

# Expert reports on WACC for UCLL and UBA FPP

Final report for Vodafone New Zealand, 21 July 2014

Network Strategies Report Number 34013

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## 0 Executive summary

In estimating the Weighted Average Cost of Capital (WACC) for the Unbundled Copper Local Loop (UCLL) and Unbundled Bitstream Access (UBA) final pricing principle (FPP) process the Commission proposes to use as a starting point the 2010 input methodologies formulated in the context of Part 4 regulation. At the same time, since the FPP uses the Total Service Long Run Incremental Cost (TSLRIC) standard, the Commission recognises that some of the components of the WACC will need to be ‘tailored to the context of the forward-looking cost based price’. This mission differs in many respects from the development of a WACC in the context of a building block model. As such the relevant reference point is a hypothetical efficient provider of UCLL / UBA services, not the regulated entity.

Consistent with overseas regulatory practice, we consider that a true forward-looking approach would not take into account historical debt associated with existing assets, but would consider only the efficient issue of new debt. Furthermore, in setting the regulatory cost of debt the Commission should not consider the possible impact on output prices. To do so would imply that the Commission is setting WACC in a way that will influence the FPP cost model results rather than making an independent assessment of an appropriate forward-looking WACC.

Naturally benchmarking information relating to the UCLL / UBA services of the regulated entity should be considered along with comparative data from other relevant comparators. While historical data may also be used to inform estimates TSLRIC requires a forward-looking WACC. This means that where there are alternative approaches available to estimating parameters the Commission should prefer those that reflect forward-looking costs rather than actual or historical costs.

Our key conclusions and recommendations are:

- Chorus’ actual credit rating should not be given primary weight in selecting a target credit rating
- a term credit spread differential (TCSD) is inappropriate in the context of TSLRIC as it is associated with actual debt rather than a hypothetical operator

- no adjustments to the cost of debt are necessary based on Chorus' actual debt holdings
- the use of historical averages in setting the cost of debt is inconsistent with a TSLRIC approach
- an averaging approach is likely to be superior to a curve-fitting approach for estimation of the debt risk premium (DRP); furthermore foreign currency denominated bonds should not be considered in this calculation
- both the approach and data used in the estimation of the tax adjusted market risk premium (TAMRP) requires further scrutiny, and the use of historical data dating back to 1900 may be inconsistent with estimating a forward-looking WACC
- in estimating the asset beta the proposed comparator sample is in general robust, but the estimation method introduces a bias into the results and as such medians rather than averages should be used
- an appropriate leverage assumption reflects efficient leverage rather than actual leverage and as such a 40% assumption based on comparative data is suitable
- a zero debt beta assumptions is appropriate at 40% notional leverage
- a separate beta is not required for UCLL and UBA.

## 1 Introduction

Two expert reports on the Weighted Average Cost of Capital (WACC) have been prepared by Martin Lally<sup>1</sup> and Oxera<sup>2</sup> for the Commerce Commission specifically for use in the Unbundled Copper Local Loop (UCLL) and Unbundled Bitstream Access (UBA) final pricing principle (FPP) process.

On behalf of Vodafone New Zealand we have reviewed the following aspects of :

- Lally's report (Section 2)
  - choice of a target credit rating for a UCLL / UBA provider
  - use of a firm-specific term credit spread differential (TCSD)
  - regulatory debt policy

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<sup>1</sup> Lally, M. (2014), *Review of submissions on the cost of debt and the TAMRP for UCLL and UBA services*, 13 June 2014.

<sup>2</sup> Oxera (2014), *Review of the beta and gearing for UCLL and UBA services: evidence and recommendations*, June 2014.

- DRP estimates
  - methods used to find tax-adjusted market risk premium (TAMRP) estimates.
- Oxera’s report (Section 3)
    - observed Chorus beta
    - selection of the sample of comparator companies
    - approach to estimating the beta
    - suitability of Oxera’s proposed notional leverage
    - debt beta
    - need for a separate beta for UCLL/UBA.

Finally we present our concluding remarks in Section 4.

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

## 2 The Lally report

### 2.1 The choice of a target credit rating for a UCLL / UBA provider

In selecting a target credit rating Lally recommends that the Commission does not rely solely or place primary weight on Chorus’ actual credit rating. As Lally notes, to do so ‘would constitute a cost-based rather than an incentive-based approach to the cost of debt for a UCLL/UBA provider’<sup>3</sup>. We agree with Lally’s recommendation, as in implementing a LRIC model the Commission must consider the credit rating of a hypothetical efficient provider of UCLL / UBA services. The assumed leverage should be then be set consistent with the target credit rating. This is further discussed in Section 3.4.

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<sup>3</sup> Lally, M. (2014), *Review of submissions on the cost of debt and the TAMRP for UCLL and UBA services*, 13 June 2014. Section 2.2.

## 2.2 The use of a firm-specific term credit spread differential

Lally considers that the inclusion of a term credit spread differential (TCSD) – to compensate for the greater debt premium some regulated firms may incur where their average debt tenor is greater than the regulatory period – may give rise to perverse incentives. In particular, Lally notes that this may encourage some firms ‘to lengthen their average debt term without consideration of the cost of doing so’<sup>4</sup>.

In earlier submissions on this issue both Network Strategies (on behalf of Vodafone)<sup>5</sup> and PwC (on behalf of Telecom)<sup>6</sup> preferred the Commission’s practice with respect to Telecommunications Service Obligation (TSO) decisions<sup>7</sup>. In this case the regulatory period was one year which clearly may not normally reflect an efficient borrowing term. Accordingly the Commission made allowances for this in its estimation of the regulatory WACC and a debt margin was set as the sum of:

- the one year debt premium (proxied by a five year debt premium)
- annualised debt issuance costs
- interest rate swap contract costs.

In adopting the above approach a TCSD is unnecessary. However Lally suggests that both PwC and Network Strategies fail to take proper account of staggered borrowing. Lally notes that even if the prudent (or efficient) borrowing term matches the regulatory term the need for staggered debt remains, and consequently an allowance for transactions costs on interest rate swap contracts should be included in the regulatory cost of debt.

For the TSO the WACC of an efficient TSO provider was required but, unlike the UCLL and UBA FPP process, the TSO estimation was undertaken retrospectively. The current

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<sup>4</sup> Lally, M. (2014), *Review of submissions on the cost of debt and the TAMRP for UCLL and UBA services*, 13 June 2014. See page 19.

<sup>5</sup> Network Strategies (2014), *Commission consultation on WACC for UCLL and UBA services*, 27 March 2014.

<sup>6</sup> PwC (2014), *Submission on Commerce Commission’s technical consultation paper: Determining the cost of capital for the UCLL and UBA price reviews*, 7 March 2014.

<sup>7</sup> Commerce Commission (2009), *Final TSO Cost Calculation Determination for TSO Instrument for Local Residential Telephone Service for period between 1 July 2006 and 30 June 2007*.

FPP TSLRIC methodology requires a forward-looking WACC as appropriate for a hypothetical efficient UCLL / UBA provider. It appears that Lally (in arguing that even when the regulatory term matches the prudent borrowing term allowances would still be required for staggered debt) implicitly accepts the following CEG interpretation of forward-looking as reflecting an existing operator with existing assets<sup>8</sup>, rather than a new or hypothetical operator:

I consider that, in relation to debt funding, “forward-looking costs over the long run” means the costs of implementing an efficient debt management policy to fund assets that are assumed to already be in existence and capable of providing the “total quantity of the facilities and functions that are directly attributable to, or reasonably identifiable as incremental to, the service”.

The Commission in its UCLL issues paper proposes to use as a starting point the 2010 input methodologies formulated in the context of Part 4 regulation, but admits that some of the components of the WACC will need to be ‘tailored to the context of the forward-looking cost based price for the UCLL’<sup>9</sup>.

A true forward-looking approach would not take into account historical debt associated with existing assets, but would consider only the efficient issue of new debt. The emphasis placed by CEG on historical information and CEG’s cited ‘regulatory precedents’ relate not to TSLRIC-based models but to top-down building block models (used in the electricity and gas industries in Australia). The concept of the TCSD is also firmly associated with **actual** debt. The inconsistency between assuming a debt management policy relevant for existing assets and TSLRIC principles becomes more pronounced if the TSLRIC model assumes that existing assets are not re-used and an optimised replacement cost is applied to all assets.

If Lally and / or the Commission consider that particular adjustments to the cost of debt are necessary based on Chorus’ actual debt holdings, then this should be made explicit with

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<sup>8</sup> CEG (2014), *Response to Commerce Commission UCLL/UBA WACC consultation paper*, March 2014, paragraph 273.

<sup>9</sup> Commerce Commission (2013), *Process and issues paper for determining a TSLRIC price for Chorus’ unbundled copper local loop [UCLL] service in accordance with the Final Pricing Principle*, 6 December 2013. See paragraph 183.

reasons, given that such a course of action would be inconsistent with the TSLRIC pricing principle. Further discussion of these issues follows in Section 2.3.

### 2.3 Regulatory debt policy

Lally proposes that the Commission's approach in setting the cost of debt should be based on seven criteria. According to Lally these criteria both encompass and extend CEG's four recommended criteria<sup>10</sup> for the best regulatory approach. In our view Lally's criteria relate to three main issues:

- |  |   |
|--|---|
| <i>Impact on the regulated firm</i>      | <ul style="list-style-type: none"> <li>• A viable debt policy exists 'that in conjunction with the regulatory policy will satisfy the NPV=0 principle'</li> <li>• Bankruptcy risk for the firm is minimised.</li> </ul>   |
| <i>The wider impact</i>                  | <ul style="list-style-type: none"> <li>• Give rise to low average output prices for consumers</li> <li>• Give rise to low volatility in output prices for consumers</li> <li>• Not give rise to undesirable incentives, particularly 'in respect of capex and new entrants to the regulated sector'.</li> </ul> |
| <i>Practical / implementation issues</i> | <ul style="list-style-type: none"> <li>• Implementation of the approach should be both possible and straightforward</li> <li>• Should the regime change a simple transitional approach should be possible which minimises windfall gains or losses to firms caused by the regime change.</li> </ul>             |

Using the above criteria Lally then considers three alternative regulatory approaches to setting the cost of debt:

- **Option A:** the cost of debt is the sum of:
  - the risk-free rate at the beginning of the regulatory period for a term matching the regulatory period

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<sup>10</sup> Consistency with actual firm behaviour, capable of replication by firms, low transactions costs in the process of replication, and yielding low price volatility to consumers.

- the DRP at the beginning of the regulatory period for a term matching the average period over which firms borrow
  - transactions costs of interest rate swap contracts required to align the RFR component of the firm’s staggered debt with the regulatory term
- **Option B:** the cost of debt is the sum of:
    - the risk-free rate at the beginning of the regulatory period for a term matching the regulatory period
    - the historical average DRP for a term matching the average period over which firms borrow
    - transactions costs of interest rate swap contracts required to align the RFR component of the firm’s staggered debt with the regulatory term
  - **Option C:** the cost of debt is based on historical averages for a term matching the average period over which firms borrow.

Lally recommends Option A on the basis that it presents fewer practical difficulties in implementation, and reduces incentive problems for new entrants, and new capital investment (Exhibit 1). With respect to the impact on the regulated firm, Lally’s analysis indicates that the risk of increased bankruptcy is immaterial, while violations of the NPV = 0 principle are unlikely to be substantial (and mitigation measures are possible).

We broadly agree with Lally’s recommendation, but for differing reasons to those presented by Lally, and with the exception of using a term matching the average borrowing term rather than the regulatory period for the DRP calculation. 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. Therefore the key criterion from Lally’s list is incentives for new entrants. As Lally implicitly identifies, the approaches that encompass the historical averages may not deliver efficient incentives for new entrants. Indeed, an approach that encapsulates historical debt costs may in fact preclude new entry, where the new entrant raising all its debt at the commencement of the regulatory period is faced with a current cost of debt above the historical average. The impact on the regulated firm of the regulatory debt policy is only important to the extent that the legislation allows for regulatory consideration of the actual circumstances of the firm. The risk of bankruptcy for a particular firm falls into the same category.



We also agree with Lally that the practicality and ease of implementation of the proposed approach to setting the cost of debt must be considered. For example, an approach which requires regular updating of parameters introduces additional costs to the regulatory process, together with uncertainty for affected parties.

With respect to the impact on output prices – on both the average level and volatility – we are unsure of the significance of these issues in the context of determining an appropriate WACC. The implication of considering, at this juncture, the impact on output prices suggests that the Commission should set WACC in a way that will influence the cost model results rather than to make an independent assessment of an appropriate forward-looking WACC.

	<i>Option A</i>	<i>Option B</i>	<i>Option C</i>
<i>Impact on firm</i>			
– viable debt policy	No	Yes	Yes
– minimised bankruptcy risk	?	Yes	Yes
<i>Wider impact</i>			
– low average output prices	A and B the same	A and B the same	Higher
– low volatility on output prices	A and B the same	A and B the same	Less volatility
– incentives for new entrants and capex	Yes	No	No
<i>Practical issues</i>			
– ease of implementation	Yes	No	No
– ease of transition with regime change	Yes	No but possible	No but possible

**Exhibit 1:** *Lally's assessment of alternative regulatory approaches to cost of debt [Source: Lally, Network Strategies]*

Both ComReg in Ireland and Ofcom in the United Kingdom use forward-looking approaches with respect to the cost of debt in WACC calculations for fixed line services. ComReg recently decided that the cost of debt already incurred by firms should not be included in forward-looking estimates for WACC.

As the proposed WACC is calculated on the basis of a Hypothetical Efficient Fixed Line Operator, there is no clear basis on which to judge what, if any, existing debt that a

Hypothetical Efficient Fixed Line Operator would have incurred, nor the size of this relative to future debt requirements. It is quite feasible to expect this to be minimal for a Hypothetical Efficient Fixed Line Operator as an efficient new entrant would not have any legacy debt. It is on this basis that the cost of debt is calculated on the basis of forward looking cost of debt.<sup>11</sup>

Thus ComReg did not propose to take account of the financial situation of the Irish incumbent fixed line operator, Eircom, which has experienced severe financial difficulties in recent years, culminating in a default on debt.

As Eircom is currently very highly geared, one consequence of this is an associated higher cost of debt. Eircom's 2012 default on its debt is likely to have impacted on its cost of debt. These inefficiencies are not included in the analysis of the cost of debt of a Hypothetical Efficient Fixed Line Operator.<sup>12</sup>

In its assessment of the risk free rate ComReg used as a reference point ten-year German government bonds. Note that the regulatory term will be three to five years, commencing in 2014/15. The debt premium was based on expert judgement following a review of debt premiums for utilities from various European companies.

In the United Kingdom, Ofcom's general approach to estimating the cost of debt for the regulatory WACC takes into account historical and current information but with a forward-looking focus ensuring relevance for the regulatory period which is typically three years. Note that for fixed services Ofcom's modelling approach has changed over time from LRIC to an RAB-style method, but Ofcom still seeks an appropriate forward-looking efficiency standard.

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<sup>11</sup> ComReg (2014), *Review of Cost of Capital: Mobile Telecommunications, Fixed Line Telecommunications, Broadcasting (Market A and Market B)*, ComReg 14/28, 11 April 2014. See paragraph 6.44.

<sup>12</sup> *Ibid*, paragraph 6.57.

When estimating the cost of debt, we consider that BT's current estimate of debt is a good proxy for the efficiently incurred forward looking cost of debt to be included in the WACC estimate.<sup>13</sup>

Furthermore, Ofcom acknowledges that, with no allowances for historical debt, under- or over-recovery may occur due to the nature of forecasting. In other words, depending on actual performance over the regulatory period NPV for the regulated firm may be negative or positive and there is no opportunity for any clawback.

We note that our normal approach to setting regulated charges involves a forecast of the costs of providing a service. Where costs need to be estimated, the risks of under-recovery sit with BT and the rewards of over-recovery accrue to BT. We would not seek to claw-back any previous over recovery which BT received. In the same regard, we do not consider it appropriate to include the costs associated with historic debt. Under this approach, it may be the case that costs turn out to be higher or lower than expected. In a new price control period, new information may inform the latest set of assumptions and forecasts, however, we do not take "retrospective" action".<sup>14</sup>

## 2.4 The debt risk premium estimate

### *Foreign currency denominated bonds*

Lally recommends that the Commission does not include foreign currency denominated bonds when estimating the DRP based on:

- an observed lack of liquidity
- the need to rely on low quality secondary market based estimates

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<sup>13</sup> Ofcom (2014), *Fixed access market reviews: wholesale local access, wholesale fixed analogue exchange lines, ISDN2 and ISDN30 – Annexes*, 26 June 2014. See Annex 14.

<sup>14</sup> Ofcom (2011), *WBA Charge Control, Charge Control framework for WBA Market 1 Services, Statement*, 20 July 2011. See paragraph 6.70.

- the extent of foreign-denominated bonds to be included and whether weightings need to be applied to bonds of different types.

We agree with Lally's recommendation. While we accept that firms do raise funds through various channels, the introduction of foreign currency denominated bonds into the DRP calculation inevitably increases the need for subjective judgement which would increase the margin of error. Furthermore, with no systematic bias in the difference between DRPs on local currency bonds versus foreign currency denominated bonds there is no justification for including the latter in the DRP calculation.

#### *Estimating the debt risk premium*

Lally notes that while averaging is commonly used to obtain a debt risk premium (DRP) by averaging over a sample of suitable bonds with appropriate terms to maturity, this can introduce some bias:

- a downward bias due to concave yield curves
- an upward bias due to estimating the DRP at an average term.

This is illustrated by an example, however we note that the quantum of both biases will be dependent on the actual characteristics of the bonds – the combinations of DRP values and terms to maturity. So while in Lally's example the upward bias is more significant than the downward bias, this may not always hold.

We agree with Lally in that ideally both averaging and curve fitting approaches be used to estimate DRP, as this provides a useful cross-check of the results.

We recall in a previous TSO exercise undertaken by the Commission in which a regression of bond data was used in estimating the DRP, there were actually very few suitable bonds that could be incorporated within the analysis.<sup>15</sup> This would tend to suggest that there may be insufficient information to support a robust curve-fitting approach. Without sufficient

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<sup>15</sup> Network Strategies (2010), *Cross submission on TSO Draft Determination 2008/09*, 25 February 2010.

data to support the analysis, a curve-fitting approach may be misleading and provide little value.

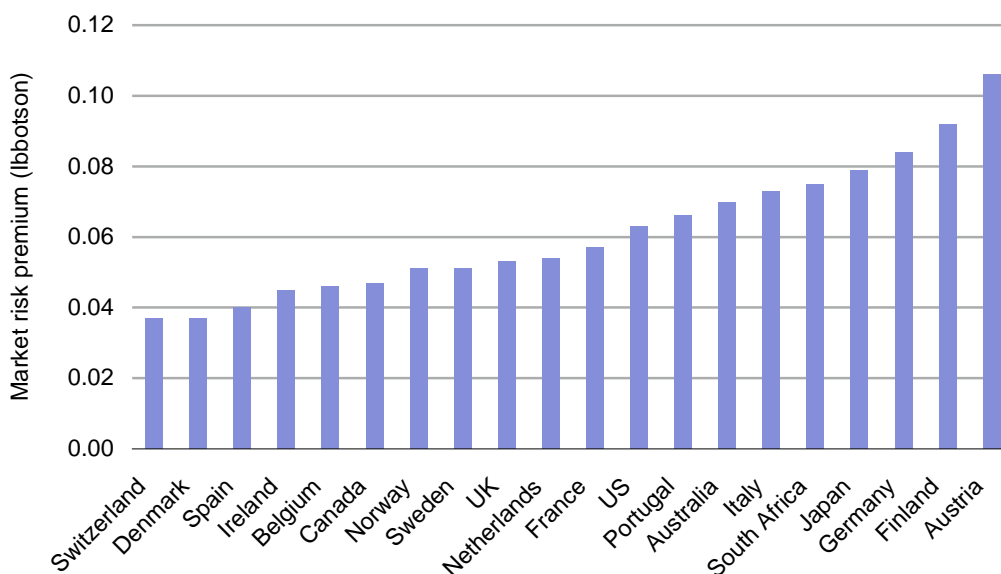
The averaging approach has the advantage that it is relatively straightforward to implement, whereas curve fitting can be quite complex and, as noted above, requires sufficient suitable data.

## **2.5 Estimating the tax-adjusted market risk premium**

Lally estimates the TAMRP using five different methods. For each of these five methods, Lally produces an estimate for New Zealand and an average estimate across different samples of foreign markets. A median across all methods is determined and then the two medians are averaged to obtain a final TAMRP. This process is performed both with ten year as well as five year risk free rates.

### *Ibbotson approach*

This method involves historical averaging of excess returns based on New Zealand market data over the period 1931 to 2013. Lally also uses this approach in estimating the average TAMRP for a sample of 20 foreign markets (Exhibit 2). We would recommend the use of the sample median rather than the sample average, to reduce the effect of outliers or extreme values.



**Exhibit 2:** Market risk premium (Ibbotson estimate) for the sample of foreign markets  
[Source: Lally]

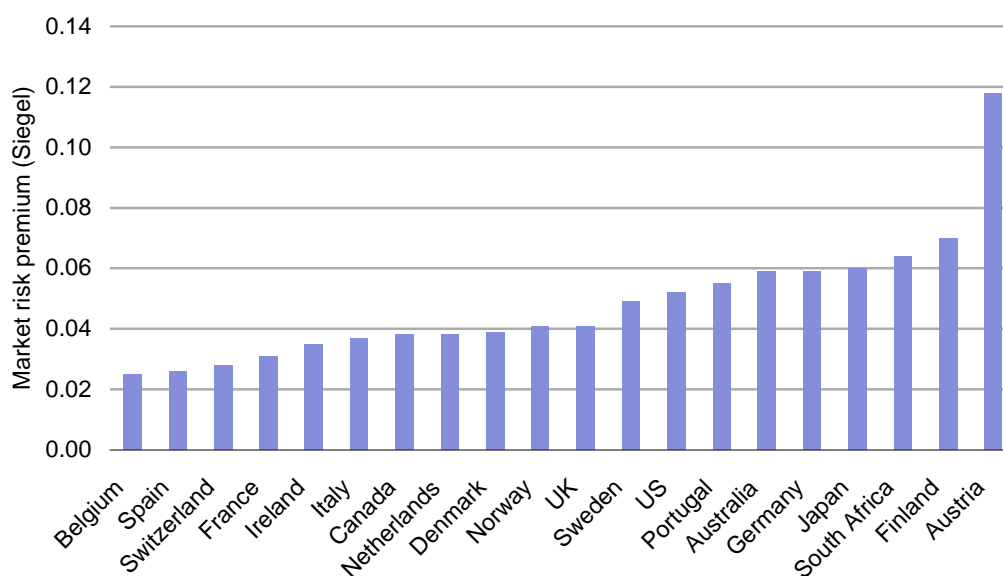
Lally notes that all the countries within the sample – with the exception of South Africa – are developed countries and are thus ‘suitable comparators for New Zealand’. We do not understand why South Africa was retained within the analysis, however omitting it has no impact on the sample average of the market risk premium and only a small impact on the median.

#### *Siegel estimate*

This method is an adaptation of the Ibbotson approach, which adjusts for biases that may be due to low returns from bonds that may be due to unanticipated inflation – the “late 20<sup>th</sup> century inflation shock”. Lally applies this approach to New Zealand market data for the period 1931 to 2013.

Lally also applies a modified version this approach in estimating the average TAMRP for a sample of 20 foreign markets, as in the Ibbotson approach. Note that one market –

Austria – is an extreme value<sup>16</sup> (Exhibit 3) and has a highly influential effect on the sample average. We therefore recommend use of the sample median – as is our usual practice – rather than the average. This reduces the market risk premium from 0.048 to 0.041, and the resultant estimated TAMRP from 0.061 to 0.054. Alternatively, Austria could be omitted from the analysis, in which case the average market risk premium of the reduced sample falls to 0.045, and the estimated TAMRP becomes 0.058.



**Exhibit 3:** Market risk premium (Siegel estimate) for the sample of foreign markets [Source: Lally]

As in the Ibbotson approach we do not understand why South Africa was retained within the analysis, however omitting it has only a small impact on the sample average of the market risk premium (0.047) and no impact on the median.

<sup>16</sup> Even though Austria is now a relatively prosperous nation, real equity returns since 1900 have been extremely low – only 0.7% per year, the lowest amongst a sample of 20 countries in a study published by Credit Suisse. The remaining countries ranged from 1.7% (Italy) to 7.4% (Australia and South Africa). While trading in Austria was interrupted during the wars, after the stock exchange reopened trading remained sluggish for several decades. See Credit Suisse (2014) *Credit Suisse Global Returns Yearbook 2014*.

*DGM model*

While it uses dividend growth models (DGMs) the AER commented that:

They rest upon the fundamental proposition that the value of an asset is a function of expected future income and the discount rate, which in this case is the required return on equity. DGMs are suited to the estimation of the rate of return from current market information, as demonstrated by US regulators using them for this purpose. However, the outcomes are sensitive to the model assumptions, especially the assumed long term growth in dividends and the transition from current dividends to the long term growth path. There are a range of plausible assumptions that one could make on these parameters.<sup>17</sup>

Lally notes that this approach assumes convergence to the long-run expected growth rate in dividends per share (DPS) over an 11-year period – longer periods would produce higher estimates of the TAMRP, and thus the 11-year period represents a conservative view. Furthermore the resultant estimates are high as the method assumes a constant return in perpetuity.

In the case of Lally's comparison of estimates from foreign markets, this method could only be applied to Australian data, rather than a wider sample, which renders it less useful for comparative purposes.

These issues, in our opinion, would suggest that the DGM model not be included in the approaches considered – or should be given less weight – however omitting it has only a small effect on the median across all the methods.

*Surveys*

For this method Lally uses data from a previous study<sup>18</sup>, in which estimates of the standard MRP from 51 markets were obtained from survey data. The study was based on responses

<sup>17</sup> Australian Energy Regulator (2012), *Better Regulation Explanatory Statement: Rate of Return Guideline*, December 2013. See Section 6.3.5.

<sup>18</sup> Fernandez, P., Aguirreamalloa, J., and Linares, P. (2013), *The Market Risk Premium and Risk Free Rate Used in 51 Countries*, IESE Business School working paper. Available at [http://www.netcoag.com/archivos/pablo\\_fernandez\\_mrp2013.pdf](http://www.netcoag.com/archivos/pablo_fernandez_mrp2013.pdf).



from finance and economic professors, analysts and managers of companies in those markets.

Lally excludes Hong Kong from his analysis, and divides the remainder into 22 advanced markets (comprising the 20 markets used in his Siegel estimation plus South Korea and Singapore) and the rest. Lally further claims that New Zealand is comparable to the former group. As before, we would question the inclusion of South Africa, but note that its omission would have little effect on the result. Lally also includes three Asian markets (Japan was in the sample for the Siegel estimation), yet does not include Taiwan which could have been considered an advanced economy; however there is little impact if these markets are omitted.

We do note however that some of the foreign market estimates are based on relatively few survey responses. Denmark, Finland, Ireland, the Netherlands, Singapore and South Africa, as well as New Zealand, all had less than ten survey responses. By contrast, the Australian estimate was based on 17 responses, the Spanish estimate on 804 responses and the United States estimate on 2394 responses. This suggests that the quality of some estimates may be better than others.

Unlike the other methods, the survey data was collected in 2013, and thus may not necessarily reflect a long-run average over a period comparable to that used by Lally in the Ibbotson and Siegel methods.

#### *Obtaining an final estimate*

In relation to the various methods that can be used to estimate the market risk premium, the AER noted:

...we give greatest consideration to historical averages followed by estimates of the MRP from DGMs and then surveys. We also give some consideration to conditioning variables and other regulators' estimates of the MRP.<sup>19</sup>

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<sup>19</sup> *Ibid*, Section 6.3.4.

This can be contrasted with Lally's approach of taking the median across all methods, that is, where there is no weighting based on expert opinion of the characteristics of those methods.

We note that in the derivation of the final TAMRP estimate, Lally uses a relatively gross level of rounding, to the nearest 0.5%, to obtain his final result of 7.0%.

We also note several arithmetic errors in the various methods. The most notable problem is the value used for New Zealand ten year and five year differential rates, in the Ibbotson estimate and the Siegel version 1 estimate – 0.8% has been used instead of the stated value of 0.08%. Correcting for these errors has a small effect on the estimates for the individual methods.

#### *Using historical data*

The use of historical data dating back to 1931 (or even 1900 in some methods) may have little relevance to either the required forward looking estimates. There may well be some fundamental structural changes in a market which may result in very old historical data becoming less relevant for estimating future risk. In fact Lally's weighted averaging of the TAMRP estimates across two time periods – for example in the Ibbotson approach estimates for the two periods 2003-2013 and 1931-2002 are weighted by the number of years in each period – introduces a bias favouring the older data.

Clearly there is variation in the TAMRP over time. If estimated over different time periods, different results are obtained, as is shown by Lally. So what time period should be used? Ultimately the Commission must decide what time period is appropriate in the context of estimating a forward-looking WACC.

#### *Estimation based on a five year risk free rate*

We note that Lally's estimation of TAMRP using a five year risk free rate seems to be based on a rather 'quick and dirty' approach. Lally states:

...five year data is only available in New Zealand since 1985. However, data is available on both five and ten-year rates in the US since 1953. This allows an approximation as follows. Firstly, the average differential for the New Zealand five and ten year rates since 1985 has been 0.07%. In addition, the average differential for the US five and ten year rates over the period 1953-1985 has been 0.08%. I extrapolate the latter differential to New Zealand for the same period and also to the earlier period 1931-1953. The average differential over the entire period 1931-2014 is then 0.08%.<sup>20</sup>

Lally's assumption that the differential between ten- and five-year rates in New Zealand would be the same as that in the United States has no firm basis, and does not consider whether or not there may be fundamental differences between the two markets. Further, he replaces actual New Zealand data with US data, again with little justification.

Our suggestion would be to obtain sample data from other markets, and/or use only the New Zealand actual data.

### 3 The Oxera report

Oxera has examined company-specific components of the WACC for the UCLL and UBA services. In particular the report addresses:

- the asset beta for a fixed access telecommunications provider
- the gearing and long-term credit rating for a fixed access telecommunications provider
- the debt beta and equity beta that would be assumed for a hypothetical operator
- whether the UCLL and UBA services should have a different beta to the hypothetical operator.

In doing so Oxera states that it has considered previous WACC submissions in the FPP process, as well as more general Commission consultations and decisions regarding the WACC.

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<sup>20</sup> Lally, M. (2014), *Review of submissions on the cost of debt and the TAMRP for UCLL and UBA services*, 13 June 2014, page 37.

With respect to the key issue of the quantum of the beta, Oxera's recommendations are based on reviews of international telecommunications betas as well as the observed Chorus beta.

### 3.1 Assessment of the observed Chorus beta

Oxera estimates Chorus' asset and equity beta from market data. With Chorus' relatively short trading history of 2.5 years, Oxera notes that the use of daily data has the benefit of providing a larger sample size than if weekly or monthly data were to be used.

However, the disadvantage of the short time period is that there is insufficient information to smooth out any seasonal or cyclical effects, if present. Furthermore data from the early days of Chorus' trading may contain some anomalies due to initial sentiment associated with the implementation of separation. While certainly Chorus' share price has fallen since trading commenced, this may be due to a combination of market shocks (such as the unexpected increases in UFB build costs), as well as an easing of market sentiment.

We note in its calculations Oxera uses the NZX50 and ASX300 rather than the relevant All Share indices. Inclusion within the two indices require companies to meet certain liquidity thresholds, which would ensure that the beta estimates are not affected by companies with little or no trading.

Chorus is also listed on the Australian stock exchange, and forms part of the ASX300, as does Telecom, Auckland Airports and Sky Network Television, all of which are used as comparators for Chorus. Using ASX data as well as NZX data would provide additional observations and thus may improve the quality of the sample estimates.

Oxera compares Chorus' estimated betas with those of a sample of New Zealand and Australian listed utilities in the telecommunications, energy and airport sectors. We note that Oxera did not include several potential Australian-listed comparators, including:

- Envestra – natural gas distribution, operating as regulated monopolies in key population centres in three states
- M2 Group – telecommunications

- Singapore Telecommunications – telecommunications operator
- SP AusNet – electricity transmission, electricity distribution and gas distribution.

All of these firms are included in the ASX300.

In addition, Oxera did not include Mighty River Power – a member of the NZX50 index – in its analysis. Oxera provides no information as to the criteria for selection in its sample, so there is no evidence to support why these firms were excluded from its analysis.

While we would suggest that the analysis be strengthened by the inclusion of these companies, we would also ask Oxera for information on the reasons for selection, as these firms may have been purposefully omitted.

### 3.2 Selection of the sample of comparator companies

In its estimation of the asset beta, Oxera undertakes an analysis of a sample of international comparators. This sample was based on that of CEG's analysis on behalf of Chorus<sup>21</sup>, with the exclusion of a small number of companies.

We are in agreement with Oxera and CEG in that there are no direct comparators for Chorus: that is, there are no publicly traded pure-play fixed network access operators. The challenge therefore in deriving a sample is to ensure that the companies do not diverge too significantly from Chorus.

An alternative approach would be to use a large sample which would seek to reduce the effect of sample variation. However the characteristics of Chorus would suggest that it may well be an outlier when compared with companies that are vertically integrated and have substantial mobile operations – which typify most of the companies within CEG's sample or indeed most publicly listed telecoms companies around the world. In such a situation, a larger sample is unlikely to provide an improved estimate for Chorus' asset beta.

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<sup>21</sup> Competition Economists Group (2014), *Response to Commerce Commission UCLL/UBA WACC consultation paper*, March 2014.

With little guidance on where Chorus may be placed relative to companies within a sample, the pragmatic approach would be to have a sample that is not too small – that is, large enough to deliver robust results without being unduly affected by any extreme datapoints – but not too large so that there is a strong influence from companies that are not suitable comparators for Chorus.

We previously noted<sup>22</sup> that some companies within the CEG sample should not have been included as they are very different to Chorus, in particular:

- some companies had substantial international operations
- some had fibre-only networks and operated in only metropolitan areas.

These issues were also recognised by Oxera, which reduced CEG’s sample by requiring companies to meet certain criteria, namely:

- 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.

Based on these criteria, Oxera eliminated eight companies from the sample:

- Cogent Communications
- Colt Group
- Lumos Networks
- Telecom New Zealand
- Telefónica
- Telenor
- TeliaSonera

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<sup>22</sup> Network Strategies (2014), *Setting a value for the WACC: benchmarking, risk and uncertainty*, final report for Vodafone, 11 April 2014.

- TW Telecom.

We concur with Oxera's view that these companies would be less reliable as comparators for Chorus. However Oxera retained Deutsche Telekom even though it generates less than half of revenues from domestic operations – the given reason being that the majority of its earnings came from Eurozone countries. European (excluding Germany) revenues comprised around 23% of total Group revenues in 2013, however this component of Deutsche Telekom's operations focuses mainly on Eastern Europe<sup>23</sup> and Greece – areas that involve quite a different level of risk to that of Germany or even New Zealand. Furthermore, we estimate that over half of Deutsche Telekom's revenues are sourced from mobiles, and that wholesale revenues from its German operation comprise only around 6% of Group revenues. We therefore do not believe that Oxera's criteria should have been relaxed in this instance to include Deutsche Telekom as a comparator for Chorus, however we note that excluding this company has very little effect on the results.

### 3.3 Approach to estimating the beta

Estimates of the asset beta are calculated from the selected sample. Oxera follows CEG's approach, in that the sample average for each five year period is calculated (over the period 1999 to 2014), and then the end result is calculated as the average across these five year periods.

The implicit assumption for this method is that there is some underlying long run average for the asset beta. In reality the values vary over time, which is demonstrated most clearly by examining the trends in the individual companies' asset betas. While this could well be in response to various economic and environmental factors in this particular instance we note that the small sample size for the first ten years – and in particular, for the first five year period – may also be a significant factor in this variation.

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<sup>23</sup> Deutsche Telekom operates in a number of Eastern European markets: Bulgaria, Croatia, Czech Republic, Hungary, Poland, Romania and Slovakia. Deutsche Telekom also has operations in Austria and the Netherlands, but these countries comprise around 18% of its non-German European revenues. The Eurozone country that generates the most revenue outside of Germany is Greece (around 22% of non-German European revenues). Source: Deutsche Telekom (2014), *Annual report 2013*,

A single company – BT Group – is highly influential for the 1999 time period. The use of averages rather than medians produces estimates that are affected by extreme values, such as that for BT Group. This effect is also more pronounced in situations with small sample sizes, such as the 1999 time period (Exhibit 4).

<i>Time period</i>	<i>All comparators</i>	<i>Refined comparators</i>
1999	7	6
2004	14	13
2009	26	19
2014	27	20

**Exhibit 4:** Number of datapoints used to estimate asset beta [Source: Oxera]

Furthermore, we find that the estimation method used by Oxera and CEG actually introduces a bias into the result, placing equal weight on each of the time periods. This means that a time period with relatively few datapoints – and thus having a large standard error, in addition to being affected by any influential datapoints – is given the same weighting as a time period with a much larger sample of companies.

We would therefore recommend that medians be used, rather than averages. In addition, in the absence of any analysis of the relationship between asset beta and environmental factors, we recommend that less weight be placed upon older data, as this may be less relevant to the time period associated with the FPP process, as well as being associated with greater sampling error.

### 3.4 Suitability of Oxera’s proposed notional leverage

We agree with the approach taken by Oxera in estimating notional leverage. This approach reflects efficient leverage rather than the actual leverage of the firm. Although in some circumstances efficient leverage may be the same as the actual leverage of the regulated firm<sup>24</sup>, like Oxera we do not believe that this currently applies in New Zealand. Chorus

<sup>24</sup> For example, in 2011 Ofcom used Vodafone’s observed leverage over the previous two years as it considered that this represented an appropriate assumption for an average efficient provider of mobile services. In its latest mobile communications review Ofcom has proposed to use the same approach. See Ofcom (2014), *Mobile call termination market review 2015-18*, 4 June 2014, Annex 14.



currently has increasing net debt and declining equity value, and its own expectation is that the leverage ratio will increase further during the UFB build period<sup>25</sup>. This highlights the fact that Chorus' actual leverage bears a relationship to its UFB deployment and so cannot be considered as representative of that of an efficient provider of UCLL and UBA services only.

The Oxera estimate of 40% is, as it demonstrates, consistent with both current regulatory practice for fixed line services, and with the average of comparator firms. Should Deutsche Telekom be omitted from the comparator set as we recommended above there would be a very small decline in Oxera's average two-year leverage results for comparator firms.

In comparison with previous leverage assumptions in estimating the WACC for fixed line services in New Zealand, during the TSO Determinations the Commission used an assumption of 30%. However in a 2009 Standard Terms Determination<sup>26</sup> the Commission decided that it was reasonable to increase leverage to 35% 'in light of recent declines in equity values', and noting that this value was consistent with the assumption applied by Ofcom (at that time).

Oxera also considers the implications of its proposed leverage for the asset beta and credit rating, given that there may be relationships amongst these three variables. Oxera reviews the trade-offs between business and financial risk typically considered by a credit rating agency that for 40% leverage a target credit rating of A- would be appropriate. Oxera also considers regulatory precedent, notably:

- the ACCC assumes an A credit rating for Telstra
- the Commission assumes A- for airports
- the Commission assumes BBB+ for electricity and gas.

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<sup>25</sup> Chorus (2013), *Chorus full year result, FY13*, 26 August 2013. See page 23.

<sup>26</sup> Commerce Commission (2009), *Standard Terms Determination for the designated services of Telecom's unbundled copper local loop service (sub-loop UCLL), Telecom's unbundled copper local loop network co-location service (sub-loop co-location) and Telecom's unbundled copper local loop network backhaul service (sub-loop backhaul)*, 18 June 2009.

Oxera concludes that on balance a target credit rating of A-/BBB+ is appropriate but that A- should be used as the base case. On the basis of Oxera's own analysis it would appear that A- would be most suitable and we agree that the Commission should apply this as its base case assumption.

### 3.5 The debt beta

Oxera considers that there will be an impact on the equity beta if the Commission applies a 40% notional leverage assumption while Chorus' actual gearing is above 60%. As such Oxera recommends a non-zero debt beta assumption. Our view is that a zero debt beta assumption is appropriate at a 40% notional gearing level but we agree that in practice where actual leverage differs substantially from notional leverage a non-zero debt beta is likely. This is typically acknowledged by regulators although normal regulatory practice is to invoke a simplifying assumption of zero on the grounds that the impact of including a non-zero value does not justify tackling the difficulties involved in estimation of the parameter. For example, ComReg states:

The use of zero debt betas reflects the difficulties of producing reliable estimates of debt beta. It also reflects the fact that, where debt beta is low and notional gearing is close to companies' actual gearing levels, the inclusion of debt beta does not make a material difference to the cost of capital. However, a non-zero debt beta may be appropriate in some circumstances, for example if elevated debt premiums suggest that the systematic risk of debt has increased.<sup>27</sup>

In reaching a decision on whether to include a non-zero beta the Commission should consider whether it is appropriate to give significant weight to the Chorus beta as Oxera appears to have done in this instance.

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<sup>27</sup> ComReg (2014), *Review of Cost of Capital: Mobile Telecommunications, Fixed Line Telecommunications, Broadcasting (Market A and Market B)*, ComReg 14/28, 11 April 2014. See paragraph 5.33.

### 3.6 Is a separate beta required for UCLL/UBA?

We agree with Oxera that there should not be separate asset betas for UCLL and UBA. While we recognise that there would be extreme practical difficulties in estimating different asset betas for the two services, due to the lack of suitable market data from Chorus and comparator companies, we agree that there is no compelling evidence to suggest that there should be separate betas.

We note that the Swedish regulator, PTS, applies a single fixed network WACC to all fixed access products.

In contrast, Ofcom uses a different WACC for bitstream (wholesale broadband access, or WBA) and unbundled local loop. For the latter, the BT Openreach WACC is used, and for WBA the Rest of BT WACC. Ofcom derives separate estimates for the two WACCs.

Ofcom's reasoning for separate WACCs is based on its finding that:

...demand for WBA is likely to be more uncertain and more cyclical than demand for copper access.

This supports the argument that cash flows of WBA will be more variable and result in a higher cost of capital than copper lines services. For this reason we believe WBA should not be classified within BT's copper access business for the purposes of an assessment of risk levels. We expect that their future demand will be more closely correlated with the economy-wide level of economic activity than other access services.<sup>28</sup>

Ofcom's supporting analysis examined the variability of demand for the six year period 2004/05 to 2009/10, the underlying assumption being that services with stable demand involve less risk than services with volatile or highly variable demand. Since that time we note that there have been some significant structural changes in many telecommunications markets, including:

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<sup>28</sup> Ofcom (2011), *Proposals for WBA charge control*, 20 January 2011.

- increased fixed-mobile substitution
- declining demand for copper services
- increased take-up of broadband services
- increasing availability and take-up of mobile data and WiFi services.

This would tend to suggest that any differences in the risk profiles of copper services and WBA may have reduced since Ofcom conducted its initial analysis. If repeated today, this analysis may result in a very different outcome.

#### **4 Concluding remarks**

It will be important for the Commission to be guided by the principles of TSLRIC in selecting appropriate values for many of the parameters that comprise the WACC. This mission differs in many respects from the development of a WACC in the context of a building block model. As such the relevant reference point is a hypothetical efficient provider of UCLL / UBA services, not the regulated entity. Naturally benchmarking information relating to the UCLL / UBA services of the regulated entity should be considered along with comparative data from other relevant comparators. While historical data may also be used to inform estimates TSLRIC requires a forward-looking WACC. This means that where there are alternative approaches available to estimating parameters the Commission should prefer those that reflect forward-looking costs rather than actual or historical costs.

Finally, the WACC should not be set in a way that will influence the FPP cost model results but should reflect an independent assessment of an appropriate forward-looking WACC.