

Final report for Spark New Zealand
and Vodafone New Zealand

Review of issues from UCLL and UBA submissions

Cross submission for the UCLL and
UBA Draft Determination

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0 Executive summary

Network Strategies' review of the Commerce Commission's Draft Determinations for the Unbundled Local Loop (UCLL) and Unbundled Bitstream Access (UBA) pricing reviews concluded that the Commission's TSLRIC estimate was likely to approach an upper bound. In contrast, Chorus claims that the Commerce Commission has underestimated TSLRIC as a result of modelling omissions, oversights and incorrect judgements. We have reviewed a range of issues raised by Chorus and its consultants relating to the Commission's proposed approach and assumptions and find that Chorus has not demonstrated downward bias in the Commission's estimate in respect of these issues.

Fixed Wireless Access

Chorus raises concerns with a number of assumptions applied in the Commission's Fixed Wireless Access (FWA) modelling, encompassing capacity, costs, coverage and availability.

The Commission's assumption of constant throughput is questioned by Chorus. However, even a 20% increase in throughput would represent an over-generous allowance since a significant proportion of customers are voice-only customers who are not using the full capacity of the service.

The amended FWA model that we have proposed addresses Chorus' concern in regard to potential coverage problems that may arise for existing base stations. The RF planning that underlies our model adds extra base stations and repeaters to ensure that adequate signal strength is received by all customers. The costs of these base stations and repeaters have been included in our FWA cost model results.

The Chorus suggestion that the spectrum price should be corrected upwards is entirely unrealistic for a Hypothetical Efficient Operator (HEO) who will be providing only FWA services and in limited geographic areas. Furthermore the model should only encompass costs that an HEO would actually incur in the provision of these services – these do not include additional costs for CPE and the core network.

Weighted Average Cost of Capital

Chorus asserts that the Commission's draft weighted average cost of capital (WACC) has been materially underestimated in the light of international comparisons and tests for 'reasonableness'. We observe that the difficulties inherent in comparing WACCs across jurisdictions make it problematic to draw meaningful conclusions from international comparisons. While it is certainly valid to assess individual parameters of the WACC in the light of experience from other comparable firms in other jurisdictions, any comparison with benchmark data needs to be informed by an understanding of how the benchmark data was derived. For example, the international regulatory benchmark comparison for the asset beta presented by Chorus' consultants is in fact a benchmark analysis of benchmarks. Within these benchmark samples there are many operators that are unsuitable for use as comparators to an HEO in New Zealand.

Chorus also claims that the telecommunications context does not provide a sound reason for the Commission to depart from its approach in Part 4 WACC determinations. This belief also appears to underlie its consultants' approach to estimating some of the parameters of the WACC. For example, Chorus and its consultant claim that the Commission should use a long period to estimate the beta. This suggestion ignores completely the dynamic nature of the telecommunications business which is subject to massive changes in technology and its operating environment and as such the nature of risk is also likely to be changing over time. Thus long-term estimates of the beta, typified by precedents from the electricity industry referenced by Chorus' consultants, may be misleading for future telecommunications businesses – even for the long term.

Our examination of Chorus' arguments in respect to each parameter of the WACC has found no justification for Chorus' claims that there is downward bias in the Commission's

estimated WACC. As such the Commission should not change its approach in estimating WACC for this price review.

Aerial deployment

Chorus alleges that the Commission has overstated the feasibility of aerial deployment and has omitted associated costs. In fact observable behaviour in New Zealand supports significantly higher use of aerial structure in fibre deployment than the Commission has used. The extent of aerial deployment should not be based on Chorus' actual or UFB targets as other evidence suggests more aerial deployment is feasible than indicated by Chorus' actual or targeted use, in addition to extensive use of existing poles without the need to upgrade or replace.

Chorus' arguments for omitted costs focus on different consenting regimes in New Zealand. However the Commission's assumptions are valid as they are consistent with the proposed national environmental standards to support efficient and rapid high-speed broadband deployment.

We note that the HEO would consider sharing with electricity networks in the deployment of its network where it is cost-efficient to do so. As the majority of plant on the poles would be electricity lines, the Commission's assumption of equal sharing of costs between the lines company and the HEO may be inappropriate.

Allowance for asymmetries

Chorus suggests that WACC estimation error should be addressed through selection of a higher percentile than the mid-point WACC, while an uplift should be applied to the TSLRIC estimate to address residual asymmetric consequences of a TSLRIC price that is 'too low'.

In the first place, we recommend that the Commission ensures that its assumptions deliver a mid-point estimate in the case of both WACC and the TSLRIC estimate. An uplift should not be introduced as a means of correcting upward or downward bias. Secondly, we

demonstrate that an uplift is likely only to drive losses in consumer welfare as the opportunities for incentivising copper investment by Chorus are extremely limited in the UFB world.

Demand

Chorus questions the Commission's demand scenario for the HEO, noting that it does not serve demand of Local Fibre Companies (LFC) and so cannot recover the TSLRIC of providing this service. While we do believe that the Commission should amend its constant demand scenario to reflect accurate market conditions over the regulatory period (as described in our submission) the Commission should not exclude LFC demand. If it were to do so then the HEO would have a network footprint smaller than that of Chorus' copper network and thus the economies of scale it could achieve would be less than those of Chorus. The resultant cost of the UCLL service would be inflated.

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1 Introduction

Network Strategies Limited has been commissioned by Spark New Zealand (Spark) and Vodafone New Zealand (Vodafone) to review selected aspects of submissions on the Commerce Commission's Draft Determinations for the Unbundled Local Loop (UCLL)¹ and Unbundled Bitstream Access (UBA)² pricing reviews. Our report addresses:

- Fixed Wireless Access (Section 2)
- WACC (Section 3)
- price trends (Section 4)
- aerial deployment (Section 5)
- asymmetries and the uplift (Section 6)
- other issues (Section 7).

Concluding remarks are presented in Section 8.

It should be noted that modelling issues relating to boundaries and the Telecommunications Service Obligation (TSO) have been addressed in a separate report.

In keeping with our confidentiality undertakings any Confidential Information (CI) and Restricted Information (RI) quoted in this report is marked as such with square brackets.

¹ Commerce Commission (2014), *Draft pricing review determination for Chorus' unbundled copper local loop service*, 2 December 2014.

² Commerce Commission (2014), *Draft pricing review determination for Chorus' unbundled bitstream access service*, 2 December 2014.

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

2 Fixed Wireless Access

Chorus and Analysys Mason have criticised a number of inputs and assumptions used in TERA's FWA model. In this Section we consider the issues they raised which fall into four main categories:

- the appropriate throughput assumption over the regulatory period (Section 2.1)
- cost components (Section 2.2)
- opex (Section 2.3)
- coverage and availability (Section 2.4).

2.1 Capacity

The Commission's draft determination³ proposed an FWA network deployment using a constant throughput of 250kbit/s for the regulatory period (2015-2020). We have submitted an FWA cost model⁴ which is based on Commission's constant throughput assumption. However Analysys Mason and Chorus have both criticised this assumption, stating that an increasing throughput should be assumed. Analysys Mason states:

³ Commerce Commission (2014), *Draft pricing review determination for Chorus' unbundled copper local loop service*, 2 December 2014, paragraph 604.

⁴ Network Strategies (2015), *FWA Model*, 20 February 2015.

The 250kbit/s service modelled may have been sufficient to meet typical NZ retail broadband demand in early 2014, but it is not sufficient on 1 December 2014 and will be grossly inadequate in 2019.⁵

In addition Chorus states:

The Commission model only allows for a constant bandwidth requirement of 250 kbps per end-user. This is lower than the bandwidth expected to be delivered by Chorus at the commencement of the regulatory period and assumes, contrary to real-world projections and experience, that bandwidth will not experience any growth during the regulatory period.

In order to ensure that the Commission model takes into account the costs of the HEO providing sufficient capacity / bandwidth to cater for end-users' needs for the whole of the regulatory period the Commission model should be dimensioned so that it has sufficient capacity to deliver anticipated growth in demand throughout the regulatory period.⁶

In the light of comments from Analysys Mason and Chorus, we have investigated the impact of increasing throughput on the final cost results. We have undertaken the analysis for 20% year-on-year increase in throughput – starting from 250kbit/s in 2015 and increasing to 622kbit/s in 2020.

Exhibit 2.1 compares the Commission's price for UCLL services with two different options for throughput increase (constant, or 0% increase, and 20% year-on-year) from our FWA model⁷. The price for rural areas increases from \$30.89 to \$38.02 due to the increase in throughput but it is still notably lower than Commission's price of \$47.73. Also the average national price increases if we assume a rise in throughput (from \$23.50 to \$25.50). However it is lower than Commission's price of \$28.22.

⁵ Analysys Mason (2015), *UCLL and UBA FPP draft determination submission*, 20 February 2015, page 45.

⁶ Chorus (2015), *Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' UCLL and UBA Access Services (2 December 2014) and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations (19 December 2014)*, 20 February 2015, Appendix F, paragraphs 508-510.

⁷ Network Strategies (2015), *FWA Model*, 20 February 2015.

	TERA	Network Strategies	
		Throughput constant	Throughput 20% growth
National	28.22	23.50	25.50
Urban	20.63	20.63	20.63
Rural	47.73	30.86	38.02

Exhibit 2.1: Geographically averaged price for UCLL services for different throughput assumptions [Source: Commerce Commission and Network Strategies]

However we believe that the Commission should not assume any increase in throughput in dimensioning its FWA network. The areas considered for FWA have a significant proportion of voice-only customers who are not using UBA services. Hence even though the network is dimensioned to provide coverage and capacity for all customers, a significant number will not be using the full throughput capacity of the service. Consequently those customers that do use UBA services will have access to spare capacity which will allow them to achieve greater throughputs.

As an example, an analysis undertaken on the areas selected for our FWA cost model⁸ shows that the number of Chorus' UBA end users⁹ represents only []CCNZCI of the total number of dwellings included for the FWA network dimensioning. This means that the remaining []CCNZCI are voice-only customers. While the model assumes that the HEO will provide coverage to 100% of the dwellings within the TSO areas, voice-only customers will not be using the full capacity of the network. In other words the network – if dimensioned to deliver 250kbit/s throughput to all customers, both UBA and voice-only – would have additional capacity available for UBA customers. As FWA is fungible, the network will be able to handle traffic growth without the need of an upgrade.

⁸ Network Strategies (2015), *FWA Model*, 20 February 2015.

⁹ Chorus (2014), *Section 98 submission to the Commerce Commission*, 7 February 2014, Q 2.1 Chorus UBA Service end Users.csv.

2.2 Cost components

Analysys Mason has advocated the inclusion of equipment and installation costs at the customer premises:

RSPs seeking to use the modelled FWA service would not be able to use existing voice or data CPE. As we have previously argued, and as the Swedish regulator agrees, the costs of the wireless-specific equipment required at the end customer premises ought to be included within the modelled network costs.¹⁰

However we do not agree with Analysys Mason and believe that CPE costs must not be included for FWA analysis. Although the Swedish LRIC model's FWA analysis includes some wireless equipment costs at the subscriber site, it explicitly excludes the equipment and installation costs for CPE:

Just the cost of the wireless equipment - not the NTP or customer [*sic*] premises equipment, and ignoring any costs borne by customer.¹¹

In addition the virtual unbundled local access (VULA) service provided in Europe can be compared to the FWA service. According to the European Commission one of the characteristics of the virtual unbundled local access (VULA) service is that access seekers should have the choice of customer premise equipment (CPE).¹² The control of CPE will provide the access seekers with the 'flexibility needed to differentiate services delivery to their customers'¹³ and management of access at a local level will create 'conditions for

¹⁰ Analysys Mason (2015), *UCLL and UBA FPP draft determination submission*, 20 February 2015, page 46.

¹¹ Post- och telestyrelsen (2013), *Hybridmodell version 10.1*, 16 December 2013.

¹² European Commission (2013), *Regulation of the European Parliament and of the Council: laying down measures concerning the European single market for electronic communications and to achieve a Connected Continent, and amending Directives 2002/20/EC, 2002/21/EC and 2002/22/EC and Regulations (EC) No 1211/2009 and (EU) No 531/2012*, 20 September 2013, page 70.

¹³ Gaudino R., Giuliano R., Mazzenga F., Valcarengi L. and Vatalaro F. (2014), *Unbundling in Current Broadband and Next-Generation Ultra-Broadband Access Networks*, April 2014, page 9.

sustainable competition across the internal market'¹⁴. The European Commission believes that this will allow the access seeker to compete efficiently by controlling its quality of service:

...the access seekers' control of the core network elements, network functionalities, operational and business process as well as the ancillary services and systems (e.g. customer premises equipment) should allow for a sufficient control over the end user product specification and the quality of service provided (e.g. varying QoS parameters).¹⁵

Consequently the access seekers should have the flexibility to choose and install CPE and thus it should not be the responsibility of the HEO deploying the FWA network. This will encourage innovation and competition along with creating opportunities for better quality of service for the end customers.

In addition Chorus and Analysys Mason have argued that a higher spectrum fee should be included for FWA. Analysys Mason¹⁶ states that the assumed fee of NZD88 million is 'too low' and should be at least based on the final outcome of the recent 700MHz auction:

The Commission should increase the assumed spectrum cost, as a minimum based on the final outcome of the 700MHz auction, (4/9 of the final auction results is approximately NZD120 million).

Even this may be too low, as a hypothetical new entrant would have been another (fourth) participant in that auction, which would have increased the level of competition for spectrum. Therefore, we would expect a higher price paid for four lots of this spectrum in this circumstance. So the actual price paid may not even be high enough.

¹⁴ European Commission (2013), *Regulation of the European Parliament and of the Council: laying down measures concerning the European single market for electronic communications and to achieve a Connected Continent, and amending Directives 2002/20/EC, 2002/21/EC and 2002/22/EC and Regulations (EC) No 1211/2009 and (EU) No 531/2012*, 20 September 2013, page 21.

¹⁵ European Commission (2014), *Explanatory Note Accompanying the document Commission Recommendation on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services*, 9 October 2014, page 44.

¹⁶ Analysys Mason (2015), *UCLL and UBA FPP draft determination submission*, 20 February 2015, pages 46-47.

Although we have found that none of the existing publicly available TSLRIC models (for example, the Swedish¹⁷ and Australian¹⁸ cost models) include a spectrum fee for the provision of FWA, we agree with the Commission that some spectrum costs should be included for accessing the spectrum. However we believe it should be a realistic value rather than a price that reflects what winning bidders paid during the 700MHz auction for a national coverage licence with no restrictions on service provision. Clearly the economic value placed on spectrum by an operator serving only a rural geographic market segment would be quite different. In other words, the spectrum fee suggested by Chorus and Analysys Mason is completely unrealistic for a HEO who will be providing only FWA services and in limited areas/zones. If the HEO was to provide additional services (such as mobile) on a national level it may be possible to justify paying the spectrum fee levels achieved in the auction. In that case revenues from the multiple streams using the spectrum would decide what proportion of the spectrum fee should be allocated to FWA services.

There are also comments from Analysys Mason regarding the inclusion of core infrastructure in modelling FWA:

The Commission also models a service which does not include the necessary core infrastructure (such as switches, support nodes, remote node controllers) to allow an RSP to interface to the modelled components (base stations). As it stands, there is no service which could be offered.¹⁹

Analysys Mason's claim is inconsistent with the approach previously used in its 2009 fixed access model for the ACCC.²⁰ Similarly to the Commission's current approach, Analysys Mason's model did not include additional core equipment to provide FWA access, and

¹⁷ Post- och telestyrelsen (2013), *Hybridmodell version 10.1*, 16 December 2013.

¹⁸ Australian Competition and Consumer Commission (2010), *Analysys fixed network cost model*, October 2010, available at <http://www.accc.gov.au/regulated-infrastructure/communications/fixed-line-services/fixed-line-wholesale-services-pricing-review-2009-2010/consultant-report>.

¹⁹ Analysys Mason (2015), *UCLL and UBA FPP draft determination submission*, 20 February 2015, page 46, section 6.3.

²⁰ Australian Competition and Consumer Commission (2010), *Analysys fixed network cost model*, October 2010, available at <http://www.accc.gov.au/regulated-infrastructure/communications/fixed-line-services/fixed-line-wholesale-services-pricing-review-2009-2010/consultant-report>.

only the base station and backhaul network components are considered as part of the access network:

The wireless access technology has been implemented to connect the BTS to the local exchanges (LE) through microwave backhaul links, rather than directly into a national mobile network operator. At the LE, it is assumed the service is presented to the core in a similar manner as the copper network. Therefore the LRIC model currently considers the wireless BTS and backhaul as access elements.²¹

Similarly, the hybrid LRIC cost model developed for the Swedish regulator²² does not show any indication that core cost components were included for the FWA calculations.

Finally Analysys Mason has commented on the FWA backhaul deployment:

FWA backhaul assets are deployed even in the FTTN/copper access model even though no FWA base stations are deployed in the FTTN/Copper case. This can be seen in the Inventory Sheet of the access model workbook, rows 310-406. This is an error.²³

We analysed the impact on the Commission's model outputs by excluding these cost components and found that there were no changes. These network inputs only affect the FTTN / Copper network total cost which is calculated solely for the purpose of undertaking a cost-based adjustment of the FTTH / FWA access network results.

The reduction of the cost of the FTTN / Copper network when excluding these network elements is not sufficient to produce a change in the result of the cost-based comparison – the FTTH / FWA network is still the lowest cost and thus the prices of the UCLL service are based on the cost of this network.

²¹ Analysys Mason (2009), *Fixed LRIC model documentation – Version 2.0*, August 2009, section 6.2, page 71.

²² Post- och telestyrelsen (2013), *Hybridmodell version 10.1*, 16 December 2013.

²³ Analysys Mason (2015), *UCLL and UBA FPP draft determination submission*, 20 February 2015, section 6.6, page 47.

2.3 Opex

Analysys Mason states that the opex value assumed in the Commission’s model is lower than benchmarks from overseas regulators:

The source of the FWA opex is not documented. Benchmarks from regulator’s cost models in Europe indicate higher figures for site and base station equipment operating costs. The opex for 550 sites might be as much as NZD10-14M/annum based on public mobile models from EU regulators.²⁴

Opex costs for FWA were provided as part of Vodafone’s Section 98 submission to the Commerce Commission²⁵ – namely, annual opex for open access and single operator site. These values are also inputs to our FWA cost model together with annual opex for co-location sites. Assuming a weighted average²⁶ of open access, single operator and co-location site costs the total annual opex incurred by an HEO for 550 sites is around NZD[]CCNZCI – a cost that is lower than Analysys Mason’s proposed values by between []CCNZCI and []CCNZCI.

The information submitted by Vodafone would be a superior estimate of the opex that an HEO will incur to provide FWA in New Zealand. Opex from other markets such as the EU would not capture the characteristics of New Zealand’s local conditions. Furthermore, Analysys Mason has not provided any background information about the benchmark value presented – such as mobile technology, or the countries included in the benchmark analysis. The lack of supporting information is insufficient for a thorough analysis to assess the applicability of this value to the New Zealand market.

²⁴ Analysys Mason (2015), *UCLL and UBA FPP draft determination submission*, 20 February 2015, section 6.5, page 47.

²⁵ These values are inputs in our FWA cost model.

²⁶ Based on the percentages of open access, single operator, and co-location sites from Vodafone’s radio planning results for our FWA model.

2.4 Coverage and availability

In our FWA report²⁷ we discussed several simplifying assumptions used by the Commission for coverage and availability, including:

- coverage based on Vodafone's actual RBI sites rather than reflecting an efficient LTE deployment
- confining FWA deployment to RBI areas
- conservatively capping the number of premises served per tower
- adding no new sites to cover premises in excess of the per-tower caps
- assuming an unrealistic and inefficient network planning approach by serving the most costly premises with FWA and those premises in excess of the per-tower caps are connected by fibre to the nearest exchange.

Chorus²⁸ and Analysys Mason have criticised the Commission's assumption of modelling its FWA network based on Vodafone's RBI network. They believe that an efficient HEO's FWA deployment will use a different technology and spectrum band compared to those of Vodafone's network and hence the RBI coverage/availability cannot be directly assumed. However there are no details about their suggested approach/alternatives for implementing FWA and calculating the corresponding costs.

In our FWA report²⁹, we have also extensively discussed the issues regarding coverage and technology assumptions adopted in the Commission's model. In order to address those issues we developed an FWA cost model³⁰ which is based on actual coverage analysis. The RF coverage analysis was performed by Vodafone for LTE deployment in the 700MHz band rather than relying on Vodafone's original RBI coverage maps for different technology/bands.

²⁷ Network Strategies (2015), *Modelling Fixed Wireless Access*, 20 February 2015, Section 2.3.

²⁸ Chorus (2015), *Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' UCLL and UBA Access Services (2 December 2014) and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations (19 December 2014)*, 20 February 2015, Appendix F.

²⁹ Network Strategies (2015), *Modelling Fixed Wireless Access*, 20 February 2015. See Section 2.2.

³⁰ Network Strategies (2015), *FWA Model*, 20 February 2015.

In addition Chorus believes it is not cost effective for an HEO to provide FWA to RBI areas in absence of an appropriate Government subsidy:

Vodafone's RBI network is a government subsidised project with the primary aim of delivering better broadband access to rural areas where the costs associated with geography, line distance and low population densities would otherwise make the delivery of network infrastructure cost prohibitive.³¹

Chorus' assumptions concerning FWA cost-effectiveness are consistent with our belief that an efficient HEO will not confine FWA to RBI areas but would extend it to Zone 3 (that is, Zones 3a and 3b which represent small towns that are generally away from the main cities). The relevant footprint for an FWA MEA would be much wider than the RBI footprint, particularly given the superior performance speeds available through LTE. The application of a boundary based on a political initiative effectively constrains the HEO to inefficient FWA deployment.

Chorus and Analysys Mason have both discussed the failure rates of wireless networks in rural areas. Analysys Mason³² has discussed the possible failure levels 'due to either local terrain or vegetation' and given the examples of Telecom's Extend service in New Zealand and NBN Co in Australia. Both Chorus and Analysys Mason have stated the need to include additional costs for some failure-prone premises. Chorus³³ has recommended that the FWA deployment should 'allow for an appropriate percentage of failed connections or an adjustment to fixed costs to allow for additional unforeseen costs to address failed connection rates'.

It is worth noting that Telecom's failure rates for its Extend service refer to the previous decade (that is, the 2000s) and hence are based on an older technology compared to LTE.

³¹ Chorus (2015), *Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' UCLL and UBA Access Services (2 December 2014) and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations (19 December 2014)*, 20 February 2015, Appendix F, paragraph 505.

³² Analysys Mason (2015), *UCLL and UBA FPP draft determination submission*, 20 February 2015, pages 45-46.

³³ Chorus (2015), *Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' UCLL and UBA Access Services (2 December 2014) and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations (19 December 2014)*, 20 February 2015, Appendix F, paragraph 521.

LTE is far superior to these older technologies and hence the failure rates cannot be compared.³⁴

Chorus has cited NBN Co's *Fixed Wireless and Satellite Review report*³⁵ released in May 2014 and stated (in its submission) that the 'real-world experience of the NBN Co roll out in Australia is that failure rates of around 7% have been experienced, even where a house is within an FWA cell site's notional coverage area'.³⁶ However the report discusses the model for technology allocation and one of the inputs for the model is 'Premises which cannot reliably receive the signal (service qualification failure – these locations need to be served via satellite)'.³⁷ The model assumes that a 'fixed wireless service qualification failure rate of 7 percent is in place'.³⁸ It is unclear how Chorus interpreted this statement as a real-world experience of NBN Co. The same report also mentions that the share of premises unable to receive a wireless signal in fixed line areas is 'estimated at ~5 percent, which is lower than the 7 percent assumed in the non-fixed line footprint as there are typically fewer line-of-sight obstructions'.³⁹ Hence it is inappropriate to assume a 7% failure rate even in all regions of Australia as it varies significantly for different areas and depends on the presence of obstructions. Consequently it is also inappropriate to directly apply the 7% assumption to a New Zealand environment.

It is also worth noting that the service of NBN Co is based on a completely different frequency band – 2.3GHz – than that used for modelling FWA in New Zealand. The 700MHz band can provide better coverage than the 2.3GHz band. This difference has been clearly highlighted in the Analysys Mason report which evaluates NBN Co's design for its fibre and wireless networks:

³⁴ Network Strategies (2014), *Cross-submission for consultation on UCLL and UBA FPP regulatory framework*, 20 August 2014, Section 4.3, page 24.

³⁵ NBN Co Limited (2014), *Fixed Wireless and Satellite Review*, May 2014.

³⁶ Chorus (2015), *Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' UCLL and UBA Access Services (2 December 2014) and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations (19 December 2014)*, 20 February 2015, Appendix F, paragraph 520.

³⁷ NBN Co Limited (2014), *Fixed Wireless and Satellite Review*, May 2014, page 85.

³⁸ *Ibid.*

³⁹ NBN Co Limited (2014), *Fixed Wireless and Satellite Review*, May 2014, page 71.

The 700MHz band offers a larger geographic cell range than 2.3GHz, which generally means that fewer base stations are required to meet coverage requirements. This attribute makes the 700MHz spectrum very valuable, especially in rural areas where the access network is likely to be coverage limited rather than capacity limited.⁴⁰

Analysys Mason also concluded that ‘NBN Co’s design of its fixed wireless network reflects an efficient and prudent network design’.⁴¹

Hence the differing terrain and spectrum bands means that it is not appropriate to make a direct comparison of the modelled FWA service with NBN Co’s wireless service.

To mitigate any coverage problems that may arise for existing base stations (resulting in insufficient signal strength at the customer premises), the RF planning (performed for our cost model) adds extra base stations and repeaters which ensure that adequate signal strength is received by all customers. The costs of these base stations and repeaters have been included in our FWA cost model results.

Finally we believe that the Commission should adopt our FWA model as this addresses the coverage and availability issues in both the network planning and costing. Our cost model represents the network deployed by an efficient HEO and the results (discussed in our FWA report⁴²) are significantly lower than Commission’s results for both rural areas and the national average.

2.5 Conclusion

Both Chorus and Analysys Mason have questioned the Commission’s assumption of constant throughput for FWA services. Consequently we investigated the impact of a

⁴⁰ Analysys Mason (2012), *Review of the efficiency and prudence of NBN Co’s fibre and wireless network design*, 2 March 2012, page 116.

⁴¹ Analysys Mason (2012), *Review of the efficiency and prudence of NBN Co’s fibre and wireless network design*, 2 March 2012, page 6.

⁴² Network Strategies (2015), *Modelling Fixed Wireless Access*, 20 February 2015, Section 2.3.

20% year-on-year increase in throughput using our FWA model and found that the results remained lower than those of the Commission's model. However a 20% increase in throughput would represent an over-generous allowance since a significant proportion of customers are voice-only customers who are not using the full capacity of the service.

On the cost components:

- we agree with the Commission that equipment and installation costs for CPE should not be included in the analysis
- the spectrum fee suggested by Chorus and Analysys Mason is completely unrealistic for a HEO who will be providing only FWA services and in limited areas/zones.
- we have found no publicly available precedents where core costs were included in the comparison of FWA costs with fibre costs.

The costs used in our FWA cost model are based on inputs from Vodafone and Spark and hence they reflect the costs that will be incurred by an HEO operating in local conditions. Consequently we believe that the opex values assumed in our FWA model should be used rather than costs for operators in other countries which are subject to different conditions.

Chorus and Analysys Mason have raised issues regarding coverage and availability problems in the Commission's FWA model. However those issues have already been considered in our FWA model which is based on Vodafone's RF planning for the sample areas in rural New Zealand. This planning aimed to achieve 100% coverage of premises in the sample areas. Furthermore our cost model incorporates expenses that will be incurred by an operator deploying the network in local New Zealand conditions.

3 WACC

Both Chorus and its consultants have recommended changes in many parameters of the Commission's proposed WACC. In this Section we review these recommendations as follows:

- asset beta (Section 3.1)
- cost of debt (Section 3.2)
- international comparisons (Section 3.3).

3.1 Asset beta

CEG argues⁴³ that the Commission should select an asset beta of 0.50 to replace its draft value of 0.40, on the grounds that the higher estimate is consistent with a long term (20 year) average, international regulatory decisions and the Commission's approach in its Input Methodologies process for electricity distribution and gas pipeline services.

Both Chorus⁴⁴ and CEG suggest that the approach of the Commission's consultants (Oxera) suffers from 'estimation issues'⁴⁵, largely due to Oxera's reliance on the five-year period ending in April 2014. Chorus and CEG note that the use of a two-year period ending

⁴³ CEG (2015), *WACC parameters in the UCLL and UBA draft decision*, February 2015.

⁴⁴ Chorus (2015), *Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' UCLL and UBA Access Services (2 December 2014) and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations (19 December 2014)*, 20 February 2015, page 10, Appendix H, paragraphs 566 to 580.

⁴⁵ *Ibid*, paragraph 577.

on the same date indicates that a higher asset beta is appropriate, and also recommend that more recent newly available data should be used.

We agree that for the required forward-looking estimates it is preferable to rely on the most recent data available. We also agree with both Oxera and CEG that the key objective for this pricing review is to estimate the expected future level of beta – that is, the beta that will apply for the duration of the regulatory period (the next five years). So, CEG proposes that the best estimate for this would be either the last two years or the last twenty years, but not the last five years. According to CEG the five years to 2014 has been biased by the impact of the Global Financial Crisis and the European sovereign debt crisis, and the beta is now reverting to a long-term average.

The empirical evidence CEG offers in support of its position is:

- a time-series of six month beta estimates from 1994 to 2014
- a comparison of European finance versus telecommunications betas from October 2004 to October 2014
- indicative evidence on the timing of the European sovereign debt crisis.

Long term data series and data volatility

CEG presents a series of six month beta estimates that spans a 20-year timeframe from 1994 to 2014 and claims that the low values observed over the period 2008 to 2012 represent an ‘abnormally low level’.⁴⁶

CEG’s underlying premise is that there exists a long-run beta for telecommunications businesses, and that the any beta estimate used by the Commission should reflect this value rather than being influenced by short- to medium-term volatility.

This assumes that the nature of a telecommunications business remains constant over time. However telecommunications is a dynamic industry and there have been significant

⁴⁶ CEG (2015), *WACC parameters in the UCLL and UBA draft decision*, February 2015, Figure 1 and paragraph 31.

underlying changes over the past two decades. Over this period the telecommunications industry has been characterised by:

- a shift from often state-owned monopolies to more competitive markets, particularly at the retail level
- the growing importance of wholesale services to fixed line operators
- the disruptive effect of the Internet throughout all sectors of the economy
- the decline in voice services, traditionally the core business of operators
- technological changes, such as developments in wireless technology, that bring new revenue streams and facilitate infrastructure competition
- mobile services becoming ubiquitous and the increase in fixed-mobile substitution.

These factors – which are not aligned with economic cycles or shocks – will affect the risk associated with the business. The risks of an operator 20 years ago would differ from an operator of today due to the very different operating environments, which we would expect to affect the value of the asset beta. Ofcom clearly shares this view:

However, we have generally placed most weight on the 2-year beta. This is because we consider that it provides the most appropriate balance between a short enough estimation period to remain relevant whilst having enough data points to be sufficiently statistically robust.⁴⁷

Indeed, our examination of several European regulators' derivations of asset betas (see below) found no evidence of data adjustments or lengthening of data series to smooth out the effects of depressed asset betas over the period 2008 to 2012.

We therefore do not believe that the older data suggested by CEG would be particularly relevant for determining a forward-looking beta. Unlike CEG, we agree with Oxera:

...betas have fallen and there is no reason to believe that investors would expect them to rise to pre-2000 levels. Statistical analysis demonstrates that betas have been lower in

⁴⁷ Ofcom (2014), *Fixed access market reviews: wholesale local access, wholesale fixed analogue exchange lines, ISDN2 and ISDN30 – Annexes*, 26 June 2014, paragraph A14.87.

recent years, and a forward-looking analysis should not take into account data from a period when betas were different from those anticipated for the future.⁴⁸

We therefore find CEG's discussion of the European sovereign debt crisis and its empirical comparison of European finance and telecommunications betas essentially irrelevant.

Survey of international regulatory decisions

CEG presents a sample of asset betas relating to fixed line regulatory decisions from European and Australian regulators, and claims that its long-term (20-year) estimate is consistent with the sample average.⁴⁹ The sample consists of 12 European and one Australasian regulatory telecommunications fixed line asset beta decisions. We note that this sample includes Norway and Spain, whereas Oxera's refined comparator sample excluded Telenor and Telefónica. Furthermore, the CEG sample does not present regulatory betas for Austria, Germany, Greece, and Switzerland whereas all of these countries are represented in the Oxera refined comparator sample. In addition, the Oxera sample includes a number of American comparator companies which are not reflected at all in the CEG survey.

In our opinion, any comparison with benchmark data needs to be informed by an understanding of how the benchmark data was derived. Only then can it be possible to determine whether the estimate in question should be directly comparable with the benchmark data.

We have therefore investigated the methodology used to derive the asset beta for a subset of half the regulators in CEG's sample, and have found that while the overall approach is similar, there are significant differences in the data used – both in regards to the selection of comparator firms and the time periods – as well as in the degree of subjective judgement applied by the regulator in setting the asset beta value.

⁴⁸ Oxera (2014), *Review of expert submissions on the WACC for UCLL/UBA*, 4 November 2014, page 7. Bold text is in the original.

⁴⁹ CEG (2015), *WACC parameters in the UCLL and UBA draft decision*, February 2015. See Section 2.3.

Denmark

The asset beta used in Danish regulatory decisions was 0.50. The regulator compared this value against its own updated estimates of the incumbent operator TDC's asset beta using various periods from one to five years (which were lower than 0.50) and also against benchmark betas from nine European countries – Belgium, Croatia, France, Ireland, Lithuania, Netherlands, Romania, Sweden and the United Kingdom – which had an average of 0.73. Subsequently the regulator decided to retain the value of 0.50 as it was between the values obtained by the two analyses.⁵⁰

Ireland

As the Irish incumbent operator, eircom, is no longer publicly listed, the regulator ComReg uses benchmark analysis and regulatory precedent to set the asset beta. Both two- and five-year betas were estimated from share price data up to December 2013 for a sample of European operators – BT, Deutsche Telekom, KPN, Orange, Swisscom, Telefónica and TeliaSonera. ComReg subsequently updated its analysis to incorporate more recent data (to October 2014) and the asset beta was then increased to be marginally below the midpoint of the sample two-year betas for the period January to October 2014, reflecting the slight upward trend in ComReg's sample betas over the preceding year.⁵¹

Netherlands

The estimate for the asset beta is based on the average of the asset betas for a peer group of operators. In the case of fixed line, the peer group consisted of just three European operators: BT, Free-Iliad (France) and TDC. The company asset betas were based on daily data over a period of three years.⁵²

⁵⁰ Erhvervsstyrelsen (2014), *Afgørelse om fastsættelse af maksimale netadgangspriser efter LRAIC-metoden for 2015 – fastnet*, 4 December 2014.

⁵¹ ComReg (2014), *Cost of Capital*, 18 December 2014.

⁵² The Brattle Group (2012), *The WACC for mobile, fixed-line and cable termination rates*, report for OPTA, 15 March 2012.

Norway The estimates of the betas for fixed line regulatory decisions were based on monthly data over the period November 2008 to October 2013 for a sample of nine European operators: BT, Elisa, Hellenic Telecom, Portugal Telecom, TDC, Telekom Austria, TeliaSonera, Telenor and Tele2. The value selected (0.45) was slightly lower than the sample average (0.47) as it was considered that fixed network operations should have a lower risk than mobile and other activities.⁵³

Sweden The Swedish regulator, PTS, estimated the betas based on the average across 13 European operators – Belgacom, BT, Deutsche Telekom, France Telecom, KPN, Portugal Telecom, Swisscom, TDC, Telecom Italia, Telefónica, Telekom Austria, TeliaSonera and Telenor. Weekly share price information over a period of five years was used.⁵⁴

United Kingdom When deriving the betas for BT Group, Ofcom estimated the one-year and two-year daily betas, as well as the five-year weekly beta, although as noted earlier it preferred the two-year beta.⁵⁵

Ofcom then disaggregated the BT Group asset beta (0.72) into Openreach (for copper access services – 0.50) and Rest of BT (0.83) asset betas. The UK asset beta quoted by CEG is the Openreach asset beta, the derivation of which was informed by benchmark data of two-year asset betas from UK utilities (National Grid, Pennon Group, Severn Trent, United Utilities, Centrica and Scottish & Southern Energy), Chorus (New Zealand), UK telecoms operators (Talk Talk, Colt, Virgin Media and Sky) and European telecoms operators (Belgacom, Deutsche Telekom, KPN, Orange, Telecom

⁵³ Johnsen, T. (2013), *Kapitalkostnad for norsk telekom fastlinjevirkosomhet*, December 2013.

⁵⁴ PTS (2013), *Förslag till uppdaterad kalkylränta för det fasta nätet*, 3 June 2013.

⁵⁵ Ofcom (2014), *Fixed access market reviews: wholesale local access, wholesale fixed analogue exchange lines, ISDN2 and ISDN30 – Annexes*, 26 June 2014.

Italia and Telefónica). In fact, in its selection of an asset beta value, Ofcom appears to have ignored the European data, and been influenced only by data from UK utilities, UK telecoms operators and Chorus.

In the case of Openreach, we consider that its asset beta should lie somewhere below the asset beta for the entirety of BT Group, as we would expect that Openreach's copper access business has lower systematic risk than the other parts of BT Group. In addition, we believe Openreach's asset beta should be above the average asset beta of network utilities, recognising that the systematic risk of energy and water utilities is likely to be lower than that for fixed line telephony...

...*a priori* it might be argued that the Openreach asset beta should not be higher than that of the UK telecoms operators that are large users of wholesale access services from BT. However, moving to an asset beta for Openreach much below the mid-point of the range between the network utilities and BT Group would represent a large departure from the asset beta of 0.60 we determined early in 2013.⁵⁶

The extensive use of benchmark data by regulators indicates that CEG's comparison is a benchmark analysis of benchmarks. It is highly questionable whether some of the operators or countries within these benchmark samples are suitable comparators for an HEO in New Zealand. The operators France Telecom, Telefónica, Telenor, TeleSonera and Tele2 – which are included in at least one of the benchmark samples above – are not within the Oxera sample.

Furthermore some operators – such as BT and Telefónica – appear more frequently in the benchmark samples than operators such as Elisa and Telekom Austria. The more frequently

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Ofcom (2014), *Fixed access market reviews: wholesale local access, wholesale fixed analogue exchange lines, ISDN2 and ISDN30 – Annexes*, 26 June 2014, paragraphs A14.216 and A14.218.

used operators will therefore be given a higher weighting than operators that appear less frequently. This is likely to introduce a bias in CEG's comparator analysis. Other operators in Oxera's sample – such as Hawaiian Telecom – may not be represented at all. We can only conclude that CEG's benchmark of benchmarks encompasses a very different sample of operators to that of Oxera.

We also note that asset betas estimated by regulators for BT may be for BT Group, not the lower value for Openreach as estimated by Ofcom and used by Oxera – this would have the effect of increasing a benchmark estimate. As BT is included in many of the benchmark samples, we would therefore assume that this introduces an upward bias to the results.

Both Ofcom and NKOM (the Norwegian regulator) clearly recognise that the asset beta for fixed line operations should be lower than for mobile or other operations and set the asset beta accordingly.

We therefore conclude that it is appropriate for the asset beta for the HEO's fixed line business to be lower than CEG's sample average.

Relevance of Input Methodologies precedent

Chorus and CEG claim that the Commission should follow a precedent set in the Input Methodologies (IM) in which a long period was used to estimate the beta. However the Commission is in an entirely different situation with estimating the asset beta for a provider of UCLL and UBA services compared to EDBs. For the latter the Commission has the benefit of a very rich dataset which simply does not exist for UCLL and UBA service providers.

Furthermore the types of changes that have occurred in the telecommunications industry since the 1990s (as described above) are only now confronting the electricity industry. These new challenges include changing models of electricity generation, the introduction of new technologies such as smart grids and the need for efficiency improvements in an environment of increasing demand and high costs of replacing ageing infrastructure. This sounds very familiar to the telecommunications industry, and indeed many analysts have

commented that the electricity industry is now facing similar challenges to those of the telecommunications industry over the past two decades.⁵⁷

Where business risk has been relatively stable over a long period of time – as has been the case for the electricity industry until relatively recently – then long term estimates of the beta are appropriate. However in a dynamic business subject to massive changes in technology and its operating environment the nature of risk is also likely to be changing. Thus long-term estimates of the beta, typified by the electricity industry precedent cited by CEG, may be misleading for future telecommunications businesses – even for the long term. Indeed there is growing evidence that the use of such long-term estimates for electricity may also need to be reviewed.

3.2 Cost of debt

Debt risk premium

CEG argues that the Commission in estimating the debt risk premium (DRP) should include the three bonds characterised as ‘anomalous’ by the Commission – that is, Genesis Power Limited, Mighty River Power Limited and Meridian Energy Limited. Although CEG agrees that the DRPs of the bonds of these companies were inflated due to the New Zealand Power Proposal of 2014, it claims that a UCLL and UBA service provider faces similar regulatory risks and as such it is reasonable to consider these bonds in the DRP estimate.

In our recent report we recommended that the Commission includes the bonds of Genesis Energy and Mighty River Power in its sample, but on different grounds to those of CEG⁵⁸. Our main concern was the small sample size, and although we recognised the possibility of

⁵⁷ See for example World Economic Forum (2015), *The Future of Electricity: Attracting investment to build tomorrow's electricity sector*, January 2015.

⁵⁸ Network Strategies (2015), *Commerce Commission Draft Determination for UCLL and UBA*, 20 February 2015. See Section 7.1.

upward bias as a result of the inflated values of these two companies we also noted that this would offset to a certain extent the effect of the inclusion of WIAL.

CEG claims that the corresponding five bonds – for the anomalous issuers Genesis, Meridian Energy and Mighty River Power – should be included as the NZ Power Proposal would have resulted in a similar increase in regulatory risk and potential devaluation of assets for the UCLL and UBA provider.

We consider the UCLL and UBA situation to be very different. In contrast to the NZ Power Proposal which was originally raised in 2013, it has been well known for many years that the TSLRIC-based final pricing principle would be applied to the UCLL and UBA services. Therefore the effect of the associated risks should have already been factored in by investors.

Debt issuance costs

CEG acknowledges that its approach to estimating the debt issuance costs is conservative in that:

...the methodology used to amortise debt issuance costs assumes that the entire cost is incurred upfront on a one-off basis and is non-recurring. We would expect part of the debt issuance costs to be recurring each year.⁵⁹

Yet CEG proposes no adjustment to account for the effect of this assumption.

CEG's assumption of solely upfront costs would be a worst case (and highest cost) scenario and thus must be viewed as an upper bound.

We do not believe that the entire debt issuance cost will be incurred upfront – rather there will be some portion of the cost that will be incurred at various points in time over the

⁵⁹ CEG (2015), *WACC parameters in the UCLL and UBA draft decision*, February 2015, paragraph 78.

seven-year timeframe. There is no reason to believe that the costs will be for equal amounts, or that they will occur on a regular basis.

Any estimate of debt issuance costs expressed in terms of a per-annum percentage would therefore need to be an assumption for a series of incurred costs over the required time period. The use of an annuity formula – such as that described by CEG – requires that both the cost amounts and when they are paid are known or assumed, as well as an appropriate cost of capital.

Another problem is the choice of the cost of capital when this requires as an input the parameter to be estimated. It may be possible to identify a solution via iterative methods, however we cannot assume such a solution would be unique.

In support of its claim for an increase in the debt issuance costs, CEG cites an analysis of debt issuance costs of a sample of 17 bonds issued by 15 New Zealand firms undertaken by PwC⁶⁰. The prospectuses for these bonds ranged over the period August 2003 to May 2010. The amounts raised varied between \$50 million and \$300 million, with terms varying from 3.2 to 9.5 years.

PwC noted that smaller bond issues have relatively higher issuance costs, that the issuance costs vary by bond term, and that:

...bigger companies that are well known “household names” and/or have a government shareholder tend, on average, to enjoy lower issuance costs. On the other hand smaller, less well known companies appear to have to pay higher rates of brokerage in order to successfully undertake a bond issue.⁶¹

An example of this is Silver Fern Farms which appears to be a sample outlier. Silver Fern Farms issued four year bonds for \$75 million – the shortest term and the second lowest amount in the sample – yet the debt issuance costs, expressed as a percentage of the

⁶⁰ PwC (2010), *Submission on the Cost of Capital Material in the Commerce Commission's Draft Input Methodologies Determinations and Reasons Papers*, report for Telecom New Zealand, August 2010.

⁶¹ *Ibid*, paragraph 6.52.

amount raised, were the highest at 3.33%. We also note that the nature of this business is very different to the other firms, which are mostly infrastructure companies. Omitting this bond reduces the sample mean and median.

This suggests that for the purposes of estimating a debt issuance cost for the HEO the smaller, less well-known companies should be excluded from the sample.

However, the main problem with the PwC sample is that the data is between five and twelve years old, which is hardly indicative of forward-looking costs. If the Commission wishes to review debt issuance costs, we would recommend using more up-to-date data from suitable comparator firms.

Similarly, the Commission's estimate is also based on old data. This estimate – 0.35% per annum over a five-year term or 0.25% for a seven-year term – was based on data provided in submissions to its 2010 consultation on the IMs for airport services⁶². As a result of this consultation, the Commission's original draft estimate for debt issuance was revised:

The Draft Reasons Paper proposed an allowance of 0.30% per annum for a public issue of five year bonds, which was based on prior Commission decisions and a 1995 US estimate of debt issuance costs. Submissions from suppliers on the Draft Reasons Paper included more up-to-date data on the costs of issuing public bonds in New Zealand. Notwithstanding some issues with the quality of this data, the Commission considers this information does provide an improved basis for estimating the level of issue costs, and has increased the allowance for issue costs on publicly issued bonds to 0.35% per annum.⁶³

Clearly the Commission recognises the importance of timely information. As the data underlying its estimate would be no more recent than that of PwC's sample a review of debt issuance costs is recommended.

⁶² Commerce Commission (2010), *Input Methodologies (Airport Services) Reasons Paper*, December 2010, paragraph 6.3.37.

⁶³ *Ibid*, paragraph 6.3.37.

Benchmark term for the cost of debt

CEG repeats its previous arguments⁶⁴ in favour of a ten-year benchmark term for the cost of debt, rather than the seven-year term preferred in the Commission's draft decision. CEG contends that:

Professor Lally's recommendation of a term of debt based on the sample from the Input Methodologies process in preference to our sample of telecommunications firms appears to place an unreasonable degree of reliance upon the geographical location of a firm as a driver for its debt raising behaviour, over and above other potentially very relevant characteristics such as industry of operation, the size of the business and ownership structure.⁶⁵

Our view, as noted in our earlier report⁶⁶, is that indicative data from relevant New Zealand comparators provides very useful guidance for this parameter although we recommended that the Commission consider updating its survey which was based on information from regulated infrastructure suppliers in 2010. We consider that local circumstances are more relevant for the debt term than evidence based on international benchmarks.

In fact the evidence that has been presented by CEG indicates that there are regional differences in average debt terms. Using CEG's estimates of the weighted average tenor of debt at issuance from Table 6⁶⁷ we found a significant difference between the simple average of the European firms (CEG full sample) and the American firms (CEG full sample). Our results indicate that American firms tend to have debt terms that are around 4.5 years longer than their European counterparts (Exhibit 3.1).

It should be noted that we have included a value of zero for Colt Group in this analysis as the company does not have any debt⁶⁸. However, CEG appears to have treated this as a

⁶⁴ CEG (2015), *WACC parameters in the UCLL and UBA draft decision*, February 2015, Section 3.3.

⁶⁵ *Ibid*, paragraph 113.

⁶⁶ Network Strategies (2015), *Commerce Commission Draft Determination for UCLL and UBA*, 20 February 2015. See Section 7.1.

⁶⁷ CEG (2015), *WACC parameters in the UCLL and UBA draft decision*, February 2015, page 32.

⁶⁸ Colt Group (2014), *Annual Report and accounts for the year ended 31 December 2014*, see page 119.

missing value and did not include Colt in its average calculation. This means that the 10.7 years result reported by CEG is an over-estimate. We have reported the corrected estimate in Exhibit 3.1. It should also be noted that we did not check the accuracy of CEG's estimates of each of the debt terms.

	<i>European firms</i>	<i>United States firms</i>	<i>CEG full sample</i>
Simple average	8.96	13.55	10.34
Median	8.00	12.45	8.90

Exhibit 3.1: *Debt term - years [Source: CEG estimates, Network Strategies]*

This evidence indicates the Commission is correct in its assumption that firms' decisions on the term of debt primarily reflect local conditions and as such, in this instance, local benchmark information is more appropriate than the practices of overseas firms.

Gearing

Chorus believes that the Commission's estimate for leverage – 43%, which is based on Oxera's refined comparator sample – should be increased to 50%.⁶⁹ Chorus' preferred estimate is obtained from a reduced sample, where nine of the 23 firms in Oxera's refined comparator sample were omitted. These omitted operators were:

- AT&T
- Belgacom
- BT
- Cincinnati Bell
- Elisa Oyj
- Fairpoint Communications
- Iliad
- Swisscom

⁶⁹ Chorus (2015), *Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' UCLL and UBA Access Services (2 December 2014) and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations (19 December 2014)*, 20 February 2015, paragraphs 581-595.

- Telstra.

Chorus suggested that to be retained in the sample, the firm should have a ‘reasonable’ observed level of gearing. To assess the ‘reasonableness’ Chorus proposes two tests:

- comparing the comparator firm’s observed level of gearing with the level of gearing specified by the relevant regulator, when applicable. Where the comparator firm’s observed level of gearing is significantly different from the level of gearing specified by the regulator, the comparator firm is excluded from the comparator set; and/or
- comparing the comparator firm’s observed level of gearing (measured as market debt to capital ratio) with its book debt to capital ratio. Where the comparator firm’s market debt to capital ratio is significantly different (more than 50% higher (or lower)) from its book debt to capital ratio, the comparator firm is excluded from the comparator set.⁷⁰

Chorus notes that the regulators in Belgium and Australia set the (fixed network) gearing to be higher than the observed levels of the incumbent operators (Belgacom and Telstra respectively). In both instances the firms operate both fixed and mobile networks, and thus in our opinion a gearing level appropriate for the whole company may not be suitable for an efficient fixed line business. In regards to its estimation of gearing, the ACCC noted that:

In the September 2010 Draft Report, the ACCC noted that it has previously adopted a debt/equity ratio of 40:60 per cent in telecommunications decisions. Ovum’s analysis of Telstra’s accounts as part of the ACCC’s assessment of the ULLS undertaking found an average level of 34 per cent debt to 66 per cent equity across its entire business. However, the ACCC considered that the CAN [Customer Access Network, or fixed network] was less risky than Telstra’s other operations (such as mobiles) and therefore should be able to service more debt. Telstra’s debt ratio at the time of privatisation was 41.3 per cent, when it more closely resembled a pure fixed line service operator. The ACCC therefore used a

⁷⁰ *Ibid*, paragraph 589.

debt/equity ratio of 40:60 in the September 2010 Draft Report, as an appropriate gearing level for the CAN assets.⁷¹

In the case of BT, we note that the estimate used by Ofcom for leverage (32%) is based on the two-year average for BT Group.⁷²

In regards to the second test, Chorus presents data for most of the firms, however no information is provided on the nature or timeframe of this information. We do not know if this information is a point estimate for a specific date or an average over some time span. As much financial data is quite volatile, we consider that an average value would be preferable. Nonetheless without further information on the nature of this data, we cannot endorse Chorus' criterion for exclusion.

In addition, Chorus provides no justification for its use of the 50% threshold for determining whether a difference in the ratios is significant.

Furthermore, there is missing data for three firms – BT Group, Cincinnati Bell and Fairpoint Communications – so we conclude that these firms were excluded on the basis of unavailable data and not as a result of Chorus' reasonableness test.

Indeed, given Chorus' stated preference for having an estimated gearing closer to its own observed level of gearing, it is difficult to understand the reason for exclusion of BT, when Ofcom bases its estimate on the operator's observed gearing.

It should be noted that the Commission is under no obligation to use Chorus' observed gearing – it is setting the gearing for an efficient fixed line operator, and has based that estimate on a sample of suitable comparator firms. As Chorus has provided no robust justification of the implementation of its reasonableness test, we therefore support the Commission's use of Oxera's refined comparator sample to estimate leverage.

⁷¹ Australian Competition and Consumer Commission (2), *Public inquiry to make final access determinations for the declared fixed line services*, discussion paper, April 2011, page 98.

⁷² Ofcom (2014), *Fixed access market reviews: wholesale local access, wholesale fixed analogue exchange lines, ISDN2 and ISDN30 – Annexes*, 26 June 2014, paragraph A14.84.

Credit rating

The Commission has assumed a Standard & Poor (S&P) long term credit rating of BBB+, however Chorus suggests that a rating of BBB- be used. The Commission has previously rejected Chorus' suggestion, as it believes the BBB+ rating satisfies the following criteria better than BBB-:

In estimating the WACC UCLL and UBA, we seek to estimate the costs of a hypothetical efficient operator. We consider an efficient operator would seek to maintain a strong investment-grade credit rating so as to ensure satisfactory access to debt capital markets at reasonable cost. In selecting its target credit rating, an efficient operator would also prefer a strong investment-grade credit rating so as to provide it with a margin of safety.⁷³

Indeed, the only new evidence provided by Chorus in support of its claim is a table of credit rating and gearing for the telecommunications industry from Moody's. Great care needs to be taken in interpreting this information.

As we have noted previously⁷⁴, credit ratings are an opinion of relative risk, not a numerical measure or scale. In regard to Standard & Poor's ratings (although the same applies to any credit ratings):

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.⁷⁵

⁷³ Commerce Commission (2014), Cost of capital for the UCLL and UBA pricing reviews, draft decision, 2 December 2014, paragraph 103.

⁷⁴ Network Strategies Limited (2014), *Setting a value for the WACC: benchmarking, risk and uncertainty*, 11 April 2014.

⁷⁵ See http://www.standardandpoors.com/aboutcreditratings/RatingsManual_PrintGuide.html.

It is therefore inappropriate to attempt to interpolate values across credit ratings.

The Moody's credit ratings presented by Chorus differ from those of S&P, although there is a recognised mapping between the two ratings schemes. S&P BBB+ is equivalent to Moody's Baa1 and BBB- is equivalent to Baa3. Yet the table presented by Chorus provides no information on the gearings for these ratings, only for the Baa rating which encompasses Baa1, Baa2 and Baa3 (equivalent to S&P BBB+, BBB and BBB-). There is thus no firm evidence of significant differences in leverage between the Baa1 and Baa3 credit ratings.

We therefore find no grounds to modify the Commission's assumption of a BBB+ credit rating.

Risk-free rate

Chorus states that the risk-free rate should be calculated in reference to either ten-year Government bond yields or longer periods of averaging than the one-month average for five-year Government bonds used by the Commission.

Our own view, as noted by the Commission, is that the risk-free rate should be matched to the regulatory period⁷⁶.

As in the case of asset beta, regulators have used a variety of approaches and levels of subjective judgement to estimate the risk-free rate.

Australia For its Final Access Determination for fixed line services⁷⁷, the ACCC derived the risk-free rate from ten-year Government bonds averaged over a 20-day period. Previously to this FAD, the ACCC

⁷⁶ Commerce Commission (2014), *Cost of capital for the UCLL and UBA pricing reviews - draft decision*, 2 December 2014. See paragraph 60.

⁷⁷ Australian Competition and Consumer Commission (2011), *Public inquiry to make final access determinations for the declared fixed line services*, discussion paper, April 2011.

used ten-year Government bonds averaged over a ten-day period, however given evidence from submissions of the averaging period used by other regulators, it was increased to 20 days.

The ACCC noted that:

While a longer averaging period may reduce the impact of day-to-day volatility in the market on the estimated risk-free rate, increasing the length of the averaging period also increases the presence of dated information in the estimate. In determining the appropriate length of the averaging period for the risk-free rate, a trade-off is needed between these two factors.⁷⁸

The ACCC's 20-day averaging period is selected to be as close as possible to the start of the regulatory period.

United Kingdom

Ofcom's latest estimate of the risk-free rate is informed by both five and ten year gilts (bonds) using a range of averaging periods – spot rate, one and three months, and one, two, five and ten years – for three separate dates – 6 December 2012, 24 June 2013 and 17 February 2014. In addition, Ofcom also considers forward rates on five- and ten-year index-linked gilts.

These factors inform our estimate of the real RFR [risk-free rate], but we are cautious when interpreting the data because of the level of uncertainty that has persisted and the potential impact of temporary distortions such as quantitative easing. There is no straightforward answer to the question of what interest rates will do in the future and we need to be mindful of current rates, historical rates, and future expectations. Therefore, we do not mechanically weight different sources of evidence but rather consider the available evidence and use our regulatory judgement

⁷⁸ *Ibid*, page 87.

to come to a view on what an appropriate forward-looking risk-free rate would be for 2017, the final year of the charge control.⁷⁹

As noted by the ACCC, there is a trade-off between smoothing out the effects of market volatility and ensuring that the underlying information is timely. While we appreciate the value of consideration of longer averaging terms as an aid to understanding movements in the market – as implemented by Ofcom – this should not be at the expense of ignoring data based on shorter average periods. We therefore cannot support Chorus’ suggestion of a replacement of a one-month averaging period with a longer term.

Debt swap costs

CEG claims that the Commission’s assumption on the costs of debt swaps is too low as it believes that:

- two swap costs are incurred instead of one
- benchmark data on Australian costs of swaps is higher than the Commission’s estimate.

The number of swap costs that are incurred is likely to depend on the nature of the hedging. A worst case (and highest cost) situation – which is CEG’s assumption – would be that two swap costs are incurred, however it is possible that there would be some mix of single and double swap costs.

We note that the methodologies for deriving debt swap costs cited by CEG – from Evans & Peck⁸⁰ and UBS⁸¹ – both derive estimates based on Australian data. Ideally any estimate for this parameter should be based upon New Zealand data, although we note that overseas hedging may incur similar costs.

⁷⁹ Ofcom (2014), *Fixed access market reviews: wholesale local access, wholesale fixed analogue exchange lines, ISDN2 and ISDN30 – Annexes*, 26 June 2014, paragraph A14.45.

⁸⁰ Evans & Peck (2013), *SEQ Retail Water Price Review*, 4 February 2013.

⁸¹ UBS (2015), *Analysis of liquidity of interest rate swaps*, 13 January 2015.

It should be noted that the Australian Energy Regulator (AER) has to date not explicitly allowed for debt swap costs – the UBS report (on behalf of the provider TransGrid) was claiming that an explicit allowance should be made. The AER’s draft decision stated that:

While it is correct that we did not explicitly provide an allowance for transaction costs associated with swap contracts, the NSW service providers were compensated based on:

- A broad BBB credit rating even though the benchmark credit rating was BBB+
- A 10 year debt term (risk free rate and DRP) even though the benchmark efficient entity would have incurred a 5 year risk free rate due to hedging.⁸²

A final decision has not yet been released by the AER, and so it is not possible to ascertain whether the regulator has accepted UBS’s analysis.

3.3 International comparisons

CEG provides an international comparison of the ‘WACC premium’ – defined as the regulatory nominal vanilla WACC less the five-year local government bond rate that prevailed in the month of the regulatory decision⁸³.

This risk free rate will with high probability be different from the risk free rate used in the decision. Calculating the WACC premium in this way will ensure that we are making a like-for-like comparison.⁸⁴

CEG then states that its methodology results in a WACC premium of 3.56% for Chorus which it claims is the lowest in its sample. This is purported to show that:

⁸² Australian Energy Regulator (2014), *Draft decision TransGrid transmission determination 2015–16 to 2017–18 Attachment 3: Rate of return*, November 2014.

⁸³ CEG, *WACC parameters in the UCLL and UBA draft decision*, February 2015, section 4.1.

⁸⁴ *Ibid*, paragraph 142.

...the Commission's cost of capital parameters affecting its allowed WACC premium – its debt risk premium, TAMRP and asset beta – together give lower compensation above the risk free rate than regulators of comparable businesses.⁸⁵

We note that according to CEG's Executive Summary the sample consists of eleven European jurisdictions, the United States and Australia⁸⁶. However the summary of results presented in Table 8 does not include the United States, but presents two results for Australia (dated July 2011 and May 2013). We note that CEG's results for Australia (3.57% and 3.89%) are very comparable to its estimate for the Commerce Commission's draft decision.

Note that we have not checked the calculations that CEG has made in deriving its estimates.

We have already discussed in the context of asset betas (in Section 3.2) the difficulties inherent in making international comparisons of regulatory WACCs. In particular, we illustrated that the underlying methodologies for estimating components of the WACC differ from one jurisdiction to the next. Furthermore, the manner in which the WACC calculation has been implemented also may differ across jurisdictions. As such, CEG cannot be comparing like with like, and therefore it is difficult to draw any meaningful conclusions from its results.

3.4 Conclusions

CEG does not present a compelling case for the Commission to change its draft approach to WACC in respect of any of the financial parameters.

With respect to the asset beta we found that:

- older data suggested by CEG is irrelevant for determining a forward-looking beta

⁸⁵ *Ibid*, paragraph 14.

⁸⁶ *Ibid*, paragraph 13.

- CEG's international regulatory benchmark comparison is a benchmark analysis of benchmarks. Within these benchmark samples there are many comparators that are unsuitable for an HEO in New Zealand
- long-term estimates of the beta, typified by the electricity industry precedent cited by CEG, may be misleading for forward-looking telecommunications businesses.

As regards Chorus and CEG's recommendations with respect to the cost of debt we observed that:

- contrary to CEG's claims the impact on bonds (and the debt risk premium) of the NZ Power Proposal which was originally raised in 2013 cannot be characterised as equivalent to the application of the TSLRIC-based final pricing principle to UCLL and UBA services. Therefore the Commission was correct in assuming that the bonds of affected power companies are 'anomalous'
- CEG's proposed approach to debt issuance costs does not encompass data any more recent than that of the Commission's and its assumptions reflect a worst case (highest cost) scenario
- Chorus provided no robust justification for the implementation of its reasonableness test with respect to leverage therefore the Commission should retain its use of Oxera's refined comparator sample to estimate leverage
- the data provided by Chorus to support changing the Commission's credit rating is open to interpretation and as such the Commission should retain its existing assumption
- with respect to the risk-free rate, while consideration of longer averaging terms assists in understanding movements in the market this should not be at the expense of ignoring data based on shorter average periods hence the Commission should reject Chorus' suggestion of a replacement of a one-month averaging period with a longer term
- CEG's proposal regarding debt swap costs also represents a worst case scenario which may not apply in practice
- a review of CEG's evidence indicates the Commission is correct in its assumption that firms' decisions on the term of debt primarily reflect local conditions and as such local benchmark information is more appropriate than the practices of overseas firms.

Finally, we note that the difficulties inherent in comparing WACCs across jurisdictions make it problematic to draw meaningful conclusions from CEG's international comparison of the so-called 'WACC premium'.

4 Price trends

CEG, on behalf of Chorus, reviewed the implementation of price trends within the TERA model.⁸⁷ In this section we comment on some of CEG's findings, in particular:

- use of a trend growth rate rather than a geometric average (Section 4.1)
- use of the Reserve Bank target inflation rate (Section 4.2)
- use of price trends within actual Chorus supplier contracts (Section 4.3).

4.1 Estimation of the growth rate

CEG quite rightly states that the price trend parameter, or tilt, used in the calculation of depreciation based on a tilted annuity represents the price trend for the lifetime of the asset, not the regulatory period. This price trend must also be constant over that asset's lifetime.

However, CEG recommends that the Commission should use a long-term forecast of the price trend for which:

...the Commission should have regard to as long as possible a time series of price data, including both historical observations and forecasts of future values.⁸⁸

In our view, it is erroneous to believe that a price trend applicable for an asset's lifetime should reflect some long-term natural trend (if indeed such a thing exists). The assets used

⁸⁷ CEG (2015), *Evidence on price trends*, February 2015.

⁸⁸ *Ibid*, paragraph 36.

in the Commission’s model have various lifetimes – from five to fifty years – and, if we assume the existence of a long-term trend, such a value would certainly not be appropriate for assets with relatively short lifetimes.

Even for assets with very long lifetimes, the price trend must still be forward-looking – it should not be presumed that price movements over the past few decades will be indicative of future price trends. Therefore we consider that while historical data may provide some limited insight into future trends, the Commission should be mindful that projecting past trends may not necessarily be appropriate for estimating forward-looking price trends.

TERA estimates the average price trends for the various data series by calculating the compound annual growth rate from a given start date to a given end date. The characteristics of this method:

- only two datapoints are used (even if more datapoints are available)
- the endpoint of the projected data series will be identical to the endpoint of the original data (which, as CEG notes⁸⁹, is a useful property).

CEG states that using this method will result in error in determining the trend rate of growth if there is variation in price trends. CEG recommends using a regression model instead, where the log of the price is assumed to have a linear trend over time. An estimate based on this model will **not** have the useful property where the endpoint of the projection is the same as the endpoint of the original data.

In theory, we would expect that CEG’s model would have a reasonable fit for well-behaved data series that exhibit a relatively consistent trend. However, for more volatile data series – such as that for copper prices – even if the overall fit is good, the model may be a poor predictor of forward-looking prices over the medium-term.

⁸⁹ *Ibid*, paragraph 41.

Deriving long-term data series

In its analysis and estimation of the so-called long-term price trends, CEG has used alternative data to that of the Commission in order to construct a long-term data series.

Wages / labour CEG recommended that a labour cost index (LCI) for specific occupation types (which it states to be technicians and associated professionals) should be used instead of a LCI for all occupations.

It should be noted the Australian and New Zealand Standard Classification of Occupations (ANZSCO) system was introduced in September 2009, replacing the New Zealand Standard Classification of Occupations (NZSCO99), which created a major discontinuity in the LCI data series. For data prior to June 2010 CEG used the LCI for technicians and associated professionals (based on NZSCO99), while for data after that date CEG used the LCI for technicians and trades workers (based on ANZSCO).

In relation to the implementation of the new classification scheme, Statistics New Zealand notes that:

As there is a high level of discontinuity between the old and new occupation and industry breakdowns, the new series have not been linked to the old series.⁹⁰

The occupation group for technicians and trade workers (under ANZSCO) differs from the earlier NZSCO99 technicians and associated professionals. Some of these differences include:

- the shift of a number of occupations from the abolished NZSCO99 group for agriculture and fishery workers to the ANZSCO technicians and trade workers group

⁹⁰ Statistics New Zealand (2010), *Labour cost index (salary and wage rates): June 2010 quarter*, 3 August 2010.

- a number of occupations previously in the NZSCO99 technician and associated professionals group were moved to other occupation groups.

Furthermore, the projections used by CEG in constructing its data series from 1992 to 2019 were those for the all occupations LCI. So CEG's data series is constructed from three separate data series, each of which relate to a different time period.

Fabricated steel

CEG does not provide a definition of the MEPS carbon steel price index that it uses for historical data. MEPS produces price indices for a number of different carbon steel product forms, of which hot rolled coil steel is one. As CEG states that a linear interpolation was required to form a continuous data series from the two sets of data, this suggests that the projections of hot rolled coil steel used by CEG are not fully compatible with the historical data. Indeed the two parts of the conjoined series may have differing (although probably related) trends.

Copper

CEG also combined data from various sources to obtain a long-term series of copper prices:

- LME average monthly prices to October 2014 (it appears the series may commence in January 1990), constructed from daily price data
- LME futures over 3, 15 and 27 months to predict spot prices to January 2017
- a long-term forecast from Consensus Economics for copper prices at April 2022.⁹¹

Beyond October 2014, CEG does not have monthly data – rather it has four projected data points over a period of seven years. CEG

⁹¹ CEG (2015), *Evidence on price trends*, February 2015, paragraph 60.

then interpolates the missing data (that is, 90 data points, or 23% of the total data points over CEG's time period) and uses that within its analysis. Hence CEG's selection of the long-term forecast data point (at April 2022) governs the slope of the last five years of the constructed data series, and thus will have a considerable impact on the estimation of the long-term trend.

It should be noted that CEG's regression methodology does not require the missing data to be interpolated, however without doing so the four data points relating to copper price forecasts will have little effect on the overall trend estimation.

CEG estimated average monthly copper prices from daily prices. Ideally a monthly average price should be weighted by trading volumes rather than being a simple average of the daily prices.

We note that CEG has used market exchange rates to convert copper and steel prices to New Zealand dollars which is certainly preferable to any attempt to use blended rates for currency conversion. However, it is important to use a consistent series and CEG has used historical information from the Reserve Bank of New Zealand and traded forward exchange rates from Bloomberg for the future. There is a similar requirement for the use of consistent series for the data itself. In order to construct a long-term time series for estimation of long-term growth rates, CEG – by necessity – had to use different data series for discrete time periods within entire time span, or it interpolated its own trend series. This introduces additional sources of error into the analysis, due to the discontinuities, and potentially differing trends, of the various component data series.

Given CEG's approach to deriving long-term time series, it is highly questionable as to whether its analysis gives a better result than the more simple calculation of compound annual growth rates. In other words, the quality of the data may not support a sophisticated analysis. We therefore do not believe that CEG has provided compelling evidence for the Commission to replace the forecasts obtained from NZIER with CEG's own projections from constructed data series.

It would certainly be possible to adapt CEG’s linear price trend model to incorporate factors to denote discontinuities in the data series, but we question whether the end result would be superior to that obtained from the simpler approach.

Fibre optic cabling

CEG criticises the Commission’s use of the “insulated wire and cable; optical fibres cables” component of the capital goods price index (CGPI) from Statistics New Zealand for a price trend of fibre optic cabling. We agree with CEG that this series is inappropriate as optical fibres represent only a small part of the index. We suggested that benchmark data be used⁹², however CEG has identified other relevant data series for consideration:

- US Producer Price Index (PPI) for fibre optic cable manufacturing in the United States
- total optical fibre value and quantity indices from the Japanese Electric Wire & Cable Makers’ Association (JCMA)
- the price Chorus pays for fibre optic cable.

CEG claims that monthly data for the US PPI has only been available on a monthly basis since January 2004. In fact, monthly historical data extends much further back than 2004. CEG claims that its methodology requires a long-term data series in order to estimate the long-term trend, and for its analysis of the copper price trend used monthly data back to 1990. We therefore applied CEG’s methodology to the same timeframe for the US PPI.

It is clear that the length of the data series can have an effect on the estimated price trend. Using data from January 1990 to December 2014 we estimated an average annual trend of -4.28%. However with the shorter time period used by CEG – January 2004 to December 2014 – the annual trend was -3.75%.

This result differs from that obtained by CEG. We believe this may be due to two factors:

⁹² Network Strategies Limited (2015), *Commerce Commission Draft Determination for UCLL and UBA: a review of key issues*, 20 February 2015, Section 6.2.

- there may be differences in the exchange rate data used for currency conversion (we used average monthly market exchange rates sourced from Oanda)
- there may have been some changes in the raw US PPI data due to data revisions in the most recent months.

CEG's analysis shows that the JCMA data corresponds fairly closely with the price Chorus pays for fibre optic cable, suggesting that this data series may be more relevant as an indicator of past price movements than the US PPI data.

It is important to note that this analysis of fibre optic price trends is based solely on historical data – CEG assumes that future trends will be influenced only by the past. Without suitable projections we therefore do not consider that CEG's methodology results in a forward-looking price trend for fibre optic cable.

Nevertheless we believe that this data is still useful to inform the Commission's choice of a price trend for fibre optic cable. In particular we note the close relationship between Chorus prices and the JCMA data, which suggests that the latter data series may have more relevance for a New Zealand HEO than the US PPI data. We suggest that the Commission consider both benchmark data and the JCMA series

Buildings

CEG assumes that the growth rate estimated by TERA for buildings represents a price index and states that the capital goods price index for non-residential buildings should be used instead. TERA's spreadsheet clearly states that the information relates to buildings projections (not a price index). As we previously noted⁹³, this growth rate does not appear to be used elsewhere in the model.

⁹³ Network Strategies Limited (2015), *Commerce Commission Draft Determination for UCLL and UBA: a review of key issues*, 20 February 2015, Section 6.2.

4.2 Inflation rate

We note that CEG offers two contradictory suggestions for a suggested value for the inflation rate (Consumer Price Index, or CPI). In its Executive Summary (and also in the summary of Section 3), CEG clearly states:

The price trend for CPI should be decreased from 2.18% to 2%, in order to be consistent with the Reserve Bank’s target average inflation over the medium term.⁹⁴

However in an emphasised paragraph in Section 3:

CEG proposes that the Commission use a price trend for CPI of 2.22%, based on the estimated price trend for the consumer price index using the trend rate of growth methodology between December 1989 and March 2019.⁹⁵

We will assume that CEG is recommending that the Commission use a CPI of 2%, given this is the value stated in its Executive Summary.

Both target inflation and forecast inflation are available from the Reserve Bank of New Zealand (RBNZ), however the two differ:

- target inflation – a long-term goal set by the central bank and used to set monetary policy
- forecast inflation – prediction of the future (typically short- to medium-term) inflation rate. Note that this figure frequently differs (often significantly) from the target inflation, due to expected short- and medium-term price fluctuations.

The RBNZ sets a target inflation rate of 1-3%. CEG chooses to refer to the midpoint of this range (2%) as “the Reserve Bank’s target average inflation”⁹⁶. According to the RBNZ the

⁹⁴ *Ibid*, paragraph 6.

⁹⁵ *Ibid*, paragraph 50.

⁹⁶ *Ibid*, paragraph 6.

average inflation over the period 2000 to 2014 was 2.7%, and average inflation over the period from 1990 to 2014 was 2.5%⁹⁷ – clearly both are above the target midpoint (Exhibit 4.1). This suggests that for the medium- to long-term, the target midpoint may not necessarily be appropriate for an inflation projection.

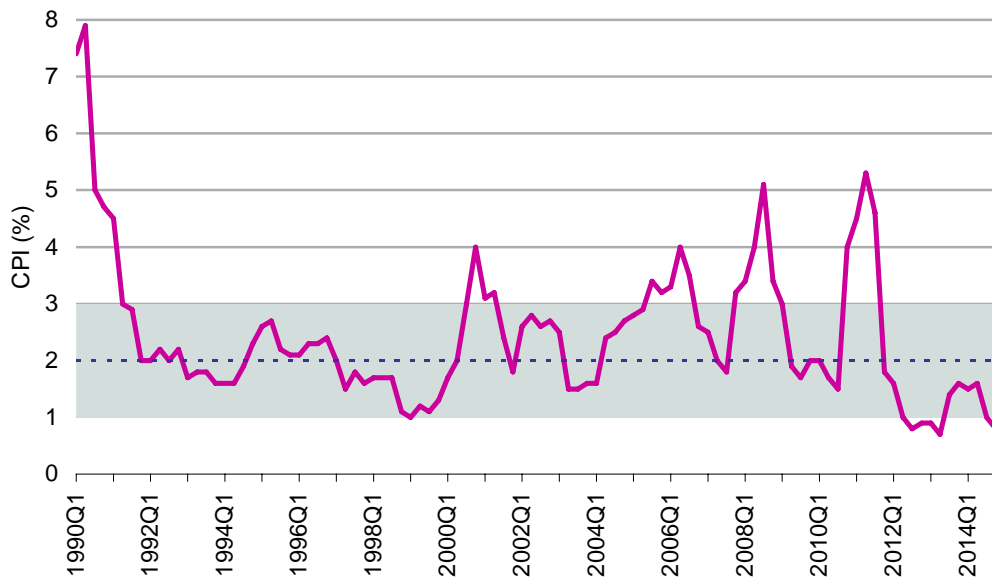


Exhibit 4.1: Consumer Price Index, 1990 to 2014 – the target inflation rate is shaded [Source: RBNZ]

We note that the latest RBNZ inflation forecasts⁹⁸, incorporating more recent data than those developed by NZIER for the Commission, are lower than the projections used in the Commission’s modelling (Exhibit 4.2).

⁹⁷ See http://www.rbnz.govt.nz/statistics/key_graphs/inflation/, accessed 6 March 2015.

⁹⁸ Reserve Bank of New Zealand (2015), *Monetary Policy Statement December 2014*.

<i>Year ending March</i>	<i>RBNZ</i>	<i>NZIER</i>
2013	0.9%	0.9%
2014	1.5%	1.3%
2015	1.1%	1.6%
2016	1.7%	2.3%
2017	2.0%	2.2%
2018	n.a.	1.9%
2019	n.a.	1.9%

Exhibit 4.2: CPI projections [Source: RBNZ, Commerce Commission]

We therefore agree with CEG that a reduction in the projected inflation rate used in the Commission’s modelling is warranted, but our reasoning differs from that of CEG – namely that the more recent data supports a reduction in the forecast, rather than the objective of setting the projection to be the midpoint target inflation rate. We consider that a 2% inflation rate would be appropriate.

4.3 Using Chorus service contract data

CEG suggests that useful information on price trends for operating costs could be found in Chorus’ service contracts with its three main contractors (Transfield, Downer and Visionstream) which include a formula for determining changes in prices over time. The formula includes four separate price indices, each with a weighting specific to the individual work item in the service contract.⁹⁹

We agree that this is useful information for the Commission as a comparator for its own price trends, however in undertaking any comparative analysis the Commission should note that:

- no information is provided on the time period covered by the contract, so it is unclear if it aligns with the regulatory period, or if these contracts are subject to re-negotiation at some point within this period

⁹⁹ *Ibid*, Appendix A.

- no information is provided on the date of contract commencement, so it is unclear whether the information is compatible with a current view of forward-looking prices
- it is unclear as to what proportion of Chorus' relevant costs are addressed by these three contracts
- it is uncertain whether the indices incorporate a premium due to resource constraints associated with the Christchurch re-build (noting also that the Commission appears to view this as inappropriate¹⁰⁰)
- CEG estimates a simple average of the weights applicable to the various ducting and trenching services in all three contracts, however this assumes that the share of work undertaken by each contractor is the same, and that there is an equal mix of the four work items quoted. A weighted average would be more appropriate.

4.4 Summary

CEG's analysis of price trends has provided some useful information, however we do not believe that it has provided sufficient compelling evidence for the Commission to replace its own price trend estimates with those of CEG.

- CEG's long-term estimates of price trends are not necessarily indicative of forward-looking prices, due to the strong emphasis on historical data – the past is not always a good indicator of future trends
- To construct data series of sufficient length for its analysis, CEG by necessity had to utilise data from differing sources or definitions, thus incorporating additional sources of error into the analysis – it is therefore questionable that the quality of the underlying data is sufficient to support CEG's more sophisticated analysis
- Data from the JCMA (and to a lesser extent, the US PPI) on fibre optic price trends will be useful to assist the Commission in determining a more robust estimate of an appropriate price trend, however as only historical data is available we recommend that the Commission also considers benchmark data used in the models of the Danish, Norwegian and Swedish regulators.

¹⁰⁰ Commerce Commission (2014), *Draft pricing review determination for Chorus' unbundled copper local loop service*, 2 December 2014, paragraph 157.

- We do agree with CEG that the inflation rate could be reduced slightly to 2%, however our analysis is based on recent data rather than CEG's use of the RBNZ's midpoint target inflation rate.
- Information from Chorus' service contracts will also be useful for the Commission, however more information is needed to be able to undertake a comparative analysis.

5 Aerial deployment

Chorus claims that the Commission’s model does not ‘account for commercial and legal realities which cannot be “assumed away” and which will result in the HEO incurring additional costs’¹⁰¹. Chorus concludes that the model overstates the feasibility of aerial deployment and does not account for a number of costs that the HEO would incur. In this Section we consider:

- when sharing is feasible (Section 5.1)
- the issue of consents (Section 5.2)
- the use of Chorus information (Section 5.3)
- omitted costs (Section 5.4).

5.1 When is sharing feasible?

The HEO is characterised by Chorus as engaging in a ‘joint build’:

...in which a new pole network is constructed and the costs of aerial deployment are shared equally between the HEO and electricity lines companies, with each taking the benefit of Chorus’ existing resource consents.¹⁰²

¹⁰¹ Chorus (2015), *Submission for Chorus in response to Draft Pricing Review Determinations for Chorus’ UCLL and UBA Access Services (2 December 2014) and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations (19 December 2014)*, 20 February 2015, paragraph 475.

¹⁰² *Ibid*, paragraph 474.

Chorus suggests that this scenario is unrealistic and that in the real world in fact the HEO would be confronted with an existing lines network and as such would need to engage in commercial negotiations with lines companies for access to existing infrastructure.

In our view, the HEO would inevitably end up sharing poles with electricity lines companies rather than undertaking a new joint build. In our view, modelling this “shared” scenario is more realistic than the Commission’s joint build approach.¹⁰³

Certainly an HEO would seek to share existing infrastructure but only where it made commercial sense to do so. It is also quite possible, as noted in our August 2014 report that in New Zealand an HEO deploying a widespread fibre network is most likely, on balance, to be a lines company (or a consortium of lines companies)¹⁰⁴ as illustrated by the fact that two lines companies obtained UFB contracts (Northpower and Ultra Fast Fibre) while a third local fibre company (LFC) is Enable, a council-owned company with access to public infrastructure.

Structure sharing is consistent with our recommendations regarding the deployment of FWA by the HEO – that it would share existing sites where available¹⁰⁵. It is also consistent with the real world evidence we provided in our more recent report on the Irish fibre deployment¹⁰⁶. However, based on empirical observations, we suggested that the Commission should consider whether sharing assumptions should extend further than the draft model assumptions.

As a cost minimiser, the HEO would seek to deploy aurally as much as possible as this method is far cheaper than undergrounding and takes much less time. NorthPower, which has deployed 60% of its UFB infrastructure aurally using existing poles, was the first LFC to complete its build. At a TUANZ presentation attended by Network Strategies staff in

¹⁰³ Chorus (2015), *Submission for Chorus in response to Draft Pricing Review Determinations for Chorus’ UCLL and UBA Access Services (2 December 2014) and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations (19 December 2014)*, 20 February 2015, paragraph 480.

¹⁰⁴ Network Strategies (2014), *Key issues in modelling UBA and UCLL services*, 6 August 2014. See section 2.5.

¹⁰⁵ Network Strategies (2015), *Modelling Fixed Wireless Access*, 20 February 2015.

¹⁰⁶ Network Strategies (2015), *Commerce Commission Draft Determination for UCLL and UBA*, 20 February 2015, see Section 5.2.

Auckland in 2014 Northpower stated that that its aerial deployment was critical to its success with fast installation at minimum cost. Key design considerations included leveraging from existing assets, and minimising the cost per customer passed. As such it considered all available options in terms of existing structures (including infrastructure owned by third parties) and compared the costs of access to these with the cost of building their own structure.

5.2 Consents

Chorus has devoted substantial attention to the impact of the Resource Management Act (RMA), planning and consent issues.

We have provided evidence in previous submissions of the real-world complexity of achieving aerial deployment in the context of modern planning regulations and limitations on access to aerial distribution networks maintained by electricity lines companies. The Commission appears to have “assumed away” much of this complexity and cost by adopting a simple hypothetical scenario in which the costs of aerial deployment are shared equally between the HEO and electricity lines companies, with each taking the benefit of Chorus’ existing resource consents.¹⁰⁷

Chorus notes that its existing consents do not cover all areas and thus in some towns and areas the HEO would be faced with the task of obtaining consents. Chorus describes its own aerial deployment ‘standard’ methodology or rules for areas where it has consents and recommends that “the Commission’s aerial deployment parameters should be amended to ensure that the HEO’s aerial build is compliant with such rules”¹⁰⁸. One of these rules is that ‘existing Chorus service poles may be replaced with a new pole within 2m and up to 1m higher, but no new poles may be installed’¹⁰⁹.

¹⁰⁷ *Ibid*, paragraph 30.

¹⁰⁸ *Ibid*, paragraph 487.3.

¹⁰⁹ *Ibid*, paragraph 487.2.

We note that the Ministry of Environment has recently released consultation documents on National Environmental Standards for Telecommunications Facilities (NESTF). The documents include an independent report which reviews how the RMA and different councils regulate the telecommunications infrastructure and installation activities¹¹⁰. The report examined the consent requirements of 54 local councils and found that the majority either permitted above ground cables, together with new poles and overhead cables, or permitted subject to specified conditions (Exhibit 5.1). It is certainly not the case that consents are required in every local council area.

	<i>Above ground cables (% of local councils)</i>	<i>New poles and overhead cables (% of local councils)</i>
Permitted	46%	33%
Permitted subject to conditions	21%	30%
Consent required	33%	37%

Exhibit 5.1: *Consent requirements – by percentage of local councils [Source: Jacobs SKM]*

While we agree that in the past ensuring compliance with local council policies for consents may have led to additional costs for operators in some regions, it is clear that in the future this situation will not apply. Government policy is to facilitate high-speed broadband deployment through amending the NESTF.

The existing NESTF covers only a small proportion of telecommunications facilities that are now being installed. As discussed in section 3, any other facility that falls outside the NESTF, such as most of the Ultra-Fast Broadband (UFB), Rural Broadband Initiative (RBI) and mobile infrastructure, is subject to district plan rules. If the status quo continues, then there will continue to be varying plan rules for this equipment across the country.

This creates significant costs and uncertainties for telecommunications operators seeking to roll out new services, or to extend their networks and improve the capacity of their services, using their right to occupy road reserves in providing utility services. This may in turn create barriers to new services, choice and competition between service providers. The

¹¹⁰ Jacobs SKM (2014), *Environmental Effects of Implementing Ultra-Fast Broadband and Mobile Infrastructure*, 6 May 2014.

costs may then be ultimately passed on to consumers. Therefore, maintaining the status quo is not considered to be an appropriate option for achieving the policy objective¹¹¹.

Under the proposed amendment aerial provisioning of telecoms cables (and associated ancillary equipment) by a telecoms operator will become a new permitted activity, subject to the following conditions¹¹²:

- no additional poles are to be installed in the road reserve
- aerial provisioning should use existing crossing and corridors
- no more than 30mm diameter of new cabling, including hybrid solutions
- relocation and/or replacement of poles where necessary may be up to 3 metres from the original location.

The proposed amendment also permits ongoing operation and maintenance of the network.

The Government has undertaken a preliminary cost-benefit analysis of the proposed amendments and found that they:

...would ensure that the objectives of the NESTF could be fully achieved to enable the delivery of the current communication infrastructure, including the development of the Ultra-Fast Broadband and mobile infrastructure.¹¹³

We understand that while a consultation process is currently active, the proposed amendments have been drafted with the input of industry. As such we recommend that the Commission does not attempt to capture historical differences in consenting practices district by district, nor should the Commission adopt Chorus' 'standard' methodology, but instead assumes for its forward-looking model that a consistent national standard is in place that permits aerial provisioning to facilitate high-speed broadband deployment.

¹¹¹ Ministry for the Environment, and Ministry of Business, Innovation and Employment (2015), *Proposed Amendments to the National Environmental Standards for Telecommunications Facilities*, March 2015.

¹¹² *Ibid*, see Appendix C.

¹¹³ *Ibid*, Section 8.

5.3 Use of Chorus information

Chorus claims that:

- the Commission's model assumption that poles are 4.5 metres high would not meet legal requirements
- the Commission has unrealistic deployment assumptions and a greater number of poles would be required to support the modelled network. Chorus notes that while the Commission bases its unit cost for distribution poles on lead-in poles of Chorus' network, these poles would not be structurally capable of supporting both telecoms and electricity.

As regards the legal requirements for pole heights in New Zealand the Telecommunications Act does indeed have a requirement that wires not interfere with road traffic with the specification that 5.5 metres or more meets this requirement. However this requirement relates only to wires that cross the road and for most of the distribution network this is simply not an issue. Thus 4.5 metre poles would in general be acceptable for telecoms plant alone, but if electricity wires are to be carried as well as telecoms plant then 5.5 metre poles would be required under the terms of electricity legislation.

With respect to the Commission's use of Chorus' lead-in pole unit costs for distribution poles, we understand that the majority of these poles are wooden and it may be the case that they would not support both telecoms and electricity wires. Hence the Commission should not rely exclusively on Chorus data for this purpose.

While Chorus considers that the Commission adopts unrealistic aerial deployment assumptions, it is important to note that Chorus' experience in UFB deployment may not reflect efficient practices. For example, the timing and geographical roll-out of the UFB initiative is not determined independently by Chorus but is subject to extensive stakeholder involvement. Furthermore, decisions that have been taken by Chorus will in part reflect the existence of a legacy network.

We recommend that the Commission, in seeking the most cost-effective options open to the HEO, considers other sources for aerial cost and deployment information such as NorthPower and Vector. We understand, for example, from Vector that, had it been

successful in its UFB bid, it planned to deliver UFB to approximately 45% of premises in Auckland using aerial fibre network. This would have used approximately 65% of Vector's 115 000 electricity poles. This information provides more reliable guidance to the Commission in relation to the HEO's strategy in Auckland than Chorus information.

5.4 Omitted costs

Chorus argues that costs have been omitted relating to 'pole inspection and other variable costs associated with operating an aerial network once the "joint build" is complete'¹¹⁴. In particular, Chorus claims that the Commission should include an allowance 'for the real-world costs that an HEO would incur relating to administration of pole sharing arrangements'¹¹⁵ such as pole inspection charges and application fees charged by electricity lines companies for the administrative costs associated with requests for access.

In the real-world, Chorus pays, and an HEO would pay, pole access charges, set by the lines companies at a commercial rate, together with supplementary charges relating to the sharing of infrastructure. ...

The Commission should adjust the cost reduction for shared aerial network to less than 100% to account for costs associated with network sharing, including pole inspection fees, which are not directly related to the cost of deployment, and which would be charged to an HEO.¹¹⁶

Chorus appears to be claiming that since it pays costs associated with sharing with electricity companies then so too must the HEO. As the HEO shares with utilities to defray expenses the arrangement is mutually beneficial and consequently no supplementary costs may be incurred by the HEO. In fact it would be most likely in these circumstances that the

¹¹⁴ *Ibid*, paragraph 475.1.

¹¹⁵ Chorus (2015), *Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' UCLL and UBA Access Services (2 December 2014) and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations (19 December 2014)*, 20 February 2015, paragraph 491.

¹¹⁶ *Ibid*, paragraphs 492 and 493.

other utilities would carry out their own inspections before agreeing to share and hence bear the cost.

If, however, the HEO seeks access to existing poles then the HEO would pay a “make ready” cost. This may include a charge for pole inspection to determine whether the structure can support the telecoms fibre. We understand that in reality where a pole is found capable of supporting additional plant but needs replacement on other grounds (for example, other safety issues) then the electricity company would pay for the replacement.

We note that EDBs typically have asset replacement plans which allow for regular upgrading and replacement of poles as part of their normal business operations. Consequently it is not surprising that Vector would have readily been able to use its existing poles for UFB deployment with limited requirements for pole replacement. In fact our understanding is that where asset replacement plans are in place all existing poles would be suitable for fibre deployment in terms of height and there would be no need to strengthen or replace any.

5.5 Summary

The Commission should identify the most cost-effective options for the HEO’s aerial deployment. The HEO would consider sharing with electricity networks in the deployment of its network where it is cost-efficient to do so. As the majority of plant on the poles would be electricity lines, an assumption of equal sharing of costs between the lines company and the HEO may be inappropriate.

The Commission should be wary of using both the incurred costs and the extent of aerial deployment by Chorus as benchmarks for the HEO. Chorus’ experience in UFB deployment may not reflect efficient practices and Chorus’ decisions will partly reflect the existence of a legacy network. To this end the Commission should review other sources for information such as NorthPower and Vector.

Finally, the Commission should not attempt to capture different consenting regimes for different regions in New Zealand. Rather, it should assume that the proposed national

environmental standards are adopted which are consistent with Government policy to support efficient and rapid high-speed broadband deployment.

6 Asymmetries and the uplift

The Commission has previously considered in detail the issue of the justification for and the quantum of an uplift to the WACC in the context of Part 4 regulation of electricity distribution businesses. However in the present context the Commission's draft decision was that an uplift to the WACC is inappropriate. Chorus has commissioned Professor Jerry Hausman¹¹⁷ and CEG¹¹⁸ to consider whether the Commission should consider uplifts in relation to both the WACC and the TSLRIC cost estimate.

6.1 Bias and the uplift

Both Professor Hausman and CEG consider that the Commission may have underestimated the TSLRIC price. Professor Hausman lists the following points of concern in this regard¹¹⁹:

- 50% discount on Chorus' operational expenditure
- 50% reduction on aerial deployment costs as a result of sharing with electricity businesses
- the inclusion of an allowance for capital contributions
- the assumption of constant demand.

¹¹⁷ Hausman, J.A. (2015), *Response to the Commerce Commission's Draft Determination on Uplift*, February 2015.

¹¹⁸ CEG (2015), *Uplift asymmetries in the TSLRIC price*, February 2015.

¹¹⁹ Hausman, J.A. (2015), *Response to the Commerce Commission's Draft Determination on Uplift*, February 2015, paragraph 49.

CEG makes an extraordinary statement that implies it is normal practice for regulators to apply an uplift on modelled TSLRIC prices, yet cites no overseas regulatory precedents in this regard.

...the Commission's implementation of TSLRIC cannot reasonably be described as 'generous' and does not provide a rationale to not implement a pricing uplift.¹²⁰

As evidence CEG refers to modelling choices and assumptions such as:

- the HEO capturing all copper and fibre demand, including LFC demand
- the use of a 'greenfields optimisation approach'.

We are uncertain as to why CEG considers that the Commission has applied a greenfields approach to optimisation. The Commission is quite clear about its use of the modified scorched node approach and furthermore this approach is commonly accepted regulatory practice.

We have adopted a modified scorched node approach for the modelled network. This approach is an orthodox approach in TSLRIC modelling and is more reflective of an incremental roll-out. We consider that basing the regulated price on modelling an approach that is compatible with an incremental roll-out is more likely to promote efficient investment. Accordingly, TERA has modelled an "optimally structured network" which is constrained by the existing number of nodes (exchanges) and their existing locations, and follows the road network.¹²¹

The Commission's decisions with respect to opex and aerial deployment costs simply reflect the universally accepted practice of regulators applying TSLRIC: they seek to derive efficient costs rather than inappropriately relying on the actual costs of the incumbent. The inclusion of an allowance for capital contributions is an attempt by the

¹²⁰ CEG (2015), *Uplift asymmetries in the TSLRIC price*, February 2015, paragraph 112.

¹²¹ Commerce Commission (2014), *Draft pricing review determination for Chorus' unbundled copper local loop service*, 2 December 2014, paragraph 289.1.

Commission to exclude the possibility of double recovery of costs by Chorus where it has already received subsidies.

As regards the Commission's constant demand assumption we have previously explained that in fact this leads to an extremely conservative scenario in which the impact of population growth or the availability of fibre services has been ignored over the relatively long five-year regulatory period. We estimated that costs per line may be inflated by around 9% as a result of this¹²².

We also identified a number of other model assumptions which indicate that the Commission's calculated point estimates in fact approach an upper bound rather than achieving the Commission's aim of achieving a mid-point estimate. In particular we highlighted:

- the use of P2P technology rather than GPON
- the use of the RBI to determine the FWA boundary
- the approach to fibre deployment within the RBI areas
- inefficient trenching costs
- the uneconomic extent of the HEO's fibre footprint
- potential underestimation of the RBI subsidy
- the use of Chorus' accounting lives.

Similarly we identified parameters in the WACC that would suggest that the Commission's estimate is above the mid-point. Our view is that the Commission should address these issues in order that any upward (or downward) bias is removed so that the final model estimate approaches a true mid-point, rather than attempting adjustments via an uplift. In any event a rationale for such an uplift must be proven to be justified. We note that this viewpoint is consistent with the Commission's thinking in respect to the WACC percentile for EDBs¹²³.

¹²² Network Strategies (2015), *Commerce Commission Draft Determination for UCLL and UBA*, 20 February 2015. See Section 2.

¹²³ Commerce Commission (2014), *Amendment to the WACC percentile for price-quality regulation for electricity lines services and gas pipeline services*, Reasons paper, 30 October 2014. See paragraph 4.26.

Both Professor Hausman and CEG take issue with the Commission's consultant, Professor Vogelsang, for his view that the Commission's failure to allow for the re-use of civil works amounts to an uplift on the estimated price. Both Professor Hausman and CEG note that the re-use of civil works is inconsistent with the application of a TSLRIC methodology. However neither comment on the European Commission's position on this issue.

Although endorsing TSLRIC as achieving cost recovery, the European Commission sees civil works as an asset category deserving special treatment in today's market and technological conditions in order to avoid cost over-recovery:

Unlike assets such as the technical equipment and the transmission medium (for example fibre), civil engineering assets (for example ducts, trenches and poles) are assets that are unlikely to be replicated. Technological change and the level of competition and retail demand are not expected to allow alternative operators to deploy a parallel civil engineering infrastructure, at least where the legacy civil engineering infrastructure assets can be reused for deploying an NGA network.

In the recommended costing methodology the Regulatory Asset Base (RAB) corresponding to the reusable legacy civil engineering assets is valued at current costs, taking account of the assets' elapsed economic life and thus of the costs already recovered by the regulated SMP operator. This approach sends efficient market entry signals for build or buy decisions and avoids the risk of a cost over-recovery for reusable legacy civil infrastructure. An over-recovery of costs would not be justified to ensure efficient entry and preserve the incentives to invest because the build option is not economically feasible for this asset category.¹²⁴

Professor Vogelsang's point is consistent with the underlying rationale of the European Commission's recommendation – that cost over-recovery would be expected if civil works are not regarded as a special category.

Professor Hausman and CEG both ignore the concerns of other regulators that TSLRIC outcomes may lead to cost over-recovery. In the case of Australia this has led to the

¹²⁴ European Commission (2013), *COMMISSION RECOMMENDATION of 11.9.2013 on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment*, 11 September 2013.

replacement of the TSLRIC methodology with the Regulated Asset Base (RAB) approach for regulated fixed line services. The ACCC cited¹²⁵ a number of reasons for considering that the TSLRIC approach might no longer be appropriate for Australian fixed line services, including the possible failure to capture previous depreciation of actual assets, leading to an over-recovery of cost when assets are revalued at optimised replacement cost.

We conclude that neither Professor Hausman nor CEG have presented a compelling case that the Commission has under-estimated the TSLRIC price. Our own review indicated that on balance it was far more likely that the Commission's estimate approaches an upper bound. In any event, even if the Commission has under-estimated the TSLRIC price this does not constitute a reason to apply an uplift. Rather, the Commission should amend its assumptions to deliver a mid-point estimate.

6.2 TSLRIC and investment incentives

Professor Hausman highlights the significant welfare gains to consumers and firms from new and improved telecoms services. We agree that in general investment in telecoms infrastructure may improve the quality of existing services, and will likely foster the development of new services, thereby improving consumer welfare.

According to Professor Hausman 'the use of TSLRIC prices will distort investment incentives by Chorus'¹²⁶. He fears that TSLRIC prices are likely to create disincentives for investment in the copper network, leading to adverse impacts on end-users as service quality degrades and outages increase. He argues that such outcomes outweigh the negative impact on consumers of 'somewhat higher prices'¹²⁷ although 'Chorus will still have increased investment incentives if the Commission provides an uplift to WACC or the

¹²⁵ Australian Competition and Consumer Commission (2010), *Review of the 1997 telecoms access pricing principles for fixed line services*, Draft Report, September 2010. See section 4.1.

¹²⁶ Hausman, J.A. (2015), *Response to the Commerce Commission's Draft Determination on Uplift*, February 2015, paragraph 21.

¹²⁷ *Ibid*, paragraph 19.

TSLRIC price'¹²⁸. Similarly CEG notes that 'the business case for investing in fault prevention would be improved with higher prices for the regulated service'¹²⁹.

Neither Professor Hausman nor CEG acknowledge that there are other influences at work on Chorus' incentives to invest apart from the TSLRIC price. Professor Hausman appears to ignore totally Chorus' obligations with respect to the supply of UCLL and UBA services, in addition to Chorus' contractual circumstances with respect to its legacy copper network. Chorus separated from its retail arm in 2011 in order to enter into a contractual arrangement with the Crown through Crown Fibre Holdings (CFH) to receive Government funding of \$929 million to deploy Ultra Fast Broadband (UFB) to Auckland, the eastern and southern parts of the North Island and much of the South Island. The terms of the Network Infrastructure Project Agreement (NIPA) include a commitment that Chorus will actively support the Government's UFB uptake objective of maximising connections to the UFB network¹³⁰. As such Chorus has undertaken to prioritise investment in fibre access and uptake while minimising ongoing copper investment in future business plans.

In other words, as a result of its own commercial choices Chorus does not have strong incentives to invest in the copper network (apart from in a minority of areas where it did not secure a UFB contract), regardless of any regulatory incentives. It does, however, have strong incentives to maximise returns from the legacy network. Network Strategies has previously undertaken detailed examinations of the economics of UFB and concluded that Chorus is likely to have underpriced its bid¹³¹. In addition to Crown funding, in 2011 Chorus estimated that the total cost of deploying the common elements of the fibre network in its UFB areas would be between \$1.4 billion and \$1.6 billion. In February 2013 Chorus amended this estimate to \$1.7 billion to 1.9 billion while more recently Chorus has refined its estimates to \$1.75 billion to \$1.80 billion¹³². As such a key plank of its financial strategy

¹²⁸ *Ibid*, paragraph 21.

¹²⁹ CEG (2015), *Uplift asymmetries in the TSLRIC price*, February 2015, paragraph 40.

¹³⁰ Crown Fibre Holdings (2011), *Network Infrastructure Project Agreement, Telecom New Zealand Limited and Crown Fibre Holdings Limited*, 24 May 2011. See Schedule 1.

¹³¹ Network Strategies (2013), *Review of the Telecommunications Act 2001: key issues*, 13 September 2013. See Section 4.

¹³² Chorus (2015), *Chorus Half Year Result, FY15*, 23 February 2015.

now is to maximise returns from the legacy infrastructure while minimising investment in it. Since tax-paying New Zealand consumers are already subsidising Chorus' investment in new fibre services, effectively Professor Hausman is requesting additional contributions by way of 'somewhat higher prices' for regulated copper services.

Professor Hausman compares the effect of regulation on investment in the EU with the United States:

... the EU Commission has recognized that insufficient investment in telecommunications infrastructure has created an economic problem which requires increased investment in broadband infrastructure and mobile technology.

This policy shift in Europe arising from decreased investment is similar to the outcome in the US where TSLRIC (TELRIC) regulation led to decreased investment. When the FCC changed its policy to exempt new internet infrastructure from price regulation, Verizon built its FTTH (FiOS) network and AT&T built its FTTN (U-verse) network, which provide high speed internet service to residential customers.¹³³

Professor Hausman points to the European Digital Agenda¹³⁴ and the drive to change the regulatory environment to foster investment in Europe, however he does not discuss the implications for costing wholesale copper access in New Zealand, with one exception. He makes the erroneous conclusion that since the European Commission has recommended a premium on the cost of capital for Next Generation Access services for higher risk the Commission should do so too since it has modelled a FTTH network¹³⁵. In 2010 the European Commission considered regulatory issues in relation to Next Generation Networks. In general cost-based pricing was supported but, noting the uncertainties

¹³³ *Ibid*, paragraphs 13 to 14.

¹³⁴ See <http://ec.europa.eu/digital-agenda/en/our-goals/pillar-iv-fast-and-ultra-fast-internet-access>.

¹³⁵ Hausman, J.A. (2015), *Response to the Commerce Commission's Draft Determination on Uplift*, February 2015, paragraph 37.

associated with such large and new investment, the European Commission recommended that regulators include a higher risk premium when setting access prices.¹³⁶

Investments into fibre depend for their amortisation on the take-up of new services provided over NGA networks in the short and medium terms. The costs of capital of the SMP operator for the purpose of setting access prices should reflect the higher risk of investment relative to investment into current networks based on copper¹³⁷.

It is clear that the recommended risk premium is in respect to costing fibre services, not legacy copper services as Professor Hausman appears to believe.

6.3 Risk from sunk investments and technological change

Professor Hausman claims that:

...the copper network might appear profitable in hindsight but that does not take into account the risk that the original investors took on when building the asset, that it would be stranded earlier by superior technologies as has occurred.¹³⁸

In New Zealand taxpayers were the original investors in the deployment of the copper network as the company was wholly State-owned at that time. Similarly New Zealand taxpayers are contributing to the current UFB deployment. The Government and Chorus entered into the Telecom separation arrangement and the UFB contract with a full understanding of the implications of the new fibre network for the legacy copper network, as well as the disruptive implications for other investors in copper infrastructure.

The Amendment Act 2011 required both UCLL and UBA prices to be geographically de-averaged three years after separation (December 2011). Furthermore, the Amendment Act

¹³⁶ European Commission (2010) *Commission Recommendation of 20 September 2010 on regulated access to Next Generation Access Networks (NGAs)*, 20 September 2010.

¹³⁷ *Ibid*, paragraph 23.

¹³⁸ Hausman, J.A. (2015), *Response to the Commerce Commission's Draft Determination on Uplift*, February 2015, paragraph 63.

also specified that UBA prices, which previously had been determined using retail-minus principles, were to be cost-based three years from separation. The implications of the latter change for Chorus were predictable. Indeed, Chorus identified at the time a risk that copper-based wholesale prices could be significantly below the contractually agreed fibre prices¹³⁹ with the change in regulatory regime. After many years of enjoying retail-minus UBA prices, UBA revenues would fall with the new cost-based pricing standard. With geographic averaging the UCLL price would increase in urban areas with price rises for urban end-users, thereby altering the business case for unbundling. Unbundlers were basically given a transitional period of three years to recoup their investments.

The legislative changes of 2011 were the result of a Government policy decision to invest in a new high speed broadband infrastructure for New Zealand. These changes, as demonstrated above, had commercial implications for both access providers and access seekers. As regards Chorus' situation, its decision to participate in the UFB bidding process signalled that it had taken into account potential 'stranding' of its existing legacy infrastructure. Moreover there is strong evidence that Chorus has more than recovered its original investment in copper. The fact that UBA pricing previously was based on retail-minus principles indicates that costs would have been over-recovered for many years. The extent of this over-recovery became clear once a cost-based international benchmark was estimated by the Commission.

Finally, Network Strategies was commissioned to review an independent analysis of Chorus' return on copper investment in the early stages of the Commission's price review. As such, Professor Hausman is mistaken in assuming that there is no empirical analysis to demonstrate Chorus' high copper profitability¹⁴⁰. Vector estimated the return that the Commerce Commission would determine, should Chorus' copper network be operating under price control as per Part 4 of the Commerce Act. Network Strategies conducted a peer review of Vector's model which was based on the Commission's Information Disclosure Schedule 2 ROI methodology.

¹³⁹ Telecom New Zealand Limited (2011), *Share in two journeys, Demerger of Chorus Limited by Telecom Corporation of New Zealand Limited*, 13 September 2011, see section 9.2.5.

¹⁴⁰ Hausman, J.A. (2015), *Response to the Commerce Commission's Draft Determination on Uplift*, February 2015, paragraph 63.

Vector calculates the Commission's initial pricing determinations would allow Chorus to extract 19 - 23% return on investment (ROI) from its copper network between 2014 and 2019. While it is important to ensure regulated suppliers are able to earn a reasonable return on their investment the Commission does not permit other regulated suppliers to earn returns of this size. The Commission applied a WACC of 8.77% (2009) for the electricity distribution default price-quality path (DPP) and 7.44% (2012) for gas pipeline services. The Commission also applies a WACC of 7.01 - 8% (for disclosure year 2014) in relation to Airports for information disclosure purposes.

Vector forecast Chorus' copper network returns by adopting the Commission's Information Disclosure Schedule 2 ROI methodology. Vector's modelling has been independently reviewed by Network Strategies to ensure the assumptions and methodology are reasonable.¹⁴¹

The implication of the Vector analysis is that Chorus is extracting excessive profits to the detriment of end-users.

6.4 The build or buy decision

Professor Hausman claims that the Commission's approach has led to a distortion of the build or buy decision by access seekers.

The Commission [*sic*] decision to use FTTH rather than FTTN as the basis to determine the UCLL TSLRIC price will distort investment decisions by access seekers. If WACC or TSLRIC is underestimated, access seekers will find it in their economic interests to purchase the regulated access to legacy copper-based UCLL service instead of building an alternative fiber-based network. This distortion of the build or buy choice is inconsistent with the section 18 of the Telecommunications Act purpose statement of promoting

¹⁴¹ Vector (2014), *Submission to the Commerce Commission on the Scoping and Issues Discussion Paper for UCLL TSLRIC*, 14 February 2014.

investment in alternative infrastructure, and in turn promoting competition for the long-term benefit of end-users.¹⁴²

Effectively, Professor Hausman argues, TSLRIC-based access prices give access seekers a ‘free option’:

... application of TSLRIC to investment creates asymmetric risk because it truncates returns at the top end of the distribution of investment returns because regulation gives an access seeker a “free option” to buy access at cost-based prices if the investment is successful but take no risk for sunk investments which are not successful.¹⁴³

Even if the Commission is to include an uplift on TSLRIC that would deter purchasers of regulated copper access, Professor Hausman does not explain what commercial incentives exist in New Zealand to build an alternative fibre-based network, given the existence of the UFB. In fact it would be extremely difficult for an alternative network provider to establish a viable business case for a large scale fibre network in view of the UFB initiative.

In support of his arguments Professor Hausman refers to his own research from the 1990s and 2014 which focussed primarily on mandatory local loop unbundling. We note that Professor Hausman’s 2014 reference is in fact a reprint in a book of an article he first presented at a conference in 2005 and subsequently revised in 2007¹⁴⁴. That article discusses the decision of the New Zealand Commerce Commission not to mandate unbundling in 2003. It includes some commentary on telecoms prices and investment at the time, purported to illustrate that even in the absence of mandatory unbundling ‘New Zealand is in the forefront of video over the fixed-access network’, and that ‘prices for telecommunications services in New Zealand have not increased substantially’¹⁴⁵ (from 1999 to 2004). Clearly the evidence did not support Professor Hausman’s observations as in 2006 a raft of new measures were enacted (including mandatory unbundling) to address

¹⁴² Hausman, J.A. (2015), *Response to the Commerce Commission’s Draft Determination on Uplift*, February 2015, paragraph 6 vi.

¹⁴³ Hausman, J.A. (2015), *Response to the Commerce Commission’s Draft Determination on Uplift*, February 2015, paragraph 24.

¹⁴⁴ Hausman, J.A. and J. Gregory Sidak (2007), *Telecommunications Regulation: Current Approaches with the End in Sight*, Revised October 2007.

¹⁴⁵ *Ibid*, page 61.

issues of broadband affordability and uptake that were negatively affecting economic growth in New Zealand.

Professor Hausman cites Guthrie’s 2005 article on investment and regulation to support his position. However Guthrie’s main focus is on the United States (with no mention of New Zealand, although Guthrie is a New Zealand economist from Victoria University) and no relevant empirical evidence is provided. In fact he concludes:

Almost ten years have passed since the Telecommunications Act transformed telecommunications regulation in the US and economists still do not have a thorough understanding (theoretically or empirically) of how local loop unbundling affects investment.¹⁴⁶

6.5 Copper to fibre migration

CEG argues that the Commission should encourage migration from copper to fibre and ‘high copper prices will contribute to increased [copper to fibre] migration which will spur significant benefits’¹⁴⁷. CEG asks that the Commission considers ‘the absolute level of copper prices’¹⁴⁸ since the current relativity of the Commission’s draft price and UFB prices may change ‘absent a concrete proposal as to how fibre prices will be set in the future’¹⁴⁹.

It is not the Commission’s role to set relativities between copper and UFB prices, or to set ‘high copper prices’ as a way of ensuring that copper prices will always exceed UFB prices, whatever they may be in the future. Furthermore, if it attempted to do so, the Commission would face a similar problem as seeking to encourage unbundling through this

¹⁴⁶ Guthrie, G. (2005), *Regulating Infrastructure: The Impact on Risk and Investment*, 7 October 2005, page 54.

¹⁴⁷ CEG (2015), *Uplift asymmetries in the TSLRIC price*, February 2015, paragraph 48.

¹⁴⁸ *Ibid*, paragraph 52.

¹⁴⁹ *Ibid*.

price review – that is, it might not achieve the objective and the outcome may simply be a wealth transfer with end-users paying more. As the Commission notes:

... the migration to fibre is affecting access seekers' investment intentions in a way that means that we cannot be sure that any incentives we attempt to introduce through these pricing review determinations in favour of unbundling will in fact lead to unbundling, or will instead simply result in end-users paying more¹⁵⁰.

So what will be the impact of higher prices? Even though the take-up of broadband in New Zealand is slightly higher than the OECD average (Exhibit 6.1), our analysis indicates that affordability represents a significant barrier to further growth in the market¹⁵¹. We found that much of the growth in the broadband market over the past few years has been due to subscribers switching from dial-up services, however as this avenue for service providers is closing, broadband penetration will only increase by targeting lower income market segments (annual household income up to NZD70,000) – there is little room for growth elsewhere. The level of entry level prices will be critical for this market segment.

¹⁵⁰ Commerce Commission (2014), *Draft pricing review determination for Chorus' unbundled copper local loop service*, 2 December 2014, paragraph 473.

¹⁵¹ Network Strategies (2013), *Review of the Telecommunications Act 2001*, 13 September 2013. See Section 5.2.

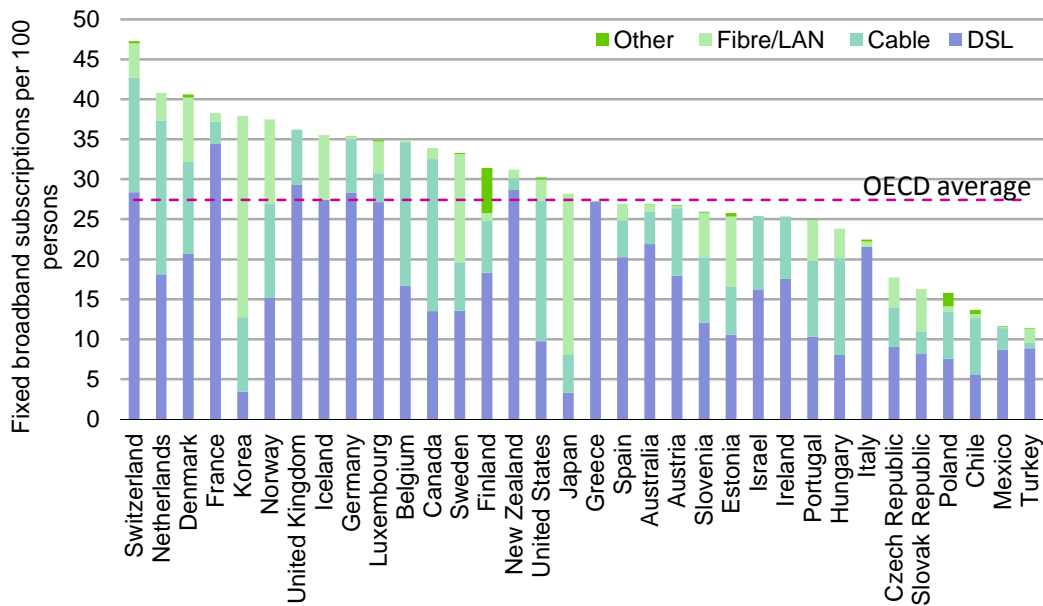


Exhibit 6.1: Fixed broadband penetration for OECD countries, June 2014 [Source: OECD]

6.6 Empirical analysis

The rationale for an uplift of the WACC from the midpoint to the 75th percentile comes from the IMs for electricity distribution and gaslines. In these instances, the Commission’s analysis found that the costs to consumers of under-estimating the WACC were higher than from over-estimating the WACC.

The choice of the 75th percentile was, as noted by the Commission, based on judgement. After its recent review of the WACC¹⁵², the Commission has reduced this to the 67th percentile.

It should be noted that the assumptions used in the Commission’s analysis were relevant for the electricity industry, not the telecommunications industry – in particular within an

¹⁵² Commerce Commission (2015), *Amendment to the WACC percentile for price-quality regulation for electricity lines services and gas pipeline services*, 30 October 2014.

environment where Chorus has limited incentive to invest in the copper network. Therefore there is no firm evidence to support whether an uplift for a fixed-line telecommunications WACC is justified, nor what that uplift should be.

Nonetheless, in order to estimate the uplift between the midpoint and the 75th percentile, CEG uses a Monte Carlo analysis to simulate the distribution of the WACC given assumed distributions of its parameters.¹⁵³ This Monte Carlo analysis is based on the assumptions used by the Commission for its cost of capital determination for electricity distribution businesses (EDBs) and Transpower.¹⁵⁴ Given that the same assumptions were used, it is not surprising that CEG's Monte Carlo analysis obtained a similar result to the Commission's mathematical workings.

However, while these assumptions may be applicable for EDBs, it does not follow that the assumptions should also apply to the problem of deriving a WACC for the HEO. The WACC parameters for UCLL and UBA were based on a different sample of companies, and so the sample means and standard errors will differ from those of the samples used to derive the EDB WACC parameters.

If these assumptions differ, then the WACC's statistical distribution will also differ. Hence CEG's estimation of the difference between the 75th percentile and the median based on the EDB assumptions would be incorrect.

The assumptions used by CEG for its Monte Carlo analysis are:

- the tax-adjusted market risk premium (TAMRP) is normally distributed with a mean of 0.07 and a standard deviation of 0.015
- the equity beta is normally distributed with a mean of 0.61 and a standard deviation of 0.2350
- the debt premium is normally distributed with a mean of 0.0165 and a standard deviation of 0.0015

¹⁵³ CEG (2015), *Uplift asymmetries in the TSLRIC price*, February 2015, section 6.2.

¹⁵⁴ Commerce Commission (2014), *Cost of capital determination for electricity distribution businesses' default price-quality paths and Transpower's individual price-quality path [2014]* NZCC 28, 31 October 2014.

- the TAMRP, equity beta and the debt premium are statistically independent¹⁵⁵
- neither the risk-free rate nor leverage have associated uncertainty.

Choice of distribution

The TAMRP, equity beta and debt premium are all assumed to be normally distributed. In reality, these variables would all have truncated distributions, with a minimum value, and one-sided tail. The lower bound for the minimum value would be zero, but the minimum may in fact have a positive, non-zero value.

A normal distribution could be a reasonable proxy for a truncated distribution, however this depends upon the characteristics of the variable – for example the coefficient of variation (the ratio of the standard deviation to the mean). If the coefficient of variation is small, then a normal distribution might be appropriate; if large, then a truncated distribution should be considered.

While CEG has assumed values for the means and standard errors, as we discuss below these are not appropriate for a telecommunications business, and thus it is not possible to assess whether or not CEG's assumption of normality is reasonable.

Note that a Monte Carlo analysis should be able to cope with non-normally distributed variables.

Are the variables independent?

It is often assumed for convenience that financial variables are independent, however in reality there is often some degree of correlation. For example, there is a relationship between leverage with the TAMRP and beta which means that if (as we discuss below) variation in leverage is being modelled, the independence assumption is invalid.

¹⁵⁵ Two variables are statistically independent if the value of one does not affect the value of the other. If two variables are independent, then they are uncorrelated, but note that uncorrelated variables are not necessarily independent.

Constant terms CEG assumes that the risk-free rate and the leverage do not have associated uncertainty.

Leverage for the EDBs, as well as in the Commission's Draft Determination, was estimated from a sample of firms. In the case of the Commission's Draft Determination, the sample was Oxera's refined comparator sample.

As leverage is estimated from a sample, there is a sample mean and standard error, and thus we conclude that there is definitely uncertainty associated with this parameter. A Monte Carlo analysis that does not include this source of variation will be flawed.

Statistical parameters

The means used by CEG in its Monte Carlo analysis differ from the values of the parameters in the Draft Determination (Exhibit 6.2). CEG's values are determined for the price-quality paths for EDBs, not for the HEO, and they differ because they are based on different sample data. We would expect the parameters for EDBs to differ from those for a fixed-line telecommunications business. A Monte Carlo analysis should therefore use parameters based on relevant data for its simulation – that is, the means should reflect those values used in the Draft Determination.

Similarly, the values used for the standard errors also relate to the sample used for EDBs, and thus the latter will not be appropriate for the HEO. A Monte Carlo analysis should use standard errors based on the data used to estimate the WACC parameters for the HEO, not the data for EDBs.

	<i>Draft Determination</i>	<i>CEG Monte Carlo analysis</i>
TAMRP	7.0%	7.0%
Equity beta	0.70	0.61
Asset beta	0.40	0.34
Debt premium	1.85%	1.65%
Risk-free rate	4.19%	n.a.
Leverage	43%	44%

Exhibit 6.2:

Comparison of WACC parameters

[Source: Commerce Commission, CEG, Network Strategies]

We note that the values for the standard errors of the TAMRP and equity beta are not specified within the cited source¹⁵⁶. CEG states that the standard error for the equity beta is based on that for the asset beta divided by $(1 - \text{leverage})$, however the cited source does not specify the standard error of the asset beta.

These values for the TAMRP and asset beta standard errors are contained in a 2010 Commission paper¹⁵⁷, which suggests that they are not based on recent data, and thus a sample of more up-to-date data may give a different result.

We therefore conclude that the statistical distribution derived through CEG's Monte Carlo analysis does not reflect that of the HEO's WACC. Subsequently CEG's estimate of the difference between the 75th percentile and the median is fatally flawed.

6.7 Summary

The TSLRIC approach to wholesale access costing has come under considerable scrutiny in recent years by policy-makers, regulators, service providers and academics. Professor

¹⁵⁶ Commerce Commission (2014), *Cost of capital determination for electricity distribution businesses' default price-quality paths and Transpower's individual price-quality path [2014]* NZCC 28, 31 October 2014.

¹⁵⁷ Commerce Commission (2010), *Input Methodologies (Electricity Distribution and Gas Pipeline Services) Reasons Paper*, December 2010, Table 6.4.

Hausman presents a very one-sided and incomplete discussion of the issues inherent in adopting this approach, concluding with the sweeping statement that ‘it has been widely recognized as creating regulatory disincentives to new investment’¹⁵⁸ and as such an uplift is required. He shows little appreciation of current New Zealand market conditions, including the implications for Chorus, unbundlers and access seekers of the change in legislation in 2011 to accommodate the national UFB initiative.

CEG asks that the Commission errs on the high side in order to incentivise Chorus to invest in the copper network, and consumers to shift to fibre services, and in order to ensure that Chorus is ‘effectively’ compensated for potential regulatory stranding, technological and competitive stranding and catastrophic risk. In reality Chorus’ contractual UFB obligation requires it not to invest further in copper in most parts of the country. We have previously examined the stranding issues and concluded that a firm should not be compensated for normal business risk or for investments that have already been recovered¹⁵⁹. Furthermore, while Chorus should be adequately compensated for its copper investment there are other influences at work on Chorus’ incentives to invest apart from the TSLRIC price which constrain future investment in copper-based services so that an uplift on the TSLRIC mid-point would simply drive welfare losses for end-users via higher prices and impede further fixed broadband uptake. The extent to which these consumer welfare losses might be outweighed by potential gains from increased fibre uptake is unclear.

Our analysis of CEG’s empirical analysis found that the resultant estimate of the difference between the 75th percentile and the median is invalid for use in for the UCLL and UBA process due to inappropriate assumptions that do not reflect the characteristics of a fixed-line telecommunications business.

¹⁵⁸ Hausman, J.A. (2015) *Response to the Commerce Commission’s Draft Determination on Uplift*, February 2015, paragraph 24

¹⁵⁹ Network Strategies (2015), *Commerce Commission Draft Determination for UCLL and UBA*, 20 February 2015. See Section 7.

7 Other issues

7.1 Demand

Over the past two years, total fixed connections have remained virtually static (Exhibit 7.1), however this shows clear evidence of a changing mix in the type of connection.

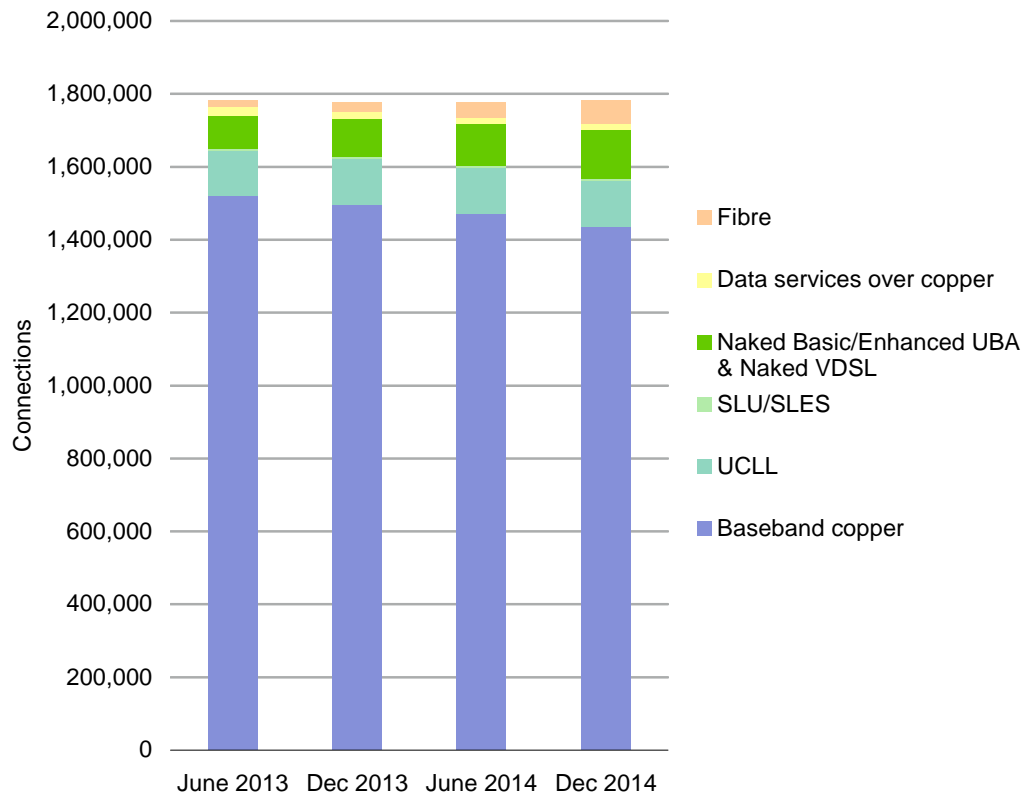
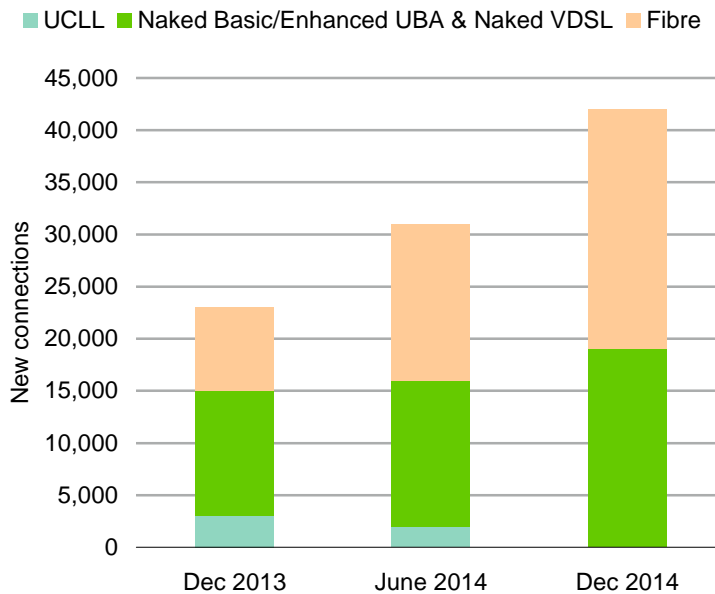


Exhibit 7.1: Fixed line connections, June 2013 to December 2014 [Source: Chorus investor presentations]

While baseband copper lines have been declining over this period, there has been strong growth in both UBA and fibre – indeed the growth in new UBA connections since June 2013 is only slightly less than the number of new fibre connections – 45 000 and 46 000 new connections respectively – and growth has increased over this period (Exhibit 7.2).

**Exhibit 7.2:**

*New connections,
December 2013 to
December 2014
[Source: Chorus
investor
presentations]*

This provides further evidence that the Commission’s constant demand scenario may be inappropriate.

Chorus claims that demand for the hypothetical efficient operator (HEO) should exclude the LFC areas as this delivers greater economies of scale than can be achieved by Chorus.¹⁶⁰

We emphasise that this determination is for the UCLL and UBA services, which Chorus offers nationwide – including in the LFC areas – over its copper network.

If demand in the LFC areas was excluded, then the HEO would have a network footprint smaller than that of Chorus’ copper network and thus the economies of scale it could achieve would be less than those of Chorus. The resultant cost of the UCLL service would be inflated.

¹⁶⁰

Chorus (2015), *Submission for Chorus in response to Draft Pricing Review Determinations for Chorus’ Unbundled Copper Local Loop and Unbundled Bitstream Access Services (2 December 2014) and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations (19 December 2014)*, 20 February 2015, paragraph 297.

Chorus' fibre footprint – which does not include the LFC areas – is of no consequence to the estimation of prices for unbundled copper.

7.2 Treatment of capital cost

The Commission has excluded certain capital costs from the model to allow for a situation in which the HEO receives a “capital contribution”, either from the end customer or some other source.

For connections outside the Commission's TSO-derived investment boundary the demand and operating costs are included within the model, but the capital costs are excluded. These capital costs for the HEO are assumed to be fully offset by a capital contribution by the end-user. The rationale for this approach is the recognition that without such a capital contribution it would be uneconomic for the HEO to provide a service, and furthermore that the HEO has no obligation – via the TSO – to provide a service. In other words, as the HEO is an economically efficient operator, there would be no service in the absence of the capital contribution.

However Chorus does not appear to have understood how an efficient operator would treat such services:

... the Commission should not exclude capital costs from the TSLRIC model on the basis that those costs will be notionally recovered through a hypothetical capital charge which does not actually form part of the price for the service.¹⁶¹

The Commission's logic is quite clear:

- the model includes services outside the TSO-derived boundary
- such services are, by definition, uneconomic and the HEO has no obligation to provide them

¹⁶¹ Chorus (2015), *Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' UCLL and UBA Access Services (2 December 2014) and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations (19 December 2014)*, 20 February 2015, paragraph 95.

- as the HEO is efficient, therefore some contribution must be received for it to deliver the services
- the model must therefore take this contribution into account otherwise the HEO would be compensated twice for the cost of these services (via the cost model and via the contribution).

Chorus states that it has an obligation under Section 30S of the Act to provide a UCLL or SLU service on request, however it does not provide any information on how many such services are outside the TSO boundary. Nonetheless, this situation would not necessarily preclude payment of a capital contribution in cases where the service is uneconomic.

Analysys Mason notes that the Commission assumes that there will be no capital costs incurred for those assets that receive capital contributions – even when the assets are replaced at the end of their lifetimes.¹⁶² It would be inappropriate to require further capital contributions in this instance. Clearly this is not a material issue for most of the network assets as they have lifetimes beyond that of the regulatory timeframe, however it is a consideration for those assets that are replaced within the model timeframe.

There are several approaches to addressing this problem. Analysys Mason's suggestion is that the capital contribution be treated as an asset in its own right, with a negative capital cost and a long lifetime (that is, beyond the required timeframe). However we note that it would be important to check that any associated depreciation is treated correctly. Another approach would be to treat the capital contribution as an incoming cashflow.

¹⁶² Analysys Mason (2015), *UCLL and UBA FPP draft determination submission*, 20 February 2015, Section 2.2.

8 Concluding remarks

Chorus and its consultants claim that material omissions and oversights have occurred in the Commission's draft UCLL and UBA pricing decision, as well as errors of judgement.¹⁶³ We have examined these claims focussing on FWA, aerial deployment, price trends, WACC and asymmetries.

Are the Commission's assumptions appropriate for FWA?

- Even a 20% increase in throughput (from the Commission's constant throughput assumption) would represent an over-generous allowance since a significant proportion of customers are voice-only customers who are not using the full capacity of the service.
- Chorus' concern with potential coverage problems that may arise for existing base stations has been addressed with the RF planning (performed for our cost model) which adds extra base stations and repeaters to ensure that adequate signal strength is received by all customers. The costs of these base stations and repeaters have been included in our FWA cost model results.
- The Chorus suggestion that the spectrum price should be corrected upwards is entirely unrealistic for an HEO who will be providing only FWA services and in limited geographic areas.

¹⁶³

Chorus (2015), *Submission for Chorus in response to Draft Pricing Review Determinations for Chorus' UCLL and UBA Access Services (2 December 2014) and Process and Issues Update Paper for the UCLL and UBA Pricing Review Determinations (19 December 2014)*, 20 February 2015, pages 6 to 10.

Has the Commission applied inappropriate assumptions for aerial deployment?

- The model should only encompass costs that an HEO would actually incur in the provision of these services – these do not include additional costs for CPE and the core network.
- The extent of aerial deployment should not be based on Chorus’ actual or UFB targets as observable behaviour in New Zealand supports significantly higher use of aerial structure in fibre deployment, including extensive use of existing poles without the need to upgrade or replace
- The Commission has not omitted costs for different consenting regimes in New Zealand. The proposed national environmental standards should be assumed as these are consistent with Government policy to support efficient and rapid high-speed broadband deployment and are thus appropriate for forward-looking costs.
- The HEO would consider sharing with electricity networks in the deployment of its network where it is cost-efficient to do so. As the majority of plant on the poles would be electricity lines, the Commission’s assumption of equal sharing of costs between the lines company and the HEO may be inappropriate.

Is the Commission’s WACC estimate consistent with benchmarking evidence?

Chorus requests that the Commission reconsider its WACC estimate in the light of international benchmark evidence. However the difficulties inherent in comparing WACCs across jurisdictions make it problematic to draw meaningful conclusions from international comparisons. With respect to the individual parameters of the WACC no new information has been presented by either Chorus or its consultants that would support a substantive change in the Commission’s draft approach.

Should the Commission adjust WACC or the TSLRIC price for asymmetries

Chorus suggests that WACC estimation error should be addressed through selection of a higher percentile than the mid-point WACC, while an uplift on the TSLRIC estimate is required ‘to address residual asymmetric consequences of estimating the TSLRIC price too low’. We recommend that the Commission ensures that its

assumptions deliver a mid-point estimate in the case of both WACC and the TSLRIC estimate. An uplift should not be introduced as a means of correcting upward or downward bias. Furthermore, we demonstrate that an uplift is likely only to drive losses in consumer welfare as the opportunities for incentivising copper investment by Chorus are extremely limited in the UFB world.

Is there a case to replace the Commission's price trends?

While Chorus' consultant has provided some useful information, it has not provided sufficient compelling evidence for the Commission to replace its own price trend estimates. Our analysis indicates that the Commission should consider reducing its inflation rate assumption slightly to 2%.

Is the Commission's demand scenario appropriate?

Chorus asks that the Commission reconsiders the inclusion of LFC demand on the grounds that its inclusion delivers greater economies of scale than can be achieved by Chorus. However if demand in the LFC areas was excluded, then the HEO would have a network footprint smaller than that of Chorus' copper network and thus the economies of scale it could achieve would be less than those of Chorus.

Chorus' own data illustrates that there has been strong growth in both UBA and fibre in the last two years which suggests that a constant demand scenario may be inappropriate.