NETWORK STRATEGIES
• Telecommunications Strategy •

Cross-submission: Commission expert reports on WACC

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Contents

0 Executive summary

Following a review of the submissions of Chorus' consultants in relation to the Commission's expert reports on the cost of capital for the UCLL (Unbundled Copper Local Loop) and UBA (Unbundled Bitstream Access) price reviews we recommend that the Commission, in general, relies on its initial advice from its own experts.

Although the Chorus consultant prefers its own recommended sample for determining an appropriate asset beta, we demonstrate that the exclusion of particular firms from this sample is justified and statistically robust. Thus the conclusions of the Commission's expert are sound.

With regard to the recommendations of the Commission's expert on benchmark gearing and credit rating assumptions, we agree that sample consistency is important but indicate why it is also necessary to consider regulatory precedent in making a final decision on these assumptions. Again we conclude that the recommendations of the Commission's expert are reasonable.

The Chorus consultant claims that there are flaws in the analysis underpinning the Commission's experts' recommendations regarding the cost of debt. We demonstrate that in the context of the required TSLRIC pricing principle the prevailing Debt Risk Premium (DRP) delivers superior investment signals than the preferred approach of the Chorus consultant which relies upon historical averages. Consequently the Commission should accept its expert's recommendation that the cost of debt be based on the prevailing cost of debt at the commencement of the regulatory period.

Chorus' consultants have recommended that the Commission includes in the cost of capital an allowance for costs of financial distress. There are many difficulties associated with this recommendation, including the arbitrary nature of the proposed adjustment. This would increase significantly the margin of error of the Commission's cost of capital estimate, and we recommend that the Commission does not include any such adjustment.

In common with the Chorus consultant we recommend that the Commission does not include the DGM model in the approaches considered for estimating the TAMRP.

1 Introduction

In response to the Commission's expert reports on the cost of capital for the UCLL and UBA price reviews, Chorus has submitted two consultants' reports from CEG[1] and Professor Grundy[2].

Vodafone New Zealand has requested that we consider the following issues:

- CEG's assertion that Oxera's estimate of the asset beta may be too low (Section 2)
- the claim that Oxera's recommendations regarding gearing and the credit rating are inappropriate (Section 3)
- counter-arguments to Lally on debt management strategies (Section 4)
- Professor Grundy's claim that the Commission should include an allowance for costs of financial distress (Section 5)
- recommendations in relation to the Tax Adjusted Market Risk Premium (TAMRP) estimation (Section 6).

Although this report has been commissioned by Vodafone the views expressed here are entirely our own.

2 Estimation of the beta

Oxera's estimate of the asset beta is substantially lower than CEG's own estimate. CEG claims that this lower estimate under-estimates the risk of providing UCLL and UBA services, thus providing inadequate compensation:

- 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

1 Competition Economists Group (2014), *Review of Lally and Oxera reports on the cost of capital*, July 2014.

2 Professor Bruce D. Grundy (2014), *Observations on the Review of Submissions on the Cost of Debt and the TAMRP for UCLL and UBA services*, 17 July 2014.

- it places too much weight on recent observations relative to long-term averages, particularly given the history of regulatory precedent in New Zealand.[3]

Chorus' own beta

In its assertion regarding Oxera's analysis of Chorus' own beta, CEG appears to exaggerate the significance of a so-called focus on this datapoint. In fact Oxera clearly states that:

> Chorus' beta is used as a focal point for our analysis, as it represents the most relevant datapoint, but *only to the extent that it can be tested for consistency* [our emphasis] with the alternative sources below [international and regional comparators, and regulatory precedent].[4]

Further, Oxera finds that its estimate of Chorus' asset beta is indeed consistent with those alternative sources.

While we certainly concur with Oxera that Chorus would be the best comparator to a hypothetical provider of UCLL and UBA in New Zealand in fact it is the only direct comparator. Nonetheless a strong reliance upon only a single comparator with a relatively limited trading history may introduce some error or bias within the resultant estimate. In our view it is also essential to incorporate additional information from other suitable comparators, such as those within Oxera's refined sample.

Exclusion of comparators from the sample

Oxera's analysis of a sample of international comparators was based on that of CEG's analysis on behalf of Chorus[5], with the exclusion of a small number of companies.

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3 Competition Economists Group (2014), *Review of Lally and Oxera reports on the cost of capital*, July 2014, paragraph 38.

4 Oxera (2014), *Review of the beta and gearing for UCLL and UBA services*, June 2014, Table 1.

5 Competition Economists Group (2014), *Response to Commerce Commission UCLL/UBA WACC consultation paper*, March 2014.

Oxera's criteria for inclusion were:

- companies must have copper fixed network assets
- companies must have the majority of its revenues (that is, more than 50%) from domestic operations
- companies must have non-zero trading volumes on at least 80% of all trading days ('liquidity threshold')
- data must be available for the time since Chorus commenced trading on 25 November 2011.

CEG claims that these 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.[6]

Given that all comparators have significant differences with Chorus, CEG's preference is to retain the larger (original) sample on the grounds that excluding data observations disregards "potentially useful information".

Statistical theory indicates that increasing the size of a randomly selected sample will improve the accuracy of sample estimates. Hence we need to understand if CEG's sample is truly random or whether it is more typical of a collection of subgroups[7] (Exhibit 1). In the case of the latter, an overall sample estimate (if not adjusted appropriately) may be misleading to use as a metric for Chorus, if these subgroups represent very different risk profiles.

6 Competition Economists Group (2014), *Review of Lally and Oxera reports on the cost of capital*, July 2014, paragraph 53.

7 Note that in this graph, and in the subsequent discussion, we have not separated Deutsche Telekom into the 'significant international' subgroup as Oxera chose to relax its criterion in this case. Nonetheless our own advice was that Deutsche Telekom should be excluded from the sample for failing to meet this criterion.

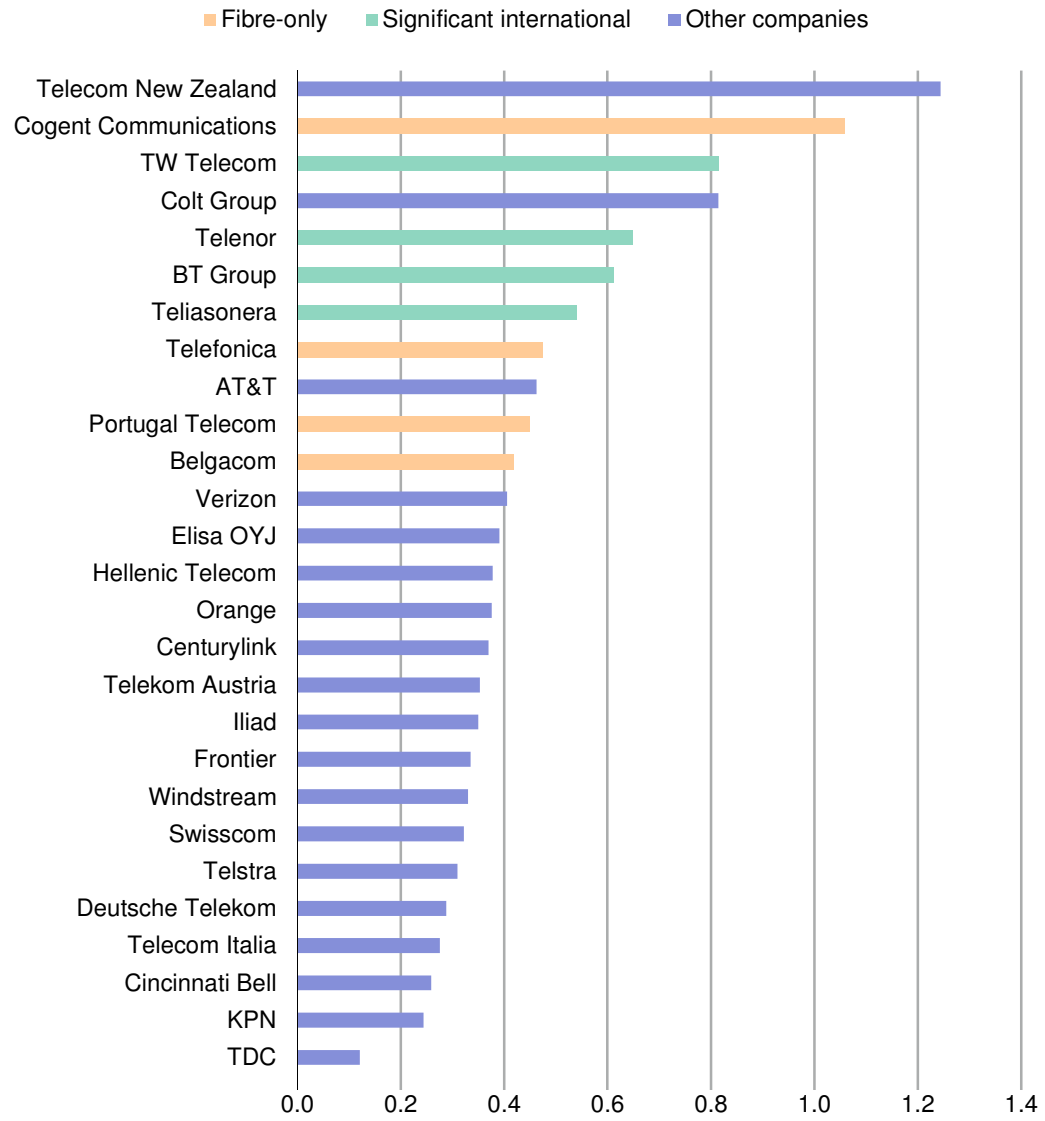

Exhibit 1: *Estimated daily five-year asset betas, ending 13 March 2014 [Source: CEG]*

Oxera's criteria certainly assume the existence of subgroups, and indeed the objective of identifying 'suitable' comparators for Chorus seeks to exclude any subgroups that would increase the uncertainty or error associated with sample estimates.

One potential subgroup is that of businesses without copper assets, which may further be split into fibre-only businesses and businesses without any fixed network assets. The fibre-

only businesses are viewed by CEG as being potentially superior comparators to Chorus than those firms that have substantial mobile businesses.

It should be noted that this particular criterion, and CEG's discussion, represents only a very superficial perspective of the nature of the businesses that were excluded. A more careful investigation of the operations of these fibre-only businesses – namely Cogent Communications, Colt Group, Lumos Networks and TW Telecom – shows that they operate only in metropolitan areas, where there is likely to be strong competition from multiple carriers. Such firms would have a very different risk profile to a business – like Chorus – that faces little or no competition across a substantial part of its operational footprint, and thus we would naturally expect them to have a relatively high asset beta.

Cogent Communications	Cogent Communications is a Tier 1 ISP providing Internet and data services (no voice services) over a fibre data-only IP network which extends from North America to Europe and Asia. The network appears to be limited to metropolitan areas. Cogent services only business and wholesale customers. It also has some of the highest asset betas of any firms within the sample (exceeded only by Telecom New Zealand).
Colt Group	The Colt Group is a provider of networking, communications and IT managed services to business, corporate and wholesale customers across 41 metropolitan areas in Europe. Colt's asset betas are well above CEG's sample average.
Lumos Networks	Lumos Networks provides services via a fibre network to residential, business, corporate and wholesale customers across several states in the Mid-Atlantic United States. The network appears to be restricted to metropolitan areas. As the company only commenced public trading in November 2011, a five-year asset beta is not available, and thus it was not included in CEG's analysis.
TW Telecom	TW Telecom provides managed services, including Ethernet and IP VPN services via a metropolitan fibre network to corporate and wholesale customers. It is one of the largest providers of business

> Ethernet in the United States and also has some of the higher asset betas within the sample.

These firms demonstrate consistently high asset betas (Exhibit 1), which are representative of the increased risk of operating within highly competitive wholesale environments. Inclusion of such firms would – rather than increasing the confidence in the sample estimates as a comparator for Chorus – introduce an upward bias in the results.

Telecom New Zealand was also excluded from Oxera's sample as it does not own a copper asset[8]. CEG argues that as this was not the case prior to November 2011, this should not be a criterion for excluding Telecom. We would assume that the effects of separation and the increasing exposure of Telecom to competition must have some impact on the level of risk, and thus would affect the asset beta. Telecom's only access network asset is mobile and it has no wholesale business. Thus the nature of Telecom's risk would be expected to differ from that of Chorus.

As we have previously noted[9] companies with substantial international ventures may face a very different level of risk to those that focus on domestic operations. It is clear from the five-year asset beta data (Exhibit 1) that firms excluded by Oxera based on this criterion – Telefonica, Telenor and TeleSonera – all have asset betas higher than the sample average.

Increased weight on recent data

CEG disagrees with Oxera's statement that:

> …more recent calculations are likely to provide the widest range of evidence for the asset risk faced by a representative firm operating and maintaining copper network assets.[10]

8 Telecom also failed Oxera's liquidity test.

9 Network Strategies (2014), *Expert reports on WACC for UCLL and UBA FPP*, 20 July 2014.

10 Oxera (2014), *Review of the beta and gearing for UCLL and UBA services*, June 2014, Table 1.

Oxera's analysis showed a declining asset beta for the average of its comparator set over four observations of five-year asset betas, which CEG claimed to be insufficient evidence to support the existence of any trend. However, if we examine the individual companies, we see that of the 16 firms that had data available for the five-year asset beta in 2004, only one (Frontier) had an asset beta in 2014 that was higher than that in 2004. If we examine the trend between 2009 and 2014, only six (BT Group, Colt Group, Orange, TDC, Telecom New Zealand and Telenor) of the 25 firms with data available in 2009 experienced an increase in the asset beta. Although this represents data for relatively few points in time, it does show clear evidence that asset betas for the majority of the companies exhibited similar movements over this period – in other words a consistent trend.

Even so, CEG admits that:

> …estimates of beta is [sic] subject to very significant measurement error and can change materially over time.[11]

CEG notes that for the electricity and gas industries the Commission relied upon five-year asset betas estimated over a period of 20 years.[12] What CEG neglects to mention is that the Commission's Expert Panel recommended that beta estimates should be checked for short-term anomalies:

> …when betas are directly estimated using returns data, the Commission should be wary of bubble-type periods and periods where firm-specific leverage has changed significantly. Such events can bias forward-looking estimates of beta. For example, there is evidence that during the 1987 October Crash, correlations between returns on securities and the market portfolio changed significantly and generated biased beta forecasts.[13]

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11 Competition Economists Group (2014), *Review of Lally and Oxera reports on the cost of capital*, July 2014, paragraph 43.

12 Commerce Commission (2010), *Input Methodologies (Electricity Distribution and Gas Pipeline Services) Reasons Paper*, 22 December 2010.

13 Franks, J., Lally, M. and Myers, S. (2008), *Recommendations to the New Zealand Commerce Commission on an Appropriate Cost of Capital Methodology*, Report prepared for the Commerce Commission, 18 December 2008, paragraph 100.

Furthermore, the Commission noted that the asset betas for firms within the sample were relatively stable over the 20 year timeframe (1990 to 2010).[14]

The situation for telecommunications is somewhat different in that the initial part of the previous two decades was a highly unusual time. The earlier estimates of asset betas would reflect the dot-com bubble (1997 to 2000) and subsequent tech-wreck period (1999 to 2001). Applying equal weighting to data encompassing such anomalous events would introduce a bias – as suggested above by the Commission's Expert Panel – and is unlikely to reflect a long-term view.

If there is some underlying trend within the data, use of a long-term average in a situation where there is a declining trend will lead to an over-statement of the forecast for the asset beta, with the result that Chorus will be over-compensated. Furthermore, the TSLRIC approach of the FPP must be forward-looking, and thus it is inappropriate for the Commission to apply a similar weighting for historical data as to the most recent information.

3 Gearing and the credit rating

CEG appears to endorse Oxera's recommended 40% as appropriate for the benchmark level of gearing based on average gearing across the full sample of comparators. However the average of Oxera's refined comparator sample is 47%. CEG indicates that the Commission should use the same sample as the basis for decisions on parameter values, avoiding mixing and matching. In principle we agree with CEG that a consistent sample is preferable. Nevertheless the range of observations in both samples for two year leverage is wide. In these circumstances we consider that it is reasonable to compare the results from both samples and it is also appropriate to consider regulatory precedent to form a final view.

Similarly CEG criticises Oxera for recommending a target credit rating of A- or BBB+ 'based on a completely different analysis, including appeal to regulatory precedent'[15].

14 Commerce Commission (2010), *Input Methodologies (Electricity Distribution and Gas Pipeline Services) Reasons Paper*, 22 December 2010, paragraph H8.50.

While we agree that Oxera could have provided a more detailed analysis, when considering credit ratings of selected comparators it is important to note that credit ratings are an opinion and do not represent a numerical measure or scale. As we have noted previously[16]:

> Standard & Poor's credit ratings are not exact measures of the probability that a certain issuer or issue will default but are instead expressions of the relative credit risk of rated issuers and debt instruments. In assigning ratings, Standard & Poor's rank orders issuers and issues from strongest to weakest based on their relative creditworthiness and credit quality within a universe of credit risk. To link any rating to precisely expected default rates would imply a degree of scientific accuracy that the rating process is not intended to provide or deliver[17].

As such there is no standard interval between all ratings and it is impossible to average observed values. Consequently Oxera's approach is, in our view, reasonable as is the resultant recommendation.

4 Debt management strategies

CEG claims that there are flaws in Lally's analysis which underpin Lally's recommendation that the cost of debt be based on the prevailing cost of debt at the commencement of the regulatory period.

In particular CEG disputes:

- Lally's illustration that the difference between the prevailing and historical average DRP (debt risk premium) allowances is immaterial
- that the prevailing DRP delivers superior investment signals than historical averages
- that the introduction of a historical average methodology would involve both complexity and the need for transitional arrangements.

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15 Competition Economists Group (2014), *Review of Lally and Oxera reports on the cost of capital*, July 2014. See paragraph 114.

16 Network Strategies (2014), *Setting a value for the WACC: benchmarking, risk and uncertainty*, 11 April 2014.

17 See http://www.standardandpoors.com/aboutcreditratings/RatingsManual_PrintGuide.html.

Differences between prevailing and historical average DRP allowances

CEG criticises Lally's analysis of the Commission's allowed DRP versus that actually incurred in New Zealand for regulated industries since 2007. CEG claims that 7.5 years is too short a sample period 'to assess the potential future magnitude of errors'[18].

Using historical United States data dating back to 1919 CEG purports to illustrate that the difference between a ten-year trailing average and a prevailing rate reset every five years (with the first regulatory period commencing in 1929) is larger than the trivial difference found by Lally, with firms being under-compensated more often than over-compensated. CEG concludes that one cannot safely assume under-compensation in one period will be offset by over-compensation in the next, but that there will be 'significant under or over compensation for long periods – at considerable cost to either the business in question or the customers'[19].

We doubt that CEG's historical information is as relevant as the more recent local information presented by Lally. The CEG data spans time periods in which commercial and regulatory circumstances evolved and changed substantially in the United States. Without more information about these circumstances it would be difficult to use this data as the basis of setting a forward-looking cost of debt. It is unlikely, for instance, that the approach regarded by firms as efficient in respect of debt financing in the 1930s would be the same as that in the 2000s. Moreover, if the prevailing regulatory environment influenced firms' debt policies at the time, it is questionable how relevant this information is in the current regulatory context. Finally we note that CEG's results would vary depending on the assumed year of the regulatory reset. For example, the results would change if 1932 was the assumed commencement of the five year regulatory period rather than 1929.

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18 Competition Economists Group (2014), *Review of Lally and Oxera reports on the cost of capital*, July 2014. Paragraph 181.

19 *Ibid*, paragraph 190.

Investment signals

CEG appears to claim that investment incentives in relation to capex and new entry are irrelevant as Chorus is not subject to Regulatory Asset Base (RAB) regulation. With an RAB regime CEG notes that:

> … 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 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.
>
> 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 [a historical average approach] Option B (which accurately compensates efficient debt raising costs over time) will provide better incentives than [Lally's recommended] Option A.[20]

CEG has above described the circumstances of the Australian electricity and gas entities subject to regulation by the AER, and as CEG has rightly identified these are not the current regulatory circumstances of Chorus. Yet paradoxically CEG's own recommendation to the Commission is to apply a historical approach for the cost of debt consistent with 'the approach implemented by the AER and Ofgem in the UK'[21]. Neither of these regulators are required to apply a TSLRIC costing standard, as the Commission must apply in its UCLL and UBA FPP process. As we have noted previously[22], in the context of a TSLRIC assessment the regulator seeks to establish the forward-looking cost for a hypothetical efficient operator to provide the regulated service. New investment is central to TSLRIC methodologies and as such approaches to setting the cost of debt that

20 *Ibid*, paragraphs 199 to 200.

21 *Ibid*, paragraph 211.

22 Network Strategies (2014), *Expert reports on WACC for UCLL and UBA FPP*, 21 July 2014.

encompass historical averages may not deliver efficient incentives for the hypothetical operator. An approach that encapsulates historical debt costs may preclude new entry, where the new entrant raising all its debt at the commencement of the regulatory period would incur a current cost of debt above the historical average.

Complexity and transitional arrangements

CEG asserts that in order to implement its recommendations, no transitional process is necessary as there is no existing regime 'applied to Chorus for the purpose of modelling the cost of debt for UBA and UCLL services'[23]. While it is indeed the case that the Commission has not previously estimated a cost of debt specifically for these services, the Commission has established precedents in estimating the WACC for telecommunications services – notably for the Telecommunications Service Obligation (TSO) between 2001 and 2010. Lally's recommendation with respect to the cost of debt is aligned with the approach used in the TSO while CEG's recommendation, if implemented, would represent a significant and unanticipated change in the Commission's approach.

One of Lally's major concerns with the implementation of a historical averaging approach is addressing the issue (discussed above) of incentives for new entry and capex. Lally identifies possible approaches to achieve this, which would introduce considerable complexity to the estimation process. As CEG does not believe that new entry and capex are relevant considerations in the Commission's TSLRIC modelling exercise, CEG considers that its recommendation has no associated complexities. We agree with Lally that new entry and capex must be accommodated and consequently should the CEG recommendation be adopted additional complexity in estimation would be unavoidable.

5 The costs of financial distress

Professor Grundy considers that the Commission should include an allowance in the cost of debt for the costs of financial distress (CFD) – that is, future costs associated with debt financing. The argument is couched entirely in terms of 'allowed revenues'. Relying on

23 Competition Economists Group (2014), *Review of Lally and Oxera reports on the cost of capital*, July 2014. Paragraph 205.

empirical research from 2007 Grundy suggests that the present value of CFD is 5% of the market value of the average firm[24], and thus recommends an adjustment to 'allowed revenues' to avoid a 5% decrease in the value of a regulated firm.

> The future annual allowed revenues need to be increased by such an amount that the present value of the future annual allowed revenues is increased by 5%. Treating the annual increase as a perpetuity, the allowed revenues should be increased by WACC x 5% x firm assets[25].

We can find no regulatory precedent for the inclusion of such an allowance, although Grundy notes that 'regulatory regimes invariably overlook CFD' and that 'CFD should be included as a building block in the regulatory process'[26].

We recommend that the Commission does not consider the introduction of a CFD allowance as it is associated with many difficulties including:

- the concept does not appear to reconcile readily with setting a WACC for a hypothetical efficient operator
- reliance on one empirical estimate for an appropriate assumption is unsatisfactory
- it is unclear from Grundy's submission how such an allowance would be implemented in the regulatory WACC.

Given these uncertainties any attempt to include a CFD allowance in the regulatory WACC, in the absence of considerable additional research, would increase the margin of error.

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24 Professor Bruce D. Grundy (2014), *Observations on the Review of Submissions on the Cost of Debt and the TAMRP for UCLL and UBA services*, 17 July 2014. See paragraph 42.

25 *Ibid*, paragraph 44.

26 *Ibid*, paragraph 51.

6 The Tax Adjusted Market Risk Premium

CEG concurs with Lally's criticism of its application of a dividend growth model (DGM) methodology in that it calculates a market return for an infinite time horizon rather than for a five-year term that corresponds to the period required for the TAMRP. CEG does not believe this approach to be unreasonable.

We have previously discussed[27] the reasons why the DGM model should not be included in the approaches considered for estimating the TAMRP – or at worst should be given less weight.

Nonetheless we do find inconsistencies within CEG's arguments over the TAMRP. CEG clearly states that:

> …current forward-looking measures of the TAMRP need not necessarily be similar to those in 2010.
>
> …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. [28]

Following this logic, we would then expect a TAMRP forecast for the next five years to differ from that based on a market return to infinity. We cannot therefore understand why one would use an estimate based on a different time horizon to that required.

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27 Network Strategies (2014), *Expert reports on WACC for UCLL and UBA FPP*, 20 July 2014.

28 Competition Economists Group (2014), *Review of Lally and Oxera reports on the cost of capital*, July 2014, paragraphs 233-234.

7 Conclusions and recommendations

In general the recommendations of Chorus' consultants imply that the Commission's choices in estimating parameters of the regulatory WACC for a hypothetical UCLL / UBA provider should to a large extent be driven by Chorus' actual financial position and historical decisions. Where precedents for recommendations are cited by the Chorus consultants these typically relate to regulated revenues and RAB methodologies, particularly in the context of the regulation of Australian electricity and gas industries. Such precedents are of little or no relevance to the Commission's task of estimating the forward-looking cost of capital in the context of a TSLRIC modelling exercise. It is not surprising that the Chorus consultants can find no relevant precedents for their recommendations from TSLRIC-based regulatory decisions.

We recommend that the Commission in estimating the regulatory WACC for a hypothetical UCLL / UBA provider:

- accepts Oxera's analysis of the asset beta, although we recommend exclusion of Deutsche Telekom from the sample
- accepts Oxera's recommendations regarding gearing and the credit rating
- accepts Lally's recommendation that the cost of debt be based on the prevailing cost of debt at the commencement of the regulatory period
- does not include any allowance for costs of financial distress
- does not include the DGM model in the approaches considered for estimating the TAMRP.

The various WACC input parameters are associated with differing degrees of uncertainty, due to the nature of the estimation process and limitations of the underlying data. It may be helpful for the Commission to undertake sensitivity testing to explore the overall impact on the WACC of various likely combinations of inputs – note that our emphasis here is to focus on more likely values rather than those at the edges of associated confidence intervals. This may provide the Commission with added certainty in the selection of the resultant WACC value – which, given the sensitivity of cost models to even small changes in the WACC, would provide additional support to the Commission's assumptions.