

114. I further note that this applies not just to the estimates of beta and gearing but also to credit rating. As discussed in the next section, Oxera proposes setting a benchmark gearing of 40% based on its sample of comparable firms but then a target credit rating of BBB+ or A- based upon a completely different analysis, including appeal to regulatory precedent. In contrast, the same basis that Oxera provides for choosing its preferred gearing would also give rise to a credit rating of BBB-.

## 3.2 Target credit rating

115. My analysis of the credit rating of comparable firms in my previous report suggested that a credit rating of about BBB- was in line with Chorus' rating and those of comparable businesses.

### 3.2.1 Lally's characterisation of my position

116. In his report for the Commission, Lally claims that I argue for a credit rating to be based solely on the credit rating of Chorus.[24] This is not an accurate restatement of the position in my paper. I said that:[25]

- Chorus' credit rating is BBB with Standard & Poor's and BBB- with Moody's;
- in several jurisdictions, the target credit rating is set equal to the credit rating of the service provider;
- the average credit ratings across the sample of comparable businesses is low, generally around BBB-; and
- on the basis of the above BBB- is a reasonable target credit rating.

[24] Lally, *Review of submissions on the cost of debt and the TAMRP for UCLL and UBA services*, June 2014, (hereafter "Lally report") pp. 3, 9-10

[25] CEG, *Response to CommerceCommission UCLL/UBA WACC consultation paper*, March 2014, pp. 21-25

117. Apart from incorrectly describing my position on this issue, Lally does not identify an alternative basis upon which to determine an appropriate target credit rating for Chorus.

### 3.2.2 Oxera's review of target credit rating

118. Oxera recommends a benchmark credit rating of BBB+ or A-. Despite collecting a large sample of comparable businesses that it estimates equity beta and gearing for, Oxera does not consider this sample in determining the benchmark credit rating. This is, in my view, an important limitation in its overall advice on the WACC.

119. Instead, Oxera's advice is based in large part on Standard & Poor's statement that Chorus has a 'strong' business profile and that my recommended credit rating of BBB- *"appears to be unusually low for a network operator with a strong business risk profile such as Chorus"*.[26] Oxera states that at its preferred gearing of 40%, Standard & Poor's guidance would suggest a credit rating of around A-.

120. Oxera's advice completely sets aside all the information from the set of comparable firms that Oxera had regard to in determining its view on asset beta and gearing. Oxera seems to base its conclusion on its own interpretation of Standard & Poor's guidance rather than either Standard & Poor's actual rating for Chorus or how Standard & Poor's sets the credit rating for other comparable firms. The international evidence clearly shows that a BBB+ or A- credit rating is not the norm across the sample of firms that Oxera uses to determine asset beta and gearing.

121. Oxera argues that a credit rating benchmark of A- for the UCLL and UBA service provider is reasonable because:

- S&P describes Chorus' business risk profile as 'strong'; and
- a table from a 2008 S&P publication which states that, for the average firm with a 'strong' business risk profile and an 'intermediate' financial risk profile the credit rating would be A-; and
- based on the same table, Oxera's proposed benchmark gearing of 40% would (in combination with defined "Debt/EBITDA" and "Funds from operations/debt ratios") be consistent with an 'intermediate' financial risk profile.

122. This approach is problematic for a number of reasons:

- Even over Oxera's preferred sample, the average current credit rating with Standard & Poor's is BBB-, associated with an average gearing of around 40%. Oxera is justifying a significant departure from the average credit rating of its sample of comparators based on its analysis of the relevant table from S&P;

[26] Oxera report, p. 43

- The table that Oxera basis its analysis on is not telecommunications specific and is a guideline only, about which S&P states "*the rating matrix is not meant to be precise*";[27]
- Inconsistent with the table that Oxera references, Oxera has implicitly assumed that financial risk profile is determined solely by gearing. In reality, gearing is just one of three elements in the table and firm's financial risk profile will be determined by all three (and likely other) metrics not just, or even primarily, by gearing.
    - For example, AT&T, which also has a 'strong' S&P business risk profile should, based on its gearing of 27%, have a credit rating of AA/A[28] not its current credit rating of A-.
- In order to use the S&P table in the way that Oxera wishes to it is necessary to perform a full assessment of all three credit metrics included in the table (and, in reality, other metrics) in order to arrive at a properly constructed estimate of credit rating;
- I note that while S&P states that Chorus' has a 'strong' business risk profile this is a wide band and it is far from clear how where in this band S&P believes Chorus' sits. It may be that Chorus' sits at the bottom of the band close to 'satisfactory' business risk profile.
- Finally, I note that Oxera has based its assessment on the assumption that it is Chorus who must be assigned a credit rating at a 40% gearing rather than a notional UBA/UCLL provider. Or, at least, the UBA/UCLL provider can be assumed to have the same 'strong' business risk profile as Chorus. Given Chorus' business risk profile is determined by Chorus' actual position, including its contract with Crown Fibre Holdings, it is unclear that this is an appropriate starting point (I note that Moody's regards the CFH securities as 'a positive for Chorus').[29]

123. In my view, these problems mean that Oxera's conclusion that a 40% gearing would be associated with a credit rating of A- cannot be relied on. Rather, in the absence of a thorough 'bottom up' assessment of credit rating, the best estimate of credit rating for a 40% geared firm is benchmarked from the wider sample of firms. This results in a credit rating of BBB-.

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27 S&P, Corporate Ratings Criteria, 2008, p. 21.

28 With gearing of 27% it is on the border, in the S&P table, between gearing associated with 'minimal' financial risk (less than 25%) and gearing associated with 'modest' financial risk (25% to 35%).

29 Moody's Credit Opinion: Chorus Limited, Global Credit Research - 21 Jan 2014.

124. I note that Moody's[30] has published a more recent (December 2010), telecommunications specific, guideline for how credit ratings are determined.[31] If one were to go down the route of attempting to develop a 'bottom up' estimate of the credit rating for the UBA/UCLL provider then this would appear to be a more relevant document to start from. In this regard, I note that Moody's sets out five relevant credit metrics it uses – and gearing (neither debt to total capital nor debt to equity) is included in these metrics. This further supports the conclusion that Oxera's sole focus on gearing as determining credit rating is unreasonable.

125. Furthermore, Oxera's claim that *"evidence from regulatory precedent suggests that a target credit rating of A- is reasonable"* is based entirely on precedent from Australia and the United Kingdom where the target credit rating is set based on the credit rating of the regulated operator.[32] This approach would give rise to a target credit rating for Chorus of BBB- (Moody's) or BBB negative watch (S&P).

126. As with Oxera's appeal to regulatory precedent on gearing, Oxera has quoted the outcome of the regulatory processes without setting the process or methodology that gave rise to those outcomes. I do not consider it a reasonable use of regulatory precedent for Oxera to simply quote the outcome of the considerations of the ACCC and Ofcom without explaining that the application of the same rationale and methodology for these outcomes would give rise to an entirely different result for Chorus.

### 3.2.3 Input Methodologies position on credit rating

127. In its IMs Final Reasons Paper the Commission sets out a view that the target credit rating should be well in excess of an investment grade credit rating:[33]

> *The Commission considers that the notional long-term credit rating used for estimating the regulated service wide notional debt premium should reflect a prudent long-term level of exposure to credit default risk. Specifically, the notional long-term credit rating should be, and remain,*

30 I note that, in footnote 33, Oxera states: "Although Moody's assigns a Baa3 rating to Chorus, which is equivalent to BBB- on the S&P scale, Dr Hird bases his analysis largely on S&P ratings." It is correct that it is my practice, for ease of presentation and comparison, to convert Moody's ratings into S&P ratings. However, this should not be taken to imply that I consider S&P ratings to be in any sense superior to Moody's ratings.

31 Moody's investor service, Rating Methodology: Global Telecommunications Industry, December 2010.

32 Noting also that these firms operate in lower risk RAB based regulatory regimes – where the value of the regulatory asset is not revisited and capital and operating expenditure are compensated on an as incurred basis (albeit within an incentive regulation framework).

33 Commerce Commission, *Input Methodologies (Electricity Distribution and Gas Pipeline Services) Reasons paper*, December 2010, p. 459

> *comfortably within an 'investment grade' credit rating as defined by the major credit rating agencies, and a S&P long-term credit rating of BBB+ (or equivalent rating from Moody's or Fitch) is the minimum notional long-term credit rating that provides an adequate margin of safety with respect to EDBs, GPBs and Transpower. Setting the minimum notional long-term credit rating at, for example, BBB (being only one notch above BBB-, the lowest investment grade long-term credit rating) provides a materially lower margin of safety that a reasonable investment grade is maintained in the long-term.*

128. I disagree with much of the Commission's reasoning. Specifically I do not believe that the Commission is well placed to substitute its judgement of what a prudent level of default risk is in place of what it is that businesses actually do across a wide sample of telecommunications network businesses. The average credit rating across this sample of firms (whether my preferred sample or Oxera's) is BBB-. The Commission's reasoning provides no clear or logical reason why the target credit rating needs to remain "comfortably within an investment grade credit rating".

129. I note that, to the extent that the Commission's imposes a credit rating assumption that is higher than benchmarking suggests it will make it harder for the actual UBA/UCLL provider to achieve the same credit rating as its peers That is, simply assuming a high credit rating does not make this happen in practice, quite the opposite.

# 4 Cost of debt

## 4.1 Foreign currency bonds

130. In my previous report I set out an analysis of DRP based on a large dataset of bonds issued by New Zealand issuers, including bonds denominated in New Zealand dollars and bonds denominated in foreign currencies (swapped into New Zealand dollar terms).

131. I noted that issuing bonds denominated in foreign currencies is a common practice amongst large New Zealand businesses, particularly infrastructure businesses. Indeed, the only bond issued by a New Zealand provider of UCLL or UBA services is a bond issued by Chorus denominated in British pounds. I stated that:[34]

> *…I consider that the exclusion of bonds issued by New Zealand companies in foreign currencies inappropriately fails to have regard to a relevant source of information on the cost of corporate debt.*

132. In his report Dr Martin Lally expresses the view that including foreign currency denominated bonds in a DRP estimate is problematic for a number of reasons, including concerns about the liquidity of foreign currency bonds, other data quality issues, and the need to determine the appropriate weights to place on different types of bonds. Lally does not substantiate with evidence his view that foreign currency bonds should not be included in the DRP estimation process.

133. I discuss below individual elements of Lally's claims with respect to the inclusion of foreign currency bonds. In my view, none of the reasons offered by Lally for not having regard to yields on foreign currency bonds are persuasive and the Commission should include foreign currency bonds in its assessment of the DRP.

### 4.1.1 Liquidity of foreign currency bonds

134. Lally observes that foreign currency bonds are not very liquid because they are typically held to maturity. This, he suggests, implies that secondary market based estimates from parties such as Bloomberg would be of low quality.

135. Lally does not provide evidence to support this claim. Of course, exactly the same observations can be made in respect of New Zealand dollar denominated bonds. In my view, Lally's claims do not establish any sound basis not to use the information provided by foreign currency bonds or to prefer the use of New Zealand dollar bonds in preference to them.

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34 CEG, *Response to CommerceCommission UCLL/UBA WACC consultation paper*, March 2014, p. 25

136. To the extent that foreign currency bonds are indeed more likely to be held to maturity than New Zealand dollar bonds, we would expect to observe prices for these bonds would be higher in the secondary market because there are few willing sellers of such bonds. That is, we should expect *lower* yields for foreign currency bonds on average if Lally's claim is correct.

### 4.1.2 Inclusion of bank debt

137. Lally argues if one has regard to foreign currency bonds to better reflect the average cost of a firm's debt finance, then one should also have regard to bank debt.

138. I do not disagree with the concept of including of bank debt when estimating the benchmark cost of debt. I already include bank debt in my measurement of the average term of debt issued by comparators. Although Lally does not provide any evidence on the importance of bank debt in regulated businesses drawn debt portfolios, I have done this in the context Australian regulated energy business. In my letter to the AER, provided to the Commission with my previous paper, I estimated this to be around 11% of borrowings.[35]

139. Moreover, I do not consider that the inclusion of bank debt as a potential source of yield estimate for the DRP is contentious at all. To the extent that bank debt exists with a term that is similar to the benchmark term and the yield on that bank debt can be accurately estimated then it should be included in any analysis.

140. Of course, bank debt is not generally included in this analysis because it is short term in nature (i.e., much shorter than the benchmark term) and its yield is not easy to observe/estimate. In part because there is no secondary market for bank debt (i.e., it is not publicly traded) and in part because the true yield on any given debt is difficult to measure because bank debt is part of a bundle of services provided to a client and the price that is relevant is the bundled price.

141. Professor Grundy's report also considers these issues. In summary, he suggests that:[36]

    - bank debt includes loans of less than one year maturity that form part of working capital. Arguably, it is not used to finance the RAB at all. If bank debt is to be included in the calculation of the WACC, then the regulatory regime would also need to explicitly include working capital and a return thereon; and

35 CEG, *Response to CommerceCommission UCLL/UBA WACC consultation paper*, March 2014, p. 26

36 Grundy, *Response to the 13 June 2014 Review of Submissions on the Cost of Debt and the TAMRP For UCLL and UBA Services by Dr Martin Lally*, July 2014, paras. 5-8

- the interest rate on bank debt is charged in the context of what the firm pays for a suite of services provided by the bank to the firm. The interest rate paid by the firm may not represent the true cost of the bank debt.

142. In addition to the points raised by Professor Grundy, I note that bank debt is generally short-term in nature and is not likely to be informative of the yields that would be experienced on long-term debt. In section 5.4 I report my investigations of debt term across a sample of comparable telecommunications businesses. This analysis of debt term, which includes bank debt conservatively assumed to be fully drawn, finds that an average term of over 10 years is appropriate.

### 4.1.3 Reliance on Davis

143. Lally notes that the rate differential between local and otherwise identical foreign denominated bonds fluctuates considerably over time, with a typical differential of up to 1%. In support of his view, Lally references an article by Professor Kevin Davis which notes that there may be differences between foreign and local borrowing in terms of the perceptions of the default risk of New Zealand firms, the premiums for the relative illiquidity of the bonds, and/or the premium for systematic risk between local and foreign borrowing.

144. However, in relying upon Davis to support his views on this matter, Lally does not identify that Davis in fact concludes that these differences do not mean that foreign currency bonds should be excluded from the cost of debt estimate for Australian companies:[37]

> *Differences in credit spreads for the same borrower in different markets require less than perfect market integration, and a complete explanation of this phenomenon requires recourse to some version of an international asset pricing model (such as international CAPM). But while this may be required for an explanation of international differences in credit spreads,* ***it does not preclude using such data on credit spreads in estimating the cost of debt for Australian companies.***
>
> …
>
> *[…] investor's required returns on debt can be observed directly and, to the extent that a company can issue debt in a range of markets where such required returns for comparable companies can be observed,* ***such information such be included in the estimation process***. (emphasis added)

[37] Davis, *Determining Debt Costs in Access Pricing, A report for IPART*, 2011, p. 9 – 10.

145. In this respect, the evidence submitted by Lally appears to favour the inclusion of foreign currency bonds in assessing the local cost of debt, rather than providing evidence of the opposite as argued by Lally.

### 4.1.4 Differences in expected yields between New Zealand dollar and foreign currency bonds

146. The Commission and Lally accept that yields on New Zealand dollar bonds are relevant to determining the cost of debt.

147. As I note above at section 4.1.2, one would not expect the risk-adjusted cost of funding from different debt sources to be significantly different at the margin. I would expect converted yields on foreign currency bonds to be commensurate with yields on New Zealand dollar bonds, and therefore provide a wider source of data upon which to estimate the cost of debt. Increasing the size of the dataset, and particularly the number of long-dated bonds, is desirable to improve the accuracy and precision of an assessment of the long term cost of debt and DRP.

148. Lally concedes that one would expect the yields on New Zealand dollar bonds and foreign currency bonds to be the same over time. While Lally says that yields on foreign currency bonds provide a 'poor estimate', he states that:[38]

> *I understand that the DRPs on local currency bonds are not systematically above those on foreign-currency denominated bonds. Consequently, the use of only local-currency bonds in estimating a firm's DRP may sometimes be too high and sometimes too low but the average error will tend to zero over time.*

149. I address in section 4.1.1 above Lally's claims about the quality of information available from foreign currency bonds relative to that available from New Zealand dollar bonds.

## 4.2 Estimating the debt risk premium

150. In his report, Lally makes a number of comments on my approach to estimating the DRP for Chorus. His commentary includes claims that:

- reliance on a 10 year debt term could result in an estimate of the average cost of debt that is too high since firms will issue debt with varied maturities; and
- reliance on curve fitting methodologies is problematic since it requires a choice between methodologies and the availability of high quality data.

[38] Lally report, p. 9

151. Lally also suggests that I recommend a target rating of BBB- on the basis that this is Chorus' rating.

152. Lally's comments do not provide material new information that causes me to reconsider my approach to estimating the DRP. I discuss his comments in greater detail below.

### 4.2.1 Bias from using a 10 year debt term

153. Lally advises that estimating the DRP at a 10 year term will tend to over-estimate the DRP that businesses actually achieve. This is because businesses do not actually issue debt at a uniform term of 10 years but at various terms with an average of 10 years. If the DRP curve is concave, then the average DRP across the debt portfolio will be less than the DRP at 10 years.

154. This logic implicitly assumes that the benchmark maturity observed for comparators is 10 years when, in reality, my analysis suggests that it is in excess of 10 years. However, putting that objection aside, Lally references previous advice that I gave which stated that producing a 10 year cost of debt estimate by average yields over a sample of bonds with varying terms will result in an underestimate of the cost of debt even if the average term of the bonds is 10 years. Lally concludes that it would therefore be reasonable to use an average over a sample as a methodology for determining the DRP rather than more sophisticated methods such as curve fitting.[39]

155. I note that my analysis Lally refers to applied only at the level of yields – not DRP. Lally's reasoning requires concavity in DRPs not yields.

156. Professor Grundy also identifies that Lally is relying on an assumption that the DRP curve is concave. It may not be. Indeed, it would only be concave to the extent that the cost of debt yield curve was more concave than the risk free rate yield curve. Professor Grundy uses a history of Australian Bloomberg BBB fair value data to show that this has not been the case recently (Bloomberg no longer reports BBB fair value yields for New Zealand).[40]

157. I endorse Professor Grundy's analysis. I also note that to the extent that Lally's claim of bias is correct, it rests on a view that the term of debt benchmark should be a distribution of terms, rather than a single term estimate. If Lally's view is that the nature of the debt term benchmark should be changed to accommodate this view then he should recommend that. In my view this would likely add to the complexity

39 Lally report, p. 11

40 Grundy, *Response to the 13 June 2014 Review of Submissions on the Cost of Debt and the TAMRP For UCLL and UBA Services by Dr Martin Lally*, July 2014, paras. 21-26

of the estimation process with little gain in accuracy but I would not object to further empirical analysis in this regard. However, Lally provides none. I note for context that an assumption of a fixed debt term (rather than a distribution) is used widely by economic regulators around the world.

### 4.2.2 Curve fitting is not problematic, as suggested by Lally

158. In his report, Lally claims that curve fitting techniques such as those that I used to estimate the DRP at a specified maturity 'suffer' from a number of problems. The issues identified by Lally include:[41]

- that curve fitting suffers from the need to choose between various models; and
- that curve fitting suffers from the need to obtain high quality DRP data from all maturities.

159. In my view, the requirement to choose between competing models to describe a yield curve cannot reasonably be described as a problem that the approach suffers from. It is instead a reflection of the richness of the literature in this area. Lally does not provide any insight as to why one approach might be preferable to another.

160. Lally's commentary about the need for curve fitting to use high quality DRP data from all maturities is not an issue that is specific to curve fitting but is general to all methodologies for determining the DRP. Lally's implied counterfactual is a methodology that determines the cost of debt at 10 years having regard to a pool of 'high quality' data at or around 10 years while ignoring 'low quality' data at low maturities.

161. However, in fact what we observe is that most DRP data is generally low quality. It does not usually reflect observed trades but rather indications of price provided by banks. To the extent that there is high quality data, this is much more likely to be available at low maturities where the largest population of bond data resides. Only curve fitting can appropriately combine the richer data at low maturities with the sparse data at high maturities into a robust estimate of the yield on a long-dated bond.

### 4.2.3 Lally mischaracterises my basis for suggesting a BBB- credit rating

162. On two occasions in his report, Lally mischaracterises my basis for recommending a BBB- credit rating.

163. Contrary to Lally's assertions, I did not recommend a BBB- credit rating on the basis that this was Chorus' credit rating. Rather I had regard to both regulatory

[41] Lally report, pp. 11-12

precedent and the current credit ratings for a wide range of comparators firms in suggesting that it was reasonable to set a benchmark credit rating for a UCLL/UBA provider of BBB-.

164. I set out my views on the target credit rating in more detail at section 3.2 above.

# 5 Debt management strategies

165. My previous report for Chorus made a number of recommendations in relation to the debt management strategy that the Commission should cost. Key recommendations included:

    i. That the cost of debt should be based on an efficient debt management strategy that could feasibly be undertaken by a regulated business. This debt management strategy should be formally and explicitly set out by the Commerce Commission in order to:

        - Provide a transparent description of the debt management strategy to be costed; and
        - Allow the regulated entity to, should they so wish, adopt that debt management strategy in order to hedge variations in their actual cost of debt to variations in the allowed compensation for debt.

    ii. That an efficient debt management strategy involves the issuance of staggered debt in order to limit refinance risk. Equivalently, it would be inefficient for a business to refinance 100% of its debt at the beginning of each regulatory period.

    iii. That the regulator should base its estimate of an efficient debt management strategy on how similar businesses actually manage their debt portfolio. In particular, the assumed term of debt issued should match the actual term of debt issued by similar firms.

    iv. Other things equal, the chosen benchmark debt management strategy should give rise to a more rather than less stable allowance and, ultimately, prices for customers.

166. Following from these recommendations I recommended that the Commerce Commission cost a staggered debt management strategy and that, therefore, there were two broad options that the Commission should choose from:

    - A historical trailing average of the cost of debt – with the length of the trailing average reflecting the term of the debt businesses actually issue (e.g., "Y years" if businesses issue debt with a maturity of "Y years").
        - This reflects the cost of a debt management strategy that simply involves issuing evenly spaced fixed rate debt of a particular maturity such that when one "Y-year" bond matures it is replaced by another "Y-year" bond in the portfolio.
        - This is "Option C" in the nomenclature adopted by Lally.
    - A prevailing base (risk free) rate of interest plus a historical average DRP with a term of "Y years".

- This reflects the cost of a debt management strategy that is the same as above but, in addition, includes an assumed derivative contract 'overlay' the effect of which is to reset the base rate of interest every 5 years but to leave the firm with a historical average DRP on their staggered debt portfolio (noting that no derivative contracts exist that allow a firm to reset its DRP costs every 5 years).
- This is "Option B" in the nomenclature adopted by Lally.

## 5.1 Areas of agreement with Lally

167. Lally agrees with the second, third and fourth recommendations set out above. Namely, that firms efficiently engage in staggered debt issuance and that the assumed term of debt issue by the regulator should reflect actual commercial practice by similar firms. Lally also accepts that, other things equal, the basis for setting the cost of debt allowance should promote stability in prices faced by final customers.[42]

168. Similarly, with one critical exception discussed in the next section, Lally adopts the first of these recommendations – that the Commission should cost an efficient feasible debt management strategy. The logic behind this recommendation of mine is the same logic employed by Lally to:

- reject setting the assumed term of debt issues equal to the term of the regulatory period in favour of setting the term equal to the actual term of debt issues by similar firms;[43] and
- recommend providing an allowance for the costs of entering into interest rate swaps. This is because a business that issues staggered debt (a practice Lally argues is efficient) must enter into interest rate swaps if its base rate of interest is to be reset at the beginning of each regulatory period. Therefore, Lally proposes compensation for the cost of this activity (given that he proposes the regulator reset the base rate of interest at the beginning of each regulatory period). [44]

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42 Lally report, p. 15

43 Lally report, p. 19:

> *"...the best policy is to invoke the risk free rate at the beginning of the regulatory cycle (with a term matching the regulatory cycle) coupled with a DRP at the beginning of the regulatory cycle* ***(with a term matching the average term for which firms borrow)****, plus the transactions costs of interest rate swap contracts to align the risk-free rate component of the firm's staggered debt with the regulatory cycle."* (emphasis added)

44 Lally report, p. 4:

> *"...even if firms borrow for a term that equals the regulatory cycle, an allowance for the transactions costs on interest rate swap contracts* ***is warranted because*** *firms*

169. Lally makes the following critique, which I fully endorse, of Network Strategies' submission that the term for the DRP should be equal to the term of the regulatory period irrespective of term of debt actually efficiently issued by regulated businesses:[45]

> *Network Strategies (2014, pp. 11-17) argues that appropriate compensation to regulated firms is achieved by matching the risk free rate and the DRP to the regulatory cycle, and therefore the TCSD is unnecessary. Stated in terms of the criteria presented in the previous section, Network Strategies are implicitly stating that this regulatory policy (matching the risk free rate and the DRP to the regulatory cycle) satisfies the NPV = 0 principle.* ***However, this can only be true if there is a viable debt policy that can be coupled with this regulatory policy.***
>
> *Given that the CDS market is not sufficiently developed to allow the DRP on actual borrowings to be matched to the regulatory cycle, the only debt policy that could (in conjunction with the regulatory policy referred to here) involves borrowing at the beginning of each regulatory cycle for the term of the cycle.* ***Such a policy involves no staggering, and therefore high refinancing risk, and is therefore unviable. Consistent with this, regulated firms do not employ such a strategy. So, Network Strategies' argument is invalid.*** (emphasis added)

170. Other areas of agreement between CEG and Lally are that:

- once the assumed term of debt is based on actual business practice there is no need for a separate term credit spread differential allowance (TCSD);
- CEG's five criteria for assessing what debt management strategy should be costed are relevant – although Lally adds further criteria.

## 5.2 Key area of disagreement

171. The key area of disagreement with Lally is that, despite in some respects adopting recommendation i) set out above, he does not do so universally. Specifically, Lally recognises that a firm that issues staggered debt will, even if it enters into interest rate swap contracts, have a cost of debt that is based on a historical trailing average DRP. This is because, unlike the base rate of interest, there are no derivative

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*(sensibly) stagger their borrowing arrangements. Currently, such firms do not receive that allowance."* (emphasis added)

45 Lally report, p. 20

contracts that allow the DRP on staggered debt issuance to be reset at the beginning of each regulatory period.

172. However, Lally does not recommend that compensation be based on an historical average DRP. Rather, Lally proposes adopting a DRP allowance that is equal to the prevailing DRP at the beginning of the regulatory period. This is "Option A" in Lally's nomenclature.

173. This is a significant departure from my recommendation i) set out above. It introduces a, potentially very large, source of error between the cost of debt allowance and the cost of debt for an efficient regulated business. Lally has a number of justifications for this recommendation set out in the below quote:[46]

> *In comparing Option A with B, Option A suffers from the disadvantage that there is no viable debt strategy that can be combined with it to satisfy the NPV = 0 principle, and it raises bankruptcy risk. However it is easier to implement, it has lesser incentive problems for capex and new entrants (or less complexity if these incentive problems are addressed), and the transitional process from the present regime is simpler. In respect of the greater bankruptcy risk, this has been examined in Appendix 2 using data from the GFC period and the increase would have been trivial. In respect of violations of the NPV = 0 principle, Lally (2010, Appendix 1) analyses this issue and finds that the violations are not substantial. Furthermore, the CDS market is likely to continue to develop and may reach the point at which the DRP risk under the present regime can be better hedged by regulated businesses, in which case these three concerns would be further ameliorated. In view of all this, I favour Option A.*

174. In summary, Lally prefers Option A to Option B because:

- Lally presents evidence that the difference between the prevailing and historical average DRP allowance is not likely to be material (the increase in bankruptcy risk is "trivial" in Lally's dataset);
- Lally argues that investment incentives are better signalled using a prevailing DRP rather than an historical average;
- Lally argues that applying a trailing average would require a transition arrangement from the 'present regime' and that this would introduce complexity into the regulatory regime.

175. In my view, none of these points provides a reasonable basis for preferring Option A over Option B. I discuss each in turn below.

[46] Lally report, p. 19

176. However, I first note that, in my view, Lally's conceptual critique of Network Strategies' proposal (reproduced above) applies equally to Option A proposed by Lally. The DRP allowed in Option A differs only from the DRP proposed by Network Strategies in that the term of the DRP under Option A can be longer than the regulatory period. It is still the case that the allowed DRP is reset every five years equal to then then prevailing DRP (of whatever term).

177. In this context, the following statement from Lally applies equally as a criticism of Option A:[47]

> *Given that the CDS market is not sufficiently developed to allow the DRP on actual borrowings to be matched to the regulatory cycle, the only debt policy that could (in conjunction with the regulatory policy referred to here) involves borrowing at the beginning of each regulatory cycle for the term of the cycle.* ***Such a policy involves no staggering, and therefore high refinancing risk, and is therefore unviable. Consistent with this, regulated firms do not employ such a strategy. So, Network Strategies' argument is invalid.*** *(emphasis added)*

178. Lally is arguing in the above against Network Strategies' position that the DRP can be assumed to be aligned to the length of the regulatory period. However, in doing so he is equally arguing against the position that the DRP can be reset at the beginning of each regulatory period based solely on then prevailing DRP rates. That is, he is arguing against option A which he himself admits:[48]

> *"…Option A suffers from the disadvantage that there is no viable debt strategy that can be combined with it to satisfy the NPV = 0 principle…"*

### 5.2.1 Lally's empirical evidence

179. Lally concludes based on his analysis in Appendix 1 that:[49]

> *"…the overall impact of changes in the DRP and the risk-free rate on bankruptcy risk, under Option A, is examined in Appendix 1. This reveals that the increased bankruptcy risk was trivial since 2007."*

180. This conclusion is problematic for a number of reasons:

47 Lally report, p. 20

48 Lally report, p. 19

49 Lally report, p. 17

- First, even if it was true that in the 6.5 years since 2007 there was a trivial difference between Option A and Option B there is no reason to believe that future market conditions will likewise result in trivial differences. When I use a much longer data set (1919 to 2014) from US debt markets I demonstrate very significant differences such that cumulative over/under-compensation of efficient costs can have a present value that is more than 10 times the value of the debt portfolio;
- Secondly, the dataset used by Lally to measure differences between Option A and Option B since 2007 is unsatisfactory for the purpose to which it is used;
- Thirdly, Lally focuses on the contribution to bankruptcy risk of differences between Option A (which provides compensation based on a non-viable debt management strategy) and Option B (which is based on a viable debt management strategy). This is certainly a problem but it is not the only problem. With a low enough assumed gearing any such differences may never add materially to the probability of bankruptcy risk (at least not in and of themselves). However, this is not a reason to dismiss the desirability of accurately compensating efficient debt management practices (as discussed in the next section relating to incentives).

#### *5.2.1.1 Using a long term data series*

181. Seven and a half years is simply too short a time period to assess the potential future magnitude of errors in Option A as a proxy for the (viable/efficient) Option B. To the best of my knowledge no long time series exists for New Zealand. But one can obtain a measure of how just how large the differences between Option A and Option B can be by instead examining a long time series available for the US.

182. Professor Robert Shiller the Nobel Laureate provides various data series on his website.[50] The data include estimates of long-term risk-free rates going back to 1871. Moody's provides a time series of yields on long-term Baa (equivalently BBB) corporate bonds going back to 1919.[51] Differencing these two series provides a long series of estimates of the DRP on BBB bonds.

183. For 5-year regulatory cycles beginning in 1929 and running through to the first year of the 17th five-year cycle that started in 2014 one can compare the allowed DRP based on Option A to the 10-year trailing average DRP of Option B. Starting the first regulatory cycle in 1929 allows a 10-year trailing average of the DRP to be calculated from market data.

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50 http://www.econ.yale.edu/~shiller/data.htm.

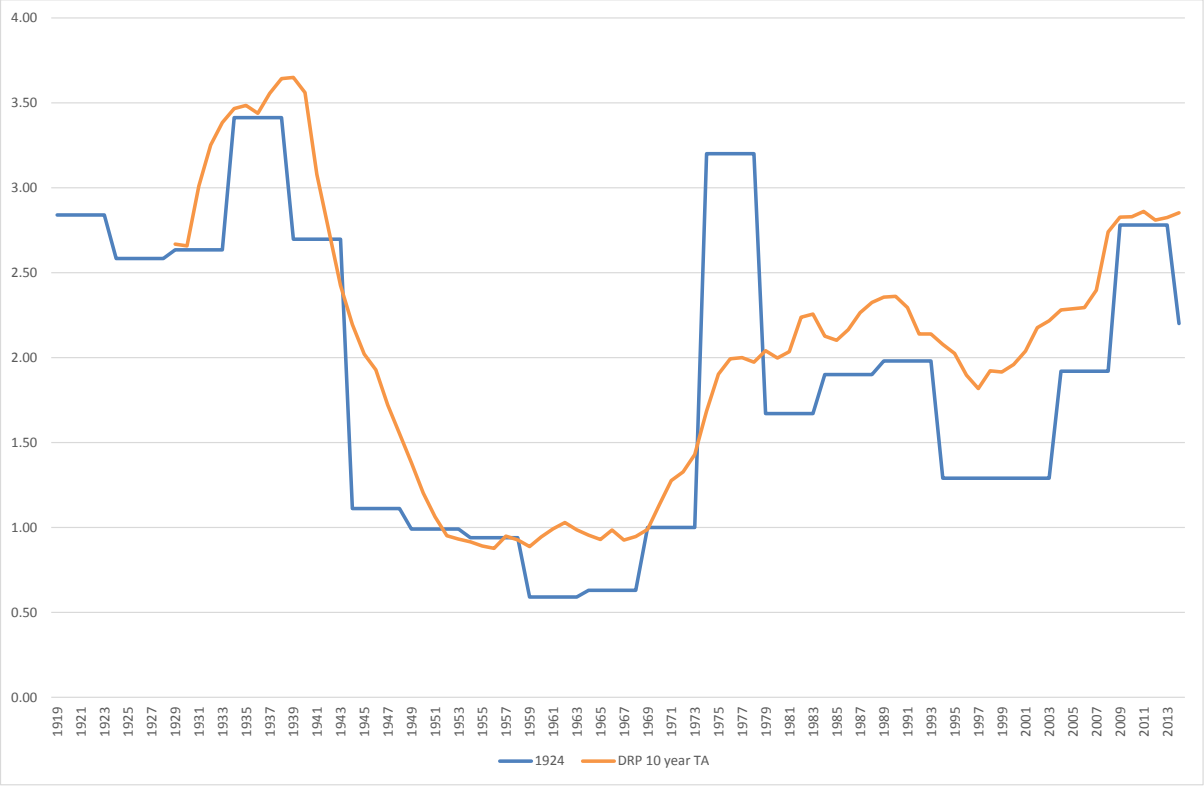
51 This is available through Bloomberg, but is also publicly available on the website of the Federal Reserve Bank of St Louis, at http://research.stlouisfed.org/fred2/series/BAA.

184. Given the Appendix 1 assumption of 44% debt financing, the maximum annual dollar difference in the DRP measures of Options A and B is positive $0.67 and negative $0.48 per $100 of RAB. Note that the maximum shortfall in Lally's analysis at Appendix 1 is only $0.14.

185. However, even at a factor of four or more times larger than the difference found by Lally, this is not the most significant problem with Lally's conclusion highlighted by the longer data series. The most important problem is that even small annual differences between Option A and Option B can add up to very large cumulative differences over time.

186. This is illustrated in the figure below which compares the ten year trailing average DRP under Option B (i.e., the actual DRP that a typical BBB business will pay if it has an evenly staggered portfolio of 10 year debt) with the prevailing DRP measured at the beginning of each 5 year regulatory period (with the first regulatory period beginning in 1929).

**Figure 2: 10 year trailing average versus prevailing rate reset every five years using 100 year history of BBB cost of debt from the US**




*Source: Bloomberg data, Robert Shiller data, CEG analysis*

187. Examination of this chart demonstrates that in any given five year period, and over a series of five year periods, the prevailing DRP at the beginning of each regulatory

period can differ significantly from the historical average DRP that represents the efficient DRP costs actually incurred by a business.

188. Critically, the allowed cost of debt under Option A is almost always below the actual cost of debt associated with staggered debt issuance (i.e., below Option B). There are 86 years between 1929 and 2014 and in 73 of these Option A undercompensates for the DRP associated with staggered debt issuance. Only in 13 of these years does Option A over-compensate for the DRP associated with staggered debt issuance (and only in the five years 1974 to 1979 is this material).

189. Over the entire period, 1929 to 2014 a business regulated under Option A would have been under-compensated relative to their efficient costs by an cumulative amount of 22.3% of their debt portfolio.

190. This clearly demonstrates the fact that it is not safe to assume that, using Option A, under-compensation in one period will be offset by over-compensation in another (and vice versa). Rather, it is likely that there will be significant cumulative under or over compensation for long periods – at considerable cost to either the business in question or the customers.

#### *5.2.1.2 Lally's short-term dataset is problematic*

191. The dataset relied upon by Lally to draw his conclusions on the relative merits of the various debt management options is problematic.

192. First, Lally does not consider a trailing average of the actual DRP in the marketplace but instead considers a trailing average of the allowed DRP. Lally simply assumes that the DRP in the six years prior to 2007 (for which he does not have data) are the same as the DRP in 2007. This means that 7 out of his 14 time-series observations are the same by assumption. Consequently, the trailing average series is artificially stable (the first seven years are assumed to be the same) and Option A and Option B are identical (by assumption) in 2007. In effect, Lally largely assumes his conclusion.

193. This further illustrates the problem with Lally's short data series. In order to compare Option A and Option B Lally needs to derive a trailing average DRP from his data. But if his data starts in 2007 and ends in 2014 he has only 8 years of data (less in reality because 2014 is not complete). It is impossible to calculate a single 10 year trailing average. Even if the trailing average is 7 years there can be only 2 observations of a trailing average.

194. This is simply not enough data to perform any meaningful comparison of Options A and B. Assuming pre-2007 data is the same as 2007 data is not a solution to this problem.

195. Second, Lally gives a single annual value for the DRP and takes that value from Commission decisions during those years. Possibly if there was more than one decision in a year, the various values were averaged to obtain a yearly number. But the commission's allowed DRP is not necessarily equal to the DRP on the firm's debt. Moreover, the Commission's estimates are themselves estimated over short windows (usually of a month or so) it maybe that these windows do not capture the full volatility in market DRP over a year.

196. The 2008 and 2009 DRP numbers given in Appendix 1 are 1.6% and 1.8% respectively. These numbers are according to Lally taken from Commission decisions. These numbers do not reflect any spike in risk around the global financial crisis. Moody's estimates that the DRP on US BBB-rated bonds rose above 6% in late 2008 and early 2009, a level not seen since 1931 and the Great Crash. By the end of 2009 the US DRP had fallen back below 3%. The RBA estimates the same pattern in Australia.[52]

197. It would be interesting to know if any of the regulatory DRP values that underlie the Lally's 2008 and 2009 DRP numbers attempted to reflect the conditions of the global financial crisis. For instance, it is possible that the decisions occurred in early 2008 and late 2009 (ie, before and after the spike in risk). If the high DRP associated with the global financial crisis had been fully reflected in the DRP values used for 2008 and 2009 by the Lally review, the results would have been quite different – even holding the other problematic components of his analysis constant.

### 5.2.2 Incentives under each option

198. Lally claims that Option A gives better incentives in relation to capex and "new entry" than Options B and C. Exactly what Lally means by this is not fully explained. However, presumably Lally is arguing that if a business expects to be compensated the prevailing cost of debt at the time a capital expenditure decision is being made it is more likely to efficiently assess whether to undertake that decision. For example, if a business expects to be compensated for an investment based on a DRP that exceeds (is less than) the DRP that it will incur when financing the investment then it will have an artificial incentive to undertake (not undertake) the investment.

199. This logic is intuitive and reasonable. However, there can be no presumption that Option A is superior to Option B (or Option C) in this regard – at least not if incentive regulation is in place. Under incentive regulation whether or not an investment is made within a regulatory period does not affect the level of regulated revenues allowed within that period. The path for the latter is fixed at the beginning

[52] http://www.rba.gov.au/publications/bulletin/2013/dec/pdf/bu-1213-3.pdf, http://www.rba.gov.au/statistics/tables/xls/f03hist.xls

of the regulatory period based on forecasts of opex and capex. The regulated business then has an incentive to "beat" those forecasts (underinvest relative to forecasts) if it can do so without breaching quality standards.

200. This means that the cost of debt allowance set at the beginning of the regulatory period has no direct effect on the incentives to undertake an investment within that period. Rather, it is the expected cost of debt at the beginning of the next and subsequent regulatory periods, when the capex is formally included in the regulatory asset base (RAB), that matters for investment incentives. Once this is realised, there is every reason to believe that Option B (which accurately compensates efficient debt raising costs over time) will provide better incentives than Option A.

201. Moreover, it is not even clear that Chorus will be subject to RAB based regulation such that Chorus' actual capex will influence the asset value against which a return is applied. In which case, the capex incentive properties of the options are all the same (i.e., the cost of debt allowance will have little mechanical direct effect on capex incentives because it will never be applied to capex in any direct fashion).

### 5.2.3 Complexity and transition

202. Lally states his preference for Option A over Option B based on the following reasoning:[53]

> *In comparing Option A with B, Option A suffers from the disadvantage that there is no viable debt strategy that can be combined with it to satisfy the NPV = 0 principle, and it raises bankruptcy risk. However it is easier to implement, it has lesser incentive problems for capex and new entrants (or less complexity if these incentive problems are addressed), and the transitional process from the present regime is simpler. In respect of the greater bankruptcy risk, this has been examined in Appendix 2 using data from the GFC period and the increase would have been trivial. In respect of violations of the NPV = 0 principle, Lally (2010, Appendix 1) analyses this issue and finds that the violations are not substantial. Furthermore, the CDS market is likely to continue to develop and may reach the point at which the DRP risk under the present regime can be better hedged by regulated businesses, in which case these three concerns would be further ameliorated. In view of all this, I favour Option A.*

203. I discuss this reasoning in more detail below.

53 Lally report, p. 19

#### *5.2.3.1 Alleged need for a transition*

204. Lally states that Option A has an advantage over Option B because:[54]

> *"...the transitional process from the present regime is simpler."*

205. I can see no basis for this statement and Lally does not provide one. There is no "present regime" applied to Chorus for the purpose of modelling the cost of debt for UBA and UCLL services. To date the prices for these services has been based on international benchmarking. The Commission has not estimated a cost of debt for this purpose in the past. It follows that there is no 'present regime' to transition from.

206. Moreover, even if there was such a regime it is not obvious that imposing a 'transition' would be sensible if there were problems/errors in the method under the 'present regime'. In that context, a transition would simply amount to a delay in fixing the error.

#### *5.2.3.2 Alleged complexity of Option B*

207. Lally states that relative to Option B, Option A:[55]

> *"...has lesser incentive problems for capex and new entrants (or less complexity if these incentive problems are addressed)..."*

208. I have already addressed the "incentive problems" above and, in my view, these are not substantiated. It follows that there is no basis for concluding that these need to be "addressed" by adding complexity.

209. However, I note that the claimed complexity that Lally is referring to is simply adopting a weighted trailing average of the DRP (where weights are determined by the amount of capex in any given year). This is a simple and mechanical exercise and does not involve any material complexity.

#### *5.2.3.3 Alleged complexity with Option C*

210. Lally rules out Option C on the following basis:[56]

> *Option C has a further complication arising from the fact that firms often undertake interest rate swap contracts to shorten the effective term*

54 Lally report, p. 19

55 Lally report, p. 19

56 Lally report, p. 16

> *associated with the risk-free rate component of the cost of debt. Thus, if a firm borrows for ten years and swaps the risk free rate component into three year debt, the debt term would be ten years for the DRP but only three years for the risk free rate component. In respect of Option C, this would require different historical averages for the two components of the cost of debt. In respect of the swap contracts, these would have to be those of similar unregulated firms and these are simply unobservable.* ***So, Option C is effectively incapable of being implemented.***

211. I find this passage irreconcilable to both the trailing average cost of debt that I proposed (and which Lally is critiquing) and Lally's own definition of Option C elsewhere in his report. Specifically, I defined two debt management strategies that could be costed:

- staggered debt issuance **with** an interest rate swap overlay (Lally's Option B); and
- staggered debt issuance **without** an interest rate swap overlay (what Lally elsewhere defines as Option C). This gives rise to the simplest estimate of the cost of debt – being a historical average of the fixed rate cost of debt over the relevant term. This is the approach implemented by the AER and Ofgem in the UK – both of which I refer to in my paper.

212. However, in the above passage Lally rules out Option C as not implementable on the basis that Option C includes an assumed interest rate swap overlay and that:

> *In respect of the swap contracts, these would have to be those of similar unregulated firms and these are simply unobservable*

213. I agree that if Option C is defined in this way it is not problematic to implement but I never defined it in this way (nor did the AER or Ofgem) and I do not understand why Lally seeks to do so in this passage. Moreover, Lally is being inconsistent in this with his own definition of Option C elsewhere in the same paper. Indeed, earlier on the same page Lally states:[57]

> *Option C also satisfies the NPV = 0 principle, in conjunction with a debt policy of staggered borrowing* ***but without interest rate swap contracts***. (emphasis added)

214. Lally goes on to state:[58]

[57] Lally report, p. 16

[58] Lally report, pp. 17-18

> *Option C will yield higher average prices to the extent that the average debt term of firms exceeds the five-year regulatory term (and therefore the average risk-free rate used is higher) net of the transactions costs of the* ***interest rate swaps*** *(which are used in options A and B* ***but not C****).* (emphasis added)

215. The alleged impossibility of implementing Option C is the reason given for ruling out Option C. Once this reason falls away, Lally has no basis for rejecting this option.

## 5.3 Lally analysis of price volatility

216. Lally claims that Option A and Option B have similar price volatility properties:[59]

> *In respect of criterion (6), one might expect that Option C would yield the lowest price volatility because it uses historical averages rather than prevailing rates and it applies the same averaging process to both the risk free rate and the DRP (thereby gaining risk reduction from the negative correlation between these two parameters). However this is an empirical question and Appendix 2 assesses it. Using data from 2003 to 2014, output prices would have exhibited similar variation under Options A and B and substantially less under Option C. However this is an empirical question and Appendix 2 assesses it. Using data from 2003 to 2014, output prices would have exhibited similar variation under Options A and B and substantially less under Option C.*

217. The same data problems in Lally's Appendix 1 are also present in Appendix 2. Specifically, Lally does not have DRP data from 2003 to 2006 but rather, just assumes that this is the same as in 2007.

## 5.4 7 vs 10 year term

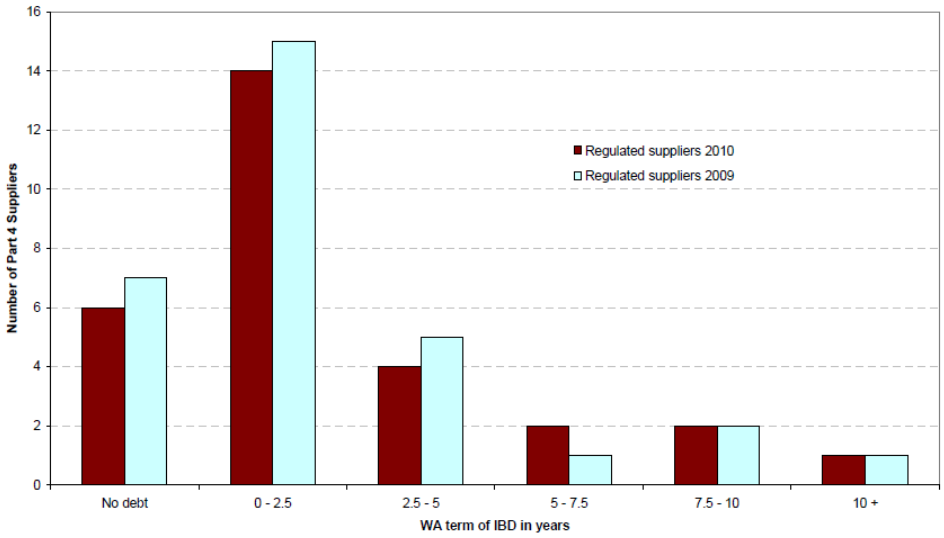
218. An area of further significant disagreement with Lally is the empirical assessment of the term of debt issuance that best reflects actual business practice. As set out in my previous report based on international evidence of telecommunications service providers (and also energy infrastructure businesses), a term in excess of 10 years is appropriate. Lally, based on a Commerce Commission calculation that relies only on NZ regulated businesses, adopts a 7 year term assumption.

219. The relevant information that Lally relies on is contained in the following quote and chart from the Commerce Commission's 2010 IMs Final Reasons Paper relating to energy businesses and airports (no telecommunications firms are in this sample):[60]

[59] Lally report, p. 18

*In 2009 and 2010 the Commission surveyed suppliers of services regulated under Part 4. In 2010 (2009), only five (four) of 29 (31) regulated suppliers which responded to the Commission's request advised that the actual weighted average original period to maturity of their debt was greater than five years - and only one was greater than ten years.*[973] *Their responses are shown in Figure H4. Large suppliers generally issued longer-maturity debt, while (the more numerous) smaller suppliers did not. In the 2010 survey, the value-weighted average original period to maturity of the regulated suppliers who responded was 7.4 years (in 2009 it was 7.3 years).*[974]

**Figure H4 Regulated suppliers' debt portfolio: weighted average original term to maturity of interest bearing debt**




*Source: Commerce Commission*

220. By contrast, the primary evidence on which I relied for a benchmark term of debt issuance of at least 10 years is the following table of international telecommunications businesses.

60 Commerce Commission, *Input Methodologies (Electricity Distribution and Gas Pipeline Services) Reasons paper*, December 2010, pp. 449-450

## Table 3: Estimated weighted average tenor of debt at issuance

| Firm | Average tenor | Firm | Average tenor |
|---|---|---|---|
| AT&T | 20.9 | Portugal Telecom | 8.0 |
| Belgacom | 9.8 | Swisscom | 7.0 |
| BT Group | 16.4 | TDC | 7.1 |
| Centurylink | 19.2 | Telecom New Zealand | 8.4 |
| Cincinnati Bell | 10.8 | Telecom Italia | 12.4 |
| Cogent Communications | 12.8 | Telefonica | 7.2 |
| Colt Group | | Telekom Austria | 8.3 |
| Deutsche Telekom | 8.7 | Telenor | 7.6 |
| Elisa OYJ | 7.0 | Teliasonera | 11.4 |
| Frontier | 12.1 | Telstra | 9.9 |
| Hellenic Telecom | 6.6 | TW Telecom | 8.9 |
| Iliad | 5.8 | Verizon | 15.1 |
| KPN | 14.8 | Windstream | 8.6 |
| Orange | 14.3 | | |
| **Simple average** | | | **10.7** |

*Source: Reproduction of Table 9 from March 2014 report. Bloomberg, CEG analysis*

221. I noted that the estimates in the above table included bank debt and were based on the assumption that 100% of bank debt is fully drawn. In reality, bank debt is almost never fully drawn and, because bank debt tends to be short term debt, assuming that it is fully drawn biases down the weighted average term of debt estimate. Based on my experience in recent work for the Australian Energy Networks Association (ENA) this can result in a material bias (less than half of all bank debt facilities for the Australian energy businesses were actually drawn).[61]

222. I also noted that a term in excess of 10 years (including bank debt) was consistent with audited evidence for energy businesses that I had recently collected for the Australian ENA and which demonstrated a simple and weighted average term of debt at issuance for private Australian energy infrastructure businesses of 10.9 and 10.5 years respectively.

223. Lally has not sought to obtain his own evidence on debt term. Given the evidence presented by CEG and the Commission Lally has simply adopted a value of 7 years based entirely on the Commission's reported numbers. In fact, 7 years is below the Commission's estimate of 7.4/7.3 years. Lally's rationale for doing so is:[62]

61 CEG, *Letter to Warwick Anderson entitled "Response to AER criticisms of estimate of average term of debt at issue"*, 11 November 2013.

62 Lally report, p. 14

> *Fourthly, CEG's belief that the average debt term for regulated firms is ten years (CEG, 2014, pp. 48-50) seems to conflict with the evidence presented by the Commerce Commission (2010, pp. 449-451). However most of the apparent conflict in evidence arises because CEG presents data from a range of markets whilst the Commission favours New Zealand data. New Zealand data is preferable, because it is more relevant. However it does suggest a figure of about seven years rather than five years.*

224. In short, Lally considers that the Commission's data is more relevant because it is solely based on New Zealand data and New Zealand data is more relevant. This may be a reasonable conclusion if the only dimension of 'relevance' were New Zealand versus foreign data. However, this is clearly only one of numerous dimensions that are relevant. Other important dimensions include:

- industry of operation: the conduct of telecommunications businesses would appear to be more relevant given that the service provider in this case is a telecommunication provider;
- the size of the businesses: small businesses (which dominate the Commerce Commission sample) tend to have little or no publicly traded corporate bonds relying instead on bank debt;
- the ownership structure: private businesses (who cannot rely on implicit or explicit Government guarantees) tend to borrow at longer terms to limit refinancing risk; and
- the sample size. The Commission's sample size is only a handful of firms when small and publicly owned businesses are excluded.

225. Taking account of each of these dimensions of relevance would materially increase the estimated term of debt to a value well above the Lally's 7 years (which is itself less than the Commission's reported estimate of 7.4/7.3 years). When account is taken of each of these factors it is my opinion that the best estimate of the benchmark term for a New Zealand telecommunications provider is above 10 years.

226. First, the average term of debt at the time of issue exceeds 10 years for the telecommunications businesses surveyed in Table 3 above (and, as noted above, this is an underestimate due to the conservative treatment of bank debt). Moreover, only two out of 26 firms in the sample have an estimate that is less than 7 years (Helenic (6.6 years) and Iliad (5.8) years).

227. Second, I assume that the benchmark UCLL and UBA service provider is a large firm for whom it is rational/economic to issue debt into publicly traded markets. I base this assumption on the fact that such a firm will have lower overall financing costs by accessing publicly traded markets and also that a minimum efficient financing size is the basis of other elements of the WACC estimate (e.g., the equity beta and TAMRP are based on data from publicly traded equity markets and debt costs are based on observed yields on publicly issued bonds). I also note that the

UCLL and UBA services are provided on a nationwide basis and the investment costs associated with providing them are very large (measuring in the billions of New Zealand dollars).

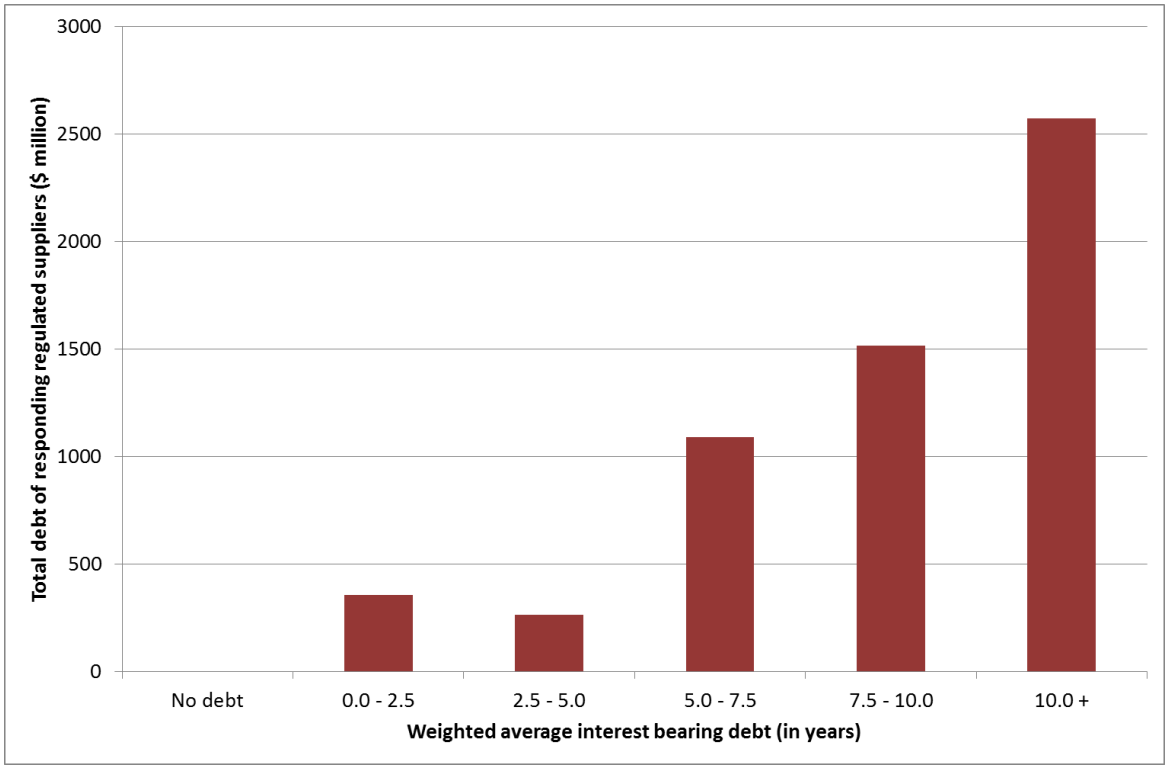
228. By contrast, the Commerce Commission's sample (on which its 7.4/7.3 year term estimate is based) is dominated by small firms, with small debt issuance programs, that do not issue debt into publicly traded markets. The same Commerce Commission quote relied on by Lally states:[63]

> *Large suppliers generally issued longer-maturity debt, while (the more numerous) smaller suppliers did not.*

229. If one accepts that the most relevant firms are the large firms who issue into publicly traded debt markets, then the Commission's estimate would need to be adjusted to better reflect the maturity profile of such firms. It is possible to do this based on publicly available information. Vector presented the following chart to the High Court as an alternative representation of the Commission's "Figure H4".

[63] Commerce Commission, *Input Methodologies (Electricity Distribution and Gas Pipeline Services) Reasons paper*, December 2010, p. 449

**Figure 3: Vector's alternative representation of 2010 NZ energy sector data**




*Source: Vector submission to the High Court (also reproduced in High Court decision)*

230. As is clear from this chart, and consistent with the Commission's own statements, there is a very large difference between the term of debt for the largest and the smallest businesses in the Commission's sample. Moreover, the average term of debt appears to increase markedly with the amount of debt on issue by any given company.

231. In summary, international benchmarking of telecommunications businesses suggest a term of debt issuance of around 10 years is efficient. Information on the debt management practices of large privately owned New Zealand regulated energy businesses is consistent with this 10 year benchmark. Lally's recommendation of a 7 year term is unreasonable because it:

- does not give any weight to the practices of telecommunications providers;
- does not ensure that the New Zealand data is properly constructed to reflect the debt management practices of large privately owned businesses;
- relies too heavily on what is a very small sample of relevant firms compared to the size of the sample available by including international comparators; and
- proposes a term (7 years) that is below even the raw New Zealand data reported by the Commission (7.4/7.3 years).

# 6 TAMRP

232. In my previous report for Chorus, I recommended that the TAMRP of 7% used by the Commission be revisited in light of estimates of the prevailing TAMRP.

233. The Commission states that in its IMs Final Reasons Paper in December 2010 it had regard to both *ex ante* and *ex post* measures of TAMRP. In general one would not expect measures of TAMRP based on long term averages to have changed significantly since 2010. However, current forward-looking measures of the TAMRP need not necessarily be similar to those in 2010. Following the precedent determined in the IMs therefore requires that at a minimum the Commission examine updated estimates of the prevailing TAMRP.

234. I stated that this was important because treating the TAMRP as a constant, unchanging value is not consistent with the CAPM. In the CAPM, the TAMRP is calculated as the difference between the return on the market and the risk free rate. Measures of historical TAMRP represent the average difference over history between the return on the market and the risk free rate. However, this may not be representative of the current TAMRP.

235. I undertook a dividend growth model (DGM) analysis to estimate the return on equity required on the New Zealand stock market over time. The analysis indicated that the current TAMRP for New Zealand is elevated and above 8.0%, expressed relative to the current risk free rate.

236. In response Lally estimates TAMRP as the median of five different methodologies. Three of the methods he relies upon use historical estimates, one is a DGM estimate and one relies on survey results. Lally's median 10 year estimate is 6.7%, and his median 5 year estimate is 6.9%. Lally concludes that, collectively this suggests that an appropriate estimate of the TAMRP at the present time is 7% based upon both the five and ten year periods.

## 6.1 Term of the TAMRP estimates

237. Lally states that my DGM analysis does not estimate an MRP over a 5 year term, instead using MRP out to infinity followed by deducting the (tax adjusted) risk free rate for the next five years. Lally considers that consistency requires that the DGM be used to estimate the expected market return over the next five years, in which case deduction of the (tax adjusted) risk-free rate for the next five years would yield the estimated TAMRP for the next five years.

238. I agree that the DGM results that I reported employ a TAMRP calculated over an infinite horizon. I do not agree with Lally that this is unreasonable. Indeed, as I note at section 6.5 below, Lally states elsewhere in his report that it would be desirable to choose a TAMRP that was the best estimator (ie, with least variance)

over the life of the assets. It is unclear to me how he reconciles this view with his critique of my approach to the DGM analysis.

239. Furthermore, the results of my TAMRP analysis, which are not contested by Lally, indicate that the TAMRP over an infinite horizon is above 8%. If one assumed that the long-term average forward-looking TAMRP were in fact consistent with historical estimates of 7% cited by Lally, then other things being equal this information could be used to solve for the TAMRP over the next five or ten years before reversion to the long-term average. However, this approach would produce an even higher estimate of TAMRP than the results that I presented in my previous report.

240. Consequently, Lally's critique serves only to illustrate the conservative nature of the DGM analysis that I undertook in my previous report.

## 6.2 Empirical support for DGM

241. Lally extensively critiques my motivation for the use of DGM on the basis that in a report that I wrote for the Australian ENA in 2013 I referred to a report by Li, Ng and Swaminathan[64] which demonstrated that a particular DGM estimate was able to predict market returns.

242. In particular, Lally observes that:[65]

- there are variances between the form of the DGM that I apply and that tested by Li *et al*; and
- the model of DGM data that I apply is not applied to United States data and therefore could not be validated by Li *et al* even if the first dot point above was moot.

243. It is important to first note that the form of the DGM that I applied in my previous report was based on the structure of the DGM that has been applied and used by the Australian Energy Regulator in recent regulatory decisions. This form of the DGM is not identical to that used by Li *et al*, but the fact that the AER has decided to use it in its assessments of forward-looking TAMRP suggests that it does not share all of Lally's concerns.

244. Secondly, Lally raises an unreasonable hurdle to the use of financial literature in his view that results obtained on United States data cannot be applied to New Zealand circumstances. While it would be ideal to be able to reference papers that rely on

64 Li, Ng and Swaminathan, "Predicting market returns using aggregate implied cost of capital", *Journal of Financial Economics*, 2013, 110, pp. 419-436

65 Lally report, p. 21

New Zealand data, the majority of published papers in the empirical literature will rely upon United States data and very few rely upon New Zealand data. It is revealing that Lally does not respond to my use of United States data by noting the existence of papers using New Zealand data that contradict the findings of Li *et al*.

245. In sum, while Lally claims that I have not properly motivated my use of this particular form of the DGM:

- he does not identify any literature that would establish that the form of the DGM that I used in my previous report is unreasonable; and
- he does not state that he himself believes that the form of the DGM that I use is not capable of generating robust estimates of the forward-looking TAMRP.

246. Finally, I note that while Lally is particularly concerned with finding empirical support in the academic literature (and in particular using New Zealand data) for the use of my particular DGM estimate as a forecast of future equity returns, he does not appear to require the same of his own preferred methods of determining TAMRP.

247. Lally cites my reliance on Li *et al* from my 2013 report for the Australian ENA.[66] However, his reference to my use of this report is unnecessarily narrow. In section 4 of my report for the ENA I reviewed a wide range of literature focused on the stability and predictability of the return on the market and the market risk premium. Many of these papers report empirical results that reject a view that the market risk premium is constant over time. These findings suggest that relying wholly or significantly on historical measures of the TAMRP is likely to lead to misestimation of the cost of equity.

248. Lally does not report or comment on this aspect of my literature review. Given the extremely high hurdle on the standard of empirical proof required to sustain the use of DGM estimates for estimating the TAMRP, he is unable to provide this level of evidence in favour of any of his three measures of historical TAMRP or the survey evidence that he relies upon.

## 6.3 Predictive power of TAMRP estimates

249. Lally rejects evaluating a methodology for estimating TAMRP on the basis of its predictive power because markets might be inefficient and the greater predictive power might reflect an ability to predict the effects of mispricing on future returns. This counsel, applied consistently, provides no guidance to the regulator on how to set the TAMRP.

66 CEG, *Estimating the return on the market*, June 2013

250. The consequence of this view is that, if the predictive power of the model is in fact good, and the regulator sets the WACC at a lower rate based on a historical average, the typical potential investor will not supply capital to the regulated firm. Only a subset of pessimistic investors (those with the lowest estimates of the future MRP) will find the allowed low return on new investment in the regulated sector attractive enough to invest in the regulated firm rather than in a broad market index

251. If the regulator is going to deviate from a methodology with good predictive ability, then the regulator also needs to be able to identify times when the methodology is not accurate because the market is mispriced – as well as whether the market is under- or over-priced. The regulator would in fact have to believe that he/she was more skilled in estimating the future TAMRP than the money managers whose beliefs are reflected in market prices.

## 6.4 Stability of TAMRP estimates

252. Lally points out that relying on the DGM methodology would give very significant variation in estimates of the TAMRP over short periods.

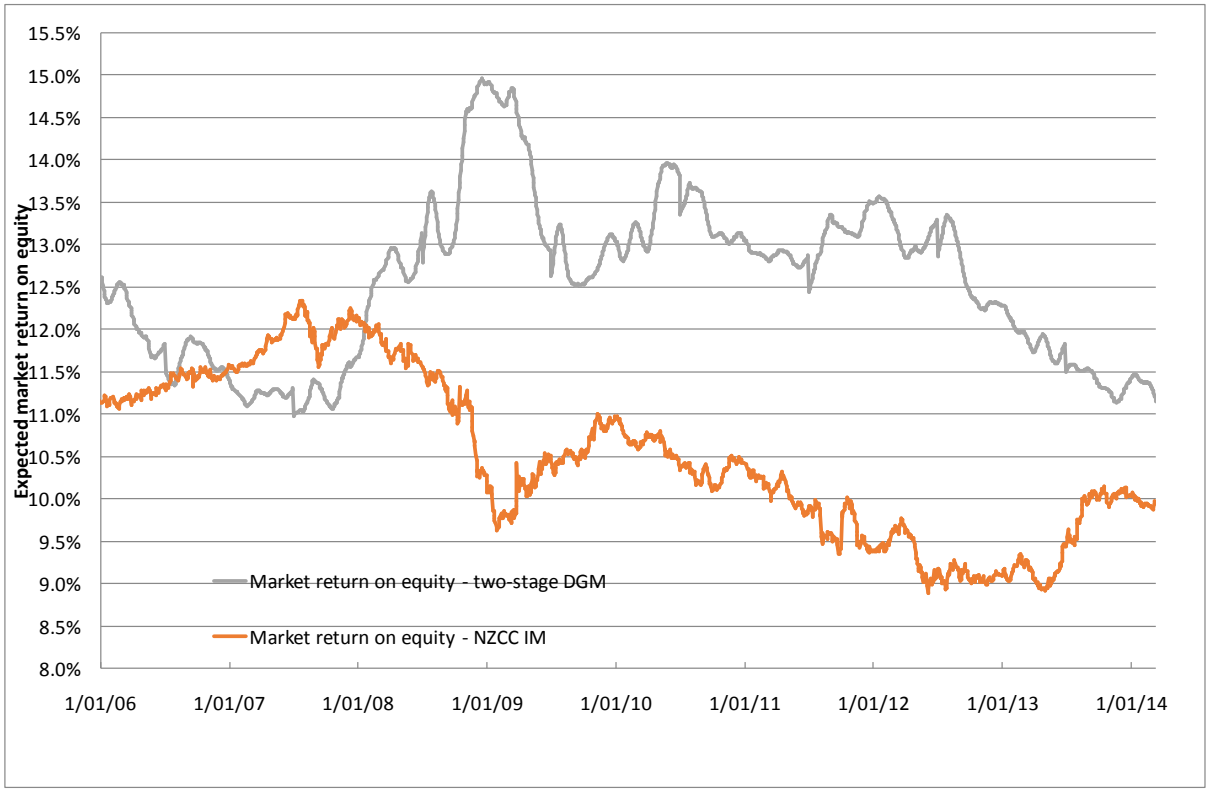
253. I agree with Lally that price stability is a criterion that should be considered in comparing methods of estimating the cost of capital. However, whether using the DGM to estimate the TAMRP gives rise to volatility in prices is relevant only to the extent that this gives rise to *greater* volatility than an alternative methodology. In considering this it is important to remember that it is changes in the cost of equity, not changes in TAMRP, that directly affect prices.

254. The findings in my previous report, and in particular Figure 6, suggest that this cannot be shown to be the case. Combined with Figure 7, it shows that:

- DGM estimates of the cost of equity tend to be more stable than DGM estimates of the TAMRP; and
- by comparison, giving overwhelming or exclusive weight to historical average measures of the TAMRP (as Lally proposes to do) does not give rise to a more stable estimate of the cost of equity and therefore prices as Lally impliedly suggests in his critique of the DGM.

255. For ease of reference, Figure 6 from my previous report is reproduced below.

**Figure 4: E[Rm](DGM with 8 year transition) vs E[Rm] with an invariant MRP**




*Source: Bloomberg, AER, CEG analysis*

256. Lally's suggestion that DGM estimates of the TAMRP would be variable does not equate to variability in prices. I show above that based on data over the past 8 years, one would not expect prices produced using the DGM method to be more variable than those using an historical average estimate for the TAMRP.

## 6.5 Lally's estimates of the TAMRP

257. In his report, Lally provides his own estimates of the TAMRP over both five and ten year periods. He estimates the TAMRP using five different methodologies: Three methodologies rely on historical estimates, one is a DGM estimate and one is based on a survey. Lally's median 10 year estimate is 6.7%, and his median 5 year estimate is 6.9%. Lally concludes that, collectively this suggests that an appropriate estimate of the TAMRP at the present time is 7% based upon both the five and ten year period.[67]

67 Lally report, pp. 36-39

258. In my view, Lally places too much emphasis on historical averages. Three out of his five estimates are based on historical data. Given that he selects the median from his sample, the use of three measures of the same approach means that Lally will almost certainly recommend a TAMRP in line with the results of an historical average TAMRP. This process for determining the TAMRP does not give any practical weight to estimates of forward-looking TAMRP.

259. This is problematic because, as I explain above, Lally does not provide any evidence that historical estimates of the TAMRP are good predictors of forward-looking TAMRP, although that is a standard that he demands of DGM estimates.

260. Based on his view that DGM estimates are unreliable, Lally appears to consider it desirable to blend these with results from different approaches *"particularly if these estimates are uncorrelated"*. Lally's ultimate method takes the median TAMRP over a sample of five estimates including three alternative measures of historical average TAMRP and one estimate based on surveys. [68]

261. The approach does not achieve what Lally claims for it. In particular:

- using a median of five estimates of TAMRP is not a 'blend' of the five estimates. It amounts to giving full weight to one of those estimates. Where three estimates are all based on the same historical average approach to estimating the TAMRP, Lally's method effectively gives full weight to this approach; and
- while I agree that combining uncorrelated estimates may be beneficial if these estimates are sufficiently robust, Lally does not do this. I note that historical average estimates of excess returns can be expected to be strongly correlated.

262. Lally claims that *"even if one of the estimates were biased, it still might warrant significant weight"*. He utilises an example that shows this numerically, indicating that under particular assumptions one would give 63% weight to forward looking estimates of the MRP and 37% weight to biased historical estimates.[69]

263. In practice, Lally's approach gives almost full weight to estimates of historical average TAMRP. Lally's arguments in favour of giving weight to biased estimates do not support this approach. Indeed, to the extent that Lally's assumptions reflect reality, these arguments support giving greater weight to DGM estimates of the TAMRP than to historical averages of the TAMRP.

264. Lally goes on to claim that *"an even better goal… would be to choose an estimator with minimal MSE… over the life of the regulated assets"*.[70] The effect of this

68 Lally report, p. 23

69 Lally report, p. 23

70 Lally report, p. 25

objective is that Lally believes that the best estimate of TAMRP that would be one over a much longer time period than 5 or 10 years. But this is wholly inconsistent with Lally's own critique of CEG's approach to the DGM analysis in section 6.1 above.

### 6.5.1 Reliance on historical averages

265. As I explain above, Lally does not provide any evidence (let alone New Zealand-specific evidence) that historical estimate of the TAMRP are good predictors of forward-looking TAMRP, although that is a standard that he demands of DGM estimates. In this context, it is difficult to understand why his sample of five estimates of TAMRP should include three estimates based on historical averages and only one based on DGM. In my view, Lally's approach involves an unreasonable composition of estimates.

266. As I set out in my previous report, I do not believe that historical estimates are generally likely to provide good predictions of forward-looking TAMRP, although it is possible that they may do so by chance on some occasions. That is, I do not believe that giving significant weight to historical measures of TAMRP is likely to improve the accuracy of these estimates. Indeed, Lally's analysis above to some extent concedes that this is the case.

267. Another motivation for averaging DGM estimates of the TAMRP with historical estimates of the TAMRP may be regulatory stability. That is, it is desirable that prices and therefore WACC parameters are not *too* variable over time. Averaging a current estimate of a volatile estimate of TAMRP with a stable historical estimate may achieve some level of stability in the estimate of TAMRP and in prices.

268. However, as I note above, it is not variability in the TAMRP that contributes to variability in prices, but variability in the cost of equity. Generating a stable estimate of TAMRP will not promote stability in pricing if it is then added to a volatile estimate of the risk free rate.

### 6.5.2 Reliance on survey evidence

269. Further, Lally's reliance on survey evidence is problematic. Lally argues that the most important characteristics of survey results are that they are recent, that they are product of careful consideration and that they contain results for other markets.

270. In my view, a survey would have to be well-designed and well-targeted to produce useful information about expectations of the forward-looking TAMRP. In respect of

the Fernandez survey relied upon by Lally, the term over which responded were estimating the MRP is not clear as Lally himself concedes.[71]

271. This was noted recently by the Australian Competition Tribunal in its consideration of survey evidence relied upon by the AER.[72]

> *Surveys must be treated with great caution when being used in this context* [of estimating the MRP].
>
> *Consideration must be given at least to the types of questions asked, the wording of those questions, the sample of respondents, the number of respondents, the number of non-respondents and the timing of the survey. Problems in any of these can lead to the survey results being largely valueless or potentially inaccurate.*
>
> *When presented with survey evidence that contains a high number of non-respondents as well as a small number of respondents in the desired categories of expertise, it is dangerous for the AER to place any determinative weight on the results.*

272. I note that a consequence of the Tribunal's view expressed above is that the quality of analysis applied by the AER to considering survey evidence is now much higher than it was previously. I do not see evidence that Lally has given careful consideration to the questions being asked, the target audience and the issue of non-respondents in the Fernandez survey that he relies upon.

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71 Lally report, p. 39

72 Australian Competition Tribunal, *Application by Envestra Limited (No 2) [2012] ACompT 3*, 11 January 2012, paragraphs 165–166.