NETWORK STRATEGIES
• Telecommunications Strategy •

Setting a value for the WACC: benchmarking, risk and uncertainty

Final report for Vodafone, 11 April 2014

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Contents

0 Executive summary

In estimating an appropriate weighted average cost of capital (WACC) for the UCLL / UBA final pricing principle model the key assumptions should not represent actual or observable values of the regulated entity, unless those values reflect those of an economically efficient operator. Furthermore, the Long Run Incremental Cost (LRIC) approach requires a *long-run* perspective, hence all WACC parameters should be forward looking. Actual values for the various WACC parameters will not necessarily be representative of the long term view of the business.

The proposals of Chorus' consultants in relation to WACC methodologies and parameters, encompass a strong emphasis on the use of Chorus' actual data. Examples include:

- an analysis based on actual returns of the business rather than the economically efficient returns required for regulatory purposes
- use of extensive historical data, extending back 20 years and the challenging period of the dotcom crisis, which would introduce some bias if used for a long term view of the future business
- arguments for a separate allowance for asymmetric risk based on Chorus' actual situation rather than that of a hypothetical efficient UCLL / UBA provider.

In order to derive appropriate estimates for WACC parameters, a methodologically sound comparative analysis or benchmarking will be key to the process. While we recognise the challenges in obtaining reliable benchmarks for telecoms businesses, in examining the benchmarking analysis presented by Chorus' consultants we found a number of inappropriate comparators, inconsistencies and inaccuracies. We believe that, using the Input Methodologies (IMs) as a starting point, a more rigorous analysis with minimal use of subjective assessment should deliver robust parameter estimates that will withstand regulatory and legal scrutiny.

1 Introduction

In response to the Commission's technical consultation paper on determining the cost of capital for the UCLL and UBA price reviews, Chorus has submitted consultants' reports from CEG[1] and Professor Grundy[2]. At the request of Vodafone New Zealand, this short report addresses the following issues raised in the two consultants' papers:

- uncertainty in WACC parameters
- benchmarking approaches to estimating particular WACC parameters
- asymmetric risk.

We note that the Chorus submissions extend to discussions on actual parameter values, which the Commission noted will be the subject of consultation at a later date. Therefore we focus primarily at this stage on the methodological issues raised by Chorus' consultants, with no discussion of actual parameter values.

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

Following this Introduction we discuss:

- dealing with uncertainty via the 75th percentile (Section 2)
- benchmarking approaches for WACC parameters (Section 3)
- allowances for asymmetric risk (Section 4).

Finally we present our concluding remarks in Section 5.

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

2 Professor Bruce D. Grundy (2014), *The Logic and Economics underlying the use of a 75% Rule in a Regulatory Environment*, 25 March 2014.

2 Dealing with uncertainty via the 75th percentile

In support of using the so-called 75th percentile[3] for WACC parameters, Professor Grundy provides an analysis that purports to explain why this is preferable to using the midpoints as estimators. He refers to the use of this higher estimate as the "75% rule".

Incorporating additional business risks

Grundy claims that a regulated business faces risks for which it is not explicitly compensated. Such risks may include the risk of stranding assets and disaster risk. If these risks are not recognised by the regulator, Grundy states that without an appropriate adjustment to the WACC the regulator will over-estimate future profits.

The key question here is whether or not the WACC already allows for such risks. If parameters are derived from sample data that incorporates such risks, then further adjustments to the WACC would be unnecessary, otherwise the risks would be double-counted. As we do not yet know the information on which the parameter estimates will be based, it is premature to state conclusively that adjustments should be made to address these risks.

If in its calculation of WACC parameters the Commission uses sample data that does not account for risks relevant to the regulated service, there may be grounds for an adjustment. However rather than simply endorsing the use of an arbitrary estimate higher than the midpoint (such as the 75th percentile), our preferred approach would be for the Commission to explore firstly how such risks have been quantified for various companies or other industries. This would give far better guidance on the appropriate adjustment.

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3 We have previously noted that the Commission's estimated 75th percentile is simply a value higher than the mid-point and does not reflect the point at which there is 75% certainty that the true WACC value is lower. See Network Strategies (2014), *Commission consultation on WACC for UCLL and UBA services*, 28 March 2014.

Regulated costs lower than actual costs

Grundy further states that an additional justification for the 75% rule is due to:

> …the regulatory underestimation of expected operating costs. The estimate of future profits used by a regulator will exceed the true value of a regulated business's expected future profits. This occurs whenever demand is uncertain and marginal cost is increasing.
>
> The regulator's calculation of the cost of producing the expected quantity demanded at the allowed price is an underestimate of the true expected cost of producing the quantity demanded at the allowed price.[4]

In his comparison of the regulator's estimate of expected profit with the "true value" of expected profit, Grundy makes some unsubstantiated assumptions, in particular the use of a quadratic cost function. There is no evidence to suggest that the cost function is quadratic – it may just as easily take on other forms, in which case Grundy's calculations would be invalid.

If the regulator uses economic costing methods, such as the long-run incremental cost (LRIC) approach required by the final pricing principle, the calculated cost will normally be lower than the operator's actual cost as economic costing is based on the costs of an efficient operator. The use of economic costing aims to encourage operators to increase efficiency and not reward operators for inefficiencies. Therefore suggesting that estimates of the WACC parameters be higher than the midpoint as actual costs are higher than economic costs essentially seeks to compensate the operator for the underlying characteristics of the LRIC approach. This would be contrary to the objectives of the final pricing principle.

Furthermore, we note that the LRIC approach requires a *long-run* perspective, hence all WACC parameters should be forward looking. Thus it may be inappropriate to use actual values for the various WACC parameters, as these will not necessarily be representative of the long term view of the business.

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4 Professor Bruce D. Grundy (2014), *The Logic and Economics underlying the use of a 75% Rule in a Regulatory Environment*, 25 March 2014, paragraphs I.4-5.

If we examine Ofcom's 2012 analysis of the WACC for the unbundled local loop (LLU) and wholesale line rental (WLR) services[5], we see that despite some movements in the actual data for the various parameters, Ofcom did not update its WACC estimate from the value estimated a year earlier for wholesale broadband access (WBA). Ofcom stated that its preference was to ensure consistency, however for some parameters the long term view was unaltered, despite some changes in actual data over the year.

75% or 80% rule?

In his consideration of how a regulator should determine the appropriate percentile to be used, Grundy claims that the regulator should seek to minimise the loss associated with underinvestment in infrastructure against loss of "greater than normal returns to investors in regulated businesses"[6].

It is difficult to understand how this exercise may fit within the final pricing principle.

While Grundy's worked example of the sum of two independent, normally distributed estimators may be of academic interest, it cannot be considered to be illustrative of the situation faced by the Commission. The cost of capital is determined by a far more complex formula of parameters: nonetheless we can assume that the standard error of the WACC will be greater than that of any individual parameter.

3 Approaches for benchmarking WACC parameters

Deriving values for the various WACC parameters is a challenging process, and one technique often used – either to set values or as a cross-check – is benchmarking. However it is generally quite problematic to obtain reliable benchmarks for telecoms businesses due to the difficulties in identifying suitable comparator businesses. Differences in scale and scope mean that the analyst may not be comparing like with like. Furthermore the

5 Ofcom (2012) *Charge control review for LLU and WLR services*, 7 March 2012, Annex 8.

6 Professor Bruce D. Grundy (2014), *The Logic and Economics underlying the use of a 75% Rule in a Regulatory Environment*, 25 March 2014, paragraph V.1.

underlying risks differ markedly from country to country, due to the frequently unique characteristics of investment in each market.

The analyst must also be mindful of the fundamentals of the regulatory process and the final pricing principle, namely that the LRIC approach requires a forward looking long run view. Data that is not consistent with this view – for example data for a period in which the nature of the business and the investment risk are very different to what is anticipated for the regulatory time period – will be inappropriate and should not be used.

In its submission, CEG has already undertaken some benchmarking analysis. The focus of our comments is on the methodological issues, not the parameter values.

Asset and equity beta

It is extremely challenging to identify a sample of firms that are comparable to Chorus. While we readily acknowledge this challenge, we believe several businesses within CEG's sample of 31 firms should not be included.

CEG notes that its sample may not be very comparable with Chorus, in particular:

- all the sample firms have a retail presence[7]
- many of the firms have a mobile business[8].

In addition several of the sample businesses – for example Telefonica and Telenor – have substantial international operations, which is another clear point of difference with Chorus.

There are few publicly listed operators that are wholesale fixed line businesses such as Chorus. BT Group – claimed by CEG as the best comparator – also has retail operations,

7 For some firms in the sample, wholesale revenues comprise a relatively small part of total revenue – for the calendar year 2013, wholesale was 21% of Centurylink's total revenue, while for Verizon wholesale was 17% of total revenue. From the 2013 Annual Reports for Centurylink and Verizon.

8 Mobiles account for a relatively high proportion of total revenues for several operators, including AT&T (46%) and Verizon (33%). From the 2013 Annual Reports for AT&T and Verizon.

however it should be noted that the UK regulator, Ofcom, estimates separate WACC values (together with all the underlying parameters, including asset beta[9]) for Openreach (the wholesale business) and Rest of BT. Openreach would be a far better comparator for Chorus than BT Group.

Some firms have other significant points of difference with Chorus. For example:

- Cincinnati Bell, in addition to its telecoms business, is also an energy reseller (electricity and gas).

- 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.

- TW Telecom provides managed services, including Ethernet and IP VPN services via a metropolitan fibre network.

CEG claims that a more robust estimate will be obtained by increasing the sample, yet some of these sample members are businesses that diverge even more from that of Chorus, which could have the effect of increasing the uncertainty associated with the sample estimates.

No details are provided by CEG on the composition of the fixed line only subsample, therefore we are unable to confirm membership of the subsample, or if the status of some firms may have changed over the 20 year timespan considered by CEG. CEG's review of company websites ('basic Internet research') may not have identified major shifts in firm scope. As an illustration, it has just been announced that the mobile business of Cincinnati Bell is to be sold to Verizon.[10]

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9 We note that Ofcom uses a two-year asset beta rather than the five-year used by CEG. Ofcom has also estimated a two-year asset beta for Chorus (0.57) which is very similar to its estimate for Openreach (0.60). See Ofcom (2014), *Fixed access market reviews: Approach to setting LLU and WLR Charge Controls*, 20 August 2013, Annex 15.

10 Cincinnati Bell (2014), *Cincinnati Bell to sell wireless spectrum licenses*, news release, 7 April 2014.

In its exploration of the sample data, CEG takes an average over the four sets of five-year betas, which span the period 1994 to 2014. CEG claims that this approach gives a greater weighting to more recent data, as there are more observations for the later time periods. However CEG's estimate for the BT Group is an average of four datapoints – in which each of the five-year betas over the 20 year period is given the same weighting. Clearly in this instance the BT Group estimate is not forward-looking. We would therefore recommend that this estimate be ignored.

In any case, we consider that the older data may be largely irrelevant to the construction of a forward-looking asset beta. Most analysts would exclude the period of the dotcom crisis (early 2000s).

Benchmark gearing

CEG quotes Ofcom's approach to estimating gearing to use:

> …an average over a period consistent with the beta estimation period in order to de-lever the equity beta and to calculate the WACC.[11]

CEG estimates gearing for its sample of 27 firms over a single five-year period, rather than the four five-year periods used for the asset and equity betas. We do not consider it appropriate to use inconsistent time periods for the different WACC parameters, as these would encompass very different business environments and underlying assumptions, both explicit and implicit. The resultant parameter estimates would therefore not represent consistent assumptions.

Credit rating

CEG recommends that a benchmark credit rating for a UCLL/UBA provider be set at BBB- on the basis of regulatory precedent and CEG's own analysis of current credit ratings

11 Ofcom (2013) *Fixed access market reviews: Approach to setting LLU and WLR Charge Controls: Annexes*, 20 August 2013, paragraph A15.88.

for comparator firms. While at this stage we have no recommendation to make on the most appropriate credit rating for the Commission to apply, we note that there are a number of problems with the CEG analysis.

CEG purports to provide average Standard & Poor's credit ratings by sample (all businesses / all businesses with five year data / fixed line businesses only / BT Group)[12]. However credit ratings are an opinion and do not represent a numerical measure or scale.

> 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[13].

As such there is no standard interval between all ratings and it is impossible to average them as CEG has attempted to do.

We also note that CEG's sample has Standard & Poor's credit ratings for all firms except for Iliad and Lumos Networks – therefore any estimate over the sample includes only 29 firms, not 31 as CEG claims.

Again, our preference would be to utilise a consistent sample for the estimation of all WACC parameters.

Debt risk premium

CEG notes that the only bond issued by Chorus is denominated in British pounds sterling and as such would not be included in the Commission's assessment of a benchmark debt

12 Competition Economists Group (2014), *Response to Commerce Commission UCLL/UBA WACC consultation paper*, March 2014. See Table 7.

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

risk premium (DRP). The Commission's practice in this respect (as reflected in the IMs and also prior determinations) is to use New Zealand Dollar denominated bonds only as reference points. CEG notes that overseas debt raising is a common practice and that it is reasonable to assume that this is motivated by the expectation that it will 'lower their overall financing costs relative to raising the same debt from New Zealand debt markets'[14].

CEG then provides two alternative approaches for the Commission to consider in estimating the appropriate DRP:

- a methodology used by the Reserve Bank of Australia which estimates a DRP for a target maturity by weighting DRPs on bonds according to their face value and a Gaussian kernel
- Nelsen-Siegel curve fitting, that seeks to fit a highly flexible functional form to the observed bond yield data.

These methodologies both produce lower DRP estimates (2.19% and 2.45%) than CEG's estimate using the Commission's IM approach (3-4%) which includes Chorus and Vector foreign denominated bonds[15]. The latter estimate is closest to Chorus' actual cost of debt (as reflected in its foreign-denominated bond). CEG then argues that this is more appropriate than the alternative methodologies as 'the most comparable bond is the bond issued by Chorus itself'[16]. At the same time CEG suggests that 'qualitative adjustments' could be made to the estimates from curve fitting methodologies, to address the problem that these approaches give equal weightage to all the bonds sampled rather than a higher weight to the Chorus bond.

It is important to note that regulators typically do not base decisions on DRPs on the actual cost of debt of the regulated firm, but prefer to rely on benchmarks to provide incentive to achieve efficiencies in the cost of capital. As such it would be inappropriate to increase the weighting on actual Chorus data. Furthermore should the Commission be minded to

14 Competition Economists Group (2014), *Response to Commerce Commission UCLL/UBA WACC consultation paper*, March 2014. See paragraph 21.

15 *Ibid*, see Table 8.

16 *Ibid*, paragraph 156.

consider alternative methodologies for DRP estimation it would be preferable to avoid the introduction of subjective judgement into the process as suggested by CEG as this would increase the margin of error.

We also note that in the IMs the Commission considered in detail whether to adopt a 'complex approach' for estimating DRPs which would recognise that firms may raise debt through different channels other than issuing bonds in New Zealand. In rejecting this approach the Commission noted that this method would involve a number of subjective assessments which would open it to challenge from affected parties[17].

4 Asymmetric risk

CEG argues that the Commission should introduce an allowance, separate to WACC, for the potential cost of asymmetric risks to the UCLL / UBA service provider[18]. According to CEG these alleged asymmetric risks to cash flows emanate from:

- 'low frequency but high impact events (such as earthquakes)' which could mean that service demand will be lower than forecast
- costs of service provision exceeding forecasts as a result of:
  - low frequency but high impact events
  - the difficulty of making cost savings if demand falls, given sunk investment
- technological and competitive developments in the broadband sector, causing stranding of assets
- future regulatory decisions which may also lead to asset stranding.

With respect to low frequency but high impact events CEG suggests that the Commission should state how it would respond in order to eliminate any asymmetric impact on Chorus. This may avoid the need for 'a pre-emptive upward adjustment to modelled cash-flows'.

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17 Commerce Commission (2010), *Input Methodologies (Electricity Distribution and Gas Pipeline Services) Reasons paper*, December 2010. See Section H5.42.

18 Competition Economists Group (2014), *Response to Commerce Commission UCLL/UBA WACC consultation paper*, March 2014. See Section 7.1.2.

In our view, requiring the Commission to anticipate and make allowances for future potential low frequency / high impact events is unreasonable and without precedent in a TSLRIC modelling process. Since the purpose of insurance is to provide a buffer against unforeseen events that could lead to network failure, the Commission would need to examine the insurance market, possibly commissioning actuarial advice. As CEG seems particularly concerned about earthquakes, presumably given the two substantial Canterbury earthquakes in September 2010 and February 2011, we note Chorus' comment in relation to these earthquakes:

> Despite the magnitude of the earthquakes that struck the Canterbury region in New Zealand in the last year, the damage to Chorus' fixed line local network has been limited.[19]

In FY2011 Chorus included in its accounts NZD22 million for costs in relation to the Canterbury earthquakes[20] and in FY2012 and FY2013 appears to have received in total NZD12 million in related insurance proceeds[21]. It is unclear from the published accounts to date whether this represents the entirety of insurance payouts for these earthquakes.

With respect to technological / competitive risks CEG notes that the regulator is 'not sufficiently powerful' to eliminate these types of risk but nevertheless can take actions that would 'reduce the potential for this sort of commercial asset stranding'[22]. In particular, CEG suggests that the Commission can take these risks into account in setting depreciation profiles in its modelling process.

It is true that the introduction of new technologies may be captured in the modelling process, for example through the use of asset tilts in the depreciation calculations. This approach returns a large proportion of the asset's value early in its lifetime. In deciding on an appropriate depreciation methodology the Commission will need to determine the extent

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19 Telecom (2011), *Share in Two Journeys*, 13 September 2011. See page 97.

20 *Ibid*, page 126.

21 See Chorus Annual Report 2012, page 8, and Chorus Annual Report 2013, page 13, respectively.

22 Competition Economists Group (2014), *Response to Commerce Commission UCLL/UBA WACC consultation paper*, March 2014. See Section 7.1.2.

to which this should encompass fixed infrastructure market risk, including fixed-to-mobile substitution and fixed line access competition.

In the case of Chorus, arguably there is an upside to potential declining demand for copper access in that demand for fibre access may simultaneously increase. Given Chorus' dominance in the supply of UFB fibre access in New Zealand, increased fibre volumes may offset any losses from declining copper volumes. As regards fixed-to-mobile substitution, there is more evidence to date in New Zealand that fixed broadband services are seen by consumers as complements to mobile services rather than substitutes.

It should also be noted that under its UFB contractual commitments Chorus has undertaken not to engage in further copper investment in its UFB areas. Presumably it entered into the UFB contract having undertaken an assessment of the impact on existing copper investments – that is, potential asset stranding. In this respect, by its own admission many of its assets are already fully depreciated.

> Some of New Chorus' systems are approaching the end of their useful lives and may not be replaced or upgraded before problems of capacity, spare parts, supplier parts and increased fault levels occur.[23]

Finally, with respect to the risks associated with future regulatory decisions CEG notes[24]:

> Of course, there [*sic*] potential asset stranding events that flow from policy decisions taken by Governments that a regulator clearly cannot credibly commit to prevent. These will always need to be quantified.

We agree that Chorus does face Government risk in the future. A parliamentary election is due to be held in New Zealand on 20 September 2014. This may or may not result in a change in Government, with potential changes in telecoms regulatory policy. However it is impractical to quantify such risks, nor is it necessary. For a regulated industry Government risk will always be present, and it is not the responsibility of the regulator to make

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23 Telecom (2011), *Share in Two Journeys*, 13 September 2011. See page 206.

24 *Ibid*, paragraph 334.

allowances for these types of unknown contingencies. Furthermore, it is arguable that over time symmetries exist in the impact of changes in Government policy. For example, a retail-minus approach to UBA pricing existed prior to the 2011 change in the UBA pricing rule which enabled Chorus to accrue returns on its copper assets well in excess of cost-based pricing.

We conclude that CEG's recommendation – that the Commission should initiate a separate process to quantify **all** of the risks it has identified – is both impractical and unnecessary. In the first place, the Commission is not tasked with modelling Chorus' actual network and financial situation, and, secondly, the onus is on Chorus, not on the Commission, to demonstrate and quantify any alleged asymmetric risk.

5 Concluding remarks

The key assumptions to be used in estimating the cost of capital for an efficient UCLL / UBA service provider should not represent actual or observable values of the regulated entity, unless those values reflect those of an economically efficient operator. On reviewing the proposals of Chorus' consultants in relation to WACC methodologies and parameters, we find strong emphasis on the use of Chorus' actual data. For example, we note that Grundy's analysis focuses on actual returns of the business rather than the economically efficient returns required for regulatory purposes. As such, this analysis is largely irrelevant for consideration within the pricing process. CEG's call for an allowance for asymmetric risk similarly appeared to be based on Chorus' actual situation rather than that of a hypothetical efficient UCLL / UBA provider.

Thus, in order to derive appropriate estimates for WACC parameters, a methodologically sound comparative analysis or benchmarking will be key to the process. While we recognise the challenges in obtaining reliable benchmarks for telecoms businesses, in examining the benchmarking analysis presented in the CEG report we found a number of inappropriate comparators, inconsistencies and inaccuracies. We believe that, using the IMs as a starting point, a more rigorous analysis with minimal use of subjective judgement should deliver robust parameter estimates that will withstand regulatory and legal scrutiny.